



Zeina A. Salman

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Academic Qualifications

08/2017 - date

PhD

Biophysics

Microelectronics and Photonics Program University of Arkansas, Fayetteville, AR, USA

Doctoral Dissertation: "A Numerical Study of the Interaction Between One Dimensional Carbyne Chain and Single Stranded DNA"

08/2009 – 05/2014

Master of Physics

Department of Physics

University of Arkansas, Fayetteville, AR, USA

Non-thesis Master

06/2008- 05/2009

Diplomain English

Spring International Language Center University of Arkansas, Fayetteville, AR, USA

10/2000 – 09/2003

Master of Physics

Theoretical Nuclear Physics Department of Physics

University of Baghdad, Baghdad, Iraq

Master's Thesis: "Calculation of the Longitudinal C2 Electron Scattering Form Factors for some of the 1p-shell Nuclei"

10/1996 – 06/2000

B.Sc. Physics

Department of Physics

University of Baghdad, Baghdad, Iraq

Scholarships and Awards

02/2023-

Wasit University-Research Scholarship

02/2024

06/2008-

Ministry of Higher Education and Scientific Research in Iraq (MOEH IRAQ)

08/2014

Scholarships

10/2000 2nd rank at the top Iraqi talented and intelligent students' competitive exam in physics out of all physics major students graduated in 2000.

06/2000 1st rank out of 112 students graduated from the College of Science at the University of Baghdad in 2000.

Professional Profile

- Innovative and determined teacher who is committed to creating learning environment based on mutual respect and collaboration.
- Dedicated to helping students understand and relate with difficult subject in physics via adapting learning approach that fits non-traditional learners while becoming successful and confident science learners.
- Demonstrated ability to develop goals, objectives and implement strategies through lesson planning and teaching experience

Academic Employment – Teaching

- **2024- present [Wasit University / College of Science / Physics Department], [Wasit, Iraq]**
[Lecturer]
 - Full time: 1st Course of 2025-2026
 - o Teaching **Radiation Biology** to fourth level medical physics major students
 - o Teaching **Medical Physics I (Lecture and Lab)** to third level medical physics students
 - Full time: 1st and 2nd Courses of 2024-2025
 - o Teaching **Physics of Biosensors** and **Physics of Drug Delivery** to fourth level medical physics major students
 - o Teaching **Medical Physics I (Lecture and Lab), Medical Physics II (Lecture and Lab), Physics of Living Systems** to third level medical physics students.
 - Full time: 2nd Courses of 2023-2024
 - o Teaching **Nanoscience in Medical Physics** and **Physics of Drug Delivery** to fourth level medical physics major students
 - o Teaching **Biophysics** to third level medical physics major students.
- **2023-2024 [University of Arkansas/College of Engineering/ Mechanical Engineering Department]**
 - **Research Visting Scholar**
- **2017 – 2023 [Wasit University / College of Science / Physics Department], [Wasit, Iraq]**
[Lecturer]
 - Full time: 1st and 2nd Courses of 2020-2021 and 2021-2022, 1st Course of 2022-2023
 - o Taught 130 students that were third level medical physics major **The Physics of Living Systems, Health Physics, and Biophysics** online and in person.
 - o Taught 159 students that were fourth level medical physics major **The Physics of Biosensors, Nanoscience in Medical Physics, and Physics of Drug Delivery** online and in person.
 - o Directed and advised 15 seniors that were physics major students throughout their graduation research project and paper.
 - Full time: 1st and 2nd Courses of 2019-2020
 - o Taught 74 students that were third level medical physics major **The Physics of Living Systems, Health Physics, and Introductory Biophysics** online.
 - o Taught **English 2** for 128 second level physics major students online.
 - o Taught **English 1** for 80 first level physics major students online.
 - o Directed and advised 5 fourth level that were physics major students throughout their graduation research project and paper.
 - Full time: 1st and 2nd Courses of 2017-2018 & 2018-2019
 - o Taught 150 students for each course of **Biophysics 1** and **Biophysics 2** which included being the lab director for non-physics major students besides grade their assignments and exams
 - o Taught **English 1, English 2, and English 4** for first level, second level, and fourth level, respectively.
 - o Taught **Elementary Particle Physics** for fourth level physics major students
 - o Directed and Advised 3 fourth level that were physics major students throughout their graduation research project and paper.

- **2013 - 2017 [University of Arkansas / Fulbright college of Arts and Sciences / Physics Department], [Fayetteville, Arkansas]**
[Teaching Assistant]
 - Full time: Summer 2013, Fall 2013, Spring 2014, Summer 2014, Fall 2014, Spring 2015, Summer 2015, Fall 2015, Spring 2016, Fall 2016, Spring 2017
 - o Taught 120 students each semester for **Physics and Human Affairs, Physics for Elementary Teachers, College Physics 1** that included being the lab instructor and grader of their related weekly assignments
 - o Received very positive feedback from students and nice comments such as “Zeina rocks” and “I will recommend you to anyone who will take this class in the future. You put such a difficult subject into ways that I could relate with and understand and I cannot thank you enough.”
- **2010 - 2012 [University of Arkansas / Fulbright college of Arts and Sciences / Physics Department], [Fayetteville, Arkansas]**
[Teaching Assistant]
 - Fulltimelabinstructor: Summer 2010, Summer 2011, Fall 2011, Spring 2012, Summer 2012
 - o Taught 120 students each semester for **Physics and Human Affairs, Physics for Architectures** that included being the lab instructor and grader of their related weekly assignments
 - Part time: Fall 2010, Spring 2011
 - o Graded 200 papers weekly for **Quantum Physics 1&2, Electrodynamics 1, University Physics 1, Analytical Mechanics**
 - o Waspromptedanddescribed as very precise, organized, and consistent in grading.
- **2004 – 2008 [Wasit University / College of Science / Physics Department], [Al-Kut, Wasit, Iraq]**
[Instructor, Lab Curator]
 - **Atomic Physics, Nuclear Physics, and Electronic Designs (Analog Circuit)**
 - o Taughtclasses of over250 students; managing and preparing the materialsand equipmentfor the classes and labs associated with the classes mentioned above.
 - o Promoted multiple times to teach the same classes for evening college students after the first semester of teaching it.
- **2006 – 2008 [Wasit University / College of Medicine], [Al-Kut, Wasit, Iraq]**
[Lab Instructor]
 - o Taught **College Physics** forfreshmen,plannedthecurriculumandweeklyreportedtothedeans of the college any changes needed to be implanted in this lab.
- **2006 – 2007 [Wasit University / College of Open Educational Systems], [Al-Kut, Wasit, Iraq]**
[Instructor]
 - o Taught **Atomic Physics** for seniors in classesof over150 students.
 - o Adapted teaching approach tofit non-traditional learners.
 - o Promoted to teach the same class for non-science major students; 100% of students passed

Research Experience

- **Doctoral Research: Micro Electronic and Photonics Program (microEP) / University of Arkansas, 2013-2017 (research advisor: Dr. Steve Tung and Dr. Arun Nair)**
 - Developed a model that uses one dimensional carbon chains of atoms, carbyne, as sensing element for DNA sequencing devices.
 - This model simulates the electromechanical properties associated with the interactions between DNA and carbyne. The sensing mechanism is based on measuring and analyzing the difference in electrical current associated with each base of DNA bases. It also provides the basis for novel bio sensing devices.
 - Successfully used quantum mechanics based and MD simulations in modeling DNA in nano systems
- **Research project in designing and testing of 3D printed microfluidic mixers and systems for bio-sensing**
 - Successfully designed and tested 3D printed microfluidic mixer for biomedical applications as a project for introduction to MEMS class.
- **Trained to make lysenin nanopore for voltage-induced gating mechanism of lysenin ionic channels in biophysics lab for non-thesis master's degree in physics / University of Arkansas.**
- **High experience in materials science, MD and First-principal simulations of biosensors at the Nano scale**
- **Master Research: Department of Physics / University of Baghdad, 2000-2003 (research advisor: Dr. Raad Rahdi and Adil Hammoudi)**
 - Theoretically investigated the core polarization effects on the electrical properties of 1p- shell nuclei.

Management Experience

- 2006 – 2007** [University of Wasit / College of Science], [Al-Kut, Wasit, Iraq] [Director of the admissions office]
- Chaired and coordinated 6 employees; supervising and directing them to develop protocols of evaluating the applications in professional manners.
 - Reviewed application forms of over 250 applicants who applied to the College of Science at Wasit University.
 - Successfully assigned tasks and prioritized them in ways that increased productivity of the office while in the position.
 - Received a certificate of appreciation from the university's chairman

Leadership Skills

2 years of experience in leadership roles, and personnel management as a team leader and a mentor in Microelectronics and Photonics Program at the University of Arkansas.

Publications

- Zeina Salman, Jin-Woo Kim, Steve Tung, "First-Principles Simulation of the Interaction between DNA Nucleotides and One-Dimensional Carbon Chain in Electrical Based Sequencing," IEEE Open Journal of Nanotechnology 2024 10.1109/OJNANO.2024.3451954.
<https://www.scopus.com/pages/publications/85203502872?origin=resultslist>
- Zeina Salman, Arun Nair, and Steve Tung, "One-dimensional carbon chains as electrical sensors for single-stranded DNA," IEEE-NEMS 2017 Conference, 2017. IEEE Xplore.
- Zeina Salman, Arun Nair, and Steve Tung, " Electromechanical Properties of One Dimensional Carbon Chains," IEEE-NANOMED 2015 Conference, 2015. IEEE Xplore
- Zeina Salman, Adel K. Hamoudi, and Ra'ad A. Radhi, "The Calculation of the Charge Density Distributions and the Longitudinal Form Factors for some of the 10B Nucleus by Using the Occupation Number of the State," Journal of Science at the University of Baghdad, 2003

Presentations

- Zeina Salman, " One-dimensional carbon chains as electrical sensors for single-stranded DNA," IEEE-NEMS 2017 Conference, April 12, 2017
- Zeina Salman, " Electromechanical Properties of One Dimensional Carbon Chains," IEEE-NANOMED 2015 Conference, November 16, 2015

Extra-Curricular Activities

Fall 2011: Tourguide for INBRE Research Conference

- Led a tour in the physics department at the University of Arkansas

2015: Girls Engaged in Engineering (GEE) in Crossett

- Participated in GEE project on December 11 to 12 at Crossett School in Crossett / Arkansas

2014-2017: Team leader in microEP

- Mentored first and second year graduate students
- Trained them to present their research in microEP monthly research seminar