

## Wasit University



First Cycle – Bachelor's Degree (B.Sc.) – Food Science

Bachelor of Science (B.Sc.) in Food Science

---



## Academic Program Description Form

**University:** University of Wasit

**College/Institute:** College of Agriculture

**Scientific Department:** Department of Food Science

**Academic or Professional Program:** Bachelor's Program in Food Science

**Final Degree Awarded:** Bachelor of Science in Food Science

**Study System:** Bologna Process

**Date of Description Preparation:** 2 November 2025

**Date of Form Completion:** 10 March 2026

**Head of Department:** Prof. Dr. Haider Naji Rasan

**Date:** 10 March 2026

**Signature:**

Handwritten signature of Prof. Dr. Haider Naji Rasan in Arabic.

**Associate Dean for Scientific Affairs:** Assist. Prof. Dr. Wissam Thamer Jabbar

**Date:** 10 / 3 / 2026

**Signature:**

Handwritten signature of Assist. Prof. Dr. Wissam Thamer Jabbar. Printed text: Assist. Prof. Wisam Thamer Jabbar Al-Mayah, Dean Assistant for Scientific Affairs.

**Reviewed by**

**Quality Assurance and University Performance Division**

**Director of the Quality Assurance and University Performance Division:**

**Date:** 10 / 3 / 2026 Hibat Allah A. Hussein

**Signature:**

Handwritten signature of Hibat Allah A. Hussein. Printed text: Assist. Prof. Hibaat Allah A. Hussein.

**Approved by the Dean**

**Assist. Prof. Dr. Hakeem Sultan Abd**

**Dean of the College**

# Table of Contents | جدول المحتويات

---

1. Mission & Vision Statement
2. Program Specification
3. Program (Objectives) Goals
4. Program Student learning outcomes
5. Academic Staff
6. Credits, Grading and GPA
7. Modules
8. Contact

## 1. Mission & Vision Statement

### *Vision Statement*

To be a leading center of excellence in food science education, research, and innovation, dedicated to enhancing food quality, safety, nutrition, and sustainability for the betterment of society and global well-being.

### *Mission Statement*

- Provide high-quality education that equips students with the scientific knowledge and practical skills necessary for careers in the food industry, research, and public service.
- Advance scientific research in food safety, processing, preservation, nutrition, and biotechnology to meet current and future challenges in food systems.
- Promote collaboration with industry, government, and communities to ensure the development of safe, nutritious, and sustainable food products.
- Foster innovation, critical thinking, and lifelong learning among students and professionals in the field of food science.

## 2. Program Specification

|                      |                       |                              |           |
|----------------------|-----------------------|------------------------------|-----------|
| <b>Program code:</b> | BSc-FS                | <b>ECTS</b>                  | 240       |
| <b>Duration:</b>     | 4 levels, 8 Semesters | <b>Method of Attendance:</b> | Full Time |

**Food Science is an exciting and interdisciplinary subject that draws from chemistry, biology, engineering, and nutrition to understand the nature of food, its processing, preservation, and impact on human health.** The emphasis of the program is on the entire food system—from the molecular composition of food components to the technology used in production and quality assurance, and to consumer behavior and food safety. This degree attracts students with a wide range of interests; for some, it's the applied scientific aspect that appeals, while for others, it's a step toward specialization in food product development, quality control, or nutrition. All students have the opportunity to transfer onto our specialist degrees in Food Safety, Nutrition, or Food Technology at the end of the first year.

**Level 1 introduces students to the fundamental principles of food science**, providing a solid foundation for all programs within the Food Science degree group. Core topics specific to the chosen program are explored in Level 2, preparing students for more advanced, research-led specialist modules at Levels 3 and 4. Graduates of the Food Science program are thus trained to appreciate the importance of evidence-based learning and how research drives innovation in food science, in alignment with the University and School's Mission Statements.

**From Level 2 onward, students can tailor their education by selecting from a variety of modules**, ensuring a balanced understanding of food science topics such as food chemistry, microbiology, sensory analysis, food engineering, and functional foods. This structure allows students to develop their own academic interests while still meeting the expected breadth and depth of knowledge required for a food science graduate. Module selection is made with the guidance of academic and personal tutors.

**The research ethos is integrated from the beginning**, through hands-on laboratory work embedded in lecture modules, dedicated practical sessions, research seminars, and small group tutorials. There is a compulsory food-related field trip or industrial visit in Level 1, which students must complete to progress to Level 2, along with optional field or industry-based experiences in Levels 2, 3, and 4. At Level 4, all students complete an independent research project, which may be a literature-based study, data analysis, or an experimental project carried out in a laboratory, food industry setting, or pilot plant.

**Academic tutorials in Levels 1 and 2 are led by the same tutor**, who also serves as the personal academic advisor, ensuring continuity and personalized support. Tutorials include workshops to build essential skills such as scientific writing, data analysis, and presentation techniques, followed by assessed tasks like essays, project proposals, or seminar talks, providing students with a platform to develop and demonstrate these skills in a food science context.

**International study opportunities and industrial placements** are available to students, with personalized support to match individual goals and professional aspirations. These placements help bridge the gap between academic learning and real-world applications, further enriching the educational journey in the Food Science Department.

### 3. Program Objectives

1. **Providing Quality Education:** Equipping students with the knowledge and skills necessary to work in the fields of food science and technology.
2. **Scientific Research:** Promoting applied scientific research to solve problems related to the food industry and improve food quality and safety.
3. **Industry Development:** Supporting the local food sector through scientific innovations and the application of modern technologies.
4. **Collaboration with Institutions:** Enhancing partnerships with academic, industrial, and community institutions to improve food products and meet market needs.
5. **Sustainable Development:** Contributing to environmental and social sustainability by developing eco-friendly food manufacturing practices.

### 4. Student Learning Outcomes

The learning outcomes in the Food Science Department at the College of Agriculture focus on equipping students with the knowledge and skills necessary to understand and apply food science concepts, and to analyze and evaluate the quality and safety of food products. These outcomes are achieved through:

1. **Theoretical Understanding of Food Components:** Understanding the chemical composition of foods, including carbohydrates, proteins, fats, vitamins, and minerals, and how they affect food quality and safety.

2. Practical Application of Food Analysis Techniques: Gaining the ability to use laboratory techniques to analyze various food components, such as chemical and microbiological analysis and quality testing.
3. Awareness of Food Safety Concepts: Understanding food safety standards and procedures and how to assess risks associated with microbial or chemical contamination, including the application of Hazard Analysis and Critical Control Points (HACCP) systems.
4. Knowledge of Food Processing: Understanding fundamental food processing operations such as drying, freezing, canning, and fermentation, and how these processes impact food quality.
5. Food Product Development: Learning how to design and develop new food products that align with market needs while considering health and nutritional aspects.
6. Quality Management in the Food Industry: The ability to implement quality management systems such as ISO and HACCP to ensure food product safety and sustainability.
7. Sensory Analysis of Foods: The ability to perform sensory evaluation of food products in terms of taste, smell, texture, and appearance, and to use this data to improve product quality.
8. Sustainability and Modern Technologies in Food Science: Understanding the impact of modern technologies such as nanotechnology, smart packaging, and industrial microbiology on the sustainable development and improvement of food products.
9. Professional Ethics: Promoting awareness of the importance of adhering to ethical and professional standards in the production, processing, and distribution of food.
10. These learning outcomes prepare students for various careers in the food industry, food safety, research and development, as well as in regulatory bodies

## 5. Academic Staff

Hyder Najy Al Zobaidy | Ph.D. in Food Science | Professor  
Email: hynajy@uowasit.edu.iq

Mobile no.: +9647719697259

---

Abdulaal Farhan | Ph.D. in Food Science | Assistant Prof.

Email: abfarhan@uowasit.edu.iq

Mobile no.: +9647714714176

---

Muhsin F. Al Quraishi | Ph.D. in Food Science | Assistant Prof.

Email: mufalih@uowasit.edu.iq

Mobile no.: +9647734404704

---

Suhad K.R. Al-Magsoosi | Ph.D. in Food Science | Assistant Prof.

Email: skareem@uowasit.edu.iq

Mobile no.: +9647740222471

---

Hamid W. Ibraheem | Ph.D. in Food Science | Lecturer

Email: hamidwafeeq@uowasit.edu.iq

Mobile no.: +9647819833654

---

Huda M. Abed | M.Sc. in Food Science | Assistant Lect.

Email: habed@uowasit.edu.iq

Mobile no.: 07723466504

---

Arkan M. Hasan | M.Sc. in Arabic | Assistant Lect.

Email: [armosa@uowasit.edu.iq](mailto:armosa@uowasit.edu.iq)

Mobile no.: 07735480229

---

## 6. Credits, Grading and GPA

### **Credits**

Wasit University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

### **Grading**

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

| GRADING SCHEME                                                                                                                                                                                                                                                                                                                                                           |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                             |                  |                     |           |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                    | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                              | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                          | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                          | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                          | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                          | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                   | FX – Fail        | راسب - قيد المعالجة | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                          | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                          |                  |                     |           |                                       |
| Note:                                                                                                                                                                                                                                                                                                                                                                    |                  |                     |           |                                       |
| Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |           |                                       |

### Calculation of the Cumulative Grade Point Average (CGPA)

- The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$CGPA = [ (1^{st} \text{ module score} \times ECTS) + (2^{nd} \text{ module score} \times ECTS) + \dots ] / 240$$

## 7. Curriculum/Modules

**Semester 1 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|------|--------|------|-------|------|------|-------------|
|------|--------|------|-------|------|------|-------------|

|        |                            |    |    |   |   |  |
|--------|----------------------------|----|----|---|---|--|
| FSD112 | Analytical Chemistry       | 79 | 96 | 7 | C |  |
| FSD113 | Dairy Principles           | 79 | 96 | 7 | C |  |
| AGR115 | Agricultural Economics     | 34 | 66 | 4 | B |  |
| FSD111 | Organic Chemistry          | 79 | 96 | 7 | C |  |
| WOU4   | Computer Programing        | 50 | 25 | 3 | B |  |
| WU04   | Democracy and human rights | 33 | 17 | 2 | B |  |

**Semester 2 | 30 ECTS | 1 ECTS = 25 hrs**

| Code    | Module                     | SSWL | USSWL | ECTS | Type | Pre-request |
|---------|----------------------------|------|-------|------|------|-------------|
| AGR123  | Machines and Workshops     | 78   | 97    | 7    | B    |             |
| AGR1211 | Microbiology               | 78   | 97    | 7    | B    |             |
| FSD124  | Food Industries            | 78   | 97    | 7    | C    |             |
| AGR127  | Statistics                 | 78   | 47    | 5    | B    |             |
| WU02    | Academic Englis Language 1 | 32   | 18    | 2    | B    |             |
| WU01    | Arabic Language            | 33   | 17    | 2    | S    |             |

**Semester 3 | 30 ECTS | 1 ECTS = 25 hrs**

| Code   | Module                 | SSWL | USSWL | ECTS | Type | Pre-request |
|--------|------------------------|------|-------|------|------|-------------|
| FSD211 | Food Plant Engineering | 78   | 72    | 6.00 | C    |             |
| AGR211 | Agricultural Marketing | 33   | 67    | 4.00 | S    |             |
| FSD212 | Food Hygiene           | 78   | 72    | 6.00 | C    |             |

|        |                           |    |    |      |   |  |
|--------|---------------------------|----|----|------|---|--|
| FSD213 | Sugar and Date Processing | 78 | 72 | 6.00 | C |  |
| FSD214 | Liquid Dairy Products     | 78 | 72 | 6.00 | C |  |
| WU21   | Arabic Language II        | 33 | 17 | 2.00 | B |  |

#### **Semester 4 | 30 ECTS | 1 ECTS = 25 hrs**

| Code   | Module                             | SSWL | USSWL | ECTS | Type | Pre-request |
|--------|------------------------------------|------|-------|------|------|-------------|
| AGR221 | Biochemistry                       | 78   | 72    | 6.00 | S    |             |
| WU23   | English Language II                | 33   | 17    | 2.00 | B    |             |
| WU22   | Computer Science II                | 48   | 27    | 3.00 | B    |             |
| FSD222 | Food Plant Management              | 78   | 72    | 6.00 | C    |             |
| WU05   | Crimes of the Ba'ath Party in Iraq | 33   | 17    | 2.00 | B    |             |
| FSD223 | Design and Analysis of Experiments | 78   | 47    | 5.00 | C    |             |
| FSD224 | Food Preservation and Storage      | 78   | 72    | 6.00 | C    |             |

## 8. Contact

Program Manager:

Hyder Al Zobaidy | Ph.D. in Food Science | Professor

Email: [hynajy@uowasit.ed.iq](mailto:hynajy@uowasit.ed.iq)

Mobile no.: +9647719697259

Program Coordinator:

Abdulaal Farhan | Ph.D. in Food Science | Assistant Prof.

Email: [abfarhan@uowasit.ed.iq](mailto:abfarhan@uowasit.ed.iq)

Mobile no.: +9647714714176

## Wasit University



### First Cycle – Bachelor's Degree (B.Sc.) – Food Science

#### Bachelor of Science (B.Sc.) in Food Science

---



---

#### Table of Contents

---

1. Overview
2. Undergraduate Modules 2024-2025

### 3. Contact

---

## 1. Overview

This catalogue is about the courses (modules) given by the program of Food Science to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

## 2. Undergraduate Courses 2025-2026

### Course 1

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course Title           | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| FSD112                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Analytical Chemistry   | 7             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3                      | 79            | 96          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |               |             |
| <p>This course introduces students to the fundamental principles, methods, and applications of analytical chemistry. It covers qualitative and quantitative analysis, with emphasis on both the theory and practical application of chemical measurements. Topics include classical methods such as gravimetric and volumetric analysis, as well as modern instrumental techniques such as spectroscopy, chromatography, and electrochemical analysis.</p> <p>Students will gain practical experience in laboratory techniques, data interpretation, error analysis, and the application of analytical methods in real-world contexts, including environmental, pharmaceutical, agricultural, and industrial analysis.</p> <p>The course aims to develop students' ability to solve chemical problems through analytical thinking, sound experimental design, and accurate presentation of data.</p> |                        |               |             |

## Course 2

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course Title           | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| FSD124                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Food Industries        | 7             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3                      | 78            | 97          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |               |             |
| <p>This course introduces students to the fundamentals of food industries, covering the principles and methods used in the processing, preservation, packaging, storage, and quality control of various food products. Topics include the industrial production of dairy products, meat, poultry, cereals, oils, fruits, and vegetables. The course emphasizes food safety standards, hygienic practices, processing equipment, and the role of technology in improving shelf life, nutritional value, and consumer appeal.</p> <p>Through this course, students acquire theoretical knowledge and practical skills that enable them to understand modern food-manufacturing operations and apply these principles in real agricultural and industrial settings.</p> |                        |               |             |

### Course 3

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Course Title           | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| AGR115                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Agricultural Economics | 4             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0                      | 34            | 66          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                        |               |             |
| <p>This course introduces students to the basic concepts and principles of agricultural economics, with emphasis on the application of economic theories in the agricultural sector. It examines the economic behavior of individuals, firms, and governments in relation to agricultural production, distribution, and consumption.</p> <p>Topics include agricultural supply and demand, production economics, farm management, market structures, price analysis, agricultural policies, and resource use in agricultural activities.</p> <p>Special attention is given to the role of agriculture in national economic development, food security, and sustainability. Students learn how to use economic tools to solve real-world problems in agriculture, agribusiness, and rural development.</p> |                        |               |             |

Course 4

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Course Title           | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| FSD111                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Organic Chemistry      | 7             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3                      | 79            | 96          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                        |               |             |
| <p>This course introduces students to the fundamental concepts of organic chemistry, a branch of chemistry concerned with the structure, properties, composition, reactions, and preparation of carbon-containing compounds. Topics include the classification and nomenclature of organic compounds, chemical structure and bonding, functional groups, reaction mechanisms, stereochemistry, and the chemistry of alkanes, alkenes, alkynes, alcohols, acids, esters, amines, and aromatic compounds.</p> <p>The course emphasizes theoretical understanding and practical applications, particularly in agriculture, pharmaceutical industries, biochemistry, and environmental science. Practical sessions, where applicable, train students in the safe handling, preparation, and identification of organic compounds using traditional and modern techniques.</p> |                        |               |             |

## Course 5

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Course Title           | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| WOU4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Computer               | 3             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3                      | 50            | 25          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |               |             |
| <p>This course introduces students to the fundamentals of computer programming, with emphasis on developing skills through software applications such as Microsoft Office. It covers basic concepts such as data types, variables, input and output operations, control structures such as loops and conditional statements, functions, arrays, and simple data structures. Students learn how to design, write, test, and debug computer programs.</p> <p>The course aims to develop computational-thinking skills and demonstrate how programming can be used to solve real-world problems, including applications in agriculture, science, data analysis, and automation.</p> |                        |               |             |

## Course 6

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Course Title               | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|-------------|
| WU04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Democracy and Human Rights | 2             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lect./Lab./Prac./Tutor     | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                          | 33            | 17          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |               |             |
| <p>This course introduces students to the fundamental concepts, principles, and practices of democracy and human rights at the national and international levels. It examines the development of democratic systems, the rule of law, citizenship, civil liberties, political participation, and the protection of individual and collective rights. Students also study major human-rights declarations and conventions, such as the Universal Declaration of Human Rights, and the roles of international organizations in promoting justice and equality. Through discussions, case studies, and interactive activities, the course aims to strengthen students' awareness of their rights and responsibilities as citizens and encourage active participation in democratic processes.</p> |                            |               |             |

Course 7

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Course Title                                     | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------|-------------|
| AGR123                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Agricultural Machinery and Engineering Workshops | 7             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Lect./Lab./Prac./Tutor                           | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3                                                | 78            | 97          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                  |               |             |
| <p>This course introduces students to the fundamentals of machinery and engineering-workshop practices, with emphasis on the practical operation, maintenance, and use of agricultural and mechanical machinery. It covers basic concepts of mechanical systems, tools, machine components, and workshop safety procedures. Students gain hands-on experience in using lathes, welding equipment, cutting tools, drilling machines, and other equipment commonly found in workshops.</p> <p>The course emphasizes the role of machinery in increasing agricultural productivity and supporting technical industries. Students learn how to operate, maintain, and troubleshoot minor faults in machines and tools used in different fields.</p> |                                                  |               |             |

## Course 8

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course Title           | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| AGR1211                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Microbiology           | 7             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3                      | 78            | 97          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |               |             |
| <p>This course provides an introduction to microbiology, focusing on the structure, classification, functions, and physiology of microorganisms, including bacteria, viruses, fungi, protozoa, and algae. It examines the roles of microorganisms in health, agriculture, industry, and the environment. Topics include microbial growth, nutrition, reproduction, metabolism, genetic diversity, and methods of microbial control.</p> <p>Special attention is given to beneficial and harmful microorganisms in agriculture, food production, and animal health. The practical component includes techniques such as microscopy, staining, culturing, isolation, and microbial identification.</p> |                        |               |             |

## Course 9

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Course Title                | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------|-------------|
| FSD113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Principles of Dairy Science | 7             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Lect./Lab./Prac./Tutor      | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3                           | 79            | 96          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |               |             |
| <p>This course provides students with a comprehensive introduction to the principles of dairy science, focusing on milk production, composition, processing, and quality control. It covers the biological and chemical properties of milk, factors affecting the quantity and quality of production, and an overview of dairy-herd management.</p> <p>Students also study the manufacture of various dairy products, including cheese, yogurt, butter, and milk powder, with emphasis on hygiene, safety standards, and quality assurance.</p> <p>The course integrates theoretical and practical aspects and prepares students to understand the role of dairy science in human nutrition, public health, and food-industry systems.</p> |                             |               |             |

Course 10

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Course Title           | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| AGR127                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Statistics             | 5             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3                      | 78            | 47          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        |               |             |
| <p>This course presents the basic principles of statistics and their applications in scientific research, particularly in agriculture, biology, and related sciences. Topics include data collection, organization, and presentation; measures of central tendency and dispersion; probability distributions; hypothesis testing; correlation; regression; and analysis of variance (ANOVA).</p> <p>Students learn how to use statistical tools and software to analyze and interpret data in support of scientific conclusions and decision-making. The course emphasizes practical applications, problem-solving, and understanding the role of statistics in research and industry.</p> |                        |               |             |

## Course 11

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Course Title                | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------|-------------|
| WU02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Academic English Language I | 2             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Lect./Lab./Prac./Tutor      | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 32            | 18          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |               |             |
| <p>This course aims to develop students' academic English-language skills, with emphasis on improving reading, writing, listening, and speaking in academic contexts. Special attention is given to vocabulary development, grammatical accuracy, sentence and paragraph construction, and basic academic-writing techniques.</p> <p>Students engage with a variety of texts and practice language skills through structured activities that build confidence in understanding and using English in university and professional settings.</p> <p>The course prepares students for future academic success by strengthening their ability to understand lectures, write assignments, participate in discussions, and read academic materials effectively.</p> |                             |               |             |

## Course 12

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course Title           | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| WU01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Arabic Language        | 2             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                      | 33            | 17          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |               |             |
| <p>This course aims to strengthen students' Arabic-language skills, with emphasis on improving reading, writing, grammar, and comprehension. It provides a foundation in both classical and contemporary Modern Standard Arabic, with attention to sentence structure, correct usage, punctuation, and writing techniques. The course also introduces students to selected texts from Arabic literature, culture, and heritage, thereby enhancing their appreciation of the richness and depth of the Arabic language.</p> <p>Students practice essay writing, text analysis, and the accurate application of grammatical rules, enabling them to communicate effectively in academic and professional contexts.</p> |                        |               |             |

Course 13

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Course Title           | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| FSD212                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Food Hygiene           | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3                      | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        |               |             |
| <ol style="list-style-type: none"> <li>1. Understand the foundations and importance of studying food hygiene for Food Science students.</li> <li>2. Identify the different types of food spoilage.</li> <li>3. Identify the sources of microbial contamination.</li> <li>4. Identify the sources of chemical contamination.</li> <li>5. Understand good manufacturing practices.</li> <li>6. Understand the sanitary requirements for food production.</li> <li>7. Understand the proper management, sanitation, and sterilization methods used to prevent contamination.</li> <li>8. Learn how to conduct and manage experiments in food-testing laboratories.</li> </ol> |                        |               |             |

Course 14

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Course Title           | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| AGR211                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Agricultural Marketing | 4             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                      | 33            | 67          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |               |             |
| <ol style="list-style-type: none"> <li>1. Understand the basic concepts of agricultural marketing.</li> <li>2. Identify the characteristics of agricultural products and agricultural markets.</li> <li>3. Analyze marketing channels for agricultural products.</li> <li>4. Study the factors affecting agricultural prices.</li> <li>5. Evaluate the efficiency of agricultural marketing systems.</li> <li>6. Propose solutions to marketing problems in the agricultural sector.</li> <li>7. Apply modern technologies in agricultural marketing.</li> </ol> |                        |               |             |

Course 15

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Course Title           | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| FSD214                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Fluid Milk Products    | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3                      | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |               |             |
| <ol style="list-style-type: none"> <li>1. Identify the composition and properties of milk and fluid dairy products.</li> <li>2. Study methods for receiving, testing, and evaluating the quality of raw milk.</li> <li>3. Understand the processing operations used for different fluid dairy products, such as pasteurized, sterilized, and flavored milk.</li> <li>4. Recognize pasteurization, sterilization, and homogenization techniques and their effects on product quality.</li> <li>5. Study the factors affecting preservation and extension of the shelf life of fluid dairy products.</li> <li>6. Identify processing and microbial defects and methods for minimizing them.</li> <li>7. Understand the standards and food-safety requirements for fluid dairy products.</li> <li>8. Develop students' skills in conducting chemical, physical, and microbiological tests on milk and dairy products.</li> <li>9. Study methods of packaging, storage, and transportation for fluid dairy products.</li> <li>10. Link theoretical knowledge with practical applications in dairy plants.</li> </ol> |                        |               |             |

Course 16

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course Title           | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| WU21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Arabic Language II     | 2             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                      | 33            | 17          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |               |             |
| <ol style="list-style-type: none"> <li>1. Develop students' fundamental language skills: listening, speaking, reading, and writing.</li> <li>2. Strengthen the ability to express ideas orally and in writing using correct and sound Arabic.</li> <li>3. Expand students' vocabulary through the study of new words and structures.</li> <li>4. Develop reading-comprehension and literary-analysis skills for different types of texts, including stories, poetry, and essays.</li> <li>5. Introduce students to basic grammatical and spelling rules and their application in writing and speaking.</li> <li>6. Strengthen attachment to the Arabic language as a language of religion, culture, and identity.</li> <li>7. Train students in critical and analytical thinking through discussion of texts and interpretation of their meanings and themes.</li> <li>8. Introduce selected examples of classical and modern Arabic literature to appreciate the aesthetics and history of the language.</li> </ol> |                        |               |             |

Course 17

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Course Title              | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------|-------------|
| FSD213                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Sugar and Date Processing | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lect./Lab./Prac./Tutor    | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3                         | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                           |               |             |
| <ol style="list-style-type: none"> <li>1. Understand sugar-processing technology and its different sources.</li> <li>2. Study the chemical and physical composition of dates and their nutritional properties.</li> <li>3. Understand sugar-extraction processes from raw materials such as sugar beet and sugarcane.</li> <li>4. Study the processing technologies used for dates and date products, including date syrup, date paste, and dried dates.</li> <li>5. Recognize refining, purification, and crystallization processes in the sugar industry.</li> <li>6. Study the factors affecting the quality of sugar and dates during processing and storage.</li> <li>7. Identify processing defects and microbial spoilage and methods for minimizing them.</li> <li>8. Understand the standards and food-safety requirements for sugar and date products.</li> <li>9. Develop students' skills in conducting chemical and physical tests on sugar and date products.</li> <li>10. Link theoretical knowledge with industrial applications in sugar and date-processing plants.</li> </ol> |                           |               |             |

Course 18

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Course Title           | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| FSD211                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Food Plant Engineering | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3                      | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |               |             |
| <ol style="list-style-type: none"> <li>1. Develop students' awareness of the industrial and environmental importance of food plant engineering.</li> <li>2. Provide students with a broad and balanced foundation of knowledge and skills within food plants.</li> <li>3. Develop students' ability to apply engineering knowledge and skills to solve theoretical and practical problems in food plants in support of sustainable-development goals.</li> <li>4. Develop skills that are valuable in the students' field of specialization.</li> <li>5. Enable students to apply their acquired skills in service to the community.</li> <li>6. Introduce students to the most important devices and equipment used in food plants.</li> <li>7. Introduce students to the main requirements of an ideal laboratory.</li> <li>8. Introduce students to safety procedures during laboratory work.</li> <li>9. Teach students the best methods for food preservation and processing.</li> <li>10. Identify suitable and rapid methods for understanding food quality and appropriate handling procedures.</li> <li>11. Enable students to perform calculations for determining material concentrations and percentages of resulting products.</li> <li>12. Identify suitable alternatives when the required equipment is unavailable.</li> <li>13. Understand the standards and food-safety requirements for fluid dairy products.</li> <li>14. Develop students' skills in conducting chemical, physical, and microbiological tests on milk and dairy products.</li> <li>15. Study methods of packaging, storage, and transportation for fluid dairy products.</li> <li>16. Link theoretical knowledge with practical applications in dairy plants.</li> </ol> |                        |               |             |

## Course 19

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Course Title           | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| FSD222                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Food Plant Management  | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                      | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                        |               |             |
| <ol style="list-style-type: none"> <li>1. Acquire the theoretical skills required for managing food plants.</li> <li>2. Acquire the basic concepts of management and the organization of production operations.</li> <li>3. Develop students' knowledge of how to select a suitable location for establishing a food plant.</li> <li>4. Understand how to manage deviations in production quality and quantity correctly.</li> <li>5. Acquire the information required for quality management.</li> <li>6. Understand how to interact with supervisors and subordinates in the workplace, including the relevant rules and professional relationships.</li> </ol> |                        |               |             |

Course 20

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Course Title                     | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------|-------------|
| FSD223                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Experimental Design and Analysis | 5             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lect./Lab./Prac./Tutor           | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3                                | 78            | 47          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                  |               |             |
| <ol style="list-style-type: none"> <li>1. Understand the fundamental principles of designing and analyzing scientific experiments in agricultural, food, and life-science fields.</li> <li>2. Understand the importance of experimental design in obtaining accurate and reliable results.</li> <li>3. Distinguish among different types of experimental designs and select the design most appropriate for an experiment.</li> <li>4. Develop skills in organizing, classifying, and statistically analyzing data.</li> <li>5. Identify sources of experimental error and methods for reducing and controlling them.</li> <li>6. Apply appropriate statistical tests to analyze experimental results.</li> <li>7. Interpret statistical results and relate them to scientific and practical aspects.</li> <li>8. Use modern statistical software to analyze experimental data.</li> <li>9. Develop the ability to write scientific reports and present experimental results correctly.</li> <li>10. Strengthen scientific-thinking skills and decision-making based on experimental results.</li> </ol> |                                  |               |             |

## Course 21

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Course Title                       | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------|-------------|
| WU05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Crimes of the Ba'ath Party in Iraq | 2             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Lect./Lab./Prac./Tutor             | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0                                  | 33            | 17          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                    |               |             |
| <ol style="list-style-type: none"> <li>1. Become familiar with a historical period experienced by Iraq under the banned Ba'ath regime from 1979 to 2003.</li> <li>2. Address a missing area of knowledge in scientific research concerning the 35-year period during which the Ba'ath Party regime committed crimes against humanity, including genocide and forced displacement.</li> <li>3. Recognize the importance of teaching this subject and transmitting this knowledge to future generations.</li> </ol> |                                    |               |             |

Course 22

| Code                                                                                                                                                                                                                                                                                                                                                                        | Course Title             | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------|-------------|
| WU22                                                                                                                                                                                                                                                                                                                                                                        | Computer Fundamentals II | 3             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                | Lect./Lab./Prac./Tutor   | SSWL (hr/sem) | USWL (hr/w) |
| 0                                                                                                                                                                                                                                                                                                                                                                           | 3                        | 48            | 27          |
| Description                                                                                                                                                                                                                                                                                                                                                                 |                          |               |             |
| <ol style="list-style-type: none"> <li>1. Use computers to perform basic tasks.</li> <li>2. Identify and discuss the hardware components of a computer system.</li> <li>3. Create documents using word-processing software and prepare presentations.</li> <li>4. Conduct research on the Internet.</li> <li>5. Gain an introduction to artificial intelligence.</li> </ol> |                          |               |             |

Course 23

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Course Title              | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------|-------------|
| FSD224                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Food Handling and Storage | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lect./Lab./Prac./Tutor    | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3                         | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                           |               |             |
| <ol style="list-style-type: none"> <li>1. Understand the foundations and importance of food handling and storage.</li> <li>2. Acquire advanced knowledge of handling different foods and keeping pace with developments in food-storage practices.</li> <li>3. Recognize the disadvantages of incorrect or unsuitable storage.</li> <li>4. Understand the scientific basis of each storage method.</li> <li>5. Understand the role of appropriate, correct, and safe storage in maintaining food safety and quality.</li> <li>6. Understand the importance of controlling the conditions of storage facilities designated for specific food products.</li> <li>7. Study the methods used to preserve and store foods and extend their storage life.</li> </ol> |                           |               |             |

Course 24

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Course Title           | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| AGR221                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Biochemistry           | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3                      | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |               |             |
| <p>The Biochemistry course aims to provide students with fundamental knowledge of the chemical composition of living organisms and the biological processes occurring within cells. It covers biomolecules, metabolic pathways, enzymes, and hormones, and explains their roles in energy production and regulation of body functions. The course also develops scientific-analysis skills and links theoretical concepts with practical applications in food science, nutrition, biotechnology, and pharmaceutical industries.</p> |                        |               |             |

Course 25

| Code                                                                                                                                                                                                                                                                                                                     | Course Title           | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| WU23                                                                                                                                                                                                                                                                                                                     | English Language II    | 2             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                             | Lect./Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                        | 0                      | 33            | 17          |
| Description                                                                                                                                                                                                                                                                                                              |                        |               |             |
| <ol style="list-style-type: none"> <li>1. Teach students the fundamentals of the English language.</li> <li>2. Develop students' basic English-language skills in reading, listening, and speaking.</li> <li>3. Enable students to communicate effectively in academic and everyday situations using English.</li> </ol> |                        |               |             |

# MODULE DESCRIPTION FORM

| Module Information                 |                                  |                               |                                                                                                                                                                                                                                                     |                                                                          |
|------------------------------------|----------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Module Title                       | Theoretical analytical Chemistry |                               | Module Delivery                                                                                                                                                                                                                                     |                                                                          |
| Module Type                        | Core                             |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                          |
| Module Code                        | FSD112                           |                               |                                                                                                                                                                                                                                                     |                                                                          |
| ECTS                               | 7                                |                               |                                                                                                                                                                                                                                                     |                                                                          |
| SWL (hr/sem)                       | 175                              |                               |                                                                                                                                                                                                                                                     |                                                                          |
| Module Level                       | 1                                | Semester of Delivery          |                                                                                                                                                                                                                                                     | 1                                                                        |
| Administering Department           | Food science                     | College                       | Agriculture                                                                                                                                                                                                                                         |                                                                          |
| Module Leader                      | Abbas W. Salman                  |                               | e-mail                                                                                                                                                                                                                                              | <a href="mailto:aalhamdani@uowasit.edu.iq">aalhamdani@uowasit.edu.iq</a> |
| Module Leader's Acad. Title        | Professor                        | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                                                               |                                                                          |
| Module Tutor                       | Hamid W. Ibraheem                |                               | e-mail                                                                                                                                                                                                                                              | <a href="mailto:hwafeeq@uowasit.edu.iq">hwafeeq@uowasit.edu.iq</a>       |
| Peer Reviewer Name                 | Name                             | e-mail                        | E-mail:                                                                                                                                                                                                                                             |                                                                          |
| Scientific Committee Approval Date | 14/10/2025                       | Version Number                | 1.0                                                                                                                                                                                                                                                 |                                                                          |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Content |                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Objectives                                     | A general study of chemistry, including analytical chemistry, which is divided into two types: quantitative analysis and descriptive qualitative analysis, knowledge of the requirements for volumetric analysis, and also methods for expressing the concentration of solutions to know their weights. Analytical chemistry also |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | <p>studies the indicators used in the analysis of acids and bases, the foundations of choosing the indicator, the mechanism of the work of the indicator, and calculating the pH for all solutions.</p> <p>Objectives of analytical Chemistry</p> <p>By knowing the objectives of analytical Chemistry, the following can be reached:</p> <p>-</p> <ul style="list-style-type: none"> <li>•Study the basics of analytical chemistry and its sections</li> <li>•Determining the weights of some chemicals using volumetric determination methods</li> <li>•Knowing the requirements for volumetric corrosion</li> <li>•Methods of expressing the concentration of solutions to determine the weights of some compounds</li> <li>•Analysis of acids and bases</li> <li>•Knowing the evidence used in analyzing acids and bases</li> <li>•Interpreting the work of the guide</li> <li>•How to choose the appropriate guide</li> <li>•Calculate the pH of all solutions</li> </ul> |
| <b>Module Learning Outcomes</b> | <p>The graduate of the department is awarded a degree (Bachelor of Science in general chemistry)</p> <p>and acquires the following skills:</p> <ol style="list-style-type: none"> <li>1- The ability to apply knowledge of the general chemistry method and related techniques</li> <li>2- The ability to evaluate and implement experiments.</li> <li>3- The ability to use ready-made programs to accomplish the required cases.</li> <li>4- The ability to work with diverse teams.</li> <li>5- The ability to know and bear responsibility.</li> <li>6- The ability to communicate.</li> <li>7- The ability to use skills.</li> <li>8- The ability to intertwine with other specializations to serve them</li> </ol>                                                                                                                                                                                                                                                       |
| <b>Indicative Contents</b>      | <p>The guiding content includes the following.</p> <p>- Be extremely careful when sorting chemicals that cause violent reactions when mixed together.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>- Immediately dispose of containers that do not have a label indicating their contents at the end of the daily working hours.</li> <li>- Operate the suction fan (pump) to get rid of fumes.</li> <li>- Connect electric heating devices to a control device to disconnect the power from the device in the event of a noticeable rise in the temperature of the device.</li> <li>- Periodically check the efficiency of the laboratory devices and keep records of the devices that have been checked to determine their validity.</li> <li>- Use both hands when handling large bottles and do not lift them up.</li> <li>- Return all materials, glassware and equipment to their designated places after use.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning and Teaching Strategies

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ol style="list-style-type: none"> <li>1- Identify the tools and devices used in chemical analysis and train to use and deal with them correctly.</li> <li>2- Identify some chemical materials and their physical and chemical properties and their solutions and how to prepare them.</li> <li>3- Practice writing equations correctly.</li> <li>4- Practice choosing the appropriate guide for the calibration process.</li> <li>5- Practice performing various chemical calibrations correctly and with high confidence.</li> <li>6- Practice performing chemical calculations and calculations of concentrations and purity.</li> </ol> |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

|                                 |            |                               |   |
|---------------------------------|------------|-------------------------------|---|
| <b>Structured SWL (h/sem)</b>   | 78         | <b>Structured SWL (h/w)</b>   | 7 |
| <b>Unstructured SWL (h/sem)</b> | 97         | <b>Unstructured SWL (h/w)</b> | 6 |
| <b>Total SWL (h/sem)</b>        | <b>175</b> |                               |   |

### Module Evaluation

|                      |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
|----------------------|-----------------|-------------|------------------|------------|---------------------------|
| Formative assessment | Quizzes         | 2           | 10% (10)         | 5 and 10   | LO #1, #2 and #10, #11    |
|                      | Assignments     | 2           | 10% (10)         | 2 and 12   | LO #3, #4 and #6, #7      |
|                      | Projects / Lab. | 1           | 10% (10)         | Continuous | All                       |
|                      | Report          | 1           | 10% (10)         | 13         | LO #5, #8 and #10         |
| Summative assessment | Midterm Exam    | 2hr         | 10% (10)         | 7          | LO #1 - #7                |
|                      | Final Exam      | 3hr         | 50% (50)         | 16         | All                       |
| Total assessment     |                 |             | 100% (100 Marks) |            |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|                                 | Material Covered                                                                                                         |
| Week 1                          | Introduction to the importance of quantitative chemistry and expression of concentrations with problems.                 |
| Week 2                          | Expressing the laws of ppm, w\w%, v\w% with dilution laws for solubility with problems.                                  |
| Week 3                          | Beginning with ionic equilibrium, hydrolysis theories, and pH for strong and weak acids, bases, and salts with problems. |
| Week 4                          | Methods of measuring pH and a pH meter with a detailed explanation of buffer solutions.                                  |
| Week 5                          | Methods of preparing buffer solutions with problems on the topic.                                                        |
| Week 6                          | Explanation of acid and base indicators with solutions to multiple problems.                                             |
| Week 7                          | Midterm exam.                                                                                                            |
| Week 8                          | K estimation method and titration curves with problems.                                                                  |
| Week 9                          | Precipitation titration, including an introduction to the Moore, Fohllhard, and Fagen method.                            |
| Week 10                         | EDTA complex titrations, their properties, and problems on the topic.                                                    |
| Week 11                         | The student will become familiar with gravimetric analysis with problems on the topic.                                   |
| Week 12                         | Spectroscopic analysis.                                                                                                  |
| Week 13                         | Chromatographic analysis.                                                                                                |

|                |                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 14</b> | Chromatographic analysis (High-performance liquid chromatography - HPLC).<br>Chromatographic analysis (Gas chromatography - GC). |
| <b>Week 15</b> | Final exam.                                                                                                                      |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                                                                                                                                                                                                                                                        |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                             | <b>Material Covered</b>                                                                                                                                                                                                                                                                |
| <b>Week 1</b>                               | Prepare standard solutions of specified concentrations and apply various techniques, such as titration, to analyze them. Concentrations are calculated using basic laws, such as the molarity law, and applied to problems involving dilution and mixing of solutions.                 |
| <b>Week 2</b>                               | Prepare solutions using concentration expressions such as ppm, w/w%, and v/v%. Dilutions are then performed on these solutions using the dilution law ( $C_1V_1 = C_2V_2$ ). Practical experiments are conducted to apply these laws to calculate final concentrations after dilution. |
| <b>Week 3</b>                               | Study ionic equilibrium and analyze the effect of hydrolysis on the pH values of acids, bases, and salts by preparing different solutions and measuring the pH using a pH meter.                                                                                                       |
| <b>Week 4</b>                               | Measure the pH of solutions using a pH meter after titration with standard solutions.                                                                                                                                                                                                  |
| <b>Week 5</b>                               | Buffer solutions are prepared by mixing a weak acid and its conjugate base, using the Henderson-Hasselbach equation to calculate the optimal ratios of components.                                                                                                                     |
| <b>Week 6</b>                               | Adding acid and base indicators such as litmus and phenolphthalein to various solutions and observing the color change to determine the pH of the solution.                                                                                                                            |
| <b>Week 7</b>                               | Exam (Report)                                                                                                                                                                                                                                                                          |
| <b>Week 8</b>                               | Estimate the $K_a$ of acids by performing titrations using a strong base, recording the pH values at each addition. Titration curves are plotted to analyze the equivalence point and calculate the acid dissociation constant ( $K_a$ ) using the data obtained.                      |
| <b>Week 9</b>                               | Perform precipitation titration using the Moore, Fohrhard, and Fagen methods to determine the concentration of ions in solutions.                                                                                                                                                      |
| <b>Week 10</b>                              | Problems related to calculating concentrations based on the volume of solution added and endpoints.                                                                                                                                                                                    |
| <b>Week 11</b>                              | Students are introduced to gravimetric analysis by accurately weighing samples and using precipitation techniques to separate compounds.                                                                                                                                               |
| <b>Week 12</b>                              | The principle of optical absorption; the use of a spectrophotometer to measure absorbance; the relationship between concentration and absorbance (Beer-Lambert law).                                                                                                                   |
| <b>Week 13</b>                              | The principle of paper chromatography; separation of mixture components; identification of unknown substances using chromatographic techniques.                                                                                                                                        |

|                |                                                                                                                                                                                                               |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 14</b> | Introduction to HPLC; operation of an HPLC instrument; analysis of HPLC results; initiation of gas chromatography; analysis of volatile organic compounds; separation and identification of samples using GC. |
| <b>Week 15</b> | Final Exam                                                                                                                                                                                                    |

| <b>Learning and Teaching Resources</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                        | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | <p>Theoretical and practical lectures.</p> <p>Fundamentals of Analytical Chemistry, translated by Zuhair Matti Qasir, Edmond Mikhail Hanna, and Abdul Latif Abdul Razzaq.</p> <p>Main References (Sources): Analytical Chemistry: Basic Concepts in Conventional and Instrumental Analysis, by Abdullah Mahmoud Abu Al-Kabbash</p> <p>Muhyiddin Al-Bakoush et al. (2003). Principles of General Chemistry, Tripoli, 687 pages.</p> | Yes                              |
| <b>Recommended Texts</b>               | Pauling, L. (1988). General chemistry. Courier Corporation.                                                                                                                                                                                                                                                                                                                                                                        | No                               |
| <b>Websites</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |

# MODULE DESCRIPTION FORM

| Module Information                 |                     |                      |                                                                                                                                                                                                                                                     |                                                                |
|------------------------------------|---------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Module Title                       | Food Industries     |                      | Module Delivery                                                                                                                                                                                                                                     |                                                                |
| Module Type                        | Core                |                      | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                |
| Module Code                        | FSD124              |                      |                                                                                                                                                                                                                                                     |                                                                |
| ECTS Credits                       | 7                   |                      |                                                                                                                                                                                                                                                     |                                                                |
| SWL (hr/sem)                       | 175                 |                      |                                                                                                                                                                                                                                                     |                                                                |
| Module Level                       | 1                   | Semester of Delivery |                                                                                                                                                                                                                                                     | 1                                                              |
| Administering Department           | Food Science Dept.  | College              | College of Agriculture                                                                                                                                                                                                                              |                                                                |
| Module Leader                      | Dr. Abdulaal Farhan |                      | e-mail                                                                                                                                                                                                                                              | abfarhan@uowasit.ed.iq                                         |
| Module Leader's Acad. Title        | Assist. Professor   |                      | Module Leader's Qualification                                                                                                                                                                                                                       | Ph.D.                                                          |
| Module Tutor                       | Hude M. Abed        |                      | e-mail                                                                                                                                                                                                                                              | <a href="mailto:huded@uowasit.edu.iq">huded@uowasit.edu.iq</a> |
| Peer Reviewer Name                 | Name                | e-mail               | E-mail                                                                                                                                                                                                                                              |                                                                |
| Scientific Committee Approval Date | 14/10/2025          | Version Number       | 1.0                                                                                                                                                                                                                                                 |                                                                |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |                                                                                                                         |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Module Objectives                                      | 1. Understanding the fundamentals and importance of food processing and its vital role in the development of countries. |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | <ol style="list-style-type: none"> <li>Identifying the most important food industries in Iraq and how to keep up with advancements in food production.</li> <li>Studying the different components of foods.</li> <li>Understanding the scientific basis of each processing step in food production.</li> <li>Recognizing the role of healthy food production in improving human health.</li> <li>Understanding the relationship between food production and the environment, with a focus on proper and healthy manufacturing methods.</li> <li>Studying the methods used in food preservation, storage, and extending shelf life.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li>Understanding the components of each food item so that the student is able to identify and describe the basic components of different food materials such as proteins, fats, and carbohydrates.</li> <li>Applying the basic steps in food processing: the student should acquire preliminary knowledge of the correct fundamental steps in the manufacturing of food products.</li> <li>Familiarization with food preservation techniques and the scientific basis of each method.</li> <li>Understanding the strong relationship between human health and the type of food consumed: the student should be able to apply health standards and procedures to produce healthy foods.</li> <li>Knowing how to utilize food processing waste and convert it into products of nutritional value.</li> <li>Developing the knowledge level of food science students and their essential role in enhancing nutritional awareness.</li> <li>Recognizing the importance of consumer awareness and their role in the production of sustainable food.</li> </ol> |
| <b>Indicative Contents</b>      | <p><b>1. Introduction to Food Processing</b></p> <ul style="list-style-type: none"> <li>Definition and importance of food processing</li> <li>Main objectives of food processing and preservation</li> <li>Food industries in Iraq</li> <li>Factors to consider when designing and establishing a food processing plant</li> <li>General guidelines and introduction to food testing laboratories – solutions (<i>Practical</i>)</li> </ul> <p><b>2. Food Components</b></p> <ul style="list-style-type: none"> <li>Liquid components: water</li> <li>Solid components: carbohydrates, proteins, lipids, vitamins, minerals, organic acids, pigments, flavor compounds</li> <li>Types and structures of carbohydrates</li> <li>Introduction to solution measuring devices (<i>Practical</i>)</li> </ul>                                                                                                                                                                                                                                                                                      |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>3. Food Components (Proteins and Lipids)</b></p> <ul style="list-style-type: none"> <li>• Definition and structure of proteins</li> <li>• Definition and structure of fats</li> <li>• Food preservation by canning (<i>Practical</i>)</li> </ul> <p><b>4. Food Components: Minerals, Vitamins, and Flavor Compounds</b></p> <ul style="list-style-type: none"> <li>• Types and importance of minerals</li> <li>• Types of vitamins</li> <li>• Examples of flavor compounds</li> <li>• Food preservation by refrigeration (<i>Practical</i>)</li> </ul> <p><b>5. Major Food Products</b></p> <ul style="list-style-type: none"> <li>• Meat and meat products</li> <li>• Food preservation by freezing (<i>Practical</i>)</li> </ul> <p><b>6. Major Food Products</b></p> <ul style="list-style-type: none"> <li>• Poultry and fish meats</li> <li>• Eggs</li> <li>• Processing of meat products (e.g., burgers)</li> </ul> <p><b>7. Major Food Products</b></p> <ul style="list-style-type: none"> <li>• Fruits and vegetables</li> <li>• Fatty substances (fats and oils)</li> <li>• Preservation of meat products (<i>Practical</i>)</li> </ul> <p><b>8. Major Food Products</b></p> <ul style="list-style-type: none"> <li>• Grains and grain products</li> <li>• Sugar, tea, and coffee</li> <li>• Preservation by fermentation and pickling (<i>Practical</i>)</li> </ul> <p><b>9. Food Preservation Methods</b></p> <ul style="list-style-type: none"> <li>• Freezing</li> <li>• Refrigeration</li> <li>• Drying (<i>Practical</i>)</li> </ul> <p><b>10. Food Preservation</b></p> <ul style="list-style-type: none"> <li>• Canning</li> <li>• Jam and jelly production (<i>Practical</i>)</li> </ul> <p><b>11. Food Spoilage and Deterioration</b></p> <ul style="list-style-type: none"> <li>• Main causes of food spoilage</li> <li>• Types of spoilage</li> <li>• Preservation with chemical and natural substances (<i>Practical</i>)</li> </ul> <p><b>12. Enzymes</b></p> <ul style="list-style-type: none"> <li>• Important enzymes used in food processing</li> <li>• Fruit juice production (<i>Practical</i>)</li> </ul> <p><b>13. Food Packaging Materials</b></p> <ul style="list-style-type: none"> <li>• Their functions</li> <li>• Environmental impact</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Production of paste and ketchup (<i>Practical</i>)</li> </ul> <b>14. Food Packaging Materials</b> <ul style="list-style-type: none"> <li>• Types of packaging materials</li> <li>• Molasses (date syrup) production (<i>Practical</i>)</li> </ul> <b>15. Effect of Processing on the Quality and Nutritional Value of Processed Foods</b> <ul style="list-style-type: none"> <li>• Bread and <i>samoon</i> (Iraqi bread) production (<i>Practical</i>)</li> </ul> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Learning and Teaching Strategies |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Strategies                       | <b>1. Learning Based on Theoretical Understanding</b> <ul style="list-style-type: none"> <li>• Teaching students to understand the theoretical concepts or ideas and anticipate the outcomes before applying them practically.</li> <li>• Employing scientific and cognitive foundations for accurate theoretical understanding in the field of food processing.</li> </ul> <b>2. Learning Through Practical Experimentation</b> <ul style="list-style-type: none"> <li>• Conducting hands-on experiments related to food preservation and processing, preceded by knowledge of equipment and lab safety protocols.</li> </ul> <b>3. Collaborative Idea Application Learning</b> <ul style="list-style-type: none"> <li>• Assigning students in groups to implement a specific idea related to the preservation or processing of a particular food product.</li> <li>• Encouraging students to conduct research and work within research groups.</li> </ul> <b>4. Learning Through Idea Exchange and Innovative Problem Solving</b> <ul style="list-style-type: none"> <li>• Teaching students how to face challenges by coming up with ideas and then applying effective solutions in a timely, cost-efficient, and safe manner.</li> <li>• Exchanging ideas with others and applying them in support of scientific research in food processing.</li> </ul> <b>5. Multimedia-Supported Education</b> <ul style="list-style-type: none"> <li>• Using educational videos and simulations to explain various processes in food production.</li> <li>• Displaying visual clips to demonstrate precise operations and chemical reactions occurring during food processing.</li> </ul> <b>6. Self-Directed and Independent Learning</b> <ul style="list-style-type: none"> <li>• Encouraging students to conduct independent research and study using scientific references and specialized articles.</li> <li>• Guiding students to prepare summaries or presentations on the steps used in producing or preserving a specific food product.</li> </ul> <b>7. Learning Based on Previous Scientific Research Findings</b> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>Understanding the final results of previous scientific studies in food production and using them as a starting point for new research that contributes to future advancements.</li> <li>Applying practical evaluation methods by testing students' abilities to perform certain laboratory experiments.</li> </ul> <p><b>8. Learning Based on Visual Characterization and Documentation of Results</b></p> <ul style="list-style-type: none"> <li>Training students to visually characterize raw materials used in food processing or processed products, and understanding its role in final product quality.</li> <li>Training students on how to professionally document their results.</li> </ul> <p><b>9. Academic Guidance and Counseling</b></p> <ul style="list-style-type: none"> <li>Providing guidance lectures that contribute to enhancing students' nutritional awareness.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)   |     |                        |   |
|--------------------------|-----|------------------------|---|
| Structured SWL (h/sem)   | 78  | Structured SWL (h/w)   | 5 |
| Unstructured SWL (h/sem) | 97  | Unstructured SWL (h/w) | 6 |
| Total SWL (h/sem)        | 175 |                        |   |

| Module Evaluation    |            |             |                  |          |                           |
|----------------------|------------|-------------|------------------|----------|---------------------------|
|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment | Tests      | 1           | 10% (10)         | 15       | LO #1 - #14               |
|                      | Projects   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Lab        | 1           | 10% (10)         | 7        | LO #1 - #6                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 8        | LO #1 - #7                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                  |
|---------------------------------|------------------|
|                                 | Material Covered |

|                |                                                            |
|----------------|------------------------------------------------------------|
| <b>Week 1</b>  | Introduction to Food Processing                            |
| <b>Week 2</b>  | Food Components (Water, Carbohydrates)                     |
| <b>Week 3</b>  | Food Components (Proteins and Lipids)                      |
| <b>Week 4</b>  | Food Components (Minerals, Vitamins, Flavor Compounds)     |
| <b>Week 5</b>  | Major Foods (Meat and Eggs)                                |
| <b>Week 6</b>  | Homework Evaluation                                        |
| <b>Week 7</b>  | Major Foods (Fruits and Vegetables, Fats and Oils)         |
| <b>Week 8</b>  | Major Foods (Grains and Products, Sugar, Tea, and Coffee)  |
| <b>Week 9</b>  | Methods of Food Preservation (Freezing, Refrigeration)     |
| <b>Week 10</b> | Food Preservation (Canning)                                |
| <b>Week 11</b> | Food Spoilage and Deterioration                            |
| <b>Week 12</b> | Enzymes and Their Role in Food Processing                  |
| <b>Week 13</b> | Materials Used in Food Packaging                           |
| <b>Week 14</b> | Effect of Processing on Food Quality and Nutritional Value |
| <b>Week 15</b> | Exam                                                       |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                          |
|---------------------------------------------|----------------------------------------------------------|
|                                             | <b>Material Covered</b>                                  |
| <b>Week 1</b>                               | General Guidelines and Introduction to Food Testing Labs |
| <b>Week 2</b>                               | Introduction to Some Solution Measurement Devices        |
| <b>Week 3</b>                               | Food Preservation by Canning                             |
| <b>Week 4</b>                               | Food Preservation by Refrigeration                       |
| <b>Week 5</b>                               | Food Preservation by Freezing                            |
| <b>Week 6</b>                               | Meat Product Processing (Burger)                         |
| <b>Week 7</b>                               | Preservation of Meat Products (Practical)                |
| <b>Week 8</b>                               | Food Preservation by Fermentation and Pickling           |
| <b>Week 9</b>                               | Preservation by Drying (Practical)                       |
| <b>Week 10</b>                              | Jam and Jelly Production                                 |
| <b>Week 11</b>                              | Preservation with Chemical and Natural Substances        |
| <b>Week 12</b>                              | Fruit Juice Production                                   |

|                |                                          |
|----------------|------------------------------------------|
| <b>Week 13</b> | Paste and Ketchup Production (Practical) |
| <b>Week 14</b> | Molasses Production (Practical)          |
| <b>Week 15</b> | Bread and Samoon Production              |

| <b>Learning and Teaching Resources</b> |                                    |                                  |
|----------------------------------------|------------------------------------|----------------------------------|
|                                        | <b>Text</b>                        | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | Principles of food processing book | Yes                              |
| <b>Recommended Texts</b>               | Scientific articles                | No                               |
| <b>Websites</b>                        |                                    |                                  |

## MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information                        |                                      |                             |                                                                                                                                                                                                                                                                |                          |  |
|-------------------------------------------|--------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--|
| معلومات المادة الدراسية                   |                                      |                             |                                                                                                                                                                                                                                                                |                          |  |
| <b>Module Title</b>                       | Principles of Agricultural Economics |                             | <b>Module Delivery</b>                                                                                                                                                                                                                                         |                          |  |
| <b>Module Type</b>                        | Basic                                |                             | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input checked="" type="checkbox"/> Seminar |                          |  |
| <b>Module Code</b>                        | AGR115                               |                             |                                                                                                                                                                                                                                                                |                          |  |
| <b>ECTS Credits</b>                       | 4                                    |                             |                                                                                                                                                                                                                                                                |                          |  |
| <b>SWL (hr/sem)</b>                       | 100                                  |                             |                                                                                                                                                                                                                                                                |                          |  |
| <b>Module Level</b>                       | 1                                    | <b>Semester of Delivery</b> |                                                                                                                                                                                                                                                                | 1                        |  |
| <b>Administering Department</b>           | Food Sciences                        | <b>College</b>              | College of Agriculture                                                                                                                                                                                                                                         |                          |  |
| <b>Module Leader</b>                      | MSc Sara Ali Hussein                 |                             | <b>e-mail</b>                                                                                                                                                                                                                                                  | sahussain@uowasit.edu.iq |  |
| <b>Module Leader's Acad. Title</b>        | Assistant lecturer                   |                             | <b>Module Leader's Qualification</b>                                                                                                                                                                                                                           | Master's                 |  |
| <b>Module Tutor</b>                       |                                      |                             | <b>e-mail</b>                                                                                                                                                                                                                                                  |                          |  |
| <b>Peer Reviewer Name</b>                 | Name                                 | <b>e-mail</b>               | E-mail                                                                                                                                                                                                                                                         |                          |  |
| <b>Scientific Committee Approval Date</b> | 14/10/2025                           | <b>Version Number</b>       | 1.0                                                                                                                                                                                                                                                            |                          |  |

| Relation with other Modules       |      |                 |  |
|-----------------------------------|------|-----------------|--|
| العلاقة مع المواد الدراسية الأخرى |      |                 |  |
| <b>Prerequisite module</b>        | None | <b>Semester</b> |  |
| <b>Co-requisites module</b>       | None | <b>Semester</b> |  |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li>1. Introducing the student to the basic concepts of this science, particularly microeconomics.</li> <li>2. How to analyze economic problems and methods of economic research.</li> <li>3. Introducing the student to the principles of demand and consumer behavior in maximizing satisfaction.</li> <li>4. Understanding the supply side and how consumers reach equilibrium.</li> <li>5. The course also aims to introduce the student to the production function and the relationship between production and production resources, production costs and their types, and markets and their types.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Module Learning Outcomes</b> | <p>Learning outcomes for teaching the principles of agricultural economics to first-year students in colleges of agriculture include:</p> <p>A - Cognitive objectives</p> <ol style="list-style-type: none"> <li>1. Understand the meaning of economics, economic analysis, and its types</li> <li>2. Understand consumer demand and behavior in maximizing satisfaction through some economic theories</li> <li>3. Understand the supply of production and how to achieve balance for the consumer</li> <li>4. Identify the types of production costs and types of markets.</li> </ol> <p>B - Course Skill Objectives</p> <ol style="list-style-type: none"> <li>1. The student will acquire skills in economic analysis at the micro-level.</li> <li>2. The student will acquire skills in understanding consumer behavior and maximizing consumer satisfaction.</li> <li>3. The student will acquire skills in distinguishing different markets, types of production resources, and types of production costs.</li> </ol> |
| <b>Indicative Contents</b>      | <p>The syllabus for the Principles of Agricultural Economics course for students in colleges of agriculture includes:</p> <ol style="list-style-type: none"> <li>1. Lectures: Lectures can be used as a means of introducing basic concepts and information in the principles of agricultural economics. The teacher can clarify concepts and theories, illustrate them with examples, and explain the relationships between different concepts.</li> <li>2. Group discussions: Group discussions can be organized around specific economic concepts. Students can discuss issues, exchange views, and</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                            |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>interact with each other. This type of learning encourages critical thinking and expands understanding.</p> <ol style="list-style-type: none"> <li>3. Interactive lessons: Interactive learning techniques such as practical activities or simulations can be used to help students apply and better understand economic concepts.</li> <li>4. Case Studies: Case studies can be used to apply economic concepts to real-life scenarios. Students collaborate to analyze the case, discuss possible solutions, and make economic decisions.</li> <li>5. Presentations: Students may be asked to prepare and deliver presentations on economic concepts. This requires students to have a deep understanding of the subject and the ability to simplify and explain it to an audience.</li> <li>6. Use of technology: Technology can be used in teaching and learning, such as using interactive educational programs and online resources to enhance student understanding and provide diverse learning experiences.</li> </ol> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Learning and Teaching Strategies |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Strategies                       | <ol style="list-style-type: none"> <li>1. Scaffolded Learning: Start with basic concepts and then progress to more complex concepts .Provide simple examples at first, then gradually increase the complexity.</li> <li>2. Brainstorm</li> <li>3. Problem-Based Learning:</li> <li>4. Present economic problems that require the application of mathematical concepts: Encourage students to work individually or in groups to find solutions. Discuss solutions in class and explain common mistakes.</li> <li>5. Visual and Graphical Learning :Use graphs and charts to illustrate concepts .Teach students how to create graphs manually. Demonstrate how to interpret graphs in the context of agriculture .</li> <li>6. Repetition and Practice-Based Learning: Repeat core concepts periodically to ensure they are consolidated. Provide a wide variety of exercises. Encourage students to complete additional exercises outside of class.</li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>7. Thinking strategy based on the student's ability, for example (if the student is able to learn the concept of applying the concept of agricultural economics on the farm, whether in terms of achieving optimal resources and production, as well as how to dispose of production in detail.</p> <p>8. Critical thinking strategy in learning, which is a term that symbolizes the highest levels of thinking, which aims to pose a problem and then analyze it logically to arrive at the desired solution.</p> <p>9. Collaborative Learning: Divide students into small groups to solve complex exercises. Encourage students to explain concepts to each other. Organize group study sessions outside of class.</p> <p>10. Continuous Formative Assessment: Periodic quizzes to assess students' understanding of concepts. Weekly assignments including homework. Progress reports on student progress.</p> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                     |     |                                                              |   |
|----------------------------------------------------------------------------|-----|--------------------------------------------------------------|---|
| The student's academic load is calculated as 15 weeks                      |     |                                                              |   |
| Structured SWL (h/sem) Regular student load during the semester            | 34  | Structured SWL (h/w) Regular weekly student workload         | 2 |
| Unstructured SWL (h/sem) Irregular student load during the semester        | 66  | Unstructured SWL (h/w) Irregular student study load per week | 6 |
| Total SWL (h/sem)<br>The student's total academic load during the semester | 100 |                                                              |   |

| Module Evaluation |             |                |          |                           |
|-------------------|-------------|----------------|----------|---------------------------|
|                   | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |

|                             |                     |     |                  |    |             |
|-----------------------------|---------------------|-----|------------------|----|-------------|
| <b>Formative assessment</b> | <b>Quizzes</b>      | 1   | 10% (10)         | 6  | LO #1 - #14 |
|                             | <b>Assignments</b>  | 1   | 10% (10)         | 15 | LO #1 - #5  |
|                             | <b>Projects /</b>   | 1   | 10% (10)         | 7  | LO #1 - #6  |
|                             | <b>Report</b>       | 1   | 10%              | 15 | LO #1 - #14 |
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 2hr | 10% (10)         | 16 | LO #1 - #7  |
|                             | <b>Final Exam</b>   | 3hr | 50% (50)         | -  | All         |
| <b>Total assessment</b>     |                     |     | 100% (100 Marks) |    |             |

| <b>Delivery Plan (Weekly Syllabus)</b> |                                                                                                                              |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|                                        | <b>Material Covered</b>                                                                                                      |
| <b>Week 1</b>                          | General Concepts of Economics / The Relationship of Economics to Other Sciences / The Economic Problem                       |
| <b>Week 2</b>                          | Aspects of Economic Life / Agricultural Economics and Its Branches / Agriculture and Types of Agriculture / Economic Systems |
| <b>Week 3</b>                          | Theory of Consumer Behavior                                                                                                  |
| <b>Week 4</b>                          | Demand / Demand Schedule / Demand Curve / Types of Demand                                                                    |
| <b>Week 5</b>                          | Elasticity of Demand / Factors Affecting Demand                                                                              |
| <b>Week 6</b>                          | Supply / Supply Schedule / Supply Curve                                                                                      |
| <b>Week 7</b>                          | Elasticity of Supply / Factors Affecting Supply                                                                              |
| <b>Week 8</b>                          | Elasticity of Supply and Time / Equilibrium Price                                                                            |
| <b>Week 9</b>                          | Production Theory / Production Function / Short Run and Long Run                                                             |

|                |                                                         |
|----------------|---------------------------------------------------------|
| <b>Week 10</b> | Law of Diminishing Returns and Its Stages               |
| <b>Week 11</b> | Costs / Explicit and Implicit Costs / Types of Costs    |
| <b>Week 12</b> | Average Costs / Long-Run and Short-Run Costs / Revenues |
| <b>Week 13</b> | Agricultural Business Management                        |
| <b>Week 14</b> | Market Concept, Functions, and Types                    |
| <b>Week 15</b> | Semester Exam                                           |
| <b>Week 16</b> | Final Exam                                              |

| Learning and Teaching Resources |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                 | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Available in the Library? |
| <b>Required Texts</b>           | <p>Principles of Economics - Dr. Karim Mahdi Al-Hasnawi (College of Administration and Economics - University of Baghdad) 2012</p> <p>Principles of Agricultural Economics - Dr. Abdul Wahab Matar Al-Dahri (Main References) (Sources) (College of Agriculture - University of Baghdad - 1998)</p> <p>*Principles of Agricultural Economics - Dr. Salem Tawfiq Al-Najfi</p> <p>College of Administration and Economics - University of Mosul - 2001</p> | yes                       |
| <b>Recommended Texts</b>        | Reliable scientific journals, scientific reports                                                                                                                                                                                                                                                                                                                                                                                                         | No                        |
| <b>Websites</b>                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |

# MODULE DESCRIPTION FORM

| Module Information                 |                           |                               |                                                                                                                                                                                                                                                     |
|------------------------------------|---------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Title                       | Organic chemistry         |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | Basic                     |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | FSD111                    |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | 7                         |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | 175                       |                               |                                                                                                                                                                                                                                                     |
| Module Level                       | 1                         | Semester of Delivery          |                                                                                                                                                                                                                                                     |
| Administering Department           | Food Science Dept.        | College                       | College of Agriculture                                                                                                                                                                                                                              |
| Module Leader                      | Dr. Muhsin Falih Abdullah | e-mail                        | mufalih@uowasit.edu.iq                                                                                                                                                                                                                              |
| Module Leader's Acad. Title        | Assistant Prof.           | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                                                               |
| Module Tutor                       | Huda M. Abed              | e-mail                        | <a href="mailto:hbed@uowasit.edu.iq">hbed@uowasit.edu.iq</a>                                                                                                                                                                                        |
| Peer Reviewer Name                 | Name                      | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Scientific Committee Approval Date | 14/10/2025                | Version Number                | 1.0                                                                                                                                                                                                                                                 |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |                                                                                                                                                                                                                                                         |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                        | 1. To provide students with an awareness of the importance of organic chemistry at the industrial, agricultural, and environmental levels.<br>2. To provide students with a broad and balanced foundation of knowledge and skills in organic chemistry. |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li>3. To develop students' ability to apply their chemical knowledge and skills to solve theoretical and scientific problems in chemistry that serve sustainable development goals.</li> <li>4. To develop students' skills of value in their field of specialization.</li> <li>5. Enabling students to apply and utilize their acquired skills to serve the community.</li> <li>6. Introducing and familiarizing students with the most important devices and equipment used in the laboratory.</li> <li>7. Introducing students to the most important requirements for an ideal laboratory.</li> <li>8. Introducing students to safety procedures during laboratory work.</li> <li>9. Teaching students the best diagnostic methods.</li> <li>10. Finding the appropriate and rapid method for diagnosis.</li> <li>11. Enabling the student to perform calculations to determine the concentrations of substances and the percentages of the resulting substances.</li> <li>12. Finding alternatives if the equipment used is unavailable.</li> </ol>                                                                                                                                                                                                                                                                                                        |
| <b>Module Learning Outcomes</b> | <p>Upon completion of the course, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Be familiar with the basic concepts of organic chemistry.</li> <li>2. Be able to identify the chemical formulas of hydrocarbon compounds.</li> <li>3. Distinguish between the types of chemical reactions of hydrocarbon compounds.</li> <li>4. Compare the results of hydrocarbon reactions.</li> <li>5. Apply the IUPAC rules for naming hydrocarbon compounds.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Indicative Contents</b>      | <ol style="list-style-type: none"> <li>1. Introduction to Organic Chemistry <ul style="list-style-type: none"> <li>• Define and study the properties of the carbon atom.</li> <li>• Study the types of reactions of organic compounds (elimination, addition, substitution).</li> </ul> </li> <li>2. Saturated Nonaliphatic Hydrocarbons (Alkanes) <ul style="list-style-type: none"> <li>• Define, name, and study their physicochemical properties.</li> <li>• Study methods for their laboratory preparation.</li> </ul> </li> <li>3. Unsaturated Hydrocarbons (Alkenes) <ul style="list-style-type: none"> <li>• Define them, understand their general formula, naming methods (systematic), and study their properties.</li> <li>• How to prepare ethylene gas in the laboratory.</li> </ul> </li> <li>4. Unsaturated Hydrocarbons (Alkynes) <ul style="list-style-type: none"> <li>• Define them, understand their general formula, naming methods (systematic), and study their properties.</li> <li>• How to prepare acetylene gas in the laboratory.</li> </ul> </li> <li>5. Aldehydes and Ketones <ul style="list-style-type: none"> <li>• Read and understand their structures, know the difference between them, and name them (systematic nomenclature).</li> <li>• Understand how some aldehydes and ketones are prepared and study their various properties.</li> </ul> </li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>6. Aromatic Compounds</p> <ul style="list-style-type: none"> <li>• Know their characteristics and systematic nomenclature.</li> <li>• Study their properties and methods of preparing benzene.</li> </ul> <p>7. Phenols</p> <ul style="list-style-type: none"> <li>• Understand their importance, study their properties, and naming methods.</li> <li>• Understand how phenol is prepared in the laboratory.</li> </ul> <p>8. Alcohols</p> <p>Define them, study their types, and systematically name them.</p> <ul style="list-style-type: none"> <li>• Understand the methods for preparing primary and secondary alcohols and study their most important properties.</li> </ul> <p>9. Carboxylic Acids</p> <ul style="list-style-type: none"> <li>• Study its importance and chemical composition.</li> <li>• Methods of preparing propionic acid and studying its properties.</li> </ul> <p>10. Ethers.</p> <p>11. Midterm and final exams.</p> <ul style="list-style-type: none"> <li>• General review of basic concepts.</li> <li>• Practical applications and performance evaluation tests.</li> </ul> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning and Teaching Strategies

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <p>1. Interactive Theoretical Lectures: Present basic information in an organized manner using educational tools such as presentations and diagrams. Use discussion and dialogue to stimulate critical thinking among students.</p> <p>2. Practical Applications and Field Experiments: Conduct practical laboratory experiments to enhance understanding of theoretical concepts. Train students on the use of laboratory tools and supplies, such as glassware, chemicals, and laboratory equipment, and teach them how to handle them.</p> <p>3. Problem-Based Learning (PBL): Present various organic solutions and ask students to identify the type of these solutions using experiments and the scientific skills provided.</p> <p>4. Demonstrations and Simulations: Use video projectors to demonstrate how to conduct practical experiments in the preparation and study of some organic compounds. Implement virtual experiments to reduce risks and improve understanding of complex processes.</p> <p>5. Cooperative Learning and Teamwork: Divide students into working groups to complete small engineering projects. Encourage the exchange of knowledge and experiences among students through collaborative exercises and experiments.</p> <p>6. Self-Assessment and Continuous Feedback: Encourage students to evaluate their performance through short tests and practical reports. Provide continuous feedback to improve understanding and application.</p> |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>7. Using Technology in Education: Employing e-learning techniques such as explanatory videos and interactive digital content. Leveraging smart systems to measure performance and provide academic recommendations.</p> <p>8. Field Visits to Industrial Facilities: Organizing field trips to factories and engineering laboratories to observe practical applications of the concepts studied. Enhancing students' understanding of the practical environment and linking theoretical information to practical application.</p> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)   |     |                        |   |
|--------------------------|-----|------------------------|---|
| Structured SWL (h/sem)   | 78  | Structured SWL (h/w)   | 5 |
| Unstructured SWL (h/sem) | 97  | Unstructured SWL (h/w) | 6 |
| Total SWL (h/sem)        | 175 |                        |   |

| Module Evaluation    |            |             |                  |          |                           |
|----------------------|------------|-------------|------------------|----------|---------------------------|
|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment | Tests      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                      | Projects   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Lab        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------|
|                                 | Material Covered                                                                                    |
| Week 1                          | definition of organic chemistry, its importance, and knowledge of the properties of the carbon atom |
| Week 2                          | Saturated hydrocarbons (alkanes): definition, preparation, properties, and reactions.               |
| Week 3                          | Alkenes: definition, preparation, properties, and reactions.                                        |

|                                             |                                                                                                              |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Week 4</b>                               | Alkynes: definition, preparation, properties, and reactions.                                                 |
| <b>Week 5</b>                               | Aldehydes and ketones: definition, importance, methods of preparation, and physical and chemical properties. |
| <b>Week 6</b>                               | Properties and nomenclature of aromatic compounds                                                            |
| <b>Week 7</b>                               | Preparation and reactions of aromatic compounds                                                              |
| <b>Week 8</b>                               | Properties and nomenclature of alcohols and phenols                                                          |
| <b>Week 9</b>                               | Preparation and Reactions Alcohols and Phenols                                                               |
| <b>Week 10</b>                              | Ethers: Properties, Preparation, and Reactions                                                               |
| <b>Week 11</b>                              | Preparation, Naming, and Reactions Aldehydes                                                                 |
| <b>Week 12</b>                              | Preparation, Naming, and Reactions Ketones                                                                   |
| <b>Week 13</b>                              | Properties and Naming of Carboxylic Acids                                                                    |
| <b>Week 14</b>                              | Reactions and Preparation Carboxylic Acids                                                                   |
| <b>Week 15</b>                              | Amines: Naming, Preparation Methods, and Properties                                                          |
| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                                                                              |
|                                             | <b>Material Covered</b>                                                                                      |
| <b>Week 1</b>                               | Determine the melting point                                                                                  |
| <b>Week 2</b>                               | Determine the boiling point                                                                                  |
| <b>Week 3</b>                               | Purify organic compounds Liquid by simple distillation                                                       |
| <b>Week 4</b>                               | Recrystallization + Scientific visit Study the sublimation                                                   |
| <b>Week 5</b>                               | Solvent extraction                                                                                           |
| <b>Week 6</b>                               | Preparation of methane gas                                                                                   |
| <b>Week 7</b>                               | Preparation of butene Preparation of acetylene gas                                                           |
| <b>Week 8</b>                               | Study the properties of alcohols                                                                             |
| <b>Week 9</b>                               | Reaction and detection of aldehydes and ketones                                                              |
| <b>Week 10</b>                              | Preparation of acetone                                                                                       |
| <b>Week 11</b>                              | Preparation of propanoic acid                                                                                |
| <b>Week 12</b>                              | Preparation of propane aldehyde                                                                              |
| <b>Week 13</b>                              | phenomenon of organic compounds                                                                              |
| <b>Week 14</b>                              | Practical Application of of define different organics solutions                                              |
| <b>Week 15</b>                              | Report Preparation                                                                                           |

| Learning and Teaching Resources |                                |                           |
|---------------------------------|--------------------------------|---------------------------|
|                                 | Text                           | Available in the Library? |
| Required Texts                  | Theory and practical lectures  | Yes                       |
| Recommended Texts               | Principle of organic chemistry | Yes                       |
|                                 |                                |                           |

# MODULE DESCRIPTION FORM

| Module Information                 |                        |                      |                                                                                                                                                                                                                                                     |                                                                          |
|------------------------------------|------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Module Title                       | Computer programming 1 |                      | Module Delivery                                                                                                                                                                                                                                     |                                                                          |
| Module Type                        | B                      |                      | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                          |
| Module Code                        | WOU4                   |                      |                                                                                                                                                                                                                                                     |                                                                          |
| ECTS Credits                       | 3                      |                      |                                                                                                                                                                                                                                                     |                                                                          |
| SWL (hr/sem)                       | 75                     |                      |                                                                                                                                                                                                                                                     |                                                                          |
| Module Level                       | 1                      | Semester of Delivery |                                                                                                                                                                                                                                                     | 1                                                                        |
| Administering Department           | Food Science           | College              | College of Agriculture                                                                                                                                                                                                                              |                                                                          |
| Module Leader                      | Tahseen A. Lafta       |                      | e-mail                                                                                                                                                                                                                                              | <a href="mailto:taltameemi@uowasit.edu.iq">taltameemi@uowasit.edu.iq</a> |
| Module Leader's Acad. Title        | Assistant Lecturer     |                      | Module Leader's Qualification                                                                                                                                                                                                                       | M.Sc.                                                                    |
| Module Tutor                       |                        |                      | e-mail                                                                                                                                                                                                                                              |                                                                          |
| Peer Reviewer Name                 |                        |                      | e-mail                                                                                                                                                                                                                                              |                                                                          |
| Scientific Committee Approval Date | 14/10/2025             | Version Number       | 1.0                                                                                                                                                                                                                                                 |                                                                          |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Objectives                                      | Identify the parts of the computer and the function of each part, and identify computer technologies, programs, and applications necessary to work on it and complete work.                                                                                             |
| Module Learning Outcomes                               | Delivering theoretical lectures to deliver information to students through the following methods: (whiteboard, data projector, interactive lecture, educational video presentation).<br>Implementing practical lectures through observations and interaction with field |

|                            |                                                                                                                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | or laboratory aspects.                                                                                                                                                                                                                |
| <b>Indicative Contents</b> | <p>Conducting daily quick exams.</p> <p>Evaluating students through the submission of academic reports and oral presentations.</p> <p>Conducting monthly exams.</p> <p>Conducting practical exams.</p> <p>Conducting final exams.</p> |

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <p>Delivering theoretical lectures to deliver information to students through the following methods: (whiteboard, data projector, interactive lecture, educational video presentation).</p> <p>Implementing practical lectures through observations and interaction with field or laboratory aspects.</p> |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

|                                 |           |                               |    |
|---------------------------------|-----------|-------------------------------|----|
| <b>Structured SWL (h/sem)</b>   | 45        | <b>Structured SWL (h/w)</b>   | 15 |
| <b>Unstructured SWL (h/sem)</b> | 5         | <b>Unstructured SWL (h/w)</b> | 10 |
| <b>Total SWL (h/sem)</b>        | <b>75</b> |                               |    |

### Module Evaluation

|                             |                        | Time/Number | Weight (Marks) | Week Due       | Relevant Learning Outcome             |
|-----------------------------|------------------------|-------------|----------------|----------------|---------------------------------------|
| <b>Formative assessment</b> | <b>Assignments</b>     | 1           | 10% (10)       | Continuou<br>s | 1,2,3,4,5,6                           |
|                             | <b>Projects / Lab.</b> | 15          | 10% (10)       | Continuou<br>s | 1,2,3,4,5,6                           |
|                             | <b>Report</b>          | 1           | 15% (15)       | Continuou<br>s | 1,2,3,4,5,6,7,8,9,10,11<br>,12,13,14, |

|                                 |                     |     |                  |                |             |
|---------------------------------|---------------------|-----|------------------|----------------|-------------|
|                                 | <b>Seminars</b>     | 1   | 5% (5)           | Continuou<br>s | 1,2,3,4,5,6 |
| <b>Summative<br/>assessment</b> | <b>Midterm Exam</b> | 2hr | 10% (10)         | 14             | 1,2,3,4,5,6 |
|                                 | <b>Final Exam</b>   | 3hr | 50% (50)         | 16             | All         |
| <b>Total assessment</b>         |                     |     | 100% (100 Marks) |                |             |

| Delivery Plan (Weekly Lab. Syllabus) |                                                                                                          |                           |
|--------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------|
|                                      | Material Covered                                                                                         |                           |
| Week 1                               | What is a computer? / Computer features / Computer components / Types of computers                       |                           |
| Week 2                               | Main parts of a personal computer                                                                        |                           |
| Week 3                               | Operating systems and their types                                                                        |                           |
| Week 4                               | Information Network                                                                                      |                           |
| Week 5                               | Telephone networks and the computer world                                                                |                           |
| Week 6                               | Internet                                                                                                 |                           |
| Week 7                               | Computers in our daily life                                                                              |                           |
| Week 8                               | Insurance, Copyright, and Law                                                                            |                           |
| Week 9                               | Dealing with menus and icons                                                                             |                           |
| Week 10                              | Desktop Quick Menu                                                                                       |                           |
| Week 11                              | Windows Explorer                                                                                         |                           |
| Week 12                              | Using some add-on programs with Windows                                                                  |                           |
| Week 13                              | How to improve the appearance of screen lines when using flat panel LCD displays or laptops              |                           |
| Week 13                              | What is the Firewall available in Windows XP and how do I activate it?                                   |                           |
| Week 14                              | Dynamic Disk                                                                                             |                           |
| Learning and Teaching Resources      |                                                                                                          |                           |
|                                      | Text                                                                                                     | Available in the Library? |
| Required Texts                       | Required textbooks: Computer Science textbook<br>☐ Main references (sources): Office software user guide | Yes                       |
| Recommended Texts                    | ☐ Recommended books and references (scientific journals, reports).                                       | Yes                       |
| Websites                             | No                                                                                                       |                           |

# MODULE DESCRIPTION FORM

| Module Information                 |                            |                      |                                                                                                                                                                                                                               |
|------------------------------------|----------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Title                       | Democracy and human rights |                      | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | S                          |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | WU04                       |                      |                                                                                                                                                                                                                               |
| ECTS Credits                       | 2                          |                      |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | 50                         |                      |                                                                                                                                                                                                                               |
| Module Level                       | 1                          | Semester of Delivery | 1                                                                                                                                                                                                                             |
| Administering Department           | Food Science Dept.         |                      | College                                                                                                                                                                                                                       |
| Module Leader                      | Arkan M. Hasan             |                      | e-mail                                                                                                                                                                                                                        |
| Module Leader's Acad. Title        | Assist. Lecturer           |                      | Module Leader's Qualification                                                                                                                                                                                                 |
| Module Tutor                       |                            |                      | e-mail                                                                                                                                                                                                                        |
| Peer Reviewer Name                 | Name                       | e-mail               | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 14/10/2025                 | Version Number       | 1.0                                                                                                                                                                                                                           |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                        | <ol style="list-style-type: none"> <li><b>Introduce students to the concept of democracy</b>, its historical development, various forms, and mechanisms of implementation in modern political systems.</li> <li><b>Enhance students' awareness of human rights</b>, including their definition, types (civil, political, economic, social, cultural), and the international and local sources that protect these rights.</li> <li><b>Promote a culture of tolerance and active citizenship</b> among students, and encourage respect for others' opinions and political and cultural pluralism.</li> </ol> |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li>4. <b>Enable students to distinguish between democratic and non-democratic systems</b>, analyze their characteristics, and assess their impact on societies.</li> <li>5. <b>Highlight the role of national and international institutions</b> in the protection and promotion of human rights.</li> <li>6. <b>Introduce students to international human rights declarations and conventions</b>, such as the Universal Declaration of Human Rights and the two International Covenants.</li> <li>7. <b>Encourage students to participate in public life</b> and practice their political and civil rights with awareness and responsibility.</li> <li>8. <b>Develop students' critical thinking</b> regarding contemporary issues related to freedom, justice, equality, and the rights of vulnerable and marginalized groups.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li>1. <b>Explain the basic concepts of democracy and human rights</b>, and distinguish them from similar or overlapping concepts.</li> <li>2. <b>Analyze the development of democratic thought throughout history</b>, and identify its forms and contemporary applications.</li> <li>3. <b>Identify the types of human rights</b> (civil, political, economic, social, cultural) and their international and local legal sources.</li> <li>4. <b>Evaluate the role of national and international organizations</b> in the protection and promotion of human rights, such as the United Nations, international courts, and civil society organizations.</li> <li>5. <b>Compare democratic and non-democratic systems</b> in terms of structure, function, and their impact on public freedoms.</li> <li>6. <b>Apply democratic principles in university and community life</b>, through respect for others' opinions, teamwork, and active participation.</li> <li>7. <b>Recognize human rights violations</b> in various contexts and be able to propose humanitarian and legal solutions or alternatives.</li> <li>8. <b>Demonstrate ethical and humanitarian commitment</b> to issues related to equality, justice, and the rights of vulnerable and marginalized groups in society.</li> </ol> |
|                                 | <ol style="list-style-type: none"> <li>1. <b>Introduction to Democracy and Human Rights</b> <ul style="list-style-type: none"> <li>○ Basic concepts</li> <li>○ Importance and objectives</li> </ul> </li> <li>2. <b>Origin and Development of Democracy</b> <ul style="list-style-type: none"> <li>○ Historical roots</li> <li>○ Contemporary models of democracy</li> </ul> </li> <li>3. <b>Forms of Democracy</b> <ul style="list-style-type: none"> <li>○ Direct democracy</li> <li>○ Representative democracy</li> </ul> </li> <li>4. <b>Human Rights: Concept and Characteristics</b></li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Indicative Contents</b> | <ul style="list-style-type: none"> <li>○ Classifications (civil, political, economic...)</li> <li>○ Fundamental principles (dignity, equality, freedom)</li> <li><b>5. International Human Rights Instruments</b> <ul style="list-style-type: none"> <li>○ The Universal Declaration of Human Rights</li> <li>○ The International Covenant on Civil and Political Rights</li> <li>○ The International Covenant on Economic, Social and Cultural Rights</li> </ul> </li> <li><b>6. Mechanisms for the Protection of Human Rights</b> <ul style="list-style-type: none"> <li>○ Nationally (constitution, judiciary)</li> <li>○ Internationally (United Nations, international organizations)</li> </ul> </li> <li><b>7. Democracy and Human Rights in the Arab Context</b> <ul style="list-style-type: none"> <li>○ Challenges and opportunities</li> <li>○ Positive and negative examples</li> </ul> </li> <li><b>8. The Role of Citizens in a Democratic System</b> <ul style="list-style-type: none"> <li>○ Political participation</li> <li>○ Social responsibility</li> </ul> </li> <li><b>9. Contemporary Human Rights Issues</b> <ul style="list-style-type: none"> <li>○ Women's rights</li> <li>○ Children's rights</li> <li>○ Freedom of expression</li> </ul> </li> <li><b>10. Conclusion and General Evaluation</b> <ul style="list-style-type: none"> <li>○ Comprehensive review</li> <li>○ Open discussions and practical applications</li> </ul> </li> </ul> |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                       | <ul style="list-style-type: none"> <li>• <b>Interactive lectures:</b> To present basic concepts and theories in a simplified and clear manner.</li> <li>• <b>Brainstorming and classroom discussions:</b> To stimulate critical thinking and promote the exchange of ideas.</li> <li>• <b>Case studies:</b> To analyze real-life situations related to human rights and democracy.</li> <li>• <b>Group work:</b> To develop a spirit of cooperation and dialogue among students.</li> <li>• <b>Student presentations:</b> To enhance communication and research skills.</li> <li>• <b>Field visits or meetings with human rights organizations (if possible):</b> To connect theory with practical application.</li> <li>• <b>Use of multimedia:</b> Such as videos and documents to showcase examples of the struggle for democracy and human rights.</li> <li>• <b>Short reports and research papers:</b> To encourage self-learning and deepen understanding.</li> </ul> |

| Student Workload (SWL)   |    |                        |   |
|--------------------------|----|------------------------|---|
| Structured SWL (h/sem)   | 33 | Structured SWL (h/w)   | 3 |
| Unstructured SWL (h/sem) | 17 | Unstructured SWL (h/w) | 1 |
| Total SWL (h/sem)        | 50 |                        |   |

| Module Evaluation    |            |             |                  |          |                           |
|----------------------|------------|-------------|------------------|----------|---------------------------|
|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment | Tests      | 1           | 10% (10)         | 7        | LO #1 - #6                |
|                      | Projects   | 1           | 10% (10)         | 15       | LO #1 - #15               |
|                      | Lab        | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                              |
|---------------------------------|------------------------------------------------------------------------------|
|                                 | Material Covered                                                             |
| Week 1                          | Definition of Human Rights                                                   |
| Week 2                          | Origin and Development of the Concept of Human Rights                        |
| Week 3                          | Overview of Human Rights in Ancient Civilizations (Mesopotamia, Nile Valley) |
| Week 4                          | Human Rights in Divine Religions                                             |
| Week 5                          | Human Rights and Their Relation to Other Variables                           |
| Week 6                          | Relationship Between Rights and Law                                          |
| Week 7                          | Relationship Between Rights and Duties                                       |
| Week 8                          | Key Fundamental Human Rights                                                 |
| Week 9                          | Impact of Globalization on Human Rights                                      |

|                |                                                                  |
|----------------|------------------------------------------------------------------|
| <b>Week 10</b> | Major International Declarations and Conventions on Human Rights |
| <b>Week 11</b> | Universal Declaration of Human Rights (1948)                     |
| <b>Week 12</b> | Cairo Declaration on Human Rights in Islam                       |
| <b>Week 13</b> | Human Rights in International Charters and Laws                  |
| <b>Week 14</b> | International Covenant on Civil and Political Rights             |
| <b>Week 15</b> | Financial and Administrative Corruption                          |

| Learning and Teaching Resources |                               |                           |
|---------------------------------|-------------------------------|---------------------------|
|                                 | Text                          | Available in the Library? |
| <b>Required Texts</b>           | Theory and practical lectures | Yes                       |
| <b>Recommended Texts</b>        | Human rights Book             | Yes                       |
| <b>Websites</b>                 |                               |                           |

# MODULE DESCRIPTION FORM

| Module Information                 |                           |                               |                                                                                                                                                                                                                                                     |
|------------------------------------|---------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Title                       | Machines and workshops    |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | Basic                     |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | AGR123                    |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | 7                         |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | 175                       |                               |                                                                                                                                                                                                                                                     |
| Module Level                       | 1                         | Semester of Delivery          |                                                                                                                                                                                                                                                     |
| Administering Department           | Food Science Dept.        | College                       | College of Agriculture                                                                                                                                                                                                                              |
| Module Leader                      | Dr. Hyder Najy Al Zobaidy | e-mail                        | hynajy@uowasit.edu.iq                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        | Professor                 | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                                                               |
| Module Tutor                       | Hyder M. Abed             | e-mail                        | <a href="mailto:Halaboodi@uowasit.edu.iq">Halaboodi@uowasit.edu.iq</a>                                                                                                                                                                              |
| Peer Reviewer Name                 | Name                      | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Scientific Committee Approval Date | 003/03/2026               | Version Number                | 1.0                                                                                                                                                                                                                                                 |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                        | <ol style="list-style-type: none"> <li><b>Understanding Motion and Its Types:</b> Comprehending the basics of mechanical motion, its various types, and their impact on the performance of engineering equipment.</li> <li><b>Power Transmission Methods:</b> Studying methods of mechanical and electrical power transmission in engineering systems, such as belts, chains, and gears.</li> </ol> |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li><b>Pump Transmission Ratio and Operating Principle:</b> Analyzing how power is transmitted in pumps and examining the factors affecting their efficiency.</li> <li><b>Pump Curves:</b> Learning how to read and analyze pump performance curves to select the appropriate type according to operational requirements.</li> <li><b>Water Installation Symbols:</b> Understanding the symbols used in engineering drawings for water supply and drainage systems.</li> <li><b>Main Electricity and Electrical Installations:</b> Understanding the basic principles of electrical systems in industrial and agricultural facilities, including distribution and protection.</li> <li><b>Electric Motor:</b> Studying the working principles of electric motors, their different types, and their applications in agriculture and industry.</li> <li><b>Dairy Plant Ventilation:</b> Learning about ventilation systems used in dairy processing plants and their importance in maintaining product quality.</li> <li><b>Storage of Agricultural Products:</b> Studying various storage methods for agricultural products and the effect of environmental factors on their quality.</li> <li><b>Cooling and Freezing Equipment:</b> Understanding the equipment used in cooling and freezing processes and their role in product preservation.</li> <li><b>Equipment Testing Methods:</b> Learning different methods for testing engineering devices and ensuring their efficient performance.</li> <li><b>Types of Welding:</b> Understanding various welding techniques, such as electric arc and gas welding, and their industrial applications.</li> <li><b>Midterm Exam:</b> Preparing students to successfully complete examinations through reviewing core concepts and practical applications.</li> </ol> |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li><b>Understanding the fundamental principles of motion and power transmission systems</b>, and the ability to analyze their impact on the performance of engineering equipment.</li> <li><b>Ability to calculate transmission ratios in pumps</b>, understand their operating principles, and analyze their curves to select the appropriate pump for each application.</li> <li><b>Proficiency in reading and interpreting water and electrical installation symbols</b> used in engineering drawings for industrial and agricultural facilities.</li> <li><b>Familiarity with ventilation systems in dairy plants</b> and their impact on production quality, along with studying techniques for agricultural product storage, cooling, and freezing.</li> <li><b>Acquisition of practical skills in testing engineering devices and equipment</b>, ensuring their operational efficiency in accordance with</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | <p>quality and maintenance standards.</p> <p>6. <b>Understanding various welding types and their applications</b>, with the ability to select the appropriate method according to engineering work requirements.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Indicative Contents</b> | <p><b>1. Introduction to Motion and Its Types</b></p> <ul style="list-style-type: none"> <li>• Definition of motion and its basic types (linear, rotational, oscillatory).</li> <li>• Applications of motion in engineering and agricultural systems.</li> </ul> <p><b>2. Power Transmission Methods</b></p> <ul style="list-style-type: none"> <li>• Belts, chains, gears, and drive shafts.</li> <li>• Advantages, disadvantages, and various applications of each method.</li> </ul> <p><b>3. Pump Transmission Ratio and Operating Principle</b></p> <ul style="list-style-type: none"> <li>• Concept of transmission ratio and its effect on pump efficiency.</li> <li>• Components and types of pumps (centrifugal, gear, piston).</li> </ul> <p><b>4. Pump Curves and Their Analysis</b></p> <ul style="list-style-type: none"> <li>• How to read performance curves (flow rate, pressure, efficiency).</li> <li>• Selecting the appropriate pump based on operational requirements.</li> </ul> <p><b>5. Water and Electrical Installation Symbols</b></p> <ul style="list-style-type: none"> <li>• Reading and understanding engineering diagrams for water supply and drainage.</li> <li>• Recognizing electrical symbols in industrial and agricultural installations.</li> </ul> <p><b>6. Main Electricity and Electrical Installation</b></p> <ul style="list-style-type: none"> <li>• Components of the main electrical network.</li> <li>• Principles of electrical installation in workshops and processing facilities.</li> </ul> <p><b>7. Electric Motors</b></p> <ul style="list-style-type: none"> <li>• Types of electric motors (single-phase and three-phase).</li> <li>• Operating principles and various applications of motors.</li> </ul> <p><b>8. Dairy Plant Ventilation</b></p> <ul style="list-style-type: none"> <li>• Importance of ventilation in dairy plants and its impact on production quality.</li> <li>• Types of ventilation systems used in the food industry.</li> </ul> <p><b>9. Storage of Agricultural Products</b></p> <ul style="list-style-type: none"> <li>• Various storage methods and the effect of environmental factors on quality.</li> <li>• Preservation techniques for fresh, dried, and frozen products.</li> </ul> <p><b>10. Cooling and Freezing Equipment</b></p> <ul style="list-style-type: none"> <li>• Components and operating principles of cooling and freezing systems.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Applications of refrigeration in food and agricultural industries.</li> </ul> <p><b>11. Equipment and Device Testing Methods</b></p> <ul style="list-style-type: none"> <li>• Periodic inspections to ensure equipment safety.</li> <li>• Using mechanical and electrical devices for testing.</li> </ul> <p><b>12. Types and Techniques of Welding</b></p> <ul style="list-style-type: none"> <li>• Electric arc, gas, friction, and laser welding.</li> <li>• Welding applications in engineering and industrial workshops.</li> </ul> <p><b>13. Midterm and Final Exams</b></p> <ul style="list-style-type: none"> <li>• General review of basic concepts.</li> <li>• Practical applications and performance evaluation tests.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Learning and Teaching Strategies |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Strategies                       | <p><b>1. Interactive Theoretical Lectures</b></p> <ul style="list-style-type: none"> <li>• Presenting foundational information in an organized manner using educational tools such as presentations and illustrative diagrams.</li> <li>• Using discussion and dialogue to stimulate students' critical thinking.</li> </ul> <p><b>2. Practical Applications and Field Experiments</b></p> <ul style="list-style-type: none"> <li>• Conducting hands-on experiments in engineering workshops to reinforce theoretical concepts.</li> <li>• Training students on the use of engineering tools and equipment such as pumps, ventilation systems, and electrical installations.</li> </ul> <p><b>3. Problem-Based Learning (PBL)</b></p> <ul style="list-style-type: none"> <li>• Presenting real-world engineering problems that require analysis and practical solutions from students.</li> <li>• Enhancing creative thinking and decision-making skills.</li> </ul> <p><b>4. Demonstrations and Simulations</b></p> <ul style="list-style-type: none"> <li>• Using engineering simulation programs to illustrate the functioning of systems like power transmission, pumps, and electrical systems.</li> <li>• Conducting virtual experiments to reduce risks and improve understanding of complex operations.</li> </ul> <p><b>5. Collaborative Learning and Teamwork</b></p> <ul style="list-style-type: none"> <li>• Dividing students into working groups to execute small engineering projects.</li> <li>• Encouraging knowledge and experience exchange among students through collaborative problem-solving and experiments.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                     |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>6. Self-Assessment and Continuous Feedback</b>                                                                                                                                                                                                                                                   |
|  | <ul style="list-style-type: none"> <li>Encouraging students to evaluate their performance through quizzes and practical reports.</li> <li>Providing continuous feedback to improve understanding and application.</li> </ul>                                                                        |
|  | <b>7. Use of Technology in Education</b>                                                                                                                                                                                                                                                            |
|  | <ul style="list-style-type: none"> <li>Utilizing e-learning technologies such as instructional videos and interactive digital content.</li> <li>Taking advantage of smart systems to measure performance and provide academic recommendations.</li> </ul>                                           |
|  | <b>8. Field Visits to Industrial Facilities</b>                                                                                                                                                                                                                                                     |
|  | <ul style="list-style-type: none"> <li>Organizing field trips to factories and engineering plants to observe practical applications of studied concepts.</li> <li>Enhancing students' understanding of the work environment and connecting theoretical knowledge to real-world practice.</li> </ul> |

| Student Workload (SWL)   |     |                        |   |
|--------------------------|-----|------------------------|---|
| Structured SWL (h/sem)   | 78  | Structured SWL (h/w)   | 5 |
| Unstructured SWL (h/sem) | 97  | Unstructured SWL (h/w) | 6 |
| Total SWL (h/sem)        | 175 |                        |   |

| Module Evaluation    |            |             |                  |          |                           |
|----------------------|------------|-------------|------------------|----------|---------------------------|
|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment | Tests      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                      | Projects   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Lab        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

### Delivery Plan (Weekly Syllabus)

|                | Material Covered                                |
|----------------|-------------------------------------------------|
| <b>Week 1</b>  | Motion and Its Types                            |
| <b>Week 2</b>  | Power Transmission Methods                      |
| <b>Week 3</b>  | Pump Transmission Ratio and Operating Principle |
| <b>Week 4</b>  | Pump Performance Curves                         |
| <b>Week 5</b>  | Water Installation Symbols                      |
| <b>Week 6</b>  | Midterm Exam                                    |
| <b>Week 7</b>  | Main Electricity                                |
| <b>Week 8</b>  | Electric Motor                                  |
| <b>Week 9</b>  | Electrical Installation                         |
| <b>Week 10</b> | Dairy Plant Ventilation                         |
| <b>Week 11</b> | Storage of Agricultural Products                |
| <b>Week 12</b> | Cooling and Freezing Equipment                  |
| <b>Week 13</b> | Equipment Testing Methods                       |
| <b>Week 14</b> | Types of Welding                                |
| <b>Week 15</b> | Motion and Its Types                            |

### Delivery Plan (Weekly Lab. Syllabus)

|               | Material Covered                                |
|---------------|-------------------------------------------------|
| <b>Week 1</b> | Transmission Devices                            |
| <b>Week 2</b> | Mathematical Applications                       |
| <b>Week 3</b> | Types of Pumps                                  |
| <b>Week 4</b> | Types of Pumps                                  |
| <b>Week 5</b> | Electrical Circuit – General Applications       |
| <b>Week 6</b> | Tools and Materials Used in Water Installations |
| <b>Week 7</b> | Electrical Circuit                              |
| <b>Week 8</b> | General Applications                            |
| <b>Week 9</b> | Electrical Power Transmission                   |

|                |                                                               |
|----------------|---------------------------------------------------------------|
| <b>Week 10</b> | Air Distribution Systems                                      |
| <b>Week 11</b> | How to Create Grounding – Applications                        |
| <b>Week 12</b> | Cooling Devices                                               |
| <b>Week 13</b> | Discharging, Charging, and Repairing Cooling Equipment        |
| <b>Week 14</b> | Practical Application of Welding and Cooling Equipment Repair |
| <b>Week 15</b> | Report Preparation                                            |

| <b>Learning and Teaching Resources</b> |                                                                                                                                                                                                 |                                  |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                        | <b>Text</b>                                                                                                                                                                                     | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | Theory and practical lectures                                                                                                                                                                   | Yes                              |
| <b>Recommended Texts</b>               | workshop processes practices and materials 5th ed<br>Bruce J. Black                                                                                                                             | No                               |
| <b>Websites</b>                        | <a href="https://ca.tindomachine.com/info/requirements-for-food-processing-workshop-45757974.html">https://ca.tindomachine.com/info/requirements-for-food-processing-workshop-45757974.html</a> |                                  |

# MODULE DESCRIPTION FORM

| Module Information                 |                     |                      |                                                                                                                                                                                                                                          |
|------------------------------------|---------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Title                       | Microbiology        |                      | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Basic               |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | AGR1211             |                      |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 7                   |                      |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 175                 |                      |                                                                                                                                                                                                                                          |
| Module Level                       | 1                   | Semester of Delivery | 2                                                                                                                                                                                                                                        |
| Administering Department           | Food Science Dept.  |                      | College                                                                                                                                                                                                                                  |
| Module Leader                      | Dr. Abdulaal Farhan |                      | e-mail                                                                                                                                                                                                                                   |
| Module Leader's Acad. Title        | Assist. Professor   |                      | Module Leader's Qualification                                                                                                                                                                                                            |
| Module Tutor                       | Safa J. Mudher      |                      | e-mail                                                                                                                                                                                                                                   |
| Peer Reviewer Name                 | Name                |                      | e-mail                                                                                                                                                                                                                                   |
| Scientific Committee Approval Date | 03/03/2026          |                      | Version Number                                                                                                                                                                                                                           |
|                                    |                     |                      | 1.0                                                                                                                                                                                                                                      |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                        | 14. Understanding the fundamentals and importance of studying microbiology for food science students.<br>15. Identifying the different branches of microbiology.<br>16. Studying the microorganisms associated with each branch of microbiology.<br>17. Recognizing the importance of beneficial microorganisms used in various applied fields.<br>18. Studying the relationships among microorganisms and the factors affecting them. |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | 19. Understanding proper sterilization techniques used to prevent contamination by microorganisms.<br>20. Knowing the relationship between microorganisms and various food sciences.<br>21. Learning how to conduct and manage experiments in microbiology laboratories.<br>22. Would you like this formatted as part of a course description or syllabus?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Module Learning Outcomes</b> | 1. Understanding the cellular structure of microorganisms and the function of each component in the microbial cell.<br>2. Understanding the methods of microbial reproduction and the factors that influence them.<br>3. Applying proper scientific procedures in microbiology laboratories so that students gain basic knowledge of how to handle microorganisms at the laboratory level.<br>4. Identifying how beneficial microorganisms can be utilized in the field of food science.<br>5. Learning the methods for detecting and identifying microorganisms.<br>6. Understanding how to benefit from bioactive compounds derived from beneficial microorganisms in producing high-quality products according to the practical application of each compound.<br>7. Enhancing the knowledge level of food science students in the field of microbiology.<br>8. Recognizing the role of food science students in advancing microbiological sciences.                                                                                                                                                                 |
| <b>Indicative Contents</b>      | 1. <b>Microbiology Definition and Development Stages:</b> Definition of microbiology, Branches of microbiology, A summary of the development of microbiology, Scientists who contributed to the development of microbiology, The importance of studying microbiology.<br>2. <b>Bacteria:</b> Definition of bacteria, Cellular structures of the bacterial cell, Chemical composition of each structure and its significance to bacteria.<br>3. <b>Bacteria (Continued):</b> Continuation of the cellular structures of the bacterial cell.<br>4. <b>Bacterial Spores:</b> Definition of spores, Causes and stages of spore formation, Types and structure of bacterial spores.<br>5. <b>Bacterial Nomenclature and Shapes:</b> The scientific system used for naming bacteria. Examples of bacterial nomenclature. The main shapes of bacteria.<br>6. <b>Nutritional Requirements for Bacterial Growth:</b> The ability of bacterial cells to utilize and benefit from nutrients. Nutrients that must be present in bacterial growth media.<br>7. <b>Factors Affecting Growth:</b> Physical factors. Chemical factors. |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>8. <b>Stages of Bacterial Growth:</b> The stages the bacterial cell goes through when placed in a growth medium.</p> <p>9. <b>Molds and Yeasts:</b> Definition of molds and yeasts. The main groups of yeasts and molds, with examples of each.</p> <p>10. <b>Molds and Yeasts (Continued):</b> Methods of reproduction in molds and yeasts. Factors affecting their growth. The importance of studying molds and yeasts.</p> <p>11. <b>Algae:</b> Definition of algae. Algal reproduction. Algal movement. Types of algae. Factors affecting algae. The importance of studying algae.</p> <p>12. <b>Viruses:</b> Definition of viruses. Types of viruses.</p> <p>13. <b>Relationship Between Microorganisms and Food.</b></p> <p>14. <b>Effect of Various Substances on Microbial Growth.</b></p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Learning and Teaching Strategies |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Strategies                       | <p>1. <b>Theory-Based Learning:</b></p> <ul style="list-style-type: none"> <li>Utilizing scientific and cognitive principles to understand the theoretical aspects of microbiology correctly.</li> </ul> <p>2. <b>Experience-Based Learning:</b></p> <ul style="list-style-type: none"> <li>Conducting practical experiments with prior knowledge about the equipment and safety procedures in microbiology laboratories.</li> </ul> <p>3. <b>Collaborative Application-Based Learning:</b></p> <ul style="list-style-type: none"> <li>Assigning students in groups to apply a specific idea related to a particular microorganism.</li> <li>Encouraging students to research and work within research teams.</li> </ul> <p>4. <b>Idea Exchange and Innovative Problem-Solving Learning:</b></p> <ul style="list-style-type: none"> <li>Learning how to face problems in scientific research with innovative scientific ideas, and then finding sustainable solutions that address the problem in the least time and cost, and in a safe manner.</li> <li>Exchanging ideas with others and utilizing them to serve scientific research in the field of microbiology.</li> </ul> <p>5. <b>Media-Supported Learning:</b></p> <ul style="list-style-type: none"> <li>Using technological media for various topics in microbiology.</li> </ul> <p>6. <b>Self-Directed and Independent Learning:</b></p> <ul style="list-style-type: none"> <li>Encouraging students to research and study independently using scientific references.</li> <li>Guiding students to prepare summaries or presentations on a specific microorganism or experiment.</li> </ul> <p>7. <b>Research-Based Learning:</b></p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>Understanding the final result of a previous scientific study related to a specific microorganism and using it as a starting point for a new research that contributes to future development.</li> <li>Using practical assessment methods by testing students' ability to perform laboratory experiments.</li> </ul> <p><b>8. Visual Description and Documentation-Based Learning:</b></p> <ul style="list-style-type: none"> <li>Training students to perform visual descriptions of an experiment related to a specific microorganism and its importance in validating the final result.</li> <li>Teaching students how to professionally document their findings.</li> </ul> <p><b>9. Academic Guidance:</b></p> <ul style="list-style-type: none"> <li>Providing general lectures that help increase students' knowledge about microbiology.</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)   |     |                        |   |
|--------------------------|-----|------------------------|---|
| Structured SWL (h/sem)   | 78  | Structured SWL (h/w)   | 5 |
| Unstructured SWL (h/sem) | 97  | Unstructured SWL (h/w) | 6 |
| Total SWL (h/sem)        | 175 |                        |   |

| Module Evaluation    |            |             |                  |          |                           |
|----------------------|------------|-------------|------------------|----------|---------------------------|
|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment | Tests      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                      | Projects   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Lab        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |
|---------------------------------|
|---------------------------------|

|                | <b>Material Covered</b>                                 |
|----------------|---------------------------------------------------------|
| <b>Week 1</b>  | Introduction to Microbiology and its Development Stages |
| <b>Week 2</b>  | Bacteria                                                |
| <b>Week 3</b>  | Bacteria (Continued)                                    |
| <b>Week 4</b>  | Bacterial Spores                                        |
| <b>Week 5</b>  | Bacterial Nomenclature and Shapes                       |
| <b>Week 6</b>  | Nutritional Requirements for Bacterial Growth           |
| <b>Week 7</b>  | Factors Affecting Growth                                |
| <b>Week 8</b>  | Midterm Exam                                            |
| <b>Week 9</b>  | Stages of Bacterial Growth                              |
| <b>Week 10</b> | Molds and Yeasts                                        |
| <b>Week 11</b> | Molds and Yeasts (Continued)                            |
| <b>Week 12</b> | Algae                                                   |
| <b>Week 13</b> | Viruses                                                 |
| <b>Week 14</b> | Relationship Between Microorganisms and Food            |
| <b>Week 15</b> | Effect of Different Substances on Microbial Growth      |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                     |
|---------------------------------------------|-----------------------------------------------------|
|                                             | <b>Material Covered</b>                             |
| <b>Week 1</b>                               | Basics of Working in Microbiology Laboratories      |
| <b>Week 2</b>                               | Culture Media                                       |
| <b>Week 3</b>                               | Sterilization Methods                               |
| <b>Week 4</b>                               | Simple Staining                                     |
| <b>Week 5</b>                               | Gram Staining                                       |
| <b>Week 6</b>                               | Spore Staining                                      |
| <b>Week 7</b>                               | Negative Staining                                   |
| <b>Week 8</b>                               | Study of Bacterial Movement                         |
| <b>Week 9</b>                               | Bacterial Counting                                  |
| <b>Week 10</b>                              | Direct Bacterial Counting                           |
| <b>Week 11</b>                              | Study of the Effect of Physical Factors on Bacteria |

|                |                               |
|----------------|-------------------------------|
| <b>Week 12</b> | Diagnostic Bacterial Tests    |
| <b>Week 13</b> | Sensitivity Testing           |
| <b>Week 14</b> | Microbiological Water Testing |
| <b>Week 15</b> | Study of Molds and Yeasts     |

| Learning and Teaching Resources |                     |                           |
|---------------------------------|---------------------|---------------------------|
|                                 | Text                | Available in the Library? |
| <b>Required Texts</b>           | Microbiology book   | Yes                       |
| <b>Recommended Texts</b>        | Scientific articles | No                        |
| <b>Websites</b>                 |                     |                           |

# MODULE DESCRIPTION FORM

| Module Information                 |                             |                               |                                                                                                                                                                                                                                          |
|------------------------------------|-----------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Title                       | Principles of dairy science |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | C                           |                               | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | FSD113                      |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 7                           |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 175                         |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 1                           | Semester of Delivery          |                                                                                                                                                                                                                                          |
| Administering Department           | Food Science Dept.          | College                       | College of Agriculture                                                                                                                                                                                                                   |
| Module Leader                      | Dr. Hamid W. Ibraheem       | e-mail                        | <a href="mailto:hwafeeq@uowasit.edu.iq">hwafeeq@uowasit.edu.iq</a>                                                                                                                                                                       |
| Module Leader's Acad. Title        | Lecturer                    | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                                                    |
| Module Tutor                       | Hude M. Abed                | e-mail                        | <a href="mailto:haded@uowasit.edu.iq">haded@uowasit.edu.iq</a>                                                                                                                                                                           |
| Peer Reviewer Name                 | Name                        | e-mail                        | E-mail                                                                                                                                                                                                                                   |
| Scientific Committee Approval Date | 003/03/2026                 | Version Number                | 1.0                                                                                                                                                                                                                                      |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |                                                                                                                                                   |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                        | 1. <b>Understanding the Components of Milk:</b> Learn the chemical composition of milk, including proteins, fats, sugars, vitamins, and minerals. |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li><b>Understanding Basic Dairy Processing Operations:</b> Study fundamental processes such as pasteurization, sterilization, fermentation, and manufacturing as applied in dairy product production.</li> <li><b>Understanding Dairy Preservation Techniques:</b> Explore preservation methods to extend the shelf life of milk and its products, such as cooling, drying, and thermal treatments.</li> <li><b>Understanding Milk Quality and Safety:</b> Learn about health and quality standards of milk and the methods used to test its safety.</li> <li><b>Understanding Dairy By-products:</b> Explore various uses of dairy by-products such as whey and yogurt.</li> <li><b>Developing Sensory and Tasting Skills:</b> Train students to evaluate flavor and texture in dairy products and enhance their sensory analysis abilities.</li> <li><b>Acquiring Laboratory Skills in Dairy Analysis:</b> Learn essential chemical and physical analysis techniques for dairy products in laboratory settings.</li> </ol>                                                                                                                                                                                                                                                                                                                                       |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li><b>Understanding Milk Components:</b> The student should be able to identify and describe the main components of milk, such as proteins, fats, sugars, vitamins, and minerals.</li> <li><b>Mastering Basic Processing Operations:</b> The student should acquire the ability to explain and apply fundamental dairy processing operations, including pasteurization, sterilization, fermentation, and dairy product preparation.</li> <li><b>Understanding Dairy Preservation Techniques:</b> The student should be able to identify and apply various methods for preserving milk and dairy products, such as refrigeration and drying.</li> <li><b>Assessing Milk Quality and Safety:</b> The student should be capable of applying health standards to evaluate milk quality and safety using modern laboratory methods.</li> <li><b>Analyzing Dairy By-products:</b> The student should gain knowledge on how to utilize dairy by-products in sustainable and efficient ways.</li> <li><b>Developing Sensory Skills:</b> The student should be able to evaluate dairy products in terms of flavor and texture using sensory analysis techniques.</li> <li><b>Conducting Dairy Laboratory Analyses:</b> The student should acquire practical skills in performing chemical and physical analyses of milk and accurately interpreting the results.</li> </ol> |
|                                 | <ol style="list-style-type: none"> <li><b>Introduction to Dairy:</b> <ul style="list-style-type: none"> <li>Definition of milk and its importance as a complete nutritional source.</li> <li>Nutritional value of milk and its role in human nutrition.</li> </ul> </li> <li><b>Chemical Composition of Milk:</b> <ul style="list-style-type: none"> <li>Main components of milk: proteins, fats, lactose, vitamins, and minerals.</li> <li>Chemical composition of milk and its impact on quality and flavor.</li> </ul> </li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Indicative Contents</b> | <p><b>3. Basic Dairy Processing Operations:</b></p> <ul style="list-style-type: none"> <li>• Pasteurization and sterilization: importance and their impact on milk quality and safety.</li> <li>• Fermentation and production of fermented dairy products such as yogurt and (buttermilk).</li> </ul> <p><b>4. Preservation and Processing Techniques:</b></p> <ul style="list-style-type: none"> <li>• Methods of preserving milk, such as cooling and drying.</li> <li>• Thermal treatments and their effect on shelf life and quality.</li> </ul> <p><b>5. Milk Quality and Safety:</b></p> <ul style="list-style-type: none"> <li>• Milk quality standards and principles of testing.</li> <li>• Standard milk tests for detecting contamination and spoilage.</li> </ul> <p><b>6. Dairy By-products:</b></p> <ul style="list-style-type: none"> <li>• Introduction to by-products like whey and buttermilk.</li> <li>• Uses of dairy by-products in the food industry.</li> </ul> <p><b>7. Sensory Evaluation of Dairy Products:</b></p> <ul style="list-style-type: none"> <li>• Principles of sensory analysis and evaluation of flavor and texture.</li> <li>• Training students in tasting and practical evaluation of dairy products.</li> </ul> <p><b>8. Laboratory Applications:</b></p> <ul style="list-style-type: none"> <li>• Performing laboratory tests on milk, such as fat, protein, and lactose content analysis.</li> <li>• Studying changes in milk components during processing and storage.</li> </ul> <p><b>9. Issues and Challenges in the Dairy Industry:</b></p> <ul style="list-style-type: none"> <li>• Discussion of challenges such as biological and chemical contamination.</li> <li>• Reviewing techniques for improving quality and extending shelf life.</li> </ul> <p><b>10. References and Scientific Resources:</b></p> <ul style="list-style-type: none"> <li>• Providing a list of useful books, articles, and references to support students' learning in the field of dairy science.</li> </ul> |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b> |                                                                                                                                                                                                                                                  |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | <p><b>1. Experiential Learning:</b></p> <ul style="list-style-type: none"> <li>• Provide laboratory experiments to analyze milk components such as fat and protein content, helping students apply theoretical knowledge practically.</li> </ul> |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p> | <ul style="list-style-type: none"> <li>• Conduct experiments on pasteurization, sterilization, and fermentation to develop hands-on understanding of dairy processing techniques.</li> </ul> <p><b>2. Project-Based Learning:</b></p> <ul style="list-style-type: none"> <li>• Assign student projects focused on the production of dairy products, including product selection, manufacturing methods, and quality evaluation.</li> <li>• Encourage research on the uses of dairy by-products and prepare reports on their nutritional and economic impacts.</li> </ul> <p><b>3. Collaborative Learning:</b></p> <ul style="list-style-type: none"> <li>• Organize small groups to explore different aspects of the dairy industry, such as sensory evaluation, preservation methods, and processing techniques.</li> <li>• Promote the exchange of ideas and experiences to foster critical thinking and teamwork.</li> </ul> <p><b>4. Problem-Based Learning:</b></p> <ul style="list-style-type: none"> <li>• Present challenges or issues related to dairy quality or preservation, and facilitate discussion of possible solutions.</li> <li>• Analyze problems such as contamination and industry challenges, training students in analytical thinking to derive solutions.</li> </ul> <p><b>5. Multimedia-Supported Instruction:</b></p> <ul style="list-style-type: none"> <li>• Use educational videos and simulations to explain various dairy processing operations, such as pasteurization and fermentation.</li> <li>• Show visual demonstrations to clarify complex processes and chemical interactions during production.</li> </ul> <p><b>6. Self-Directed and Independent Learning:</b></p> <ul style="list-style-type: none"> <li>• Encourage students to conduct independent research using scientific references and specialized articles.</li> <li>• Guide students in preparing summaries or presentations on milk components, preservation methods, and the role of dairy in nutrition.</li> </ul> <p><b>7. Formative Assessment and Feedback:</b></p> <ul style="list-style-type: none"> <li>• Conduct short quizzes after each learning unit to assess student understanding and provide constructive feedback.</li> <li>• Use practical assessments to evaluate students' ability to perform laboratory analyses accurately.</li> </ul> <p><b>8. Sensory-Based Learning:</b></p> <ul style="list-style-type: none"> <li>• Train students in sensory evaluation of dairy products to develop tasting skills, including assessment of flavor and texture.</li> </ul> |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                 |                                                                                                                                                                                                                                                                                             |                               |   |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|
|                                 | <ul style="list-style-type: none"><li>Allocate regular tasting sessions to teach students how to conduct sensory evaluations and compare product quality.</li></ul>                                                                                                                         |                               |   |
|                                 | <b>9. Academic Advising and Guidance:</b>                                                                                                                                                                                                                                                   |                               |   |
|                                 | <ul style="list-style-type: none"><li>Provide individual support for students needing extra help understanding chemical and technological processes in dairy science.</li><li>Offer advisory lectures focused on the importance of dairy products in nutrition and public health.</li></ul> |                               |   |
| <b>Student Workload (SWL)</b>   |                                                                                                                                                                                                                                                                                             |                               |   |
| <b>Structured SWL (h/sem)</b>   | 78                                                                                                                                                                                                                                                                                          | <b>Structured SWL (h/w)</b>   | 5 |
| <b>Unstructured SWL (h/sem)</b> | 97                                                                                                                                                                                                                                                                                          | <b>Unstructured SWL (h/w)</b> | 6 |
| <b>Total SWL (h/sem)</b>        | <b>175</b>                                                                                                                                                                                                                                                                                  |                               |   |

| <b>Module Evaluation</b>    |                   |                    |                       |                 |                                  |
|-----------------------------|-------------------|--------------------|-----------------------|-----------------|----------------------------------|
|                             |                   | <b>Time/Number</b> | <b>Weight (Marks)</b> | <b>Week Due</b> | <b>Relevant Learning Outcome</b> |
| <b>Formative assessment</b> | <b>Tests</b>      | 1                  | 10% (10)              | 8               | LO #1 - #7                       |
|                             | <b>Projects</b>   | 1                  | 10% (10)              | 6               | LO #1 - #5                       |
|                             | <b>Lab</b>        | 1                  | 10% (10)              | 9               | LO #1 - #8                       |
|                             | <b>Reports</b>    | 1                  | 10% (10)              | 15              | LO #1 - #14                      |
| <b>Summative assessment</b> | <b>Mid Exam</b>   | 2hr                | 10% (10)              | 7               | LO #1 - #6                       |
|                             | <b>Final Exam</b> | 3hr                | 50% (50)              | 16              | All                              |
| <b>Total assessment</b>     |                   |                    | 100% (100 Marks)      |                 |                                  |

|                                        |
|----------------------------------------|
| <b>Delivery Plan (Weekly Syllabus)</b> |
|----------------------------------------|

|                | <b>Material Covered</b>                                          |
|----------------|------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction and Course Overview                                 |
| <b>Week 2</b>  | Economic Importance of Milk and Dairy Products                   |
| <b>Week 3</b>  | Factors Affecting the Quality, Quantity, and Composition of Milk |
| <b>Week 4</b>  | Nutritional Value of Milk                                        |
| <b>Week 5</b>  | Components of Milk                                               |
| <b>Week 6</b>  | Homework Evaluation                                              |
| <b>Week 7</b>  | Milk Proteins                                                    |
| <b>Week 8</b>  | Water and Milk Fat                                               |
| <b>Week 9</b>  | Vitamins and Lactose                                             |
| <b>Week 10</b> | Enzymes and Minerals                                             |
| <b>Week 11</b> | Physical Properties of Milk                                      |
| <b>Week 12</b> | Microorganisms Present in Milk                                   |
| <b>Week 13</b> | Milk Processing in Dairy Plants                                  |
| <b>Week 14</b> | Thermal Treatments of Milk                                       |
| <b>Week 15</b> | Introduction and Course Overview                                 |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                    |
|---------------------------------------------|----------------------------------------------------|
|                                             | <b>Material Covered</b>                            |
| <b>Week 1</b>                               | Examination of Milk Components                     |
| <b>Week 2</b>                               | Determination of Acidity in Milk                   |
| <b>Week 3</b>                               | Microscopic Fat Test and Fat Percentage Estimation |
| <b>Week 4</b>                               | Babcock and Gerber Methods                         |
| <b>Week 5</b>                               | Specific Gravity and Milk Adulteration Detection   |
| <b>Week 6</b>                               | Milk Separation                                    |
| <b>Week 7</b>                               | Cheese Making (Soft, Ricotta, Halloumi, Processed) |
| <b>Week 8</b>                               | Butter Production and Factors Affecting Churning   |
| <b>Week 9</b>                               | Dairy and Water-Based Ice Cream Production         |
| <b>Week 10</b>                              | Milk Enzymes                                       |
| <b>Week 11</b>                              | Milk Handling in Dairy Plants                      |

|                |                                           |
|----------------|-------------------------------------------|
| <b>Week 12</b> | Microorganisms in Milk and Dairy Products |
| <b>Week 13</b> | Yogurt Production                         |
| <b>Week 14</b> | Butter Manufacturing                      |
| <b>Week 15</b> | Cheese Products                           |

| Learning and Teaching Resources |                               |                           |
|---------------------------------|-------------------------------|---------------------------|
|                                 | Text                          | Available in the Library? |
| <b>Required Texts</b>           | Theory and practical lectures | Yes                       |
| <b>Recommended Texts</b>        | Dairy principles Book         | Yes                       |
| <b>Websites</b>                 |                               |                           |

# MODULE DESCRIPTION FORM

| Module Information                 |                          |                      |                                                                                                                                                                                                                                                     |                                                                        |
|------------------------------------|--------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Module Title                       | Principles of Statistics |                      | Module Delivery                                                                                                                                                                                                                                     |                                                                        |
| Module Type                        | Basic                    |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input checked="" type="checkbox"/> Seminar |                                                                        |
| Module Code                        | AGR127                   |                      |                                                                                                                                                                                                                                                     |                                                                        |
| ECTS Credits                       | 5                        |                      |                                                                                                                                                                                                                                                     |                                                                        |
| SWL (hr/sem)                       | 125                      |                      |                                                                                                                                                                                                                                                     |                                                                        |
| Module Level                       | 1                        | Semester of Delivery |                                                                                                                                                                                                                                                     | 2                                                                      |
| Administering Department           | Food Science             |                      | College                                                                                                                                                                                                                                             | College of Agriculture                                                 |
| Module Leader                      | Dr. Hakeem Sultan Abd    |                      | e-mail                                                                                                                                                                                                                                              | hsultan@uowasit.edu.iq                                                 |
| Module Leader's Acad. Title        | Assist. Professor        |                      | Module Leader's Qualification                                                                                                                                                                                                                       | PhD                                                                    |
| Module Tutor                       | Sarah A. Hussain         |                      | e-mail                                                                                                                                                                                                                                              | <a href="mailto:sahussain@uowasit.edu.iq">sahussain@uowasit.edu.iq</a> |
| Peer Reviewer Name                 | Name                     |                      | e-mail                                                                                                                                                                                                                                              | E-mail                                                                 |
| Scientific Committee Approval Date | 003/03/2026              |                      | Version Number                                                                                                                                                                                                                                      | 1.0                                                                    |

| Relation with other Modules |      |  |          |  |
|-----------------------------|------|--|----------|--|
| Prerequisite module         | None |  | Semester |  |
| Co-requisites module        | None |  | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Objectives                                      | 1 . Providing students with theoretical and practical scientific knowledge in the field of statistics.<br>2. The ability to collect and classify data.<br>3. The ability to measure the degree of relationship between variables<br>4. Providing students with the skills required in field management and its impact on field work. |
| Module Learning Outcomes                               | Learning outcomes for teaching the principles of statistics to first-year students in colleges of agriculture include:<br>1. Basic Concepts:<br>* Definition of statistics and its importance in agriculture.<br>* Understanding data types (quantitative, qualitative) and their sources.                                           |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   | <p>2. Data Analysis:</p> <ul style="list-style-type: none"> <li>* Organizing and presenting data using tables and graphs.</li> <li>* Calculating statistical measures such as mean, median, and standard deviation.</li> </ul> <p>3. Probability Distributions:</p> <ul style="list-style-type: none"> <li>* Understanding normal distributions and statistical inference.</li> <li>* Applying probability in analyzing agricultural data.</li> </ul> <p>4. Statistical Inference:</p> <ul style="list-style-type: none"> <li>* Understanding statistical hypotheses and their tests (such as the t-test, chi-square test).</li> <li>* Interpreting statistical results and making decisions based on them.</li> </ul> <p>5. Agricultural Applications:</p> <ul style="list-style-type: none"> <li>* Using statistics to analyze crop and livestock experiments.</li> <li>* Applying statistical methods to improve agricultural production.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p><b>Indicative Contents</b></p> | <p>The syllabus for the Principles of Statistics course for students in colleges of agriculture includes the following topics:</p> <p>1. Introduction to Statistics:</p> <ul style="list-style-type: none"> <li>• Definition of statistics and its importance in agriculture.</li> <li>• Types of data (quantitative, qualitative) and their sources.</li> <li>• Levels of measurement (nominal, ordinal, interval, relative).</li> </ul> <p>2. Data Presentation and Analysis:</p> <ul style="list-style-type: none"> <li>• Organizing data in frequency tables.</li> <li>• Representing data graphically (histograms, columns, circles, lines).</li> <li>• Calculating descriptive measures (mean, median, mode, range, variance, standard deviation).</li> </ul> <p>3. Probability:</p> <ul style="list-style-type: none"> <li>• Introduction to probability theory.</li> <li>• Probability distributions (normal distribution, binomial distribution).</li> <li>• Applications of probability in agriculture.</li> </ul> <p>4. Statistical Distributions :The normal distribution and its properties.</p> <ul style="list-style-type: none"> <li>• Other distributions relevant to agriculture (such as the Poisson distribution).</li> </ul> <p>5. Statistical inference:</p> <ul style="list-style-type: none"> <li>• Estimating parameters (point estimate, confidence intervals).</li> <li>• Statistical hypothesis testing (t-test, Z-test, chi-square test).</li> <li>• Analysis of variance (ANOVA).</li> </ul> <p>6. Correlation and regression:</p> <ul style="list-style-type: none"> <li>• Analyzing the correlation between variables.</li> <li>• The simple linear regression model and its applications in agriculture</li> </ul> |

## Learning and Teaching Strategies

### Strategies

1. Scaffolded Learning:
  - Breaking down statistical concepts into small, sequential steps.
  - Starting with basic concepts (such as mean and variance) and progressing to more complex concepts (such as regression and analysis of variance).
  - Presenting simple examples initially and gradually increasing complexity.
2. Intensive Hands-On Practice:
  - Allocating a significant portion of lecture time to solving statistical exercises step-by-step.
  - Assigning students to complete large sets of homework exercises to reinforce understanding.
  - Using real or quasi-real data from the agricultural field to apply concepts.
3. Problem-Based Learning:
  - Presenting realistic statistical problems that require the application of mathematical and statistical concepts.
  - Encouraging students to work individually or in groups to find solutions.
  - Discussing solutions in class and pointing out common mistakes.
4. Visual and Graphical Learning:
  - Use graphs and charts to illustrate abstract concepts (such as normal distribution and correlation).
  - Teach students how to create graphs manually and using software.
  - Demonstrate how to interpret graphs in an agricultural context.
5. Repetition and Practice:
  - Repeat key concepts periodically to ensure they are consolidated.
  - Provide a wide variety of exercises (theoretical and practical).
  - Encourage students to complete additional exercises outside of class.
6. Example-Based Learning:
  - Provide detailed practical examples of each statistical concept.
  - Demonstrate how each concept is applied in an agricultural context (such as crop or livestock data analysis).
  - Encourage students to analyze additional examples on their own.
7. Collaborative Learning:
  - Divide students into small groups to complete complex exercises.
  - Encourage students to explain concepts to each other.
  - Organize group study sessions outside of class.
8. Continuous Formative Assessment:
  - Periodic quizzes to assess students' understanding of concepts.
  - Weekly assignments that include solving statistical exercises.
  - Progress reports on student progress.
9. Real-Data Learning:

|  |                                                                                                                                                                                                                                                              |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Use real data from agricultural experiments or scientific research.</li> <li>• Teach students how to clean and analyze data.</li> <li>• Demonstrate how to interpret results in an agricultural context.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)   |     |                        |   |
|--------------------------|-----|------------------------|---|
| Structured SWL (h/sem)   | 78  | Structured SWL (h/w)   | 5 |
| Unstructured SWL (h/sem) | 47  | Unstructured SWL (h/w) | 3 |
| Total SWL (h/sem)        | 125 |                        |   |

| Module Evaluation    |                 |             |                  |          |                           |
|----------------------|-----------------|-------------|------------------|----------|---------------------------|
|                      |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment | Quizzes         | 1           | 10% (10)         | 15       | LO #1 - #14               |
|                      | Assignments     | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Projects / Lab. | 1           | 10% (10)         | 7        | LO #1 - #6                |
|                      | Report          | 1           | 10%              | 14       | LO #1 - #14               |
| Summative assessment | Midterm Exam    | 2hr         | 10% (10)         | 8        | LO #1 - #7                |
|                      | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                           |
|---------------------------------|-------------------------------------------|
|                                 | Material Covered                          |
| Week 1                          | Introduction to Statistics                |
| Week 2                          | Statistical Symbols                       |
| Week 3                          | Data Presentation and Summarization       |
| Week 4                          | Frequency Distribution of Tables and Data |
| Week 5                          | Measures of Centering                     |
| Week 6                          | Measures of Dispersion                    |

|                |                           |
|----------------|---------------------------|
| <b>Week 7</b>  | Hypothesis Testing        |
| <b>Week 8</b>  | Normal Distribution       |
| <b>Week 9</b>  | t-Test                    |
| <b>Week 10</b> | Z-Test                    |
| <b>Week 11</b> | F-Test                    |
| <b>Week 12</b> | Simple Linear Correlation |
| <b>Week 13</b> | Simple Linear Regression  |
| <b>Week 14</b> | Probability Theory        |
| <b>Week 15</b> | Midterm Exam              |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                          |
|---------------------------------------------|----------------------------------------------------------|
|                                             | <b>Material Covered</b>                                  |
| <b>Week 1</b>                               | Applications of descriptive and quantitative measures    |
| <b>Week 2</b>                               | Applications of statistical symbols                      |
| <b>Week 3</b>                               | Exercises of frequency tables and graphic representation |
| <b>Week 4</b>                               | Exercises of measures of centering                       |
| <b>Week 5</b>                               | Exercises of dispersion                                  |
| <b>Week 6</b>                               | Applications of normal graphic distributions             |
| <b>Week 7</b>                               | Exercises of t-tests                                     |
| <b>Week 8</b>                               | Exercises of z-tests                                     |
| <b>Week 9</b>                               | Exercises of the F-test                                  |
| <b>Week 10</b>                              | Exercises of correlation                                 |
| <b>Week 11</b>                              | Exercises of linear regression                           |
| <b>Week 12</b>                              | Exercises of probability                                 |
| <b>Week 13</b>                              | Data collection and analysis                             |
| <b>Week 14</b>                              | ANOVA test                                               |
| <b>Week 15</b>                              | Interval test                                            |

| <b>Learning and Teaching Resources</b> |             |                                  |
|----------------------------------------|-------------|----------------------------------|
|                                        | <b>Text</b> | <b>Available in the Library?</b> |
|                                        |             |                                  |

|                          |                                                                                                                                   |     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Required Texts</b>    | Introduction to Statistics, written by Dr. Khashe Mahmoud Al-Rawi, College of Agriculture and Forestry, University of Mosul, 1989 | Yes |
| <b>Recommended Texts</b> | )Reliable scientific journals, scientific reports.(                                                                               | No  |
| <b>Websites</b>          |                                                                                                                                   |     |

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

| Module Information                 |                    |                               |                                                                                                                                                                                                                                          |
|------------------------------------|--------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                    |                               |                                                                                                                                                                                                                                          |
| Module Title                       | English Language   |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Basic              |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | WU02               |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 2                  |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 50                 |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 1                  | Semester of Delivery          |                                                                                                                                                                                                                                          |
| Administering Department           | Food Science dept. | College                       | College of Agriculture                                                                                                                                                                                                                   |
| Module Leader                      | Inaam K. Abbas     | e-mail                        | <a href="mailto:lalshahmani@uowasit.edu.iq">lalshahmani@uowasit.edu.iq</a>                                                                                                                                                               |
| Module Leader's Acad. Title        | Assistant Lec.     | Module Leader's Qualification | MSc                                                                                                                                                                                                                                      |
| Module Tutor                       |                    | e-mail                        |                                                                                                                                                                                                                                          |
| Peer Reviewer Name                 |                    | e-mail                        |                                                                                                                                                                                                                                          |
| Scientific Committee Approval Date | 003/03/2026        | Version Number                | 1.0                                                                                                                                                                                                                                      |

| Relation with other Modules       |      |          |  |
|-----------------------------------|------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module               | None | Semester |  |
| Co-requisites module              | None | Semester |  |

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية                                                                         | to enable the learner to communicate effectively and appropriately in real life situation:<br>b. to use English effectively for study purpose across the curriculum;<br>c. to develop interest in and appreciation of Literature;<br>d. to develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and Writing;<br>e. to revise and reinforce structure already learnt.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                          | to develop the students' abilities in grammar, oral skills, reading, and study skills <ol style="list-style-type: none"> <li>1. Students will increase their awareness of correct usage of English grammar in writing and speaking.</li> <li>2. Improve their speaking ability in English both in terms of fluency and comprehensibility.</li> <li>3. Receive feedback on their performance through oral presentations.</li> <li>4. Increase their reading speed and comprehension of academic articles.</li> <li>5. improve their reading fluency skills through extensive reading.</li> <li>6. Expand their vocabulary by keeping a vocabulary journal.</li> <li>7. strengthen their ability to write academic papers, essays and summaries using the process approach.</li> </ol>                                                                                                                                                                                                                      |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                                                                         | The course aims to develop communicative competence in English for intercultural contexts by teaching language items and communicative strategies essential for such scenarios, while at the same time giving students ample chances to output such items. The aims of this course are reflected in the content, which contains several themes, such as cultural awareness, intercultural awareness and English as a global language. Indicative content includes understanding the uniqueness of your own culture and other cultures, as well as being aware of the role culture plays in communication in English as a global language. In addition, this course allows for discussions about what it means for English to be a global language of communication and how misunderstandings and miscommunications when using English occurs. The course also includes practice in the pronunciation features that help improve intelligibility in intercultural contexts, namely the Lingua Franca Core. |

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

#### Strategies

1. Cultivate relationships  
Speaking with students to know each student, helps you understand who they are, where they come from and, perhaps, gain some insight into what teaching and learning styles are most effective for them.
2. Teach language skills across all curriculum topics
3. Speak slowly and be patient: Speaking in a slower, measured cadence Being a bit more aware of your pronunciation
4. Prioritize “productive language”
5. Using a variety of methods to engage learning
6. Using visual aids by the use of pictures, diagrams, charts and other visual tools.
7. Coordinate with the ESL teacher: Such discussions can yield insights into individual students and their learning styles or challenges; they can also be helpful for sharing information about curriculum topics, potentially providing ESL teachers with ideas for highly relevant vocabulary words that can reinforce academic lessons.
8. Pre-teach new vocabulary words that may be unfamiliar to ELLs, or even to give them a copy of the article or link to the material ahead of time.
9. Build in some group work.
10. Respect moments of silence: Many new language learners tend to be a little reticent and quiet, opting for silence over speaking up and saying something “wrong” in a language that is still unfamiliar. Research-based strategies for differentiating instruction to promote student learning

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

|                                                                                |    |                                                                           |   |
|--------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 33 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 17 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 50 |                                                                           |   |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 3,6,9    | LO #1, #7                 |
|                       | Assignments     | 2           | 10% (10)         | 10       | LO #3, #4 and #6          |
|                       | Projects / Lab. | 0           | 0 %              |          |                           |
|                       | Essays          | 1           | 10% (10)         | 14       | LO #5                     |
| Summative assessment  | Midterm Exam    | 2hr         | 20% (10)         | 7        | LO #1 - #7                |
|                       | Final Exam      | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                               |
|---------------------------------|-------------------------------|
| المنهاج الاسبوعي النظري         |                               |
|                                 | Material Covered              |
| Week 1                          | Unit-1 (Hello)                |
| Week 2                          | Unit-2 (Your world)           |
| Week 3                          | Unit-3 (Personal information) |
| Week 4                          | Unit-4 (Family and friends)   |
| Week 5                          | Unit-5 (It's my life)         |
| Week 6                          | Unit-6 (Every day)            |
| Week 7                          | Mid-term Exam                 |
| Week 8                          | Unit-7 (Places I like)        |
| Week 9                          | Unit-8 (Where I live)         |
| Week 10                         | Unit-9 (Happy birthday)       |
| Week 11                         | Unit-10 (We had a good time)  |
| Week 12                         | Unit-11 (we can do it)        |
| Week 13                         | Unit-12 (Thank you very much) |
| Week 14                         | Unit-13 (Here and now)        |
| Week 15                         | Unit-14 (It's time to go)     |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                                                                      | Available in the Library? |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Headway. Beginner. Student's Book by Liz and John Soars, 2019.                                                                                            | Yes                       |
| <b>Recommended Texts</b> |                                                                                                                                                           | No                        |
| <b>Websites</b>          | <a href="https://elt.oup.com/student/headway/beg/?cc=global&amp;selLanguage=en">https://elt.oup.com/student/headway/beg/?cc=global&amp;selLanguage=en</a> |                           |

# MODULE DESCRIPTION FORM

| Module Information                 |                    |                               |                                                                                                                                                                                                                               |                                                                  |
|------------------------------------|--------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Module Title                       | Arabic Language    |                               | Module Delivery                                                                                                                                                                                                               |                                                                  |
| Module Type                        | S                  |                               | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                  |
| Module Code                        | WU01               |                               |                                                                                                                                                                                                                               |                                                                  |
| ECTS Credits                       | 2                  |                               |                                                                                                                                                                                                                               |                                                                  |
| SWL (hr/sem)                       | 50                 |                               |                                                                                                                                                                                                                               |                                                                  |
| Module Level                       | 1                  | Semester of Delivery          |                                                                                                                                                                                                                               | 2                                                                |
| Administering Department           | Food Science Dept. | College                       | College of Agriculture                                                                                                                                                                                                        |                                                                  |
| Module Leader                      | Arkan M. Hasan     |                               | e-mail                                                                                                                                                                                                                        | <a href="mailto:armosa@uowasit.edu.iq">armosa@uowasit.edu.iq</a> |
| Module Leader's Acad. Title        | Assist. Lecturer   | Module Leader's Qualification | Master degree                                                                                                                                                                                                                 |                                                                  |
| Module Tutor                       |                    |                               | e-mail                                                                                                                                                                                                                        |                                                                  |
| Peer Reviewer Name                 | Name               | e-mail                        | E-mail                                                                                                                                                                                                                        |                                                                  |
| Scientific Committee Approval Date | 003/03/2026        | Version Number                | 1.0                                                                                                                                                                                                                           |                                                                  |

| Relation with other Modules |      |          |  |
|-----------------------------|------|----------|--|
| Prerequisite module         | None | Semester |  |
| Co-requisites module        | None | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li>1. To develop the basic language skills of the student: listening, speaking, reading, and writing.</li> <li>2. To enhance the ability to express orally and in writing using correct and proper Arabic.</li> <li>3. To expand the student's vocabulary through the study of new words and structures.</li> <li>4. To improve reading comprehension and literary analysis skills across various text types (narrative, poetic, and expository).</li> <li>5. To familiarize students with essential grammar and spelling rules and apply them accurately.</li> <li>6. To foster a sense of belonging and appreciation for the Arabic language as a language of religion, culture, and identity.</li> <li>7. To train students in critical and analytical thinking skills through text discussions and interpretation.</li> <li>8. To expose students to examples of classical and modern Arabic literature to appreciate the beauty and history of the language.</li> </ol> |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li>1. The student will distinguish between different types of literary and linguistic texts.</li> <li>2. The student will correctly apply grammar and spelling rules in writing and speaking.</li> <li>3. The student will analyze written texts from both linguistic and literary perspectives.</li> <li>4. The student will compose coherent and grammatically correct paragraphs or essays in Arabic.</li> <li>5. The student will read texts aloud with proper pronunciation and expression.</li> <li>6. The student will express opinions and ideas orally using clear and correct language.</li> <li>7. The student will relate what they learn in Arabic to their daily life or academic specialization.</li> <li>8. The student will demonstrate appreciation for the role of the Arabic language in shaping cultural and religious identity.</li> </ol>                                                                                                             |
| <b>Indicative Contents</b>      | <ol style="list-style-type: none"> <li>1. Introduction to the importance and status of the Arabic language.</li> <li>2. Types of texts: narrative, descriptive, expository, persuasive, poetic.</li> <li>3. Reading skills and reading comprehension.</li> <li>4. Writing skills: paragraph writing, essay writing, letter writing.</li> <li>5. Grammar and morphology: nominal and verbal sentences, subjects and objects, diptotes.</li> <li>6. Spelling rules and punctuation marks.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|  |                                                                                                                                                                                                                                                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ol style="list-style-type: none"> <li>7. Oral expression and public speaking skills.</li> <li>8. Literary analysis of poetry and prose texts.</li> <li>9. Introduction to key figures in classical and modern Arabic literature.</li> <li>10. Practical activities: discussions – oral presentations – written exercises.</li> </ol> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning and Teaching Strategies

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ol style="list-style-type: none"> <li>1. Interactive lectures to explain linguistic and literary concepts.</li> <li>2. Group work through class discussions and collaborative activities.</li> <li>3. Written exercises to develop writing and grammar skills.</li> <li>4. Oral presentations to enhance speaking abilities and self-confidence.</li> <li>5. Analytical reading of various texts to understand deeper meanings.</li> <li>6. Project-based learning to apply knowledge in real-world contexts.</li> <li>7. Brainstorming for idea generation and creative expression.</li> <li>8. Self-assessment and feedback for performance improvement and continuous learning.</li> <li>9. Field visits or meetings with writers to connect content with real life (if applicable).</li> <li>10. Use of multimedia tools such as educational videos and presentations to enrich the content.</li> </ol> |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

|                                 |           |                               |   |
|---------------------------------|-----------|-------------------------------|---|
| <b>Structured SWL (h/sem)</b>   | 30        | <b>Structured SWL (h/w)</b>   | 2 |
| <b>Unstructured SWL (h/sem)</b> | 17        | <b>Unstructured SWL (h/w)</b> | 1 |
| <b>Total SWL (h/sem)</b>        | <b>50</b> |                               |   |

### Module Evaluation

|                             |                          | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|-----------------------------|--------------------------|-------------|----------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>           | 1           | 10% (10)       | 15       | LO #1 - #14               |
|                             | <b>Onset assignments</b> | 1           | 10% (10)       | 14       | LO #8 - #13               |

|                      |                    |     |                  |    |            |
|----------------------|--------------------|-----|------------------|----|------------|
|                      | Online assignments | 1   | 10% (10)         | 6  | LO #1 - #5 |
|                      | Reports            | 1   | 10% (10)         | 5  | LO #1 - #4 |
| Summative assessment | Midterm Exam       | 2hr | 10% (10)         | 8  | LO #1 - #7 |
|                      | Final Exam         | 3hr | 50% (50)         | 16 | All        |
| Total assessment     |                    |     | 100% (100 Marks) |    |            |

| Delivery Plan (Weekly Syllabus) |                                                                                                                                                                                                                                      |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | Material Covered                                                                                                                                                                                                                     |
| Week 1                          | Getting acquainted with the history of the Arabic language, and its sections: first: grammar: explaining the payments from the Beginner, the news, the name of Kan and her sisters, and the participation of students in applying it |
| Week 2                          | Complete the explanation of the payments from the news of Kan, her sisters and the actor The actor's deputy will activate the practical application                                                                                  |
| Week 3                          | Explanation of the postulates of the effect and absolute effect                                                                                                                                                                      |
| Week 4                          | Complete the explanation of the positions of effect and effect for him and for him                                                                                                                                                   |
| Week 5                          | The use of competition and the spirit of the group in explaining the subject of the case and raising some questions about the subject of the exception                                                                               |
| Week 6                          | Using the question-and-answer method by presenting the topic of discrimination and continuing to present the subject of the caller                                                                                                   |
| Week 7                          | Getting into the topic of prepositions: explaining the importance of prepositions from the genitive by preposition and genitive by annexation                                                                                        |
| Week 8                          | Explanation of the topic of minions, from participle, emphasis and substitution                                                                                                                                                      |
| Week 9                          | Complete the explanation of the Minions of the kindness of the pattern                                                                                                                                                               |
| Week 10                         | Entering a new topic, namely the number, and knowing its provisions                                                                                                                                                                  |
| Week 11                         | Second: to identify the exchange science and the exchange balance by applying it in practice                                                                                                                                         |
| Week 12                         | Explain the subject of the correct verb and the difference between it and the verb The sufferer                                                                                                                                      |
| Week 13                         | Touch on the subject of abstract verbs and more, explain the subject of verb attribution                                                                                                                                             |
| Week 14                         | Third: spelling: explain the topic of punctuation marks and find out their importance in writing research and University theses                                                                                                      |

|                |                                                                            |
|----------------|----------------------------------------------------------------------------|
| <b>Week 15</b> | Recognize the importance of drawing the Hamza, writing the TA and applying |
|----------------|----------------------------------------------------------------------------|

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                                    |                                  |
|------------------------------------------------------------------------|----------------------------------------------------|----------------------------------|
|                                                                        | <b>Text</b>                                        | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | Arabic language book, Dr. Rafid Sabah Altimimy     | Yes                              |
| <b>Recommended Texts</b>                                               | Journals and reports, online references, internet. | No                               |

# Module 13

## MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information                 |                     |                               |                                                                                                                                                                                                                                          |                                                                      |
|------------------------------------|---------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| معلومات المادة الدراسية            |                     |                               |                                                                                                                                                                                                                                          |                                                                      |
| Module Title                       | Food Hygiene        |                               | Module Delivery                                                                                                                                                                                                                          |                                                                      |
| Module Type                        | Core                |                               | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                      |
| Module Code                        | FSD212              |                               |                                                                                                                                                                                                                                          |                                                                      |
| ECTS Credits                       | 6                   |                               |                                                                                                                                                                                                                                          |                                                                      |
| SWL (hr/sem)                       | 150                 |                               |                                                                                                                                                                                                                                          |                                                                      |
| Module Level                       | 2                   | Semester of Delivery          |                                                                                                                                                                                                                                          | 1                                                                    |
| Administering Department           | Food science        | College                       | College of Agriculture                                                                                                                                                                                                                   |                                                                      |
| Module Leader                      | Dr. Abdulaal Farhan |                               | e-mail                                                                                                                                                                                                                                   | abfarhan@uowasit.edu.iq                                              |
| Module Leader's Acad. Title        | Assist. Prof.       | Module Leader's Qualification | PhD                                                                                                                                                                                                                                      |                                                                      |
| Module Tutor                       | Msc. Safa Mudher    |                               | e-mail                                                                                                                                                                                                                                   | <a href="mailto:sajabbar@uowasit.edu.iq">sajabbar@uowasit.edu.iq</a> |
| Peer Reviewer Name                 | Name                | e-mail                        | E-mail                                                                                                                                                                                                                                   |                                                                      |
| Scientific Committee Approval Date | 14/10/2025          | Version Number                | 1.0                                                                                                                                                                                                                                      |                                                                      |

| Relation with other Modules       |      |          |  |
|-----------------------------------|------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module               | None | Semester |  |
| Co-requisites module              | None | Semester |  |

### Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li>1. Understanding the principles and importance of studying food safety for food science students.</li> <li>2. Identifying the types of spoilage that occur in foods.</li> <li>3. Identifying sources of contamination by microorganisms.</li> <li>4. Identifying sources of contamination by chemicals.</li> <li>5. Understanding the good manufacturing practices.</li> <li>6. Study the sanitary requirements in food production.</li> <li>7. Understanding proper management and sanitation methods used to prevent food contamination.</li> <li>8. Learning how to conduct and manage experiments in food evaluation laboratories.</li> </ol> |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li>1. Understanding food supply chain.</li> <li>2. Food contamination sources.</li> <li>3. Application of GMP in food industry.</li> <li>4. Identifying methods for testing and detecting of microorganisms in food.</li> <li>5. Identifying methods for testing and detecting of chemicals in food.</li> <li>6. Understanding safe and hygienic methods for handling food products.</li> <li>7. Developing the level of knowledge of food science students in food safety and hygiene.</li> <li>8. Understanding the role of food science specialists in protecting human health.</li> </ol>                                                        |
| <b>Indicative Contents</b>      | <ol style="list-style-type: none"> <li>1. Definition of the food hygiene.</li> <li>2. Relation between human health and food type.</li> <li>3. Understanding the relation between food structure and its spoilage.</li> <li>4. Understanding food spoilage sources.</li> <li>5. Management of food safety and testing laboratories.</li> <li>6. Maintaining food safety and hygiene through food supply chain.</li> <li>7. HACCP.</li> <li>8. Health and well-being of workers in food industry.</li> <li>9. International authorities responsible for food regulations and safety standards.</li> </ol>                                                                                 |

|  |                                                                                                                   |
|--|-------------------------------------------------------------------------------------------------------------------|
|  | 10. Understanding food laws, specifications, and regulations.<br>11. Green methods for cleaning and disinfection. |
|--|-------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ol style="list-style-type: none"> <li>1. Learning based on theoretical understanding of the subject: <ul style="list-style-type: none"> <li>• Application of scientific and knowledge-based principles for the correct theoretical understanding of food safety.</li> </ul> </li> <li>2. Learning based on lab experience: <ul style="list-style-type: none"> <li>• Conducting various knowledge-equipped experiments about laboratory equipment and safety actions in food testing laboratories.</li> </ul> </li> <li>3. Learning based on applying ideas collaboratively: <ul style="list-style-type: none"> <li>• Ask student groups to apply a specific idea related to a particular food product.</li> <li>• Encourage students to conduct a research work within research groups.</li> </ul> </li> <li>4. Learning based on exchanging ideas and innovative solutions for solving the problems: <ul style="list-style-type: none"> <li>• Teach students how to apply innovative scientific ideas to face research problems, followed by sustainable green solutions.</li> <li>• Exchange ideas with others and applying them in improving a scientific research.</li> </ul> </li> <li>5. Education supported by available tools: <ul style="list-style-type: none"> <li>• Applying technological methods in various topics related to food safety.</li> </ul> </li> <li>6. Self-directed and independent learning: <ul style="list-style-type: none"> <li>• Encourage students to conduct studies and researches using scientific references of trusted sources.</li> <li>• Guide students to prepare presentations that focused on maintaining healthy foods.</li> </ul> </li> <li>7. Education based on previous scientific research results: <ul style="list-style-type: none"> <li>• Understanding the final results of previous scientific research related to a particular food product and how to apply them as a starting point for a new research that contributes to future development.</li> <li>• Using practical assessment methods by testing students' ability to perform certain lab experiments.</li> </ul> </li> <li>8. Learning based on visual description and documentation of every result:</li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>Teach and train students on how to perform a visual characterization of a specific food, and its importance in proving the validity of the result.</li> <li>Train students on how to document results professionally.</li> </ul> <p>9. Academic guidance:</p> <ul style="list-style-type: none"> <li>General lectures that contribute to increasing the nutritional culture of students.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |   |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|---|
| الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا                                        |     |                                                                           |   |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 78  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 5 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 72  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 150 |                                                                           |   |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 1           | 10% (10)         | 15       | LO #1 - #14               |
|                       | Assignments     | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                       | Projects / Lab. | 1           | 10% (10)         | 7        | LO #1 - #6                |
|                       | Report          | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment  | Midterm Exam    | 2hr         | 10% (10)         | 8        | LO #1 - #7                |
|                       | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                  |
|---------------------------------|------------------|
|                                 | Material Covered |

|                |                                                                  |
|----------------|------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction to food hygiene and safety                          |
| <b>Week 2</b>  | Food supply chain and how to produce safe and healthy foods      |
| <b>Week 3</b>  | Main types of food spoilage                                      |
| <b>Week 4</b>  | Food groups based on their spoilage ability                      |
| <b>Week 5</b>  | Microorganisms and food                                          |
| <b>Week 6</b>  | Microorganisms and food- 2                                       |
| <b>Week 7</b>  | Food microbial spoilage main sources                             |
| <b>Week 8</b>  | Main sources of food microbial spoilage based on the food source |
| <b>Week 9</b>  | Midterm Exam                                                     |
| <b>Week 10</b> | Food international regulations and specifications                |
| <b>Week 11</b> | GMP                                                              |
| <b>Week 12</b> | Hygiene requirements in food production                          |
| <b>Week 13</b> | Worker's health in food industry                                 |
| <b>Week 14</b> | Safe food handling methods                                       |
| <b>Week 15</b> | Food storage                                                     |
| <b>Week 16</b> | Preparatory week before the final Exam                           |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                          |
|---------------------------------------------|----------------------------------------------------------|
|                                             | <b>Material Covered</b>                                  |
| <b>Week 1</b>                               | Introduction to food safety and testing laboratories     |
| <b>Week 2</b>                               | Detection methods of microorganisms                      |
| <b>Week 3</b>                               | Detection methods of microorganisms (microbial stains)   |
| <b>Week 4</b>                               | Samples preparation and their transfer to the laboratory |
| <b>Week 5</b>                               | Monitoring food industry workers                         |
| <b>Week 6</b>                               | HACCP                                                    |
| <b>Week 7</b>                               | HACCP- 2                                                 |
| <b>Week 8</b>                               | Chemical hazards                                         |
| <b>Week 9</b>                               | Exam                                                     |
| <b>Week 10</b>                              | Pesticides and their transfer to foods                   |
| <b>Week 11</b>                              | Antibiotics                                              |

|                |                                         |
|----------------|-----------------------------------------|
| <b>Week 12</b> | Detection methods of chemicals in foods |
| <b>Week 13</b> | Mechanical and physical hazards         |
| <b>Week 14</b> | Mechanical and physical hazards - 2     |
| <b>Week 15</b> | Green cleaning and disinfection methods |

| <b>Learning and Teaching Resources</b> |                                            |                                  |
|----------------------------------------|--------------------------------------------|----------------------------------|
|                                        | <b>Text</b>                                | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | Recent scientific books of trusted sources | ✖                                |
| <b>Recommended Texts</b>               | High quality scientific journals           | ✖                                |
| <b>Websites</b>                        |                                            |                                  |

# Module 14

## MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information                 |                        |                      |                                                                                                                                                                                                                               |                                                                    |
|------------------------------------|------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| معلومات المادة الدراسية            |                        |                      |                                                                                                                                                                                                                               |                                                                    |
| Module Title                       | Agricultural Marketing |                      | Module Delivery                                                                                                                                                                                                               |                                                                    |
| Module Type                        | S                      |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                    |
| Module Code                        | AGR211                 |                      |                                                                                                                                                                                                                               |                                                                    |
| ECTS Credits                       | 4                      |                      |                                                                                                                                                                                                                               |                                                                    |
| SWL (hr/sem)                       | 100                    |                      |                                                                                                                                                                                                                               |                                                                    |
| Module Level                       | 2                      | Semester of Delivery |                                                                                                                                                                                                                               | 1                                                                  |
| Administering Department           | Food science           | College              | College of Agriculture                                                                                                                                                                                                        |                                                                    |
| Module Leader                      | Dr. Hakeem Sultan Abed |                      | e-mail                                                                                                                                                                                                                        | <a href="mailto:hsultan@uowasit.edu.iq">hsultan@uowasit.edu.iq</a> |
| Module Leader's Acad. Title        | Assist. Prof.          |                      | Module Leader's Qualification                                                                                                                                                                                                 |                                                                    |
| Module Tutor                       |                        |                      | e-mail                                                                                                                                                                                                                        |                                                                    |
| Peer Reviewer Name                 |                        |                      | e-mail                                                                                                                                                                                                                        |                                                                    |
| Scientific Committee Approval Date | 14/10/2025             |                      | Version Number                                                                                                                                                                                                                | 1 <sup>st</sup>                                                    |

| Relation with other Modules       |      |          |  |
|-----------------------------------|------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module               | None | Semester |  |
| Co-requisites module              | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | <ol style="list-style-type: none"> <li>1. Understand the basic concepts of agricultural marketing.</li> <li>2. Identify the characteristics of agricultural products and markets.</li> <li>3. Analyze agricultural marketing channels.</li> <li>4. Study the factors affecting agricultural prices.</li> <li>5. Evaluate the efficiency of agricultural marketing systems.</li> </ol> |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | 6. Propose solutions to marketing problems in the agricultural sector.<br>7. Apply modern technologies in agricultural marketing.                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | 1. Analyze agricultural markets effectively.<br>2. Prepare marketing plans for agricultural products.<br>3. Develop decision-making skills in agricultural marketing.<br>4. Understand the relationship between agricultural production, marketing, and profitability.                                                                                                                                                                                                                                                          |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | 1. <b>Concepts and Fundamentals of Marketing</b><br>(Definition of marketing, its importance, evolution, and objectives)<br>2. <b>Market and Consumer</b><br>(Consumer behavior, market segmentation, and demand analysis)<br>3. <b>Marketing Mix (4Ps)</b><br>(Product, Price, Place, Promotion)<br>4. <b>Marketing Research and Analysis</b><br>(Data collection, market analysis, and competitor analysis)<br>5. <b>Modern Marketing Strategies</b><br>(Digital marketing, e-commerce, and customer relationship management) |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | 1. <b>Active Learning</b><br>Engaging students in discussions, problem-solving, and group work instead of passive listening.<br>2. <b>Cooperative Learning</b><br>Dividing students into small groups to complete shared tasks and develop collaboration skills.<br>3. <b>Problem-Based Learning (PBL)</b><br>Presenting real-life problems from agriculture or marketing for students to analyze and solve.<br>4. <b>E-Learning</b><br>Using digital platforms, videos, and interactive materials to support learning outside the classroom.<br>5. <b>Self-Directed Learning</b><br>Encouraging students to independently research, read, and develop their knowledge. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب                                 |     |                                                                           |   |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 33  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 67  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 100 |                                                                           |   |

| Module Evaluation<br>تقييم المادة الدراسية |                 |             |                  |          |                           |
|--------------------------------------------|-----------------|-------------|------------------|----------|---------------------------|
|                                            |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment                       | Quizzes         | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                                            | Assignments     | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                                            | Projects / Lab. | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                                            | Report          | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment                       | Midterm Exam    | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                                            | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment                           |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري |                                                                            |
|------------------------------------------------------------|----------------------------------------------------------------------------|
|                                                            | Material Covered                                                           |
| Week 1                                                     | Introduction to Agricultural Marketing (Definition, evolution, importance) |
| Week 2                                                     | Marketing Concepts in Agriculture (Traditional vs agricultural marketing)  |
| Week 3                                                     | Marketing Functions I (Collection, grading, standardization)               |
| Week 4                                                     | Marketing Functions II (Transportation, storage, packaging)                |
| Week 5                                                     | Value Addition (Agricultural processing and value addition)                |
| Week 6                                                     | Finance & Risk (Agricultural finance and insurance)                        |

|                |                                                                    |
|----------------|--------------------------------------------------------------------|
| <b>Week 7</b>  | Information Systems (Marketing information systems)                |
| <b>Week 8</b>  | Agricultural Markets (Types and characteristics)                   |
| <b>Week 9</b>  | Supply & Demand (Market forces and demand analysis)                |
| <b>Week 10</b> | Pricing Basics (Price concept and pricing systems)                 |
| <b>Week 11</b> | Price Factors (Factors affecting price fluctuations)               |
| <b>Week 12</b> | Marketing Channels (Direct and indirect channels)                  |
| <b>Week 13</b> | Institutions (Intermediaries and cooperatives)                     |
| <b>Week 14</b> | Marketing Problems (Post-harvest losses and infrastructure issues) |
| <b>Week 15</b> | Modern Trends (E-marketing, smart agriculture, branding)           |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                                                                                   |                                  |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                 | <b>Text</b>                                                                                                                                                                       | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                           | Principles of Agricultural Marketing.<br>Agricultural Products Marketing Management.<br>Agricultural Marketing Economics.<br>Recent books and research in Agricultural Marketing. | No                               |
| <b>Recommended Texts</b>                                        |                                                                                                                                                                                   |                                  |
| <b>Websites</b>                                                 |                                                                                                                                                                                   |                                  |

# MODULE 15

## MODULE DESCRIPTION FORM

| Module Information                        |                           |                    |                                                                                                                                                                                                                                          |                                                                  |       |
|-------------------------------------------|---------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------|
| <b>Module Title</b>                       | Liquid Dairy Products     |                    | <b>Module Delivery</b>                                                                                                                                                                                                                   |                                                                  |       |
| <b>Module Type</b>                        | C                         |                    | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                  |       |
| <b>Module Code</b>                        | FSD214                    |                    |                                                                                                                                                                                                                                          |                                                                  |       |
| <b>ECTS Credits</b>                       | 6                         |                    |                                                                                                                                                                                                                                          |                                                                  |       |
| <b>SWL (hr/sem)</b>                       | 150                       |                    |                                                                                                                                                                                                                                          |                                                                  |       |
| <b>Module Level</b>                       |                           | 2                  |                                                                                                                                                                                                                                          | <b>Semester of Delivery</b>                                      | 2     |
| <b>Administering Department</b>           |                           | Food Science Dept. | <b>College</b>                                                                                                                                                                                                                           | College of Agriculture                                           |       |
| <b>Module Leader</b>                      | Dr. Hyder Najy Al Zobaidy |                    | <b>e-mail</b>                                                                                                                                                                                                                            | <a href="mailto:hynajy@uowasit.edu.iq">hynajy@uowasit.edu.iq</a> |       |
| <b>Module Leader's Acad. Title</b>        |                           | Professor          | <b>Module Leader's Qualification</b>                                                                                                                                                                                                     |                                                                  | Ph.D. |
| <b>Module Tutor</b>                       | Huda Muhamed Abed         |                    | <b>e-mail</b>                                                                                                                                                                                                                            | <a href="mailto:haded@uowasit.edu.iq">haded@uowasit.edu.iq</a>   |       |
| <b>Peer Reviewer Name</b>                 |                           | Name               | <b>e-mail</b>                                                                                                                                                                                                                            | E-mail                                                           |       |
| <b>Scientific Committee Approval Date</b> |                           | 03/03/2026         | <b>Version Number</b>                                                                                                                                                                                                                    | 1.0                                                              |       |

| Relation with other Modules |      |  |                 |  |
|-----------------------------|------|--|-----------------|--|
| <b>Prerequisite module</b>  | None |  | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None |  | <b>Semester</b> |  |

## Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li>1. To identify the composition and properties of milk and liquid dairy products.</li> <li>2. To study methods of receiving, testing, and evaluating raw milk quality.</li> <li>3. To understand the manufacturing processes of various liquid dairy products such as pasteurized, sterilized, and flavored milk.</li> <li>4. To recognize pasteurization, sterilization, and homogenization techniques and their effects on product quality.</li> <li>5. To study the factors affecting preservation and shelf life of liquid dairy products.</li> <li>6. To identify manufacturing and microbial defects and methods of prevention.</li> <li>7. To understand standards and food safety requirements related to liquid dairy products.</li> <li>8. To develop students' skills in conducting chemical, physical, and microbiological tests for milk and dairy products.</li> <li>9. To study packaging, storage, and transportation methods for liquid dairy products.</li> <li>10. To connect theoretical knowledge with practical applications in dairy processing plants.</li> </ol> |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li>7. Explain the chemical composition and physical properties of milk and liquid dairy products.</li> <li>8. Differentiate between types of liquid dairy products and their manufacturing methods.</li> <li>9. Apply pasteurization, sterilization, and homogenization processes according to scientific principles.</li> <li>10. Evaluate the quality of milk and dairy products using chemical, physical, and microbiological tests.</li> <li>11. Identify manufacturing defects and microbial spoilage in liquid dairy products.</li> <li>12. Determine the factors affecting shelf life and safety of liquid dairy products.</li> <li>13. Comply with food safety requirements and quality standards during processing and handling.</li> <li>14. Properly and safely use dairy processing equipment and laboratory instruments.</li> <li>15. Select suitable packaging and storage methods to maintain product quality.</li> <li>16. Integrate theoretical knowledge with practical applications in dairy processing plants.</li> </ol>                                               |
| <b>Indicative Contents</b>      | <ol style="list-style-type: none"> <li>1. Introduction to the dairy industry and the importance of liquid dairy products.</li> <li>2. Chemical composition and physical properties of milk.</li> <li>3. Milk components and factors affecting milk quality.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ol style="list-style-type: none"> <li>4. Reception and preliminary testing of raw milk.</li> <li>5. Milk clarification, filtration, and cooling processes.</li> <li>6. Pasteurization: concept, types, and importance.</li> <li>7. Homogenization and its effect on milk properties.</li> <li>8. Processing of pasteurized and sterilized milk.</li> <li>9. Production of flavored milk and special liquid dairy products.</li> <li>10. Packaging, storage, and handling of liquid dairy products.</li> <li>11. Microbial spoilage and manufacturing defects in milk and dairy products.</li> <li>12. Chemical, physical, and microbiological tests for liquid dairy products.</li> <li>13. Standards and food safety requirements in dairy processing.</li> <li>14. Preservation techniques and shelf-life extension of liquid dairy products.</li> <li>15. Practical applications and field visits to dairy processing plants.</li> </ol> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning and Teaching Strategies

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ol style="list-style-type: none"> <li>1. Theoretical lectures to explain the basic concepts of liquid dairy product processing.</li> <li>2. Practical training in laboratories and pilot dairy plants.</li> <li>3. Classroom discussions and interactive learning activities.</li> <li>4. Use of presentations and audio-visual teaching aids.</li> <li>5. Training students to perform chemical and microbiological tests for milk and dairy products.</li> <li>6. Field visits to dairy factories and processing plants.</li> <li>7. Problem-based learning related to quality and safety of dairy products.</li> <li>8. Assigning students scientific reports and short research projects.</li> <li>9. Cooperative learning and group work during practical activities.</li> <li>10. Using modern technologies and electronic resources in teaching and learning.</li> </ol> |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

|                                 |            |                               |   |
|---------------------------------|------------|-------------------------------|---|
| <b>Structured SWL (h/sem)</b>   | 78         | <b>Structured SWL (h/w)</b>   | 5 |
| <b>Unstructured SWL (h/sem)</b> | 72         | <b>Unstructured SWL (h/w)</b> | 5 |
| <b>Total SWL (h/sem)</b>        | <b>150</b> |                               |   |

### Module Evaluation

|                             |                   | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|-----------------------------|-------------------|-------------|------------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Tests</b>      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                             | <b>Projects</b>   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                             | <b>Lab</b>        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                             | <b>Reports</b>    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| <b>Summative assessment</b> | <b>Mid Exam</b>   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                             | <b>Final Exam</b> | 3hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>     |                   |             | 100% (100 Marks) |          |                           |

### Delivery Plan (Weekly Syllabus)

|                | Material Covered                                               |
|----------------|----------------------------------------------------------------|
| <b>Week 1</b>  | Basic Properties of Milk                                       |
| <b>Week 2</b>  | Physical Properties of Milk                                    |
| <b>Week 3</b>  | Liquid Milk: Definition and Types                              |
| <b>Week 4</b>  | Types of Liquid Milk and the Nutritional Value of Milk         |
| <b>Week 5</b>  | Milk Adulteration                                              |
| <b>Week 6</b>  | Transportation, Receiving, and Storage of Milk in Dairy Plants |
| <b>Week 7</b>  | Midterm Examination                                            |
| <b>Week 8</b>  | Milk Preparation in Dairy Factories                            |
| <b>Week 9</b>  | Milk Homogenization                                            |
| <b>Week 10</b> | Heat Treatments of Milk                                        |
| <b>Week 11</b> | Steps of High-Temperature Short-Time (HTST) Pasteurization     |
| <b>Week 12</b> | Condensed Milk Products                                        |
| <b>Week 13</b> | Dried Milk Products                                            |
| <b>Week 14</b> | Basic Properties of Milk                                       |
| <b>Week 15</b> | Physical Properties of Milk                                    |

### Delivery Plan (Weekly Lab. Syllabus)

|               | Material Covered                                                             |
|---------------|------------------------------------------------------------------------------|
| <b>Week 1</b> | Introduction to the dairy laboratory, equipment, and laboratory safety rules |
| <b>Week 2</b> | Milk sampling, preservation, and preparation for analysis                    |
| <b>Week 3</b> | Sensory evaluation tests of liquid milk                                      |
| <b>Week 4</b> | Measurement of milk density and specific gravity using a lactometer          |
| <b>Week 5</b> | Determination of titratable acidity and pH of milk                           |
| <b>Week 6</b> | Detection of milk adulteration with water and additives                      |

|                |                                                                    |
|----------------|--------------------------------------------------------------------|
| <b>Week 7</b>  | Determination of milk fat percentage by Gerber method              |
| <b>Week 8</b>  | Determination of total solids and solids-not-fat in milk           |
| <b>Week 9</b>  | Milk quality tests and milk reception procedures in dairy plants   |
| <b>Week 10</b> | Application of milk homogenization and observation of its effects  |
| <b>Week 11</b> | Laboratory pasteurization of milk                                  |
| <b>Week 12</b> | Testing pasteurization efficiency and phosphatase enzyme detection |
| <b>Week 13</b> | Preparation of flavored milk in the laboratory                     |
| <b>Week 14</b> | Production of condensed and sweetened milk                         |
| <b>Week 15</b> | Preparation of milk powder and study of its physical properties    |

| <b>Learning and Teaching Resources</b> |                                                                                                                                                                                                 |                                  |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                        | <b>Text</b>                                                                                                                                                                                     | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | Theory and practical lectures                                                                                                                                                                   | No                               |
| <b>Recommended Texts</b>               | Liquid milk book                                                                                                                                                                                | No                               |
| <b>Websites</b>                        | <a href="https://ca.tindomachine.com/info/requirements-for-food-processing-workshop-45757974.html">https://ca.tindomachine.com/info/requirements-for-food-processing-workshop-45757974.html</a> |                                  |

# MODULE 16

## MODULE DESCRIPTION FORM

| Module Information                        |                   |                    |                                                                                                                                                                                                                               |                                                                  |
|-------------------------------------------|-------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <b>Module Title</b>                       | Arabic language 2 |                    | <b>Module Delivery</b>                                                                                                                                                                                                        |                                                                  |
| <b>Module Type</b>                        | S                 |                    | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                  |
| <b>Module Code</b>                        | WU21              |                    |                                                                                                                                                                                                                               |                                                                  |
| <b>ECTS Credits</b>                       | 2                 |                    |                                                                                                                                                                                                                               |                                                                  |
| <b>SWL (hr/sem)</b>                       | 50                |                    |                                                                                                                                                                                                                               |                                                                  |
| <b>Module Level</b>                       |                   | 2                  |                                                                                                                                                                                                                               |                                                                  |
| <b>Administering Department</b>           |                   | Food Science Dept. | <b>College</b>                                                                                                                                                                                                                | College of Agriculture                                           |
| <b>Module Leader</b>                      | Arkan Ali Mosa    |                    | <b>e-mail</b>                                                                                                                                                                                                                 | <a href="mailto:armosa@uowasit.edu.iq">armosa@uowasit.edu.iq</a> |
| <b>Module Leader's Acad. Title</b>        |                   | Lec. Assist.       | <b>Module Leader's Qualification</b>                                                                                                                                                                                          |                                                                  |
|                                           |                   |                    | MSc                                                                                                                                                                                                                           |                                                                  |
| <b>Module Tutor</b>                       |                   |                    | <b>e-mail</b>                                                                                                                                                                                                                 |                                                                  |
| <b>Peer Reviewer Name</b>                 |                   | Name               | <b>e-mail</b>                                                                                                                                                                                                                 | E-mail                                                           |
| <b>Scientific Committee Approval Date</b> |                   | 14/10/2025         | <b>Version Number</b>                                                                                                                                                                                                         | 1.0                                                              |

| Relation with other Modules |      |  |                 |
|-----------------------------|------|--|-----------------|
| <b>Prerequisite module</b>  | None |  | <b>Semester</b> |
| <b>Co-requisites module</b> | None |  | <b>Semester</b> |

## Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li>11. Develop students' basic language skills: listening, speaking, reading, and writing.</li> <li>12. Enhance students' ability to express themselves orally and in writing using correct and fluent Arabic.</li> <li>13. Expand students' vocabulary and linguistic repertoire through the study of new words and structures.</li> <li>14. Develop reading comprehension and literary analysis skills through various types of texts (narrative, poetic, and expository).</li> <li>15. Introduce students to fundamental grammatical and spelling rules and enable them to apply them in writing and speaking.</li> <li>16. Strengthen students' appreciation of the Arabic language as the language of religion, culture, and identity.</li> <li>17. Train students in critical and analytical thinking skills through discussing texts and understanding their meanings and implications.</li> <li>18. Familiarize students with selected examples of classical and modern Arabic literature to appreciate the beauty, richness, and historical development of the language.</li> </ol> |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li>17. Distinguish between different types of literary and linguistic texts.</li> <li>18. Apply grammatical and spelling rules correctly in both writing and speaking.</li> <li>19. Analyze written texts from linguistic and literary perspectives.</li> <li>20. Write a paragraph or an essay in correct, coherent, and well-organized Arabic.</li> <li>21. Read texts aloud accurately and expressively.</li> <li>22. Express opinions and viewpoints orally using clear and correct language.</li> <li>23. Relate the knowledge and skills acquired in Arabic language studies to daily life and academic specialization.</li> <li>24. Demonstrate an appreciation of the importance of the Arabic language in shaping cultural and religious identity.</li> </ol>                                                                                                                                                                                                                                                                                                                       |
| <b>Indicative Contents</b>      | <ol style="list-style-type: none"> <li>16. Introduction to the importance and status of the Arabic language.</li> <li>17. Types of texts: narrative, descriptive, expository, persuasive, and poetic.</li> <li>18. Reading skills and reading comprehension.</li> <li>19. Writing skills: paragraph writing, essay writing, and letter writing.</li> <li>20. Grammar and morphology: nominal sentences, verbal sentences, nominatives, accusatives, and diptotes (non-declinable nouns).</li> <li>21. Spelling skills and punctuation marks.</li> <li>22. Oral expression and public speaking skills.</li> <li>23. Literary analysis of poetic and prose texts.</li> <li>24. Introduction to prominent figures of classical and modern Arabic literature.</li> <li>25. Practical activities: discussions, oral presentations, and writing exercises.</li> </ol>                                                                                                                                                                                                                                                                  |

### Learning and Teaching Strategies

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ol style="list-style-type: none"> <li>1. Interactive lectures to explain linguistic and literary concepts.</li> <li>2. Group work through classroom discussions and collaborative activities.</li> <li>3. Writing exercises to develop writing, grammar, and composition skills.</li> <li>4. Oral presentations to enhance speaking skills and self-confidence.</li> <li>5. Analytical reading of various texts to understand deeper meanings and interpretations.</li> <li>6. Project-based learning to apply knowledge in real-world contexts.</li> <li>7. Brainstorming activities to generate ideas and encourage creative expression.</li> <li>8. Self-assessment and feedback to improve performance and support continuous learning.</li> <li>9. Field visits or meetings with writers and literary figures to strengthen the connection between course content and real-life experiences (where feasible).</li> <li>10. Use of multimedia resources, such as educational videos and presentations, to facilitate understanding of the course content.</li> </ol> |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

### Student Workload (SWL)

|                                 |           |                               |   |
|---------------------------------|-----------|-------------------------------|---|
| <b>Structured SWL (h/sem)</b>   | 33        | <b>Structured SWL (h/w)</b>   | 2 |
| <b>Unstructured SWL (h/sem)</b> | 17        | <b>Unstructured SWL (h/w)</b> | 1 |
| <b>Total SWL (h/sem)</b>        | <b>50</b> |                               |   |

### Module Evaluation

|                             |                   | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|-----------------------------|-------------------|-------------|----------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Tests</b>      | 1           | 10% (10)       | 15       | LO #1 - #14               |
|                             | <b>Projects</b>   | 1           | 10% (10)       | 14       | LO #8 - #13               |
|                             | <b>Lab</b>        | 1           | 10% (10)       | 6        | LO #1 - #5                |
|                             | <b>Reports</b>    | 1           | 10% (10)       | 5        | LO #1 - #4                |
| <b>Summative assessment</b> | <b>Mid Exam</b>   | 2hr         | 10% (10)       | 8        | LO #1 - #7                |
|                             | <b>Final Exam</b> | 3hr         | 50% (50)       | 16       | All                       |

|                         |                  |  |  |
|-------------------------|------------------|--|--|
| <b>Total assessment</b> | 100% (100 Marks) |  |  |
|-------------------------|------------------|--|--|

| <b>Delivery Plan (Weekly Syllabus)</b> |                                                                                                                         |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                                        | <b>Material Covered</b>                                                                                                 |
| <b>Week 1</b>                          | Explanation and interpretation of Surah Al-Hajj and introduction to the history of the Arabic language and its branches |
| <b>Week 2</b>                          | Grammar (Nahw): nominative cases including subject, predicate, and “Kana” and its sisters with practical exercises      |
| <b>Week 3</b>                          | Completion of nominative structures: predicate of Inna and Kana, subject, and passive subject with practice             |
| <b>Week 4</b>                          | Pre-Islamic poetry: types, trends, and major poets                                                                      |
| <b>Week 5</b>                          | Poetry issues in relation to Islamic Da’wah and the Prophet Muhammad (PBUH)                                             |
| <b>Week 6</b>                          | Islam and the rejection/criticism of poetry                                                                             |
| <b>Week 7</b>                          | Using competition and teamwork to teach Al-Hal and introduction to Al-Istithna’ (exception)                             |
| <b>Week 8</b>                          | Question–answer method in teaching Al-Tamyiz and Al-Munada                                                              |
| <b>Week 9</b>                          | Parts of speech and grammatical case endings (I’rab signs)                                                              |
| <b>Week 10</b>                         | Detailed explanation of subject (Mubtada’) and predicate (Khabar)                                                       |
| <b>Week 11</b>                         | Definite and indefinite nouns                                                                                           |
| <b>Week 12</b>                         | Inflected (Mu’rab) and indeclinable (Mabni) words                                                                       |
| <b>Week 13</b>                         | Subject (Fa’il) and passive subject (Na’ib Al-Fa’il)                                                                    |
| <b>Week 14</b>                         | Grammatical abrogating particles/verbs (Nawasikh)                                                                       |
| <b>Week 15</b>                         | Arabic rhetoric (Balaghah): science of Bayan and its types                                                              |

| <b>Learning and Teaching Resources</b> |                                                                              |                                  |
|----------------------------------------|------------------------------------------------------------------------------|----------------------------------|
|                                        | <b>Text</b>                                                                  | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | Book: Arabic Language by Dr. Rafid Sabah Al-Tamimi and Taghreed Fadhil Abbas | Yes                              |
| <b>Recommended Texts</b>               | References: Scientific journals, reports                                     | No                               |
| <b>Websites</b>                        | Electronic references: Online references, internet websites                  |                                  |



# MODULE 17

## MODULE DESCRIPTION FORM

| Module Information                        |                           |                                      |                                                                                                                                                                                                                                          |
|-------------------------------------------|---------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Title</b>                       | Sugar and date processing |                                      | <b>Module Delivery</b>                                                                                                                                                                                                                   |
| <b>Module Type</b>                        | C                         |                                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| <b>Module Code</b>                        | FSD213                    |                                      |                                                                                                                                                                                                                                          |
| <b>ECTS Credits</b>                       | 6                         |                                      |                                                                                                                                                                                                                                          |
| <b>SWL (hr/sem)</b>                       | 150                       |                                      |                                                                                                                                                                                                                                          |
|                                           |                           |                                      |                                                                                                                                                                                                                                          |
| <b>Module Level</b>                       | 2                         | <b>Semester of Delivery</b>          | 1                                                                                                                                                                                                                                        |
| <b>Administering Department</b>           | Food Science Dept.        | <b>College</b>                       | College of Agriculture                                                                                                                                                                                                                   |
| <b>Module Leader</b>                      | Dr. Husain F. Khulaif     | <b>e-mail</b>                        | <a href="mailto:hfadhel@uowasit.edu.iq">hfadhel@uowasit.edu.iq</a>                                                                                                                                                                       |
| <b>Module Leader's Acad. Title</b>        | Assist. Professor         | <b>Module Leader's Qualification</b> | Ph.D.                                                                                                                                                                                                                                    |
| <b>Module Tutor</b>                       | Huda Muhamed Abed         | <b>e-mail</b>                        | <a href="mailto:habed@uowasit.edu.iq">habed@uowasit.edu.iq</a>                                                                                                                                                                           |
| <b>Peer Reviewer Name</b>                 | Name                      | <b>e-mail</b>                        | E-mail                                                                                                                                                                                                                                   |
| <b>Scientific Committee Approval Date</b> | 14/10/2025                | <b>Version Number</b>                | 1.0                                                                                                                                                                                                                                      |

| Relation with other Modules |      |                 |  |
|-----------------------------|------|-----------------|--|
| <b>Prerequisite module</b>  | None | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None | <b>Semester</b> |  |

## Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ul style="list-style-type: none"> <li>19. Understanding sugar manufacturing technology and its various sources.</li> <li>20. Studying the chemical and physical composition of dates and their nutritional properties.</li> <li>21. Understanding sugar extraction processes from raw materials (sugar beet and sugarcane).</li> <li>22. Studying date processing techniques and their various products (date syrup, date paste, dried dates).</li> <li>23. Understanding refining, purification, and crystallization processes in the sugar industry.</li> <li>24. Studying the factors affecting the quality of sugar and dates during processing and storage.</li> <li>25. Identifying processing defects and microbial spoilage and methods to reduce them.</li> <li>26. Understanding standard specifications and food safety requirements for sugar and date products.</li> <li>27. Developing students' skills in chemical and physical testing of sugar and date products.</li> <li>28. Linking theoretical knowledge with industrial applications in sugar and date processing plants.</li> </ul> |
| <b>Module Learning Outcomes</b> | <ul style="list-style-type: none"> <li>25. Introduction to the sugar industry and its natural sources.</li> <li>26. Chemical composition of sugar and dates.</li> <li>27. Sugar extraction techniques from raw materials.</li> <li>28. Stages of refining, purification, and crystallization.</li> <li>29. Manufacturing of various date products.</li> <li>30. Drying and storage processes.</li> <li>31. Quality evaluation and physical properties.</li> <li>32. Chemical and microbiological tests.</li> <li>33. Manufacturing defects and methods of their treatment.</li> <li>34. Industrial applications in sugar and date factories.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Indicative Contents</b>      | <ul style="list-style-type: none"> <li>26. Introduction to the sugar and date industries and their economic importance.</li> <li>27. Sources of sugar (sugarcane and sugar beet).</li> <li>28. Chemical composition of sugar and dates.</li> <li>29. Stages of extraction and purification.</li> <li>30. Crystallization and drying processes.</li> <li>31. Production of white sugar and brown sugar.</li> <li>32. Types of dates and their characteristics.</li> <li>33. Production of date syrup and date paste.</li> <li>34. Storage, packaging, and labeling.</li> <li>35. Manufacturing defects and spoilage.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

### Learning and Teaching Strategies

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | 11. Lectures for explaining fundamental concepts.<br>12. Practical laboratory instruction.<br>13. Classroom discussions and interactive learning.<br>14. Presentations and instructional aids.<br>15. Hands-on training in chemical analyses.<br>16. Field visits to sugar and date factories.<br>17. Problem-based learning.<br>18. Preparing reports and scientific research.<br>19. Teamwork and cooperative learning.<br>20. Use of modern electronic resources. |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

|                                 |            |                               |   |
|---------------------------------|------------|-------------------------------|---|
| <b>Structured SWL (h/sem)</b>   | 78         | <b>Structured SWL (h/w)</b>   | 5 |
| <b>Unstructured SWL (h/sem)</b> | 72         | <b>Unstructured SWL (h/w)</b> | 5 |
| <b>Total SWL (h/sem)</b>        | <b>150</b> |                               |   |

### Module Evaluation

|                             |                   | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|-----------------------------|-------------------|-------------|------------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Tests</b>      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                             | <b>Projects</b>   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                             | <b>Lab</b>        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                             | <b>Reports</b>    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| <b>Summative assessment</b> | <b>Mid Exam</b>   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                             | <b>Final Exam</b> | 3hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>     |                   |             | 100% (100 Marks) |          |                           |

### Delivery Plan (Weekly Syllabus)

|                | Material Covered                        |
|----------------|-----------------------------------------|
| <b>Week 1</b>  | Introduction to sugar and date industry |
| <b>Week 2</b>  | Chemical composition of sugar and dates |
| <b>Week 3</b>  | Raw materials for sugar production      |
| <b>Week 4</b>  | Extraction of sugar                     |
| <b>Week 5</b>  | Purification processes                  |
| <b>Week 6</b>  | Crystallization techniques              |
| <b>Week 7</b>  | Midterm exam                            |
| <b>Week 8</b>  | Sugar types and classification          |
| <b>Week 9</b>  | Date fruit characteristics              |
| <b>Week 10</b> | Date products processing                |
| <b>Week 11</b> | Drying and storage                      |
| <b>Week 12</b> | Packaging techniques                    |
| <b>Week 13</b> | Quality control                         |
| <b>Week 14</b> | Defects and spoilage                    |
| <b>Week 15</b> | Industrial applications                 |

### Delivery Plan (Weekly Lab. Syllabus)

|                | Material Covered                         |
|----------------|------------------------------------------|
| <b>Week 1</b>  | Introduction to lab equipment and safety |
| <b>Week 2</b>  | Sample preparation                       |
| <b>Week 3</b>  | Sugar quality tests                      |
| <b>Week 4</b>  | Moisture content determination           |
| <b>Week 5</b>  | Sugar purity tests                       |
| <b>Week 6</b>  | Extraction experiments                   |
| <b>Week 7</b>  | Crystallization analysis                 |
| <b>Week 8</b>  | Date moisture analysis                   |
| <b>Week 9</b>  | Sensory evaluation                       |
| <b>Week 10</b> | Production of date syrup                 |
| <b>Week 11</b> | Production of date paste                 |
| <b>Week 12</b> | Storage tests                            |
| <b>Week 13</b> | Quality control tests                    |
| <b>Week 14</b> | Packaging experiments                    |
| <b>Week 15</b> | Final practical review                   |

### Learning and Teaching Resources

|                       | Text                          | Available in the Library? |
|-----------------------|-------------------------------|---------------------------|
| <b>Required Texts</b> | Theory and practical lectures | Yes                       |

|                              |                                      |    |
|------------------------------|--------------------------------------|----|
| <b>Recommended<br/>Texts</b> | Sugar Technology and Date Processing | No |
| <b>Websites</b>              | Electronic references & internet     |    |

# MODULE 18

## MODULE DESCRIPTION FORM

| Module Information                        |                           |                    |                                                                                                                                                                                                                                          |                          |
|-------------------------------------------|---------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>Module Title</b>                       | Food Plant Engineering    |                    | <b>Module Delivery</b>                                                                                                                                                                                                                   |                          |
| <b>Module Type</b>                        | Basic                     |                    | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                          |
| <b>Module Code</b>                        | FSD211                    |                    |                                                                                                                                                                                                                                          |                          |
| <b>ECTS Credits</b>                       | 6                         |                    |                                                                                                                                                                                                                                          |                          |
| <b>SWL (hr/sem)</b>                       | 150                       |                    |                                                                                                                                                                                                                                          |                          |
|                                           |                           |                    |                                                                                                                                                                                                                                          |                          |
| <b>Module Level</b>                       |                           | 2                  | <b>Semester of Delivery</b>                                                                                                                                                                                                              | 1                        |
| <b>Administering Department</b>           |                           | Food Science Dept. | <b>College</b>                                                                                                                                                                                                                           | College of Agriculture   |
| <b>Module Leader</b>                      | Dr. Muhsin Falih Abdullah |                    | <b>e-mail</b>                                                                                                                                                                                                                            | mufalih@uowasit.edu.iq   |
| <b>Module Leader's Acad. Title</b>        |                           | Assist. Professor  | <b>Module Leader's Qualification</b>                                                                                                                                                                                                     | Ph.D.                    |
| <b>Module Tutor</b>                       | Msc. Hyder M. Abed        |                    | <b>e-mail</b>                                                                                                                                                                                                                            | Halaboodi@uowasit.edu.iq |
| <b>Peer Reviewer Name</b>                 |                           | Name               | <b>e-mail</b>                                                                                                                                                                                                                            | E-mail                   |
| <b>Scientific Committee Approval Date</b> |                           | 14/10/2025         | <b>Version Number</b>                                                                                                                                                                                                                    | 1.0                      |

| Relation with other Modules |      |  |                 |  |
|-----------------------------|------|--|-----------------|--|
| <b>Prerequisite module</b>  | None |  | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None |  | <b>Semester</b> |  |

## Module Aims, Learning Outcomes and Indicative Contents

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b></p>        | <ol style="list-style-type: none"> <li>1. . To provide students with awareness of the importance of food plant engineering at the industrial and environmental levels.</li> <li>2. To equip students with a broad and balanced foundation of knowledge and skills within food processing plants.</li> <li>3. To develop students' ability to apply their engineering knowledge and skills in solving theoretical and practical problems in factories in ways that support sustainable development goals.</li> <li>4. To develop valuable skills for students in their field of specialization.</li> <li>5. To enable students to apply and employ their acquired skills in serving the community.</li> <li>6. To introduce students to the most important devices and equipment used in food factories.</li> <li>7. To familiarize students with the essential requirements of an ideal laboratory.</li> <li>8. To introduce students to safety procedures while working in the laboratory.</li> <li>9. To teach students the best methods of food preservation and processing.</li> <li>10. To identify suitable and efficient methods for understanding food quality and the proper ways of handling food products.</li> <li>11. To enable students to perform calculations for determining material concentrations and percentage compositions of produced materials.</li> <li>12. To identify alternative solutions in cases where the required equipment is unavailable.</li> </ol> |
| <p><b>Module Learning Outcomes</b></p> | <p>Upon completion of the course, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the basic concepts of food processing plant engineering.</li> <li>2. Recognize the scientific principles upon which food processing operations are based.</li> <li>3. Distinguish between the different types of problems that occur in foods during processing and identify methods to prevent them.</li> <li>4. Compare different food processing operations and select the most suitable one for a specific food product.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | <p>5. Apply public health and safety regulations for personnel in food processing plants.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Indicative Contents | <ol style="list-style-type: none"> <li>1. <b>Material Balance and Energy Balance</b> <ul style="list-style-type: none"> <li>• Law of conservation of matter.</li> <li>• Forms of energy.</li> </ul> </li> <li>2. <b>Pasteurization and Sterilization Equipment</b> <ul style="list-style-type: none"> <li>• Types of pasteurization equipment and sterilization equipment.</li> <li>• Steps for operating a sterilizer.</li> </ul> </li> <li>3. <b>Refrigeration and Freezing Equipment</b> <ul style="list-style-type: none"> <li>• Types of refrigeration.</li> <li>• Factors affecting the refrigeration unit.</li> <li>• Coefficient of performance (COP).</li> <li>• Types of freezing equipment.</li> </ul> </li> <li>4. <b>Dimensions and Units</b> <ul style="list-style-type: none"> <li>• Definition of some units.</li> <li>• Unit conversions.</li> </ul> </li> <li>5. <b>Evaporation</b> <ul style="list-style-type: none"> <li>• Types of evaporation equipment.</li> <li>• Heat calculations required for condensation.</li> <li>• Boiling point elevation.</li> </ul> </li> <li>6. <b>Heat and Methods of Heat Transfer</b> <ul style="list-style-type: none"> <li>• Fourier's law of heat conduction.</li> <li>• Thermal resistance.</li> <li>• Types of heat transfer.</li> </ul> </li> <li>7. <b>Heat Exchangers</b> <ul style="list-style-type: none"> <li>• Fouling factor.</li> <li>• Heat exchanger effectiveness.</li> </ul> </li> <li>8. <b>Heating Systems in Food Factories</b> <ul style="list-style-type: none"> <li>• Combustion.</li> <li>• Types of fuels.</li> <li>• Heat utilization systems for food heating.</li> </ul> </li> <li>9. <b>Handling and Transportation of Food Materials</b> <ul style="list-style-type: none"> <li>• Transportation of solid materials.</li> <li>• Power required for transportation processes.</li> <li>• Types of conveying equipment.</li> </ul> </li> </ol> |

## Learning and Teaching Strategies

### **1 Teaching and Learning Methods**

#### 1. Interactive Theoretical Lectures

- Presenting fundamental information in an organized manner using educational tools such as presentations and illustrative diagrams.
- Using discussion and dialogue methods to stimulate students' critical thinking.

#### 2. Practical Applications and Field Training

- Conducting field visits to food processing plants and learning about their administrative work mechanisms.
- Training students to practice some administrative activities in food plant departments and how to manage them.

#### 3. Problem-Based Learning (PBL)

- Presenting administrative problems in several food plants and discussing methods for solving them.

#### 4. Demonstrations and Simulation

- Using video presentation equipment to demonstrate how to conduct practical procedures for selecting a suitable factory location.
- Conducting virtual experiments to reduce risks and improve understanding of complex processes.

#### 5. Cooperative Learning and Teamwork

- Dividing students into working groups to implement small administrative projects.
- Encouraging the exchange of knowledge and experiences among students through cooperation in solving exercises and practical activities.

#### 6. Self-Assessment and Continuous Feedback

- Encouraging students to evaluate their performance through quizzes and practical reports.

### **Strategies**

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Providing continuous feedback to improve understanding and practical application.</li> </ul> <p><u>7. Use of Technology in Education</u></p> <ul style="list-style-type: none"> <li>• Employing e-learning technologies such as instructional videos and interactive digital content.</li> <li>• Benefiting from smart systems to measure performance and provide academic recommendations.</li> </ul> <p><u>8. Field Visits to Industrial Facilities</u></p> <ul style="list-style-type: none"> <li>• Organizing field trips to factories to observe practical applications of the studied concepts.</li> <li>• Enhancing students' understanding of the work environment and linking theoretical information with practical application.</li> </ul> <p>applications of the concepts studied.</p> <p>o Enhancing students' understanding of the practical environment and linking theoretical information to practical application.</p> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)   |     |                        |   |
|--------------------------|-----|------------------------|---|
| Structured SWL (h/sem)   | 78  | Structured SWL (h/w)   | 5 |
| Unstructured SWL (h/sem) | 72  | Unstructured SWL (h/w) | 5 |
| Total SWL (h/sem)        | 150 |                        |   |

| Module Evaluation |
|-------------------|
|-------------------|

|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|----------------------|------------|-------------|------------------|----------|---------------------------|
| Formative assessment | Tests      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                      | Projects   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Lab        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                                                                                                                                                |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | Material Covered                                                                                                                                                                                                               |
| Week 1                          | <b>1. Material and Energy Balance</b> <ul style="list-style-type: none"> <li>Law of conservation of matter.</li> <li>Forms of energy.</li> </ul>                                                                               |
| Week 2                          | <b>Pasteurization and Sterilization Equipment</b> <ul style="list-style-type: none"> <li>Types of pasteurization equipment.</li> <li>Types of sterilization equipment.</li> <li>Steps for operating the sterilizer.</li> </ul> |
| Week 3                          | <b>Refrigeration and Freezing Equipment</b> <ul style="list-style-type: none"> <li>Types of refrigeration.</li> <li>Factors affecting the refrigeration unit.</li> <li>Coefficient of performance (COP).</li> </ul>            |
| Week 4                          | <b>Dimensions and Units</b> <ul style="list-style-type: none"> <li>Definition of some units.</li> <li>Unit conversion.</li> </ul>                                                                                              |

|                |                                                                                                                                                                                                                                                                                                                        |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 5</b>  | <b>Evaporation</b> <ul style="list-style-type: none"> <li>○ Types of evaporation equipment.</li> <li>○ Heat calculations required for condensation.</li> <li>○ Boiling point elevation.</li> </ul>                                                                                                                     |
| <b>Week 6</b>  | <b>Heat and Methods of Heat Transfer</b> <ul style="list-style-type: none"> <li>○ Fourier's law of heat conduction.</li> <li>○ Thermal resistance.</li> <li>○ Types of heat transfer.</li> </ul>                                                                                                                       |
| <b>Week 7</b>  | <b>Heat Exchangers</b> <ul style="list-style-type: none"> <li>○ Fouling factor.</li> <li>○ Heat exchanger effectiveness.</li> </ul>                                                                                                                                                                                    |
| <b>Week 8</b>  | <b>Pumps</b> <ul style="list-style-type: none"> <li>○ Types of pumps.</li> <li>○ Losses in pipes and fittings.</li> <li>○ Sanitary pumps.</li> </ul>                                                                                                                                                                   |
| <b>Week 9</b>  | <b>Heating Systems in Food Factories</b> <ul style="list-style-type: none"> <li>○ Combustion.</li> <li>○ Types of fuels.</li> <li>○ Heat utilization systems for food heating.</li> </ul>                                                                                                                              |
| <b>Week 10</b> | <b>Food Drying</b> <ul style="list-style-type: none"> <li>• Types of dryers used in food drying.</li> <li>• Moisture content.</li> <li>• Properties of air.</li> <li>• Adiabatic drying.</li> </ul>                                                                                                                    |
| <b>Week 11</b> | <b>Size Reduction and Screening of Solid Materials</b> <ul style="list-style-type: none"> <li>• Nature of forces used in size reduction.</li> <li>• Considerations governing the selection of size reduction equipment.</li> <li>• Size reduction equipment.</li> <li>• Energy required for size reduction.</li> </ul> |

|                |                                                                                                                                                                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 12</b> | <b>Handling and Transportation of Materials</b> <ul style="list-style-type: none"> <li>• Transportation of solid materials.</li> <li>• Power required for transportation processes.</li> <li>• Types of conveying equipment.</li> </ul>                                          |
| <b>Week 13</b> | <b>Cleaning and Grading of Grains</b> <ul style="list-style-type: none"> <li>• Separation based on specific gravity.</li> <li>• Differences in surface properties and shape.</li> <li>• Methods for calculating separation efficiency</li> <li>• Differences in size.</li> </ul> |
| <b>Week 14</b> | <b>Separation of Food Materials</b> <ul style="list-style-type: none"> <li>• Filtration.</li> <li>• Mechanical pressing</li> <li>• Centrifugal separation.</li> </ul>                                                                                                            |
| <b>Week 15</b> | <b>Med exam</b>                                                                                                                                                                                                                                                                  |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                                                                                        |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|                                             | <b>Material Covered</b>                                                                                                |
| <b>Week 1</b>                               | <ul style="list-style-type: none"> <li>• Metals used in the manufacture of food processing plant equipment.</li> </ul> |
| <b>Week 2</b>                               | Electrical energy in food processing plants.                                                                           |
| <b>Week 3</b>                               | Dimensions and units.                                                                                                  |
| <b>Week 4</b>                               | Steam generation.                                                                                                      |
| <b>Week 5</b>                               | Material and energy balance                                                                                            |
| <b>Week 6</b>                               | Separation of food materials.                                                                                          |
| <b>Week 7</b>                               | Methods of heat transfer by radiation and convection.                                                                  |
| <b>Week 8</b>                               | Pasteurization and sterilization.                                                                                      |
| <b>Week 9</b>                               | Report discussion                                                                                                      |

|                |                                                         |
|----------------|---------------------------------------------------------|
| <b>Week 10</b> | Food drying.                                            |
| <b>Week 11</b> | Maintenance of equipment and machinery.                 |
| <b>Week 12</b> | Health and safety of workers in food processing plants. |
| <b>Week 13</b> | Field visit to a food factory.                          |
| <b>Week 14</b> | Food equipment manufacturing project.                   |
| <b>Week 15</b> | Med. exam                                               |

| <b>Learning and Teaching Resources</b> |                                |                                  |
|----------------------------------------|--------------------------------|----------------------------------|
|                                        | <b>Text</b>                    | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | Theory and practical lectures  | Yes                              |
| <b>Recommended Texts</b>               | Principle of organic chemistry | Yes                              |

# MODULE 19

## MODULE DESCRIPTION FORM

| Module Information                        |                           |                    |                                                                                                                                                                                                                                          |                          |       |
|-------------------------------------------|---------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|
| <b>Module Title</b>                       | Food Factory Management   |                    | <b>Module Delivery</b>                                                                                                                                                                                                                   |                          |       |
| <b>Module Type</b>                        | C                         |                    | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                          |       |
| <b>Module Code</b>                        | FSD222                    |                    |                                                                                                                                                                                                                                          |                          |       |
| <b>ECTS Credits</b>                       | 6                         |                    |                                                                                                                                                                                                                                          |                          |       |
| <b>SWL (hr/sem)</b>                       | 150                       |                    |                                                                                                                                                                                                                                          |                          |       |
|                                           |                           |                    |                                                                                                                                                                                                                                          |                          |       |
| <b>Module Level</b>                       |                           | 2                  | <b>Semester of Delivery</b>                                                                                                                                                                                                              |                          | 2     |
| <b>Administering Department</b>           |                           | Food Science Dept. | <b>College</b>                                                                                                                                                                                                                           | College of Agriculture   |       |
| <b>Module Leader</b>                      | Dr. Muhsin Falih Abdullah |                    | <b>e-mail</b>                                                                                                                                                                                                                            | mufalih@uowasit.edu.iq   |       |
| <b>Module Leader's Acad. Title</b>        |                           | Assist. Professor  | <b>Module Leader's Qualification</b>                                                                                                                                                                                                     |                          | Ph.D. |
| <b>Module Tutor</b>                       | Hyder M. Abed             |                    | <b>e-mail</b>                                                                                                                                                                                                                            | Halaboodi@uowasit.edu.iq |       |
| <b>Peer Reviewer Name</b>                 |                           | Name               | <b>e-mail</b>                                                                                                                                                                                                                            | E-mail                   |       |
| <b>Scientific Committee Approval Date</b> |                           | 03/03/2026         | <b>Version Number</b>                                                                                                                                                                                                                    |                          | 1.0   |

| Relation with other Modules |      |  |                 |  |
|-----------------------------|------|--|-----------------|--|
| <b>Prerequisite module</b>  | None |  | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None |  | <b>Semester</b> |  |

## Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ol style="list-style-type: none"> <li>1. Students acquire the necessary theoretical skills for managing food laboratories.</li> <li>2. Students acquire the basic concepts of management and the organization of production processes.</li> <li>3. Providing students with experience on how to choose a suitable location for establishing a food factory.</li> <li>4. Enabling students to understand how to deal with deviations in the quality and quantity of production and manage them properly.</li> <li>5. Providing students with the necessary information for quality management.</li> <li>6. Familiarizing students with how to deal with supervisors and subordinates at work, as well as the regulations and relationships that connect them within the workplace.</li> </ol> |
| <b>Module Learning Outcomes</b> | <ol style="list-style-type: none"> <li>1. Understand the basic concepts of food laboratory management.</li> <li>2. Recognize the scientific principles upon which administrative operations within a food factory are based.</li> <li>3. Define objectives and develop the necessary plans to implement them.</li> <li>4. Correct deviations and problems that occur as a result of poor administrative processes.</li> <li>5. Develop administrative control plans to ensure the smooth operation of production processes.</li> <li>6. Be capable of selecting an appropriate location for establishing any food-related project.</li> </ol>                                                                                                                                                 |
|                                 | <p><u>1. Management Thought and Administrative Schools</u></p> <ul style="list-style-type: none"> <li>• Classical management approaches.</li> <li>• Contemporary trends in management thought.</li> </ul> <p><u>2. Concept and Characteristics of Administrative Operations</u></p> <ul style="list-style-type: none"> <li>• Concept of management.</li> <li>• Characteristics of management.</li> <li>• Functions of management.</li> </ul> <p><u>3. Planning and Organizing Administrative Operations</u></p> <ul style="list-style-type: none"> <li>• Concept of planning.</li> <li>• Benefits and levels of planning.</li> </ul>                                                                                                                                                          |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Indicative Contents</b> | <ul style="list-style-type: none"> <li>• Concept and importance of organization.</li> <li>• Principles of organization.</li> </ul> <p><u>4. Administrative Control and Materials Control</u></p> <ul style="list-style-type: none"> <li>• Concept and objectives of administrative control.</li> <li>• Steps of control.</li> <li>• Materials control.</li> </ul> <p><u>5. Selection and Determination of Factory Location</u></p> <ul style="list-style-type: none"> <li>• Factors affecting factory location selection.</li> <li>• Comparison between factory locations in city centers, rural areas, and city suburbs.</li> <li>• Determining the factory location.</li> </ul> <p><u>6. Economic Feasibility Study for Industrial Projects</u></p> <ul style="list-style-type: none"> <li>• Role of feasibility studies in determining factory location.</li> <li>• Applied fields of economic feasibility studies.</li> <li>• Analysis of investment laws.</li> </ul> <p><u>7. Total Quality Management</u></p> <ul style="list-style-type: none"> <li>• HACCP system<br/>Hazard Analysis and Critical Control Points (HACCP)</li> <li>• Food ISO systems<br/>International Organization for Standardization (ISO)</li> </ul> |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b> |                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | <p><u>1. Interactive Theoretical Lectures</u></p> <ul style="list-style-type: none"> <li>• Presenting fundamental information in an organized manner using educational tools such as presentations and illustrative diagrams.</li> <li>• Using discussion and dialogue methods to stimulate students' critical thinking.</li> </ul> <p><u>2. Practical Applications and Field Training</u></p> |

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ul style="list-style-type: none"> <li>• Conducting field visits to food processing plants and learning about their administrative work mechanisms.</li> <li>• Training students to practice some administrative activities in food plant departments and how to manage them.</li> </ul> <p><u>3. Problem-Based Learning (PBL)</u></p> <ul style="list-style-type: none"> <li>• Presenting administrative problems in several food plants and discussing methods for solving them.</li> </ul> <p><u>4. Demonstrations and Simulation</u></p> <ul style="list-style-type: none"> <li>• Using video presentation equipment to demonstrate how to conduct practical procedures for selecting a suitable factory location.</li> <li>• Conducting virtual experiments to reduce risks and improve understanding of complex processes.</li> </ul> <p><u>5. Cooperative Learning and Teamwork</u></p> <ul style="list-style-type: none"> <li>• Dividing students into working groups to implement small administrative projects.</li> <li>• Encouraging the exchange of knowledge and experiences among students through cooperation in solving exercises and practical activities.</li> </ul> <p><u>6. Self-Assessment and Continuous Feedback</u></p> <ul style="list-style-type: none"> <li>• Encouraging students to evaluate their performance through quizzes and practical reports.</li> <li>• Providing continuous feedback to improve understanding and practical application.</li> </ul> <p><u>7. Use of Technology in Education</u></p> <ul style="list-style-type: none"> <li>• Employing e-learning technologies such as instructional videos and interactive digital content.</li> <li>• Benefiting from smart systems to measure performance and provide academic recommendations.</li> </ul> <p><u>8. Field Visits to Industrial Facilities</u></p> |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                    |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>Organizing field trips to factories to observe practical applications of the studied concepts.</li> <li>Enhancing students' understanding of the work environment and linking theoretical information with practical application</li> </ul> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)   |     |                        |   |
|--------------------------|-----|------------------------|---|
| Structured SWL (h/sem)   | 78  | Structured SWL (h/w)   | 5 |
| Unstructured SWL (h/sem) | 72  | Unstructured SWL (h/w) | 5 |
| Total SWL (h/sem)        | 150 |                        |   |

| Module Evaluation    |            |             |                  |          |                           |
|----------------------|------------|-------------|------------------|----------|---------------------------|
|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment | Tests      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                      | Projects   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Lab        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------|
|                                 | Material Covered                                                                   |
| Week 1                          | The concept of management, characteristics of management, functions of management. |

|                |                                                                                                                                                                                                                                      |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 2</b>  | Levels, skills, and managerial activities, classification of managers.                                                                                                                                                               |
| <b>Week 3</b>  | fields of management (production management, purchasing management, personnel management, raw materials management, marketing management, research and development management, maintenance management, public relations management). |
| <b>Week 4</b>  | Administrative planning (concept of planning, benefits of planning, levels of planning, steps of planning).                                                                                                                          |
| <b>Week 5</b>  | Administrative organization (concept of organization and its importance, principles of organization, classification of activities, tasks, and organizations)                                                                         |
| <b>Week 6</b>  | Midterm exam                                                                                                                                                                                                                         |
| <b>Week 7</b>  | Administrative control (its concept, objectives, steps of administrative control, types of administrative control, administrative auditing)                                                                                          |
| <b>Week 8</b>  | Material control (functional cycle of material control, inventory control, administrative control through budgeting)                                                                                                                 |
| <b>Week 9</b>  | Selection and determination of food factory location (factors of site selection, comparison between concentration in major cities and rural areas, modified Gibson–Brown method for selecting factory location)                      |
| <b>Week 10</b> | Project feasibility studies (importance, concept and definition, applied fields of economic feasibility, environmental and legal feasibility studies)                                                                                |
| <b>Week 11</b> | Analysis of the investment climate in food manufacturing, study and analysis of the laws affecting it                                                                                                                                |
| <b>Week 12</b> | Marketing feasibility study, technical feasibility study for industrial projects                                                                                                                                                     |
| <b>Week 13</b> | Social and national feasibility study, study of criteria (individual profitability, job creation, added value)                                                                                                                       |
| <b>Week 14</b> | Principles of organizing and planning factory buildings, principles of work organization in factories)                                                                                                                               |
| <b>Week 15</b> | Report discussion                                                                                                                                                                                                                    |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                                   |
|---------------------------------------------|-------------------------------------------------------------------|
|                                             | <b>Material Covered</b>                                           |
| Week 1                                      | Importance of food laboratories, definition of general management |
| Week 2                                      | Study of project establishment, administrative leadership         |

|         |                                                                 |
|---------|-----------------------------------------------------------------|
| Week 3  | Design of food laboratories                                     |
| Week 4  | Waste management problems                                       |
| Week 5  | Daily exam                                                      |
| Week 6  | Health rules in food laboratories                               |
| Week 7  | Methods of advertising products                                 |
| Week 8  | Production process requirements, quality characteristics        |
| Week 9  | Report discussion                                               |
| Week 10 | application of ISO quality systems and HACCP                    |
| Week 11 | Marketing management                                            |
| Week 12 | Field visit to a food factory                                   |
| Week 13 | Project: design of an administrative program for a food factory |
| Week 14 | Financial management of food laboratories                       |
| Week 15 | Med. exam                                                       |

| Learning and Teaching Resources |                               |                           |
|---------------------------------|-------------------------------|---------------------------|
|                                 | Text                          | Available in the Library? |
| <b>Required Texts</b>           | Theory and practical lectures | Yes                       |
| <b>Recommended Texts</b>        | Food Factories Administration | Yes                       |

# MODULE 20

## MODULE DESCRIPTION FORM

| Module Information                        |                                    |                                                                                                                                                                                                                                          |                                                                        |
|-------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Module Title</b>                       | Design and analysis of experiments |                                                                                                                                                                                                                                          | <b>Module Delivery</b>                                                 |
| <b>Module Type</b>                        | C                                  | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                        |
| <b>Module Code</b>                        | FSD223                             |                                                                                                                                                                                                                                          |                                                                        |
| <b>ECTS Credits</b>                       | 5                                  |                                                                                                                                                                                                                                          |                                                                        |
| <b>SWL (hr/sem)</b>                       | 125                                |                                                                                                                                                                                                                                          |                                                                        |
|                                           |                                    |                                                                                                                                                                                                                                          |                                                                        |
| <b>Module Level</b>                       | 2                                  | <b>Semester of Delivery</b>                                                                                                                                                                                                              | 2                                                                      |
| <b>Administering Department</b>           | Food Science Dept.                 | <b>College</b>                                                                                                                                                                                                                           | College of Agriculture                                                 |
| <b>Module Leader</b>                      | Dr. Riadh Jabbar Mansoor           | <b>e-mail</b>                                                                                                                                                                                                                            | <a href="mailto:ralmaliki@uowasit.edu.iq">ralmaliki@uowasit.edu.iq</a> |
| <b>Module Leader's Acad. Title</b>        | Professor                          | <b>Module Leader's Qualification</b>                                                                                                                                                                                                     | Ph.D.                                                                  |
| <b>Module Tutor</b>                       | Salam Hameed Abdulla               | <b>e-mail</b>                                                                                                                                                                                                                            | @uowasit.edu.iq                                                        |
| <b>Peer Reviewer Name</b>                 | Name                               | <b>e-mail</b>                                                                                                                                                                                                                            | E-mail                                                                 |
| <b>Scientific Committee Approval Date</b> | 03/03/2026                         | <b>Version Number</b>                                                                                                                                                                                                                    | 1.0                                                                    |

| Relation with other Modules |      |                 |  |
|-----------------------------|------|-----------------|--|
| <b>Prerequisite module</b>  | None | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None | <b>Semester</b> |  |

## Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <ul style="list-style-type: none"> <li>29. To introduce the basic principles of experimental design and analysis in agricultural, food, and biological sciences.</li> <li>30. To understand the importance of experimental design in obtaining accurate and reliable results.</li> <li>31. To distinguish between different types of experimental designs and select the appropriate design for experiments.</li> <li>32. To develop skills in organizing, tabulating, and statistically analyzing experimental data.</li> <li>33. To identify sources of experimental error and methods of minimizing and controlling them.</li> <li>34. To apply appropriate statistical tests for analyzing experimental results.</li> <li>35. To interpret statistical results and relate them to scientific and practical applications.</li> <li>36. To use modern statistical software for experimental data analysis.</li> <li>37. To develop the ability to prepare scientific reports and present experimental findings correctly.</li> <li>38. To enhance scientific thinking and decision-making skills based on experimental results.</li> </ul> |
| <b>Module Learning Outcomes</b> | <ul style="list-style-type: none"> <li>35. Define the basic concepts of experimental design and statistical analysis.</li> <li>36. Differentiate between various types of experimental designs and their applications.</li> <li>37. Design scientific experiments correctly according to research objectives.</li> <li>38. Collect and organize experimental data accurately and systematically.</li> <li>39. Apply appropriate statistical methods to analyze experimental results.</li> <li>40. Interpret statistical findings and draw valid scientific conclusions.</li> <li>41. Identify sources of experimental error and suggest methods to minimize them.</li> <li>42. Use modern statistical software for data analysis.</li> <li>43. Prepare complete scientific reports for presenting and analyzing experimental results.</li> <li>44. Employ scientific thinking skills in solving research problems and making decisions.</li> </ul>                                                                                                                                                                                           |
|                                 | <ul style="list-style-type: none"> <li>36. Basic statistical concepts used in experiments.</li> <li>37. Methods of data collection, organization, and tabulation.</li> <li>38. Experimental errors, sources of variation, and methods of control.</li> <li>39. Principles of experimental design: randomization, replication, and local control.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Indicative Contents</b> | <ul style="list-style-type: none"> <li>40. Completely Randomized Design (CRD).</li> <li>41. Randomized Complete Block Design (RCBD).</li> <li>42. Latin Square Design (LSD).</li> <li>43. Factorial experiments and interaction analysis.</li> <li>44. Analysis of Variance (ANOVA) and hypothesis testing.</li> <li>45. Mean comparison using appropriate statistical tests.</li> <li>46. Correlation and simple regression in data analysis.</li> <li>47. Use of statistical software in data analysis.</li> <li>48. Interpretation of statistical results and scientific report writing.</li> <li>49. Applications of experimental design and analysis in agricultural and food sciences.</li> </ul> |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                       | <ul style="list-style-type: none"> <li>11. Interactive theoretical lectures to explain fundamental concepts.</li> <li>12. Problem-based learning through analysis of experimental data.</li> <li>13. Classroom discussions for interpreting statistical results and exchanging ideas.</li> <li>14. Practical training on experimental design and statistical software applications.</li> <li>15. Cooperative learning through group work in experimental analysis.</li> <li>16. Case studies and applied experiments in agricultural and food sciences.</li> <li>17. Use of modern educational tools and presentation methods.</li> <li>18. Assigning students scientific reports and experimental data analysis tasks.</li> <li>19. Self-learning through reviewing scientific references and statistical software.</li> <li>20. Continuous assessment through quizzes, practical activities, and assignments.</li> </ul> |

| Student Workload (SWL)   |     |                        |   |
|--------------------------|-----|------------------------|---|
| Structured SWL (h/sem)   | 78  | Structured SWL (h/w)   | 5 |
| Unstructured SWL (h/sem) | 47  | Unstructured SWL (h/w) | 3 |
| Total SWL (h/sem)        | 125 |                        |   |

| Module Evaluation    |            |             |                  |          |                           |
|----------------------|------------|-------------|------------------|----------|---------------------------|
|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment | Tests      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                      | Projects   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Lab        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                 |
|---------------------------------|-------------------------------------------------------------------------------------------------|
|                                 | Material Covered                                                                                |
| Week 1                          | General Review of Statistics                                                                    |
| Week 2                          | Concepts and Definitions in Experimental Design and Analysis; Types of Agricultural Experiments |
| Week 3                          | Completely Randomized Design (CRD)                                                              |

|                |                                                                          |
|----------------|--------------------------------------------------------------------------|
| <b>Week 4</b>  | Mean Comparison Tests                                                    |
| <b>Week 5</b>  | Randomized Complete Block Design (RCBD)                                  |
| <b>Week 6</b>  | Midterm Examination                                                      |
| <b>Week 7</b>  | Estimation of Missing Values and Relative Efficiency in CRD              |
| <b>Week 8</b>  | Latin Square Design (LSD)                                                |
| <b>Week 9</b>  | Relative Efficiency of Latin Square Design, Estimation of Missing Values |
| <b>Week 10</b> | Semester Examination                                                     |
| <b>Week 11</b> | Factorial Experiments under Completely Randomized Design                 |
| <b>Week 12</b> | Factorial Experiments under Completely Randomized Design                 |
| <b>Week 13</b> | Factorial Experiments under Randomized Complete Block Design             |
| <b>Week 14</b> | Factorial Experiments under Randomized Complete Block Design             |
| <b>Week 15</b> | Split-Plot Design under Completely Randomized Design (CRD)               |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                                                      |
|---------------------------------------------|--------------------------------------------------------------------------------------|
|                                             | <b>Material Covered</b>                                                              |
| <b>Week 1</b>                               | Examples of Statistical Symbols and Measures of Central Tendency and Dispersion      |
| <b>Week 2</b>                               | Examples of T-test                                                                   |
| <b>Week 3</b>                               | Examples of Analysis of Variance (ANOVA)                                             |
| <b>Week 4</b>                               | Examples of Completely Randomized Design (CRD)                                       |
| <b>Week 5</b>                               | Examples of Least Significant Difference (LSD) test and Duncan's Multiple Range Test |
| <b>Week 6</b>                               | Examples of Randomized Complete Block Design (RCBD)                                  |
| <b>Week 7</b>                               | Examples and Solutions                                                               |

|                |                                                                                 |
|----------------|---------------------------------------------------------------------------------|
| <b>Week 8</b>  | Examples of Latin Square Design (LSD)                                           |
| <b>Week 9</b>  | Examples of Relative Efficiency of Latin Square Design                          |
| <b>Week 10</b> | Examples of Factorial Experiments under Randomized Complete Block Design (RCBD) |
| <b>Week 11</b> | Examples of calculating Least Significant Difference (LSD) values               |
| <b>Week 12</b> | Examples of Factorial Experiments under Randomized Complete Block Design (RCBD) |
| <b>Week 13</b> | Examples of calculating Least Significant Difference (LSD) values               |
| <b>Week 14</b> | Examples of Factorial Experiments under Randomized Complete Block Design (RCBD) |
| <b>Week 15</b> | Examples of calculating Least Significant Difference (LSD) values               |

| <b>Learning and Teaching Resources</b> |                               |                                  |
|----------------------------------------|-------------------------------|----------------------------------|
|                                        | <b>Text</b>                   | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | Theory and practical lectures | Yes                              |
| <b>Recommended Texts</b>               |                               | No                               |
| <b>Websites</b>                        |                               |                                  |

# MODULE 21

## MODULE DESCRIPTION FORM

| Module Information                        |                                           |                             |                                      |                                                                                                                                                                                                                               |  |
|-------------------------------------------|-------------------------------------------|-----------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Module Title</b>                       | <b>Crimes of the Ba'ath Party in Iraq</b> |                             |                                      | <b>Module Delivery</b>                                                                                                                                                                                                        |  |
| <b>Module Type</b>                        | <b>B</b>                                  |                             |                                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| <b>Module Code</b>                        | <b>WU05</b>                               |                             |                                      |                                                                                                                                                                                                                               |  |
| <b>ECTS Credits</b>                       | <b>2</b>                                  |                             |                                      |                                                                                                                                                                                                                               |  |
| <b>SWL (hr/sem)</b>                       | <b>50</b>                                 |                             |                                      |                                                                                                                                                                                                                               |  |
| <b>Module Level</b>                       | 2                                         | <b>Semester of Delivery</b> |                                      |                                                                                                                                                                                                                               |  |
| <b>Administering Department</b>           | Food Science Dept.                        |                             | <b>College</b>                       | College of Agriculture                                                                                                                                                                                                        |  |
| <b>Module Leader</b>                      | Dr. Fareed J. Hassan                      |                             | <b>e-mail</b>                        | <a href="mailto:ffryd725@gmail.com">ffryd725@gmail.com</a>                                                                                                                                                                    |  |
| <b>Module Leader's Acad. Title</b>        | Lecturer                                  |                             | <b>Module Leader's Qualification</b> | Ph.D.                                                                                                                                                                                                                         |  |
| <b>Module Tutor</b>                       |                                           |                             | <b>e-mail</b>                        |                                                                                                                                                                                                                               |  |
| <b>Peer Reviewer Name</b>                 | Name                                      |                             | <b>e-mail</b>                        | E-mail                                                                                                                                                                                                                        |  |
| <b>Scientific Committee Approval Date</b> | 03/03/2026                                |                             | <b>Version Number</b>                | 1.0                                                                                                                                                                                                                           |  |

| Relation with other Modules |      |  |                 |  |
|-----------------------------|------|--|-----------------|--|
| <b>Prerequisite module</b>  | None |  | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None |  | <b>Semester</b> |  |

### Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | To study the historical period Iraq experienced under the banned Ba'ath regime from 1979–2003, clarifying a missing knowledge gap in scientific research related to 35 years during which the Ba'ath Party committed crimes against humanity including genocide and forced displacement. The necessity of teaching this subject and passing it on to future generations. |
| <b>Module Learning Outcomes</b> | Teaching the crimes of the Ba'ath regime in Iraq to second-year students in Colleges of Agriculture, including: exposing students to the crimes committed by the Ba'ath regime in Iraq in order to document, analyze, and uncover historical facts for future generations.                                                                                               |
| <b>Indicative Contents</b>      | Weekly, monthly, and daily exams, plus the final year exam. Daily attendance, behavior, and discipline.                                                                                                                                                                                                                                                                  |

### Learning and Teaching Strategies

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ul style="list-style-type: none"> <li>21. Scaffolded Learning: starting with basic concepts, then progressing to more complex ones.</li> <li>22. Brainstorming.</li> <li>23. Collaborative Learning: dividing students into small groups to solve complex exercises, encouraging peer explanation, organizing group study sessions outside class.</li> <li>24. Continuous Formative Assessment: short periodic quizzes, weekly assignments, progress reports.</li> </ul> |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

|                                 |    |                               |   |
|---------------------------------|----|-------------------------------|---|
| <b>Structured SWL (h/sem)</b>   | 78 | <b>Structured SWL (h/w)</b>   | 5 |
| <b>Unstructured SWL (h/sem)</b> | 72 | <b>Unstructured SWL (h/w)</b> | 5 |

|                          |            |
|--------------------------|------------|
| <b>Total SWL (h/sem)</b> | <b>150</b> |
|--------------------------|------------|

| <b>Module Evaluation</b>    |                   |                    |                       |                 |                                  |
|-----------------------------|-------------------|--------------------|-----------------------|-----------------|----------------------------------|
|                             |                   | <b>Time/Number</b> | <b>Weight (Marks)</b> | <b>Week Due</b> | <b>Relevant Learning Outcome</b> |
| <b>Formative assessment</b> | <b>Tests</b>      | 1                  | 10% (10)              | 8               | LO #1 - #7                       |
|                             | <b>Projects</b>   | 1                  | 10% (10)              | 6               | LO #1 - #5                       |
|                             | <b>Lab</b>        | 1                  | 10% (10)              | 9               | LO #1 - #8                       |
|                             | <b>Reports</b>    | 1                  | 10% (10)              | 15              | LO #1 - #14                      |
| <b>Summative assessment</b> | <b>Mid Exam</b>   | 2hr                | 10% (10)              | 7               | LO #1 - #6                       |
|                             | <b>Final Exam</b> | 3hr                | 50% (50)              | 16              | All                              |
| <b>Total assessment</b>     |                   |                    | 100% (100 Marks)      |                 |                                  |

| <b>Delivery Plan (Weekly Syllabus)</b> |                                                                          |
|----------------------------------------|--------------------------------------------------------------------------|
|                                        | <b>Material Covered</b>                                                  |
| <b>Week 1</b>                          | Introduction to Ba'ath regime crimes                                     |
| <b>Week 2</b>                          | Concept of crimes and their categories                                   |
| <b>Week 3</b>                          | Crimes of the Ba'ath regime documented by the Iraqi High Tribunal (2005) |
| <b>Week 4</b>                          | Types of international crimes                                            |
| <b>Week 5</b>                          | Psychological crimes – concept, mechanisms, effects                      |
| <b>Week 6</b>                          | Social crimes – militarization of society                                |
| <b>Week 7</b>                          | The Ba'ath regime's stance on religion                                   |
| <b>Week 8</b>                          | Safar Uprising of 1977                                                   |

|                |                                                                 |
|----------------|-----------------------------------------------------------------|
| <b>Week 9</b>  | Violations of Iraqi laws                                        |
| <b>Week 10</b> | Environmental crimes of the Ba'ath regime in Iraq               |
| <b>Week 11</b> | Draining of marshes – destruction of orchards, palms, and trees |
| <b>Week 12</b> | Crimes of mass graves                                           |
| <b>Week 13</b> | Chronology of military coups                                    |
| <b>Week 14</b> | Chronological classification of mass graves in Iraq (1963–2003) |
| <b>Week 15</b> | Semester test                                                   |

| Learning and Teaching Resources |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                           |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                 | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Available in the Library? |
| <b>Required Texts</b>           | <ol style="list-style-type: none"> <li>1. Crimes of the Ba'ath regime in Iraq, Ministry of Higher Education and Scientific Research.</li> <li>2. Lecture from personal experience as a witness to the Ba'ath regime, being a political prisoner sentenced to life imprisonment and spending ten years in prison without my family knowing my fate until my release.</li> <li>3. Safar Uprising of 1977.</li> <li>4. Historical sequence of military coups.</li> <li>5. Dr. Mueid Al-Saadi, Crimes of the Ba'ath Party – Crimes Against Humanity – A Reading in Basic Concepts, 2nd edition, Al-Kafeel Publishing, 2023.</li> </ol> | Yes                       |
| <b>Recommended Texts</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No                        |
| <b>Websites</b>                 | Electronic references & internet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                           |

# MODULE 22

## MODULE DESCRIPTION FORM

| Module Information                 |                              |                               |                                                                                                                                                                                                                               |                           |
|------------------------------------|------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| معلومات المادة الدراسية            |                              |                               |                                                                                                                                                                                                                               |                           |
| Module Title                       | <b>Computer principles 2</b> |                               | Module Delivery                                                                                                                                                                                                               |                           |
| Module Type                        | Basic                        |                               | <input type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                           |
| Module Code                        | WU22                         |                               |                                                                                                                                                                                                                               |                           |
| ECTS Credits                       | 3                            |                               |                                                                                                                                                                                                                               |                           |
| SWL (hr/sem)                       | 75                           |                               |                                                                                                                                                                                                                               |                           |
| Module Level                       | 2                            | Semester of Delivery          |                                                                                                                                                                                                                               | 2                         |
| Administering Department           | Food science                 | College                       | College of Agriculture                                                                                                                                                                                                        |                           |
| Module Leader                      | Tahseen A. Lafta             |                               | e-mail                                                                                                                                                                                                                        | taltameemi@uowasit.edu.iq |
| Module Leader's Acad. Title        | Assist. Lecturer             | Module Leader's Qualification | MSc                                                                                                                                                                                                                           |                           |
| Module Tutor                       |                              | e-mail                        |                                                                                                                                                                                                                               |                           |
| Peer Reviewer Name                 |                              | e-mail                        |                                                                                                                                                                                                                               |                           |
| Scientific Committee Approval Date | 003/03/2026                  | Version Number                | 1.0                                                                                                                                                                                                                           |                           |

| Relation with other Modules       |      |          |  |
|-----------------------------------|------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module               | None | Semester |  |
| Co-requisites module              | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents |
|--------------------------------------------------------|
|--------------------------------------------------------|

## أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية                | <ol style="list-style-type: none"> <li>1. Using the computer for basic tasks</li> <li>2. Identifying and discussing hardware components of the computer system</li> <li>3. Creating documents using a word processor and preparing presentations</li> <li>4. Conducting research on the Internet</li> <li>5. Introduction to Artificial Intelligence</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>1. Recognize computer components (hardware and software) and understand their basic functions.</li> <li>2. Acquire skills in using operating systems and handling application software efficiently.</li> <li>3. Develop logical thinking and formulate algorithms to solve problems using programming.</li> <li>4. Enhance research skills and the ability to manage, store, and process data securely and effectively.</li> <li>5. Commit to ethical standards in computer and internet use, respecting privacy and digital security.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | <ol style="list-style-type: none"> <li>1. Introduction to Computers: Recognizing computer components (hardware and software) and understanding their basic functions.</li> <li>2. Operating Systems: Studying the fundamentals of operating systems such as Windows and Linux, and learning how to manage files and programs.</li> <li>3. Programming and Algorithms: Developing logical thinking and formulating algorithms, with practical applications using a programming language (e.g., C++ or Python).</li> <li>4. Internet and Communications: Understanding networks, email, search engines, and the basics of information security.</li> <li>5. Practical Applications: Using application software such as Microsoft Office (Word, Excel, PowerPoint) to prepare reports and presentations.</li> <li>6. Data Management: Methods of storing and processing data, and an introduction to basic databases.</li> <li>7. Digital Security and Ethics: Commitment to ethical standards in computer and internet use, and protecting privacy.</li> <li>8. Assessments: Weekly and monthly exams, practical assignments, and a final project to apply acquired skills.</li> </ol> |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ol style="list-style-type: none"> <li>1. Scaffolded Learning: Starting with basic concepts and gradually moving to more complex ones, supported by practical examples.</li> <li>2. Collaborative Learning: Dividing students into small groups to solve exercises and discuss ideas, encouraging them to explain concepts to one another.</li> <li>3. Brainstorming: Stimulating students to generate and freely discuss ideas to broaden their understanding of the subject.</li> <li>4. Continuous Formative Assessment: Using short quizzes, weekly assignments, and progress reports to monitor students' development.</li> <li>5. Practical Application: Linking theoretical concepts with practical activities such as using software, preparing projects, or solving real-world problems.</li> </ol> |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا       |    |                                                                           |   |
|--------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 48 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 3 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 27 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 75 |                                                                           |   |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                        |             |                |          |                           |
|---------------------------------------------------|------------------------|-------------|----------------|----------|---------------------------|
|                                                   |                        | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>         | 2           | 10% (10)       | 3,6,9    | LO #1, #7                 |
|                                                   | <b>Assignments</b>     | 2           | 10% (10)       | 10       | LO #3, #4 and #6          |
|                                                   | <b>Projects / Lab.</b> | 0           | 0 %            |          |                           |

|                      |              |     |                  |    |            |
|----------------------|--------------|-----|------------------|----|------------|
|                      | Essays       | 1   | 10% (10)         | 14 | LO #5      |
| Summative assessment | Midterm Exam | 2hr | 20% (10)         | 7  | LO #1 - #7 |
|                      | Final Exam   | 2hr | 50% (50)         | 16 | All        |
| Total assessment     |              |     | 100% (100 Marks) |    |            |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                                                                                                                                                         |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                   | Material Covered                                                                                                                                                                        |
| Week 1                                                            | <b>Security and Networks:</b> What is a network? Types of networks. Basic network components. Fundamentals of network security. Understanding network threats. Network troubleshooting. |
| Week 2                                                            | <b>Microsoft Word Program</b>                                                                                                                                                           |
| Week 3                                                            | <b>Microsoft Word Program (continued)</b>                                                                                                                                               |
| Week 4                                                            | <b>Introduction to Artificial Intelligence:</b> Definition of AI, history of AI, AI techniques and methods, challenges and ethical considerations.                                      |
| Week 5                                                            | <b>Artificial Intelligence in Daily Life:</b> AI in smartphones and virtual assistants such as Siri or Google Assistant.                                                                |
| Week 6                                                            | <b>Microsoft Excel Program</b>                                                                                                                                                          |
| Week 7                                                            | <b>Microsoft Excel Program (continued)</b>                                                                                                                                              |
| Week 8                                                            | <b>Midterm Exam</b>                                                                                                                                                                     |
| Week 9                                                            | <b>Microsoft PowerPoint Program</b>                                                                                                                                                     |
| Week 10                                                           | <b>Ethical Challenges in Artificial Intelligence:</b> AI ethics, privacy and surveillance, impact of AI on the labor market.                                                            |
| Week 11                                                           | <b>Future of Artificial Intelligence:</b> Future trends in AI, recent research, and emerging technologies.                                                                              |

|                |                                                                                                                                                                                            |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 12</b> | <b>Future of Artificial Intelligence (continued):</b> Future trends in AI, recent research, and emerging technologies.                                                                     |
| <b>Week 13</b> | <b>Seminar Discussions</b>                                                                                                                                                                 |
| <b>Week 14</b> | <b>Computer Troubleshooting:</b> Identifying and solving common hardware and software problems faced by computer users, basic troubleshooting techniques, diagnostic tools, and solutions. |
| <b>Week 15</b> | <b>Final Review</b>                                                                                                                                                                        |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |             |                                  |
|------------------------------------------------------------------------|-------------|----------------------------------|
|                                                                        | <b>Text</b> | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | Lectures    | Yes                              |
| <b>Recommended Texts</b>                                               |             | No                               |
| <b>Websites</b>                                                        |             |                                  |

# MODULE 23

## MODULE DESCRIPTION FORM

| Module Information                 |                       |                               |                                                                                                                                                                                                                                          |
|------------------------------------|-----------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                       |                               |                                                                                                                                                                                                                                          |
| Module Title                       | Food care and storage |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Core                  |                               | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | FSD224                |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 6                     |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 150                   |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 2                     | Semester of Delivery          |                                                                                                                                                                                                                                          |
| Administering Department           | Food Science          | College                       | College of Agriculture                                                                                                                                                                                                                   |
| Module Leader                      | Dr. Abdulaal Farhan   | e-mail                        | abfarhan@uowasit.edu.iq                                                                                                                                                                                                                  |
| Module Leader's Acad. Title        | Assist. Prof.         | Module Leader's Qualification | PhD                                                                                                                                                                                                                                      |
| Module Tutor                       | Huda M. Abed          | e-mail                        | <a href="mailto:haded@uowasit.edu.iq">haded@uowasit.edu.iq</a>                                                                                                                                                                           |
| Peer Reviewer Name                 | Name                  | e-mail                        | E-mail                                                                                                                                                                                                                                   |
| Scientific Committee Approval Date | 03/03/2026            | Version Number                | 1.0                                                                                                                                                                                                                                      |

| Relation with other Modules       |      |          |  |
|-----------------------------------|------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module               | None | Semester |  |
| Co-requisites module              | None | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>                | <ol style="list-style-type: none"> <li>9. Understanding the principles and importance of food care and storage.</li> <li>10. Having high knowledge level about food care and how to benefit from the current development. .</li> <li>11. Having knowledge about the effects of improper food storage .</li> <li>12. Understanding the scientific basis of each food storage method.</li> <li>13. Understanding the storage role in maintaining food safety and quality.</li> <li>14. Understanding the controlled atmosphere.</li> <li>15. Study the different types of storage.</li> </ol>                                                                                          |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>9. Understanding the objectives of food storage, so that student will be able to select the proper storage method of a certain food product.</li> <li>10. Have scientific knowledge about safe storage methods.</li> <li>11. Understanding the water activity and its role in food storage.</li> <li>12. Understanding the relation between food structure and its storage method.</li> <li>13. Know how to benefit from recent research studies.</li> <li>14. Develop the student scientific knowledge to be able to manage the food stores.</li> <li>15. Understanding the role of consumers in improving the food supply chain.</li> </ol> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <ol style="list-style-type: none"> <li>12. Introduction to food care and storage.</li> <li>13. Storage technology.</li> <li>14. Solid content/vitamin C determination.</li> <li>15. Water activity and its application.</li> <li>16. Relative humidity and its role in food storage.</li> <li>17. Care of fruits and vegetables prior to storage.</li> <li>18. Fruits and vegetables storage methods.</li> <li>19. Storage under controlling atmosphere.</li> <li>20. Storage of dried plant foods.</li> <li>21. Storage of meat and their products.</li> <li>22. Eggs care and storage</li> </ol>                                                                                   |

|  |                                                                                                                                                                                                            |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>23. Storage of milk and milk products.</p> <p>24. Manufacturing of suitable food packaging materials.</p> <p>25. Understanding the relation between environmental conditions and food preservation.</p> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br><b>استراتيجيات التعلم والتعليم</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                             | <ol style="list-style-type: none"> <li>1. Learning based on theoretical understanding of the subject: <ul style="list-style-type: none"> <li>• Application of scientific and knowledge-based principles for the correct theoretical understanding of food care and storage.</li> </ul> </li> <li>2. Learning based on lab experience: <ul style="list-style-type: none"> <li>• Conducting various knowledge-equipped experiments about food storage.</li> </ul> </li> <li>3. Learning based on applying ideas collaboratively: <ul style="list-style-type: none"> <li>• Ask student groups to apply a specific idea related to a particular food storage method.</li> <li>• Encourage students to work in research groups.</li> </ul> </li> <li>4. Learning based on exchanging ideas and innovative solutions for solving the problems: <ul style="list-style-type: none"> <li>• Teach students how to apply innovative scientific solutions to face various research problems</li> <li>• Exchange ideas with others and applying them in improving the research work.</li> </ul> </li> <li>5. Education supported by available tools: <ul style="list-style-type: none"> <li>• Applying technological methods in various topics related to food care and storage.</li> </ul> </li> <li>6. Self-directed and independent learning: <ul style="list-style-type: none"> <li>• Encourage students to focus on current scientific references of trusted sources.</li> <li>• Guide students to prepare presentations that focused on maintaining food safety and quality during storage.</li> </ul> </li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>7. Education based on previous scientific research results:</p> <ul style="list-style-type: none"> <li>Understanding the final results of previous scientific research related to a particular food product and how to apply them as a starting point for a new research that contributes to future development.</li> <li>Using practical assessment methods by testing students' ability to perform certain lab experiments.</li> </ul> <p>8. Learning based on visual description and documentation of every result:</p> <ul style="list-style-type: none"> <li>Teach and train students on how to perform a visual characterization, and how to document results professionally.</li> </ul> <p>9. Academic guidance:</p> <ul style="list-style-type: none"> <li>General lectures that contribute to increasing the nutritional culture among students.</li> </ul> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |   |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|---|
| الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا                                         |     |                                                                           |   |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 78  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 5 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 72  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 5 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 150 |                                                                           |   |

| Module Evaluation     |
|-----------------------|
| تقييم المادة الدراسية |

|                      |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|----------------------|-----------------|-------------|------------------|----------|---------------------------|
| Formative assessment | Quizzes         | 1           | 10% (10)         | 15       | LO #1 - #14               |
|                      | Assignments     | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Projects / Lab. | 1           | 10% (10)         | 7        | LO #1 - #6                |
|                      | Report          | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Midterm Exam    | 2hr         | 10% (10)         | 8        | LO #1 - #7                |
|                      | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |                 |             | 100% (100 Marks) |          |                           |

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

|        | Material Covered                                      |
|--------|-------------------------------------------------------|
| Week 1 | Introduction to food care and the storage methods     |
| Week 2 | Objectives of food storage                            |
| Week 3 | Food structure and its storage stability              |
| Week 4 | Food groups based according to their moisture content |
| Week 5 | Water activity                                        |
| Week 6 | Care and storage of plant-based foods                 |
| Week 7 | Care and storage of plant-based foods part 2          |
| Week 8 | Controlling of relative humidity                      |
| Week 9 | Storage methods of fruits and vegetables              |

|                |                                            |
|----------------|--------------------------------------------|
| <b>Week 10</b> | Advantages of controlled atmosphere        |
| <b>Week 11</b> | Midterm Exam                               |
| <b>Week 12</b> | Storage of dried plant foods               |
| <b>Week 13</b> | Care and storage of eggs                   |
| <b>Week 14</b> | Storage of milk and milk-based products    |
| <b>Week 15</b> | Storage of meats and their products        |
| <b>Week 16</b> | Food packaging materials, care and storage |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                |
|-------------------------------------------------------------------------|------------------------------------------------|
|                                                                         | <b>Material Covered</b>                        |
| <b>Week 1</b>                                                           | General Introduction about food stores         |
| <b>Week 2</b>                                                           | Storage technology                             |
| <b>Week 3</b>                                                           | Fruit types                                    |
| <b>Week 4</b>                                                           | Fruit physicochemical properties               |
| <b>Week 5</b>                                                           | Solid content determination                    |
| <b>Week 6</b>                                                           | Vitamin C determination                        |
| <b>Week 7</b>                                                           | Plant stains determination                     |
| <b>Week 8</b>                                                           | Plant stains determination, part 2             |
| <b>Week 9</b>                                                           | Respiration of fruits and vegetables           |
| <b>Week 10</b>                                                          | Effect of some factors on fruit and vegetables |
| <b>Week 11</b>                                                          | Exam                                           |

|                |                                    |
|----------------|------------------------------------|
| <b>Week 12</b> | General discussion                 |
| <b>Week 13</b> | Cooling load                       |
| <b>Week 14</b> | Care and storage of food additives |
| <b>Week 15</b> | Storage of milk and its products   |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                            |                                  |
|-----------------------------------------------------------------|--------------------------------------------|----------------------------------|
|                                                                 | <b>Text</b>                                | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                           | Recent scientific books of trusted sources | لا                               |
| <b>Recommended Texts</b>                                        | High quality scientific journals           | لا                               |
| <b>Websites</b>                                                 |                                            |                                  |

# MODULE 24

## MODULE DESCRIPTION FORM

| Module Information                        |                           |                             |                                                                                                                                                                                                                                          |                       |  |
|-------------------------------------------|---------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--|
| <b>Module Title</b>                       | Biochemistry              |                             | <b>Module Delivery</b>                                                                                                                                                                                                                   |                       |  |
| <b>Module Type</b>                        | S                         |                             | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                       |  |
| <b>Module Code</b>                        | AGR123                    |                             |                                                                                                                                                                                                                                          |                       |  |
| <b>ECTS Credits</b>                       | 6                         |                             |                                                                                                                                                                                                                                          |                       |  |
| <b>SWL (hr/sem)</b>                       | 150                       |                             |                                                                                                                                                                                                                                          |                       |  |
| <b>Module Level</b>                       | 2                         | <b>Semester of Delivery</b> |                                                                                                                                                                                                                                          | 2                     |  |
| <b>Administering Department</b>           | Food Science Dept.        | <b>College</b>              | College of Agriculture                                                                                                                                                                                                                   |                       |  |
| <b>Module Leader</b>                      | Dr. Hyder Najy Al Zobaidy |                             | <b>e-mail</b>                                                                                                                                                                                                                            | hynajy@uowasit.edu.iq |  |
| <b>Module Leader's Acad. Title</b>        | Professor                 |                             | <b>Module Leader's Qualification</b>                                                                                                                                                                                                     | Ph.D.                 |  |
| <b>Module Tutor</b>                       | Huda Muhamed Abed         |                             | <b>e-mail</b>                                                                                                                                                                                                                            | habed@uowasit.edu.iq  |  |
| <b>Peer Reviewer Name</b>                 | Name                      |                             | <b>e-mail</b>                                                                                                                                                                                                                            | E-mail                |  |
| <b>Scientific Committee Approval Date</b> | 003/03/2026               |                             | <b>Version Number</b>                                                                                                                                                                                                                    | 1.0                   |  |

| Relation with other Modules |      |  |                 |  |
|-----------------------------|------|--|-----------------|--|
| <b>Prerequisite module</b>  | None |  | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None |  | <b>Semester</b> |  |

## Module Aims, Learning Outcomes and Indicative Contents

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b></p>        | <p>The Biochemistry course aims to enable students to understand the chemical composition of living organisms and the biological reactions occurring within cells through achieving the following objectives:</p> <ol style="list-style-type: none"> <li>39. Introduce the fundamental concepts of biochemistry and its importance in agricultural, food, and medical sciences.</li> <li>40. Study the chemical composition of biological compounds such as: <ul style="list-style-type: none"> <li>○ Carbohydrates</li> <li>○ Proteins</li> <li>○ Lipids</li> <li>○ Nucleic acids</li> <li>○ Vitamins and enzymes</li> </ul> </li> <li>41. Understand the processes of digestion, absorption, and metabolism of nutrients in the body.</li> <li>42. Explain the metabolic pathways of carbohydrates, lipids, and proteins and their roles in energy production.</li> <li>43. Identify the role of enzymes, the factors affecting their activity, and their mechanisms of action.</li> <li>44. Study the regulation of metabolic processes and the relationship between hormones and biological reactions.</li> <li>45. Understand the basics of homeostasis of body fluids, minerals, and vitamins.</li> <li>46. Develop students' ability to interpret biological and biochemical phenomena related to human and animal health and food quality.</li> <li>47. Provide students with analytical and scientific thinking skills and connect theoretical concepts with practical and laboratory applications.</li> <li>48. Prepare students to understand modern applications of biochemistry in the fields of food science, nutrition, biotechnology, and pharmaceutical industries.</li> </ol> |
| <p><b>Module Learning Outcomes</b></p> | <ol style="list-style-type: none"> <li>45. Define the basic concepts of biochemistry and explain its importance in life and food sciences.</li> <li>46. Differentiate between various biomolecules in terms of structure, properties, and biological functions.</li> <li>47. Explain the mechanism of enzyme action and the factors affecting enzyme activity.</li> <li>48. Interpret the processes of digestion, absorption, and metabolism of carbohydrates, lipids, and proteins in the body.</li> <li>49. Describe metabolic pathways and energy production in living cells.</li> <li>50. Relate the roles of vitamins, minerals, and hormones to their biological functions in the body.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | <p>51. Analyze biochemical changes associated with diseases and malnutrition.</p> <p>52. Apply the basic principles of biochemistry in food, agricultural, and health sciences.</p> <p>53. Use basic laboratory skills to perform biochemical experiments and tests.</p> <p>54. Interpret laboratory results and prepare scientific reports accurately and systematically.</p> <p>55. Develop scientific thinking, analytical, and problem-solving skills related to biochemistry.</p> <p><b>56.</b> Adhere to laboratory safety procedures and scientific ethics during practical work.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Indicative Contents</b> | <p>50. Introduction to biochemistry and its importance.</p> <p>51. Cell structure and the chemical components of living organisms.</p> <p>52. Water and minerals and their biological roles.</p> <p>53. Carbohydrates: structure, classification, and biological functions.</p> <p>54. Digestion, absorption, and metabolism of carbohydrates.</p> <p>55. Lipids: structure, classification, and biological functions.</p> <p>56. Digestion, absorption, and metabolism of lipids.</p> <p>57. Proteins and amino acids: structure and properties.</p> <p>58. Digestion, absorption, and metabolism of proteins and the urea cycle.</p> <p>59. Enzymes: structure, mechanism of action, and factors affecting enzymatic activity.</p> <p>60. Vitamins: types, functions, and deficiency symptoms.</p> <p>61. Hormones and their role in regulating metabolism.</p> <p>62. Nucleic acids and the structure of DNA and RNA.</p> <p>63. Homeostasis of body fluids and minerals.</p> <p>64. Introduction to clinical biochemistry and some metabolic disorders.</p> <p>65. Practical and laboratory applications in biochemistry.</p> |

| <b>Learning and Teaching Strategies</b> |                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | <p>Teaching and Learning Strategies for the Biochemistry Course</p> <p>Interactive Lecture</p> <p>Used to explain fundamental concepts and scientific theories while engaging students through discussion and questions.</p> <p>Practical Laboratory Learning</p> <p>Conducting biochemical experiments to develop practical skills and connect theoretical knowledge with practical applications.</p> |

|                   |                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <b>Problem-Based Learning</b>                                                                                          |
|                   | Analyzing problems and case studies related to metabolism and biochemical disorders and finding appropriate solutions. |
|                   | <b>Brainstorming and Group Discussions</b>                                                                             |
|                   | To enhance scientific thinking, critical analysis, and student interaction.                                            |
|                   | <b>Presentations and Scientific Seminars</b>                                                                           |
|                   | Assigning students to prepare and present specialized topics in biochemistry.                                          |
|                   | <b>Self-Learning</b>                                                                                                   |
|                   | Encouraging students to conduct research and review modern scientific references and electronic resources.             |
|                   | <b>Use of Modern Educational Tools</b>                                                                                 |
|                   | Such as presentations, educational videos, and models to explain biochemical reactions and metabolic pathways.         |
|                   | <b>Cooperative Learning</b>                                                                                            |
|                   | Working in groups to conduct experiments, analyze results, and prepare scientific reports.                             |
|                   | <b>Continuous Assessment</b>                                                                                           |
|                   | Using quizzes, laboratory reports, assignments, and classroom discussions to evaluate students' progress.              |

| <b>Student Workload (SWL)</b>   |            |                               |   |
|---------------------------------|------------|-------------------------------|---|
| <b>Structured SWL (h/sem)</b>   | 78         | <b>Structured SWL (h/w)</b>   | 5 |
| <b>Unstructured SWL (h/sem)</b> | 72         | <b>Unstructured SWL (h/w)</b> | 5 |
| <b>Total SWL (h/sem)</b>        | <b>150</b> |                               |   |

| <b>Module Evaluation</b> |
|--------------------------|
|--------------------------|

|                      |            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|----------------------|------------|-------------|------------------|----------|---------------------------|
| Formative assessment | Tests      | 1           | 10% (10)         | 8        | LO #1 - #7                |
|                      | Projects   | 1           | 10% (10)         | 6        | LO #1 - #5                |
|                      | Lab        | 1           | 10% (10)         | 9        | LO #1 - #8                |
|                      | Reports    | 1           | 10% (10)         | 15       | LO #1 - #14               |
| Summative assessment | Mid Exam   | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                      | Final Exam | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment     |            |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                  |
|---------------------------------|--------------------------------------------------------------------------------------------------|
|                                 | Material Covered                                                                                 |
| Week 1                          | Water, minerals, and their biological importance.                                                |
| Week 2                          | Carbohydrates: structure, classification, and properties.                                        |
| Week 3                          | Digestion, absorption, and metabolism of carbohydrates.                                          |
| Week 4                          | Proteins and amino acids: structure and properties.                                              |
| Week 5                          | Digestion, absorption, and metabolism of proteins and the urea cycle.                            |
| Week 6                          | Enzymes: structure, nomenclature, mechanism of action, and factors affecting enzymatic activity. |
| Week 7                          | Lipids: structure, classification, and biological functions.                                     |
| Week 8                          | Midterm Examination.                                                                             |
| Week 9                          | Digestion, absorption, and metabolism of lipids.                                                 |
| Week 10                         | Vitamins: types, functions, and deficiency symptoms.                                             |

|                |                                                                  |
|----------------|------------------------------------------------------------------|
| <b>Week 11</b> | Hormones and their role in regulating metabolic processes.       |
| <b>Week 12</b> | Nucleic acids (DNA and RNA) and protein synthesis.               |
| <b>Week 13</b> | Homeostasis of fluids and minerals and some metabolic disorders. |
| <b>Week 14</b> | Vitamins: types, functions, and deficiency symptoms.             |
| <b>Week 15</b> | Practical applications, general review, and final examination.   |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b> |                                                                                                           |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|                                             | <b>Material Covered</b>                                                                                   |
| <b>Week 1</b>                               | Identification of laboratory equipment and their proper use along with laboratory safety rules.           |
| <b>Week 2</b>                               | Determination of pH in biological solutions using a pH meter and indicator paper.                         |
| <b>Week 3</b>                               | Detection of carbohydrates using biochemical tests (Benedict's test, Fehling's test, and Molisch's test). |
| <b>Week 4</b>                               | Estimation of reducing and non-reducing sugars in biological samples.                                     |
| <b>Week 5</b>                               | Detection of proteins using Biuret test and Ninhydrin test.                                               |
| <b>Week 6</b>                               | Determination of protein concentration in different samples.                                              |
| <b>Week 7</b>                               | Detection of lipids using the emulsification test.                                                        |
| <b>Week 8</b>                               | Determination of total lipids in food samples.                                                            |
| <b>Week 9</b>                               | Study of enzyme activity (such as amylase) and the factors affecting it, including temperature and pH.    |
| <b>Week 10</b>                              | Determination of catalase enzyme activity or other biological enzymes.                                    |
| <b>Week 11</b>                              | Determination of glucose levels in blood or standard solutions.                                           |
| <b>Week 12</b>                              | Separation of blood components or proteins using simple methods such as precipitation or centrifugation.  |
| <b>Week 13</b>                              | Estimation of certain vitamins or minerals using simple chemical methods.                                 |
| <b>Week 14</b>                              | Performing simple clinical biochemical tests related to metabolism.                                       |

|                |                                                                         |
|----------------|-------------------------------------------------------------------------|
| <b>Week 15</b> | Writing laboratory reports, analyzing results, and discussing findings. |
|----------------|-------------------------------------------------------------------------|

| <b>Learning and Teaching Resources</b> |                                                                                                                                                                                                 |                                  |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                        | <b>Text</b>                                                                                                                                                                                     | <b>Available in the Library?</b> |
| <b>Required Texts</b>                  | Theory and practical lectures                                                                                                                                                                   | Yes                              |
| <b>Recommended Texts</b>               | Lehninger Principles of Biochemistry                                                                                                                                                            | No                               |
| <b>Websites</b>                        | <a href="https://ca.tindomachine.com/info/requirements-for-food-processing-workshop-45757974.html">https://ca.tindomachine.com/info/requirements-for-food-processing-workshop-45757974.html</a> |                                  |

# MODULE 25

## MODULE DESCRIPTION FORM

| Module Information                        |                    |                                      |                                                                                                                                                                                                                               |                                                                          |  |
|-------------------------------------------|--------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--|
| <b>Module Title</b>                       | English language 2 |                                      | <b>Module Delivery</b>                                                                                                                                                                                                        |                                                                          |  |
| <b>Module Type</b>                        | Basic              |                                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                          |  |
| <b>Module Code</b>                        | WU23               |                                      |                                                                                                                                                                                                                               |                                                                          |  |
| <b>ECTS Credits</b>                       | 2                  |                                      |                                                                                                                                                                                                                               |                                                                          |  |
| <b>SWL (hr/sem)</b>                       | 50                 |                                      |                                                                                                                                                                                                                               |                                                                          |  |
| <b>Module Level</b>                       | 2                  | <b>Semester of Delivery</b>          |                                                                                                                                                                                                                               | 2                                                                        |  |
| <b>Administering Department</b>           | Food Science Dept. | <b>College</b>                       | College of Agriculture                                                                                                                                                                                                        |                                                                          |  |
| <b>Module Leader</b>                      | Anaam Kadhim Abass |                                      | <b>e-mail</b>                                                                                                                                                                                                                 | <a href="mailto:alshahmani@uowasit.edu.iq">alshahmani@uowasit.edu.iq</a> |  |
| <b>Module Leader's Acad. Title</b>        | Assist. Lect.      | <b>Module Leader's Qualification</b> | MSc                                                                                                                                                                                                                           |                                                                          |  |
| <b>Module Tutor</b>                       |                    |                                      | <b>e-mail</b>                                                                                                                                                                                                                 |                                                                          |  |
| <b>Peer Reviewer Name</b>                 | Name               | <b>e-mail</b>                        | E-mail                                                                                                                                                                                                                        |                                                                          |  |
| <b>Scientific Committee Approval Date</b> | 03/03/2026         | <b>Version Number</b>                |                                                                                                                                                                                                                               |                                                                          |  |

| Relation with other Modules |      |  |                 |  |
|-----------------------------|------|--|-----------------|--|
| <b>Prerequisite module</b>  | None |  | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None |  | <b>Semester</b> |  |

### Module Aims, Learning Outcomes and Indicative Contents

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b>        | <p>49. Teaching the student the basics of the English language..</p> <p>50. . to develop students ` basic English language skills in reading , writing , listening and speaking.</p> <p>51. To enable students to communicate effectively in academic and everyday situations using English.</p>                                                                                                             |
| <b>Module Learning Outcomes</b> | <p>57. Demonstrate a basic understanding of English grammar an vocabulary.</p> <p>58. Use English effectively in simple written and spoken..</p> <p>59. Read and comprehend basic English texts related to academic and everyday contexts.</p> <p>60. Apply correct grammatical structures in writing speaking..</p> <p>61. Develop confidence in using English for learning and communication purposes.</p> |
| <b>Indicative Contents</b>      | <p>66. Basics of English Language.</p> <p>67. Parts of speech..</p> <p>68. Pronouns.</p> <p>69. Tenses.</p> <p>70. Vocabulary Development.</p> <p>71. Reading Comprehension .</p> <p>72. Writing Skills.</p>                                                                                                                                                                                                 |

### Learning and Teaching Strategies

|                   |                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <p>25. Explanation and Clarification.</p> <p>26. Lecture Method.</p> <p>27. Student Groups.</p> |
|-------------------|-------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

|                                 |    |                               |   |
|---------------------------------|----|-------------------------------|---|
| <b>Structured SWL (h/sem)</b>   | 33 | <b>Structured SWL (h/w)</b>   | 2 |
| <b>Unstructured SWL (h/sem)</b> | 17 | <b>Unstructured SWL (h/w)</b> | 1 |

|                          |           |
|--------------------------|-----------|
| <b>Total SWL (h/sem)</b> | <b>50</b> |
|--------------------------|-----------|

| <b>Module Evaluation</b>    |                   |                    |                       |                 |                                  |
|-----------------------------|-------------------|--------------------|-----------------------|-----------------|----------------------------------|
|                             |                   | <b>Time/Number</b> | <b>Weight (Marks)</b> | <b>Week Due</b> | <b>Relevant Learning Outcome</b> |
| <b>Formative assessment</b> | <b>Tests</b>      | 1                  | 10% (10)              | 8               | LO #1 - #7                       |
|                             | <b>Projects</b>   | 1                  | 10% (10)              | 6               | LO #1 - #5                       |
|                             | <b>Lab</b>        | 1                  | 10% (10)              | 9               | LO #1 - #8                       |
|                             | <b>Reports</b>    | 1                  | 10% (10)              | 15              | LO #1 - #14                      |
| <b>Summative assessment</b> | <b>Mid Exam</b>   | 2hr                | 10% (10)              | 7               | LO #1 - #6                       |
|                             | <b>Final Exam</b> | 3hr                | 50% (50)              | 16              | All                              |
| <b>Total assessment</b>     |                   |                    | 100% (100 Marks)      |                 |                                  |

| <b>Delivery Plan (Weekly Syllabus)</b> |                                |
|----------------------------------------|--------------------------------|
|                                        | <b>Material Covered</b>        |
| <b>Week 1</b>                          | Basics of the English language |
| <b>Week 2</b>                          | Pronouns                       |
| <b>Week 3</b>                          | Pronouns                       |
| <b>Week 4</b>                          | auxiliary verbs                |
| <b>Week 5</b>                          | Exam                           |
| <b>Week 6</b>                          | Verb rules                     |
| <b>Week 7</b>                          | Verb rules                     |
| <b>Week 8</b>                          | Noun rules                     |

|                |                 |
|----------------|-----------------|
| <b>Week 9</b>  | Noun rules      |
| <b>Week 10</b> | Exam            |
| <b>Week 11</b> | Adjective rules |
| <b>Week 12</b> | Adjective rules |
| <b>Week 13</b> | auxiliary verbs |
| <b>Week 14</b> | auxiliary verbs |
| <b>Week 15</b> | auxiliary verbs |

## Contact

Program Manager:

Hyder Al Zobaidy | Ph.D. in Food Science | Professor

Email: [hynajy@uowasit.ed.iq](mailto:hynajy@uowasit.ed.iq)

Mobile no.: +9647719697259

Program Coordinator:

Mrtatha Kaream Ali | Ph.D. in Genetic Engineering and Biotechnology |

Email: [malzrkani@uowasit.ed.iq](mailto:malzrkani@uowasit.ed.iq)

Mobile no.: +9647725046385

---