Gafar Abbas Elamin, Ph.D., PE

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EXECUTIVE SUMMARY

- Dynamic and motivated professional with 9+ years in academia and 5 years of industry experience
- Proven record of achievement as instructor, lead engineer, and department chair
- Dependable and organized team player with ability to build relationships and work with all colleagues
- Participated in the development of more than 15 courses in the Mechanical Engineering curricula at three different universities.
- Worked as a department head for an ABET accredited Mechanical Engineering program and utilized all available resources for faculty professional development and student's education.
- Developed the ABET accreditation self-study report for the ME department and came up with rigorous procedure in maintaining and improving course portfolios.
- Added new equipment and prepared manuals for the thermodynamics and fluid laboratories.
- Developed the curriculum for the graduate program in Mechanical Engineering.
- Performed research on CFD, energy storage, engineering education.

Nationality: US Citizen

EDUCATION

Ph.D.	Mechanical Engineering, North Carolina Agriculture & Technical State University, Greensboro, North Carolina	2008
M.S.	Mechanical Engineering, North Carolina Agriculture & Technical State University, Greensboro, North Carolina	2004
B.S.	Mechanical Engineering, University of Khartoum, Sudan	1991

PROFESSIONAL MEMBERSHIP AND CERTIFICATION

- Professional Engineer, Maryland, 2012, (License PE-40362)
- Member of American Society for Engineering Education (ASEE)
- Member of American Institute of Aeronautics & Astronautics (AIAA)
- Member of the Sigma-Xi, The Scientific Research Honor Society
- Member of National Society of Black Engineers

Awards & Honors

- The New Faculty Excellence Award, 2022, The Citadel, Charleston, South Carolina
- ASEE-SE Midterm Career Teaching Award, ASEE- Southeastern Section Conference, March 2022
- Engineer of the Year award 2022, Charleston Engineers Joint Council, Charleston, South Carolina
- Department Chairs Award 2017, College of Engineering, King Faisal University, Saudi Arabia.
- ABET Coordinators Award 2015, College of Engineering, King Faisal University, Saudi Arabia.
- Bechtel Training, Leadership, and Performance Award, 2012, Bechtel Corporation, Frederick, MD.
- Excellent Performance Recognition Award 2010, Bechtel Corporation, Frederick, MD.
- NASA Space Grant College Fellowship program (2004-2006), NC Space Grant Consortium, NCSU.
- Computational Sciences Excellence Scholarship 2005, Air Force Research Laboratory, Dept. of Defense, USA.

APPOINTMENTS

The Citadel, School of Engineering

Assistant Professor	2020 -present
University of Wisconsin-Platteville	
Lecturer	2018 – 2020
King Faisal University, Saudi Arabia	
Assistant Professor	2013 – 2018
Bechtel Power Corporation	
Lead Mechanical/Nuclear Engineer	2008-2013

CURRENT POSITION

Assistant Professor, Department of Mechanical Engineering **08/2020-Present**

The Citadel, Charleston, South Carolina

- Teach thermo-fluid, Heat Transfer, Measurement and Instrumentation, Computational Methods, Introduction to ME, and Senior Design Courses
- Supervise students on their senior design project
- Conduct technical and engineering education research.
- Work on department/School/College committees
- Mentor and advise students
- Advisor of the NSBE-Students Chapter at The Citadel

I. COURSE DEVELOPMENT AND TEACHING

- Thermo-Fluid Systems Design
- Heat Transfer
- Fluid Mechanics
- Thermodynamics Lab
- Fluid Mechanics Lab
- Computational Fluid Dynamics
- Renewable Energy
- Energy conversion systems
- Statics
- Numerical Methods
- Air conditioning and refrigeration
- Measurements and instrumentation
- Mechanics of material
- Manufacturing process
- Senior Design

II. PROFESSIONAL EXPERIENCE

Lecturer, Department of Mechanical & Industrial Engineering **08/2018-05/2020**

University of Wisconsin - Platteville, Platteville, Wisconsin

- Modified course content and taught the thermo-fluid systems design course for three sections of senior students. A course treating the concepts of Thermodynamics, Fluid Mechanics, Heat Transfer, and mechanics in a unified presentation. Particular emphasis is directed towards applications to actual physical systems including the gas power cycles, refrigeration cycles, heat exchangers, fluid flow, turbomachinery, ideal gas mixtures, psychrometrics and combustion.
- Helped the general engineering program at UW-Platteville by preparing the content/assessment and teaching the GENENG 2130-Engineering Mechanics: Statics course.

Assistant Professor, Mechanical Engineering Department Chair **08/2013-05/2018**

King Faisal University, Al-ahsa, Saudi Arabia

- Managed the Mechanical Engineering program: Duties include the usual chair's responsibilities such as budgets, schedules, annual reports, faculty evaluation, recruitment, developments, outreach, research, community services.
- Taught thermo-fluid courses such as Heat Transfer, Thermodynamics, Fluid Mechanics, Renewable Energy, refrigeration and Air Conditioning.
- Led the ME department through successful **ABET** visit to the program in September 2015. The outcome of the ABET visit was a completely clean exit statement. The ME program was accredited until September 2021.
- Prepared and submitted the ME department self-study report (SSR) to ABET Accreditation in 2014.
- Conducted researches on Renewable Energy, Energy Storage Systems, and CFD
- Represented the ME department in the college level planning and development Committees

Lead Mechanical/Nuclear Engineer **08/2008-08/2013**

Bechtel Power Corporation, Frederick, Maryland, United States of America

- Worked as a group lead on a nuclear power plant project. Duties include: provide technical assistant to young engineers and check the design quality and the technical accuracy of the nuclear group deliverables to the project. Provide input to the project scope, schedule, and budget. Attend the schedule performance meetings, model review meetings, and other technical and administrative meetings. Provide innovative and creative ideas to optimize the overall plant design and equipment layout.
- Developed design calculations for the spent fuel pool cooling and cleanup system (SFPCCS). These calculations include the determination of the reactor core decay heat load in the spent fuel pool as function of time, the spent fuel pool boil-off time, the system flowrates and equipment sizing, and the system design pressure and temperature.
- Developed the Gaseous Radwaste System (GRWS) design calculations. These calculations include the determination of the system flowrates, pressure, temperature, relative humidity, the mass of the charcoal to achieve the required radionuclide holdup times.
- Evaluated the system design against the safety requirements of nuclear power plant in the Industry Standards (ASME, ANSI/ANS, API, etc.), and the U.S. Nuclear Regulatory Commission (NRC) Guides and Standard Review Plan.
- Performed the technical bid evaluation and equipment selection (heat exchangers, pumps, valves, gas cooler, demineralizers, filters, and charcoal delay beds.)
- Prepared the process flow diagram (PFD) and the piping and instrumentation diagram (P&ID) for the main steam, seal steam, feed water, condensate, the spent fuel pool cooling systems, the gaseous radwaste system, and the components cooling water system.
- Performed the pressure drop calculation and ID fan sizing for flue gas ductwork for Co_2 capturing demonstration plants.
- Reviewed vendor's drawings and data for completeness and optimization.
- Communicated with vendors to resolve issues and discuss the work plan, and all milestone dates.
- Managed a CFD contract to develop a CFD model for the flue gas ductwork and determine the best possible layout for the ductwork. Duties included the CFD results analysis, resolution of technical issues, and the coordination of the schedule and sequence of work with other disciplines on the project.

Maintenance Engineer **03/2001-08/2002**

K-mart Distribution Center, Greensboro, North Carolina United States of America

- Performed the maintenance duties on multi-lines induction system consists of motors, chains, sprockets, conveyors, and sorters.
- Performed the regular maintenance and troubleshooting for the center equipment.

Maintenance Engineer **03/1993-08/1999**

Qatar Air Force, Doha, Qatar

- Performed the periodic inspection and preventive maintenance on hydraulic system of electro-hydraulic missile fire units.
- Repaired the fire unit's hydraulic system (magazines, launchers, pumps, accumulators, and pipes) in the workshop as well as in the field.
- Maintained the spare parts inventory and ordered supplies for all units.
- Completed and submitted all the required documentation.
- Trained the operators on how to operate the unit in a safe way.

Teaching and Research Assistant **03/1991-06/1992**

Department of Mechanical Engineering, Faculty of Engineering, University of Khartoum, Sudan

- Supervised undergraduate student in different laboratories in Mechanical Engineering Department. Graded all homework and quizzes, conducted the recitation session every week and the class in the absence of the instructor.

III. INDUSTRY PROJECTS

- *Small Modular Reactors Project:* Optimization of the spent fuel pool cooling system. Determination of spent fuel pool boil-off time and the required make-up water flowrate. Filtration and the hold time required for the reactor fission products gases (Krypton, Xenon, and Iodine).
- *Graphite Solar Energy Project:* A concentrated Solar Power (CSP) project that uses Graphite Energy's Technology to collect heat reflected from a field of heliostats (mirrors), and store the energy via heat exchangers and dispatch it as needed.
- *Calera CO_2 Capturing Project***:** Estimation of the pollutant quantities (Co_2, Co, No_x, etc) emitted from four selected fossil fuel power plants in USA and size and design equipment that utilize Calera technology to capture and reduce these quantities

IV. ANNUAL MEETINGS & WORKSHOPS

- 2023 ASEE Southeastern Section Annual Conference, Fairfax, VA, March 12-14, 2023
- 2023 KEEN National Conference, Atlanta, GA, January 26-28, 2023
- 2022 ASEE Southeastern Section Annual Conference, Charleston, SC, March 13-15, 2022
- 2022 AI for Beginners Faculty Workshop- The Citadel, Charleston, SC, August 10, 2022
- 2021 ASEE Annual Conference and Exposition, Virtual Meeting, July 26-29, 2021
- 2021 ASEE Southeastern Section Annual Conference, Virtual Meeting, March 8-11, 2021
- Mini-ExCEED, Teaching Workshop at The Citadel, Jan. 13-14, 2021
- Transformational Education Conference, University of Wisconsin-Platteville, Platteville Wisconsin, January 21,2020
- KEEN Teaching with Impact Symposium, monthly meetings (August 2019 to present)
- Teaching and Learning STEM book club, monthly meetings (August 2019 to present)
- ASEE MINI-National Effective Teaching Institution (NETI) Workshop, University of Wisconsin-Platteville, Platteville, Wisconsin, August 20-21, 2019
- Green Technologies and Energy Efficiency Workshop, KFU, Alhasa, KSA, Nom 23, 2017
- Effective Academic Leadership Workshop, British Council/Deanship of Academic Development, Nov. 06-07, 2016, Alhasa, KSA.
- Workshop on "Renewable Energy Delegation from Germany- PV and CSP in Off-Grid Application and CCP".
- Live Webinar on "Flownex- A Thermal Fluid System Level Analysis tool for Academic and Research Purposes", Fluid Codes FZ LLE, September 26, 2016
- Workshop on "Active Learning – Students-centered or Teacher-centered), Wednesday and Thursday Dec 2-3, 2015, College of Engineering, King Faisal University

- The 11th Saudi International WEPOWER, Water, Electricity, & Power Generation Forum, April 14-15, 2015, Dhahran International Exhibition Center, Dammam, KSA

V. BOOKS

- **Gafar Elamin and Frederick Ferguson, "***The Integral-Differential Scheme (IDS)*", Lambert Academic Publishing, 2016, ISBN (978-3-659-88523-5)

VI. PUBLICATIONS

- **Gafar Elamin, Mohamed Shwehdi**, *" Selection of the Best Storage Technology for Renewable Energy in Saudi Arabia"*, Open Journal for Energy Efficiency, Scientific Research Publishing, 2023, (accepted)
- Pooya Niksiar, Monika Bubacz, Deirdre Ragan, **Gafar Elamin**, Patrick Bass, "*Emerging Ways to Conquer Education Challenges in Times of COVID-19 and Their Influence on Students' Academic Performance*," Journal of Higher Education Theory and Practice Vol. 21(13), 2021
- **Gafar Elamin, Frederick Ferguson, "***A numerical solution of the NS equations based on the mean value theorem with applications to aerothermodynamics*", WIT Transactions on Engineering Sciences 2006, Volume 53, Pages 97-107.
- **Gafar Elamin and Frederick Ferguson, "***A solution method for the Navier-Stokes equations using a Consistent Averaging Scheme*", Collection of Technical Papers, 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference 2006, Volume 9, Pages 7166-7176.
- **Gafar Elamin and Frederick Ferguson, "***A solution method for the Navier-Stokes equations based on the mean value theorem*", Collection of Technical Papers -36th AIAA Fluid Dynamics Conference 2006, Volume 3, Pages 1955-1965.
- **Frederick Ferguson, Lester Jansen, Gafar Elamin, and Ji Shen**, "*An Engineering Method for the Design of Optimized Aircraft Wing Structures*", AIAA Paper 2004: Page 6064-6072.

VII. CONFERENCE PROCEEDINGS

- **Gafar Elamin**, "*Assessing the Teaching of Thermodynamics and Fluid Mechanics as a Blended Course at The Citadel"*, American Society of Engineering Education Southeastern Section Conference 2023, George Mason University, Fairfax, VA, March 12-14, 2023 (accepted)
- **Gafar Elamin**, M. Bubacz, A. DeVoria, R. Rabb, D. Ragan, P. Niksiar, "*Student-instructor academic relationships: effects of background and culture"*, Proceeding of 2022 American Society of Engineering Education Southeastern Section Conference, The Citadel, Charleston, SC, March 13-15, 2022)
- Monika Bubacz, Pooya Niksiar, **Gafar Elamin**, Deirdre Ragan, Patrick Bass, "Potentials and limitations of Face to Face and Hybrid Teaching Modes", ASEE-SE Conference 2021, March 8-11, 2021
- **Gafar Elamin, Frederick Ferguson, and Mookesh Dhanasar "**A method of consistent averages for the computational solution to the fluid dynamics", *Fifth European Conference on Computational Fluid Dynamics, ECCOMAS CFD 2010, Lisbon, Portugal, June 2010.*
- **Gafar Elamin, Frederick Ferguson, "**A numerical solution of the NS equations based on the mean value theorem with applications to aerothermodynamics", *The 9th International Conference on Advanced Computational Methods and Experimental Measurements in Heat and mass Transfer, Wessex Institute of Technology, New Forest, UK , July 2006.*
- **Gafar Elamin and Frederick Ferguson, "**A solution method for the Navier-Stokes equations using a Consistent Averaging Scheme", *42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Sacramento, California, July 2006.*
- **Gafar Elamin and Frederick Ferguson, "**A solution method for the Navier-Stokes equations based on the mean value theorem", *The 36th AIAA Fluid Dynamics Conference and Exhibit, San Francisco, California, June 2006.*
- **Gafar Elamin and Frederick Ferguson, "**The Integro-Differential Scheme - A New Approach for Solving the Conservation Laws for Fluid Flow", *The American Physical Society 58th Annual Meeting of the Division of Fluid Dynamics, Chicago, Illinois 2005.*

- **Gafar Elamin and Frederick Ferguson**, "An Innovative Computational Fluid Dynamics Solver Based on the Integral Form of the Conservation Laws for Fluid Flow", *16th Thermal and Fluids Analysis Workshop, Orlando,* Florida, 2005.
- **Lester Jansen, Gafar Elamin, Frederick Ferguson, and Ji Shen**, "An Engineering Method for the Design of Optimized Aircraft Wing Structures", presented at the Annual American Institute of Aeronautics and Astronautics Aerospace Sciences Meeting and Exhibit in Reno, Nevada, January 2004.

VIII. PRESENTATIONS

- Assessing the Teaching of Thermodynamics and Fluid Mechanics as a Blended Course at The Citadel, 2023 ASEE-Southeastern Section Conference, Fairfax, VA, March 2023
- Student-instructor academic relationships: effects of background and culture, 2022 ASEE-Southeastern Section Conference, Charleston, SC, March 2022
- Determination of the Best Technology to Store Electricity produced from Renewable Energy sources in the Kingdom of Saudi Arabia, *Green Technologies and Energy Efficiency Workshop, KFU, Alhasa, KSA, April 26, 2017.*
- Connection between Arabic Language and Engineering, Alahsa *club and king Faisal University proceeding,* January 26, 2016.