

Walid A. Metwally

Department of Mechanical and Nuclear Engineering, College of Engineering
University of Sharjah, P.O. Box 27272, Sharjah, UAE
Cell: +971528490933, Email: WMetwally@Sharjah.ac.ae

EDUCATION

- | | | |
|-----------|--|---------------------|
| 1998–2003 | North Carolina State University | Raleigh, NC, USA |
| ■ | Ph.D., Nuclear Engineering. | |
| 2008–2010 | University of North Carolina | Wilmington, NC, USA |
| ■ | Master of Business Administration (MBA). | |
| 1999–2002 | North Carolina State University | Raleigh, NC, USA |
| ■ | Master of Operations Research (MOR). | |
| 1994–1997 | Alexandria University | Alexandria, Egypt |
| ■ | M.Sc., Nuclear Engineering. | |
| 1987–1992 | Alexandria University | Alexandria, Egypt |
| ■ | B.Sc., Nuclear Engineering. | |

EXPERIENCE

- | | | |
|--|--|----------------------------|
| 2012–present | University of Sharjah | Sharjah, UAE |
| Title of posts: | | |
| 2021–present | Professor – Department of Mechanical and Nuclear Engineering | |
| 2018–2021 | Associate Professor – Department of Mechanical and Nuclear Engineering | |
| 2017–2108 | Vice Dean of the College of Engineering | |
| 2015–2017 | Founding Chairman of the Department of Nuclear Engineering | |
| 2012–2015 | Founding Coordinator of the Mechanical Engineering Program | |
| 2012–2015 | Founding Coordinator of the Nuclear Engineering Program | |
| 2007–2012 | Global Nuclear Fuel – Americas | Wilmington, NC, USA |
| Title of posts: | | |
| 2011–2012 | Technical Leader, Advanced Nuclear Methods Team | |
| 2007–2011 | Senior Engineer, Nuclear Methods Team | |
| 2004–2007 | United Arab Emirates University | Abu Dhabi, UAE |
| Assistant Professor, Department of Physics | | |
| 2003–2004 | North Carolina State University | Raleigh, NC |
| Title of posts: | | |
| 2003–2004 | Research Associate, Department of Nuclear Engineering | |
| 1998–2003 | Research and Teaching Assistant, Department of Nuclear Engineering | |
| 1994–1998 | Atomic Energy Authority | Cairo, Egypt |
| Reactor Operation | | |

GRANTS

“An Improved Monte Carlo Simulation Approach to Generate Detector Response Functions”

Funded by: United Arab Emirates University, UAE, 2006.

“Design of a Dual Gauge Assembly for Landmine Detection”

Funded by: University of Sharjah, UAE, 2014.

“An Efficient Neutron Detection Method using Existing Scintillation Detectors”

Funded by: University of Sharjah, UAE, 2015.

“Using Neutron Generators in Boron and Gadolinium Neutron Capture Therapy”

Funded by: University of Sharjah, UAE, 2017.

PUBLICATIONS/PRESENTATIONS/WORKSHOPS

Walid A. Metwally, Yumna Adel, Entesar Dalah, and Husam Al-Omari Utilizing, “Utilizing Neutron Generators in Boron Neutron Capture Therapy,” Applied Radiation and Isotopes, 174, 2021.

Eslam A. Ahmed, Jwahr A. Alnaqbi, Priyonta Rahman, **Walid A. Metwally** “Design and Experimental Verification of a Gamma Radiogauge to Detect Water Level in Ballast Tanks in Oil Platforms,”

Transactions of the American Nuclear Society, 123, 2020.

Fatima E. Alzaabi, Bassam A. Khuwaileh, **Walid A. Metwally**, “An Exploratory Study for Atmospheric Radionuclide Dispersion and Deposition at Barakah Power Plant Site,” Transactions of the American Nuclear Society, 123, 2020.

Fatima E. Alzaabi, Bassam A. Khuwaileh, **Walid A. Metwally**, “An Exploratory Study for Radionuclide Dispersion in Water Resources at Barakah Power Plant Site,” Transactions of the American Nuclear Society, 123, 2020.

Fatma Eltarabishi, Hamad Rashid, **Walid A. Metwally**, “Knowledge assessment of radiation protection practices among dental professionals- A literature review,” Proceedings of the 5th NA International Conference on Industrial Engineering and Operations Management, Detroit, Michigan, USA, 2020.

Bassam A. Khuwaileh and **Walid A. Metwally**, “Gaussian Process Approach for Dose Mapping in Radiation Fields,” Nuclear Engineering and Technology, 52, 2020

S. A. AlShamsi, B. M. Madani, **W. A. Metwally**, “Criticality Safety Analysis of Fresh Fuel Storage of Barakah Nuclear Power Plant,” Transactions of the American Nuclear Society, 122, 2020.

B. A. Khuwaileh, F. I. Al-Hamadi, M.A. Al-Shabi, **W. A. Metwally**, “Inverse Depletion of Used Nuclear Fuel: a Bayesian Approach,” Transactions of the American Nuclear Society, 122, 2020.

A. M. Riyadhha, A. M. Elshoubaky, J.A. Rihani, M.A. Al-Shabi, **W. A. Metwally**, B. A. Khuwaileh, “A Drone-Based Automated Radiation Surveillance System,” Transactions of the American Nuclear Society, 122, 2020.

Walid A. Metwally, “Recent Changes to ABET Accreditation Criteria,” Nuclear News, American Nuclear Society, March 2020.

Yumna A. Alharahsheh, Dana I. Hamad, and **Walid A. Metwally**, “A Feasibility Study on the Utilization of Neutron Generators in Thermal Neutron Imaging,” Journal of Radiation Research and Applied Sciences, 13:1, 2020.

Lucy Semerjian, Hadya Alrajaby, Nimra Naaz, Rim Kasfah, Entesar Z. Dalah, Eithar Waheed , Amal Nabalssi, **Walid A. Metwally** , “Age-dependent effective ingestion dose estimations and lifetime risk assessment for selected radionuclides (40K and 3H) in bottled waters marketed in United Arab Emirates,” Chemosphere, 249, 2020.

Walid A. Metwally, Yumna A. Alharahsheh, Entesar Z. Dalah, Husam Al-Omari, “Preliminary Study on Using Neutron Generators in Capture Therapy,” Transactions of the American Nuclear Society, 121, 2019.

W.A. Metwally, A. S. Alawad, and B. A. Khuwaileh, “On the Over-Conservatism of the 5% Depletion

Uncertainty Rule in Spent Fuel Criticality Analyses,” *Annals of Nuclear Energy*, 125, 2019.

W. A. Metwally, “Flux Variations Caused by Source Location Shifting in a Neutron Generator,” *Transactions of the American Nuclear Society*, 117, 2018.

K. Hossny, M. AlKammash, A. Hamdy, and **W. A. Metwally**, “Methodology For Optimization Of The Moderator Parameters For A D-D Neutron Generator Using Artificial Neural Networks (ANNs),” *PHYSOR 2018: Reactor Physics paving the way towards more efficient systems*, Cancun, Mexico, April 22-26, 2018

B. Goddard, **W. A. Metwally**, A. Ababneh “Irradiation experiment for living Insect-based Radiological Dispersal Device,” *International Journal of Nuclear Security*, 4, 2018.

A. S. Al Awad, A. Habashy, **W. A. Metwally**, “Sensitivity Studies in Spent Fuel Pool Criticality Safety Analysis for APR1400 Nuclear Power Plants,” *Nuclear Engineering and Technology*, 50, 2018.

R. Ajaj, S. El-Sayed, **W. A. Metwally**, T. Salah, M. A. Salem Al Yafei, “Determination of the Primordial Radionuclide Concentrations of Agricultural Soil of Eastern Region of the Arabian Desert Using High-Resolution Gamma-Ray Spectrometry,” *Current Nutrition & Food Science*, 14, 2018.

W. A. Metwally, S. El-Sayed, A. Ababneh, D. L. Williams, and A. X. Chen, “Flux Measurements for a DD Neutron Generator using Neutron Activation Analysis,” *Nuclear Science and Techniques*, 29:52, 2018.

W. A. Metwally and A. G. Emam “Experimental validation and testing of a NaI boron-lined neutron detector,” *Nuclear Instruments and Methods in Physics Research B* 422, 2018.

W. A. Metwally and A. S. Al Awad, “The effect of eccentric loading in spent fuel pool criticality safety analyses,” *Annals of Nuclear Energy*, 114, 2018.

W. A. Metwally, “Effect of Source Geometry Modeling on Flux Distributions,” *Transactions of the American Nuclear Society*, 116, 2017.

W. A. Metwally, O. A. Taqatqa, M. M. Ballaith, A. X Chen, M. A. Piestrup, “Neutron and Photon Dose Mapping of a DD Neutron Generator”, *Radiation Protection Dosimetry*, 176(3), 2017.

W. A. Metwally, O. A. Taqatqa, M. M. Ballaith, A. X Chen, M. A. Piestrup, “Dose Mapping from a DD Neutron Generator at the University of Sharjah”, *Transactions of the American Nuclear Society*, 115, 2016.

W. A. Metwally, M. Ballaith, and A. Chen, “Thermal Flux Maximization from a DD Neutron Generator”, *Transactions of the American Nuclear Society*, 114, 2016.

W.A. Metwally, “Multi-Parameter Optimization in a Neutron Backscattering Landmine Detection System”, *Applied Radiation and Isotopes* 105, 2015.

W. A. Metwally, S. Alawabdeh, and M. Ballaith, “Moderator Optimization in Neutron Backscattering Landmine Detection”, *Transactions of the American Nuclear Society*, 113, 2015.

W.A. Metwally., Q. Zhang, F. Inanc, “Experimental Verification of a Combined Porosity and C/O Logging Tool”, *Transactions of the American Nuclear Society*, 111, 2014.

W.A. Metwally, “Existing NaI detectors; an efficient alternative to He-3 detectors”, *Nuclear Instruments and Methods in Physics Research B* 338, 2014.

W. A. Metwally, “Design Considerations for Neutron Moderators in Prompt Gamma Neutron Activation Analysis”, *Transactions of the American Nuclear Society*, 109, 2013.

W. A. Metwally and Leonid Pogosbekyan, “Modeling of BWR Control Blades to Capture Skin Effect”, *Transactions of the American Nuclear Society*, 107, 2012.

W. A. Metwally, V. W. Mills, and T. Ikehara, “GNF Automation Tools for BWR Lattice Modeling”, *Transactions of the American Nuclear Society*, 105, 2011.

W. A. Metwally, “Porosity Calculations Using a C/O Logging Tool with Boron-Lined NaI Detectors,” *Applied Radiation and Isotopes*, 69, 2011.

W. A. Metwally, M. Sugawara, and V. W. Mills, and J. C. Hannah, “TGBLA Spent Fuel Isotopic Predictions and Their Effect on Criticality Calculations,” *PHYSOR 2010 – Advances in Reactor Physics to Power the Nuclear Renaissance*, May 9-14, 2010, Pittsburgh, Pennsylvania, USA.

J.C. Hannah, **W. A. Metwally**, and V. W. Mills, “Uncertainty Contribution To Final In-Rack K(95/95) From The In-Core K_{inf} Criterion Methodology For Spent Fuel Storage Rack Criticality Safety Analyses,” PHYSOR 2010 – Advances in Reactor Physics to Power the Nuclear Renaissance, May 9-14, 2010, Pittsburgh, Pennsylvania, USA.

Xiaogang Han, R. P. Gardner, and **W.A. Metwally**, “CEARCPG: A Monte Carlo Simulation Code for Normal and Coincidence Prompt Gamma-ray Neutron Activation Analysis (PGNAA),” Nuclear Science and Engineering, 155, no. 1, 2007.

W. A. Metwally, R. P. Gardner, and A. Sood, “Using Gamma-Gamma Coincidence Measurements to Benchmark Monte Carlo Generated Detector Response Functions,” Nuclear Instruments and Methods in Physics Research B, 263, 2007.

Xiaogang Han, Robin P. Gardner, **W.A. Metwally**, and Pingjun Guo, “A Conceptual C/O Tool Design with Coincidence Counting” SPWLA 47th Annual Logging Symposium, paper YY, June 2006.

W. A. Metwally, C. W. Mayo, X. Han, and R. P. Gardner, “Coincidence Counting For PGNAA Applications - Is It The Optimum Method?,” Journal of Radioanalytical and Nuclear Chemistry, vol. 265, no. 2, 2005.

R. P. Gardner, **W. A. Metwally**, and X. Han, “A New NaI Detector Arrangement For Efficient Detection of High Energy Gamma Rays”, Journal of Radioanalytical and Nuclear Chemistry, Vol. 264, No. 1, 2005.

Robin P. Gardner, W. Zhang, and **W. A. Metwally**, “Status of Software for PGNAA Bulk Analysis by the Monte Carlo – Library Least-Squares (MCLLS) Approach,” Journal of Radioanalytical and Nuclear Chemistry, vol. 264, no. 1, 2005.

W. A. Metwally, R.P. Gardner, and A. Sood, “Gaussian Broadening of MCNP Pulse Height Spectra”, Transactions of the American Nuclear Society, 91, 2004.

R.P. Gardner, **W.A. Metwally**, X. Han, and C.W. Mayo, “Q-value Summing for Coincidence Prompt Gamma-Ray Neutron Activation Analysis” , Transactions of the American Nuclear Society, 2004 Winter Meeting, Washington, D.C., Vol. 91, 2004.

W. A. Metwally and R.P. Gardner, “Stabilization of Prompt Gamma-Ray Neutron Activation Analysis (PGNAA) Spectra from NaI Detectors”, Nuclear Instruments and Methods in Physics Research B, 525, 2004.

W. A. Metwally, R.P. Gardner, and C.W. Mayo, “Two Dimensional Diagonal Summing Of Coincidence Spectra For Bulk PGNAA Applications”, Nuclear Instruments and Methods in Physics Research B, 525, 2004.

W. A. Metwally, R.P. Gardner and C.W. Mayo, “Elemental PGNAA Analysis Using Gamma-Gamma Coincidence Counting with the Library Least-Squares (LLS) Approach”, Nuclear Instruments and Methods B, 213, 2004.

R.P. Gardner, **W.A. Metwally**, and A. Shehata, “A Semi-Empirical Model for a Sr-90 Beta-Particle Transmission Thickness Gauge for Aluminum Alloys”, Nuclear Instruments and Methods B, 213, 2004.

Weijun Guo, R.P. Gardner, and **W.A. Metwally**. “Preliminary Studies on K and L Coincidence Counting for Optimizing the XRF *In Vivo* Lead in Bone Measurement”, Nuclear Instruments and Methods B, 213, 2004.

R. P. Gardner, **W.A. Metwally**, W. Zhang, X. Han, and C.W. Mayo “Practical Implementation of Coincidence Prompt Gamma-Ray Neutron Activation Analysis” , Transactions of the American Nuclear Society, 2003 Winter Meeting, New Orleans, LA, Vol. 89, 2003.

Sang Hoon Lee, Robin Gardner, and **W. A. Metwally**, “Use of Pulse Pile-Up Correction Spectrum in the Library Least Squares Method for Neutron Activation Analysis”, 5th International Topical Meeting on Industrial Radiation and radioisotope Measurement Applications, IRRMA-V, Bologna, Italy, 9-14 June 2002.

Robin P. Gardner and **W. A. Metwally**, “Spectral Analysis by Library Least Squares for Instrumental Neutron Activation Analysis”, Transactions of the American Nuclear Society, Volume 84, TANSO 84, ISSN: 0003-018X, 2001.

R.P. Gardner, C.W. Mayo, E.S. El Sayyed, **W.A. Metwally**, Y. Zheng, and M. Poezart, “A Feasibility Study of a Coincidence Counting Approach for PGNA Applications”, Applied Radiation and Isotopes, 53, 2000.

WORKSHOPS AND TRAINING ATTENDED

Workshops

- Second Middle East Nuclear Training and Simulation, Abu Dhabi, 2016, UAE
- Fourth and Fifth UAE National Workshop on Baseline Environmental Radiation Mapping, 2015, UAE
- COMSOL Workshop, Sharjah, 2015, UAE
- Sixth annual conference of the Arab Forum for Environment and Development (AFED), - American University of Sharjah, 2013, UAE
- RELAP5 and TRACG Applications for BWRs, 2011, USA
- SCALE Lattice Physics, 2009, USA
- Criticality Calculations with MCNP5, 2008, USA
- Kmax Data Acquisition Workshop, 2002, USA
- Introduction to MCNP, 2002, USA
- Measurement of Reactor Physics Parameters, 1998, Japan
- Neutronics and Shielding Calculations for Research Reactors, 1995, Ghana

Training

- Designing Course-based Assessment Approaches, 2016, UAE
- Educational Leadership, 2016, UAE
- Project Management at GE, 2011, USA
- GE Leadership Development Course, 2010, USA
- Communication Skills and Positive Attitude, 2009, USA
- Effective Coaching Skills, 2008, USA
- BWR and ABWR Systems Courses, 2007, USA
- Green Belt Six Sigma (training and certification), 2007, USA
- “Principles of Radiation Safety Training,” USA, July 1999
- “Training Course for Reactor Operation Personnel,” Egypt, March 1997

HONORS AND PROFESSIONAL RECOGNITIONS

Awards

- Certificate in Educational Leadership, The Institute for Leadership in Higher Education, 2016, UAE
- UOS Teaching Award, University of Sharjah, 2015, UAE
- GE Hitachi Nuclear Energy Engineering Award, 2011, USA
- Green Belt Six Sigma Certification, 2007, USA

Committees

- ABET EAC Commissioner, 2017-present, USA
- ABET Program Evaluator (PEV), 2012-present, USA
- Member of the ABET EAC Criteria Committee, 2017-present, USA
- Chair of the Radiation Safety Committee, UOS, 2017-present, UAE
- Vice chair of ANS Accreditation Policy & Procedures Committee, 2014-present, USA
- Member of the IAEA International Nuclear Security Education Network (INSEN), 2015-present.
- Member of the UAE Committee to develop a National Strategy for Education and Training in Radiation Protection, 2016-present, UAE.

- Member of the Advisory board of the Advanced Energy Engineering Technology Division in Abu Dhabi Polytechnic (ADPoly), 2015-present, UAE
- Session organizer and panelist in an ANS accreditation panel titled “ABET Accreditation Changes: Transition and Implementation–Panel, November 2019.
- External expert to review the IAEA Reactor Technology Assessment Methodology, 2020, IAEA.
- Member of external review committee of course materials for an IAEA Master’s degree in nuclear safety and security, 2018, IAEA.
- Course Director of the IAEA Regional Training Course on Pressurized Water Reactor (PWR) Technology Using PC Based Basic Principle and GlassTop Nuclear Power Plant Simulators, February 2018 and February 2019, UAE.
- Member of the IAEA expert mission to the Philippines to develop nuclear engineering university curricula, 2018, Philippines.
- Chair of the organizing committee of the workshop titled “Nuclear Security: The Role of Humans and Systems” (in collaboration with Sandia National Laboratories (SNL) and Partnership for Nuclear Security (PNS)), UOS, 2017, UAE.
- Chair of the organizing committee of the workshop titled “Nuclear Security: From Education to Implementation “ (in collaboration with Sandia National Laboratories (SNL) and Partnership for Nuclear Security (PNS)), UOS, 2016, UAE.
- Member of the College Council and Promotion committee in the College of Engineering, UOS, 2012-2018, UAE
- Member of the Teaching and Learning committee in the College of Engineering, UOS, 2012-2017, UAE
- Chair of Accreditation Committee in the College of Engineering, UOS, 2015-2016, UAE
- Co-chair of the second joint UAE-Japan international forum on Multipurpose High Temperature Gas Cooled Reactors (HTGR), UOS, 2016, UAE
- Member of the Burnup Credit for LWR Fuel Standard (ANSI/ANS 8.27) working group, 2011-2013, USA
- Member of NEI Spent Fuel Pool Criticality Task Force, 2011-2012, USA
- Organizing committee member in The first UAE International Conference on Biological and Medical Physics, 2005, UAE
- Organizing committee member in the UN/ESA/NASA/UAE Workshop on the International Heliophysical year (IHY), 2005, UAE

Societies

- Member of the American Nuclear Society
- Member of Phi Kappa Phi Honor Society
- Member of Alpha Nu Sigma Honor Society
- Associate member of SIGMA Xi Scientific Research Society