

Faisal Mukhtar

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 Department of Civil and Environmental Engineering (CEE)
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Appointments

2020-Present	Associate Professor, Dep't of CEE, KFUPM
2015-20	Assistant Professor, Dep't of CEE, KFUPM
Jun/Jul 2023	Visiting Scholar, Polyhedral Structures Laboratory, University of Pennsylvania
Aug/2019; Jul-Aug/2023	Visiting Scholar, Dep't of CEE, University of Illinois Urbana-Champaign
2012-15	Lecturer-B, Dep't of CEE, KFUPM
2009-12	Research & Teaching Assistant, Dep't of CEE, KFUPM
2008-09	Assistant Lecturer (National Youth Service), Dep't of Civil Engineering, Fed. Poly Idah

Education

2015	Doctor of Philosophy in Civil Engineering (Structures and Mechanics), KFUPM , DHAHRAN, KSA
2012	Master of Science in Civil Engineering (Structures and Mechanics), KFUPM , DHAHRAN, KSA
2008	Bachelor of Engineering in Civil Engineering, Bayero University Kano (BUK) , KANO, NIGERIA

Post-PhD Education (Personal Development)

2018	CEE598 Special Topics-Generalized FEM , University of Illinois at Urbana-Champaign , CHAMPAIGN, USA
2021	ICS557 Advanced Machine Learning , KFUPM , DHAHRAN, KSA

Successful Research Grants

2026	(PI) Center for Construction and Building Materials KFUPM Funding #INCB2610. Title: <i>Characterization, Performance Evaluation, and Modeling of Concrete Members Strengthened with Shape Memory Alloys.</i>
2026	(Co-PI) Saudi Aramco Funding #CCBM2686. Title: <i>Simulation, Failure Analysis and Repair of Juaymah NGL Trestle at Pier 184.</i>

- 2026 (Co-PI) Center for Manufacturing and Robotics KFUPM Funding #INMR2615.
Title: *Climate-Responsive Smart and Sustainable Modular Building Envelope for Hot-Arid Environments.*
- 2026 (Co-PI) Deanship of Research KFUPM Funding #IN26065.
Title: *Thermal Management and Design Optimization of Li-ion Batteries for Use in Electric Vehicles in Hot Conditions Using Ceramic Polymorphism-Supported Phase Change Materials.*
- 2025 (PI) Center for Construction and Building Materials KFUPM Funding #INCB2509.
Title: *Simulation of 3D Concrete Printing.*
- 2025 (PI) Deanship of Research KFUPM Funding #ISP24224.
Title: *Vulnerability Assessment of FRP-Strengthened RC Structures Using the Applied Element Method.*
- 2025 (PI) Center for Construction and Building Materials KFUPM Funding #INCB2508.
Title: *Composite Retrofitting Against Progressive Collapse in Multistory RC Frames.*
- 2024 (PI) Center for Construction and Building Materials KFUPM Funding #INCB2406.
Title: *Properties of Self-Healing Bacteria Treated Recycled Aggregate Alkali- activated Slag Concrete.*
- 2024 (PI) Center for Construction and Building Materials KFUPM Funding #INCB2405.
Title: *Mechanical and Fracture Characterization of Seawater-Mixed Sea Sand Recycled Aggregate Concrete.*
- 2023 (PI) Deanship of Research KFUPM Funding #ISP22205.
Title: *Fracture Characterization of Sustainable 3D Printed Concretes using 3D G/XFEM.*
- 2023 (PI) Center for Construction and Building Materials KFUPM Funding #INCB2305.
Title: *Structural Performance of Self-Healing Bacteria Treated Recycled Aggregate Concretes.*
- 2023 (PI) Center for Construction and Building Materials KFUPM Funding #INCB2304.
Title: *Development of seawater sea sand fiber-reinforced cementitious composites.*
- 2021 (PI) Dhahran Techno Valley Company (DTVC) Funding #POC20101.
Title: *Universal Bond Test Apparatus for FRP-Concrete.*
- 2020 (PI) Deanship of Research KFUPM Funding #SB191024.
Title: *Hydro-Mechanical Simulation of Hydraulic Fractures in Low-Permeability Shale Reservoirs using Generalized/Extended Finite Element Method.*
- 2016 (PI) Deanship of Research KFUPM Funding #SB161031.
Title: *Hygrothermal Effect on Interfacial Bond between CFRP and Concrete made from Local Materials.*
- 2016 (Co-PI) Deanship of Research KFUPM Funding #IN161055.
Title: *Ultra-High Performance Concrete for Shear Strengthening of RC Beams.*
- 2015 (PI) Deanship of Research KFUPM Funding #JF151003.
Title: *Applicability and Relative Performance of Some Mesh-Reduction Methods for Fracture Analysis of Mode III Cracks.*
- 2014 (Co-PI) Deanship of Research KFUPM Funding #SB121008.
Title: *Mesh-free Modeling of Elastoplastic Problems.*
- 2011 (Co-PI) Deanship of Research KFUPM Funding #IN101036.
Title: *Computer-Aided Modeling and Simulation of Flow of Self-Compacting Concrete.*

Honors and Awards

- 2025 **Bronze Medal**, International Exhibition of Inventions, Geneva, Switzerland.

- 2025 [Excellence in Innovation Award](#) for four inventions at KFUPM.
- 2025 [University Service Award](#) for distinguished service of 10 years at KFUPM.
- 2024 [Excellence in Innovation Award](#) for two inventions at KFUPM.
- 2023 [KFUPM Excellence Award](#) in Students' Advising.
- 2021 [Excellence in Innovation Award](#) for one invention at KFUPM.
- 2008 [Best Graduating Student in Final Year Undergraduate Project](#) at BUK.

Inventions/Patents

Granted

- 2024 F. Mukhtar. [Concrete Test Loading Frame; Patent No. 12,105,015 B2](#). U.S. Patent and Trademark Office.
- F. Mukhtar. [Frame and Testing System for Fiber-Reinforced Polymer Bond Testing; Patent No. 12,098,997 B2](#). U.S. Patent and Trademark Office.
- F. Mukhtar. [Fiber-Reinforced Polymer Concrete Bond Testing Frame; Patent No. 12,092,564 B2](#). U.S. Patent and Trademark Office.
- F. Mukhtar. [Loading Frame for Fiber-Reinforced Polymer and Concrete Bond Testing Systems; Patent No. 11,982,614 B2](#). U.S. Patent and Trademark Office.
- 2023 F. Mukhtar. [Method for Measuring Debonding in a Carbon Fiber Reinforced Polymer concrete structure; Patent No. 11,719,620 B2](#). U.S. Patent and Trademark Office.
- F. Mukhtar. [Debonding Test Apparatus for Measuring Bond Strength to Concrete; Patent No. 11,719,621 B2](#). U.S. Patent and Trademark Office.
- 2021 F. Mukhtar. [Universal Debonding Test Apparatus for Carbon Fiber Reinforced Polymer-Concrete System and Method for Sequential Multi-Testing; Patent No. 11,169,082 B2](#). U.S. Patent and Trademark Office.

Filed/Under Examination

- 2023 F. Mukhtar. [Convertible Device for Testing Bond Between Near-Surface Mounted Composites and Media](#). U.S. Patent Application Number 18/520,754.

Publications

Peer-Reviewed Journal Papers

- 2026 P. Isu, F. Mukhtar, and M.Z. Naser. [Enhanced machine learning for 3D-printed concrete compressive strength](#). *ACI Materials Journal*, Accepted.
- P. Awoyera and F. Mukhtar. [Machine learning for bridge fire performance assessment: Methods, challenges, and future directions](#). *Fire Technology*, 62, 136, 2026
- M.Y. Al-Adgham and F. Mukhtar. [Shear enhancement techniques for deep RC beams using self-prestressing heat-activated Fe–shape memory alloy plates](#). *Engineering Structures*, 362; 123014, 2026
- M. Shehadah, F. Mukhtar, M. Ibrahim, and A. Hanif. [Evaluating the influence of treatment techniques of recycled aggregate on properties of concrete towards sustainable development](#). *Case Studies in Construction Materials*, 25; e06278, 2026
- F. Mukhtar and M.Y. Al-Adgham. [Flexural behavior of partial-span strengthened RC beams using thermally activated iron-based shape memory alloy plates](#). *Construction and Building Materials*, 528; 146446, 2026

- M.M. Khan, S. Ahmad, F. Mukhtar, and M.A. Al-Osta. [Mechanical, durability and drop weight impact performance of high-performance fiber reinforced rubberized mortar: Effect of rubber size and content](#). *European Journal of Environmental and Civil Engineering*, 30(1), 2701232, 2026
- M.Y. Al-Adgham and F. Mukhtar. [Repair and retrofit of corroded RC beams: A performance review of structural distress and strengthening systems](#). *Journal of Building Engineering*, 125; 116089, 2026
- N.S. Waseetuddin, A. Abubakar, K.S. Athel, F. Mukhtar, S.S. Akhtar, and A.F.M. Arif. [Epoxy grout composites: Incorporating construction waste for enhanced under-grouting](#). *ASCE Journal of Materials in Civil Engineering*, Accepted, 2026
- A.A. Mahamood, F. Mukhtar, and M.S. Alam. [Seismic resilience of RC structures with shape memory alloys: Past and new perspectives](#). *Engineering Structures*, 346; 121638, 2026
- M.M. Khan, S. Ahmad, M. Al-Huri, F. Mukhtar, and M.A. Al-Osta. [Mechanical behaviour and impact response of ultra-high-performance concrete incorporating steel and polypropylene fibers](#). *Next Materials*, 371; 101436, 2026
- 2025 F. Mukhtar. [A unified FRP-concrete bond model and new experimental insights on size effect](#). *Composite Structures*, 371; 119469, 2025
- F. Mukhtar. [3D-printed concrete fracture: Effects of cohesive laws, mixes, and print parameters in 3D eXtended FEM](#). *Computers and Structures*, 315; 107822, 2025
- 2024 F. Mukhtar. [Comprehensive FRP-concrete bond behavior: Impact of test methods and the innovative UBoT](#). *Composite Structures*, 348; 118475, 2024
- M. Lardhi and F. Mukhtar. [Mechanical properties and fracture behavior of seawater-mixed sea sand recycled aggregate concrete](#). *Journal of Sustainable Cement-Based Materials*, 13(9); 1301-1318, 2024
- F. Mukhtar and M. Lardhi. [Punching shear of sustainable recycled aggregate FRC slabs strengthened with NSM FRP bars](#). *Case Studies in Construction Materials*, 21; e03468, 2024
- F. Mukhtar and M.O. Osta. [Hybridized bio-based repair mortars: Effects on mechanical, self- healing, and cost performance via novel generalized indexing](#). *Journal of Building Engineering*, 94; 109982, 2024
- H. Tao, Z.H. Ali, F. Mukhtar, A.W. AlZand, H.A. Marhoon, L. Goliatt, and Z.M. Yaseen. [Coupled extreme gradient boosting algorithm with artificial intelligence models for predicting compressive strength of fiber reinforced polymer-confined concrete](#). *Engineering Applications of Artificial Intelligence*, 134, 108674, 2024
- A. Odeh, M.A. Al-Shugaa, H.J. Al-Gahtani, and F. Mukhtar. [Analysis of Laminated Composite Plates: A Comprehensive Bibliometric Review](#). *Buildings*, 14(6); 1574, 2024
- F. Mukhtar and A. Jawdhari. [RC beams flexurally strengthened with CFRP sheets combined with FRC layer for mitigating debonding failures](#). *Construction and Building Materials*, 427; 136274, 2024
- F. Mukhtar. [Simulation of fracture behavior in seawater and sea-sand mixed recycled coarse aggregate concrete under three-point bending](#). *Theoretical and Applied Fracture Mechanics*, 131; 104413, 2024
- M.O. Osta and F. Mukhtar. [Effect of bacteria on uncracked concrete mechanical properties correlated with damage self-healing efficiency – A critical review](#). *Developments in the Built Environment*, 17, 100301, 2024
- 2023 M. Lardhi and F. Mukhtar. [Experimental and FE analysis of NSM FRP bond in low- and normal-strength natural and recycled aggregate concretes](#). *Construction and Building Materials*, 398; 132457, 2023
- B.A. Salami, F. Mukhtar, S. Ganiyu, S. Adekunle, and T.A. Saleh. [Graphene-based concrete: Synthesis strategies and reinforcement mechanisms in graphene-based cementitious composites](#). *Construction and Building Materials*, 396; 132296, 2023
- F. Mukhtar and A. Deifalla. [A shear model for FRP reinforced concrete elements based on refined Critical Shear Crack Theory parameters](#). *Journal of Building Engineering*, 72; 106633, 2023
- A. El-Tohfa and F. Mukhtar. [Fracture and Size Effect Analysis in Concrete using 3-D G/XFEM and a CZM-LEFM Correlation Model: Validation with Experiments](#). *Computers and Structures*, 282; 107043, 2023

- F. Mukhtar and A. El-Tohfa. [A review on fracture propagation in concrete: Models, methods, and benchmark tests](#). *Engineering Fracture Mechanics*, 28; 109100, 2023
- F. Mukhtar and A. Deifalla. [Shear strength of FRP reinforced deep concrete beams without stirrups: Test database and a critical shear crack-based model](#). *Composite Structures*, 307; 116636, 2023
- M. Lardhi and F. Mukhtar. [Radiation shielding performance of seawater-mixed concrete incorporating recycled coarse aggregate and steel slag](#). *Journal of Radiation Research and Applied Sciences*, 16(1); 100528, 2023
- 2022 F.M. Mukhtar and C.A. Duarte. [Coupled 3-D generalized/eXtended finite element method simulations of hydraulic fracture propagation experiments](#). *A Engineering Fracture Mechanics*, 276; 108874, 2022
- F.M. Mukhtar, A. Jawdhari and A. Peiris. [Mixed-mode FRP-concrete bond failure analysis using novel test apparatus and 3-D non-linear FEM](#). *ASCE Journal of Composites for Construction*, 26(6); 04022082, 2022
- F.M. Mukhtar, N. Shauer and C.A. Duarte. [Propagation mechanisms and parametric influence in multiple interacting hydraulic fractures: A 3-DG/XFEM hydro-mechanical modeling](#). *International Journal for Numerical and Analytical Methods in Geomechanics*, 46(11); 2033-2059, 2022
- A. Deifalla and F.M. Mukhtar. [A mechanical and simplified model for RC elements subjected to combined shear and axial tension](#). *Scientific Reports*, 12(1); 1-25, 2022
- A. Deifalla and F.M. Mukhtar. [Shear strength of lightweight and normal-weight concrete slender beams and slabs: An appraisal of design codes](#). *Advances in Structural Engineering*, 25(12); 2444-2466, 2022
- R. Graça-e-Costa, F.M. Mukhtar and D. Dias-da-Costa. [Mesh-independent framework for bidimensional analysis of CFRP-concrete debonding shear tests with discrete representation of fracture](#). *ASCE Journal of Composites for Construction*, 26(3); 04022030, 2022
- 2021 F.M. Mukhtar and M.E. Shehadah. [Shear behavior of flexural CFRP-strengthened RC beams with crack-induced delamination: Experimental investigation and strength model](#). *Composite Structures*, 268; 113894, 2021
- F.M. Mukhtar and M.E. Shehadah. [Experimental verification of 2- and 3-D numerical models for bond-slip behavior of CFRP-concrete](#). *Construction and Building Materials*, 287; 122814, 2021
- F.M. Mukhtar and A. Peiris. [FRP-concrete bond performance under accelerated hygrothermal conditions](#). *Construction and Building Materials*, 270; 121403, 2021
- F.M. Mukhtar and H.J. Al-Gahtani. [On the use of three-force member concept versus equilibrium equations in Statics](#). *International Journal of Mathematical Education in Science and Technology*, 52(9); 1322-1344, 2021
- 2020 F.M. Mukhtar, P.D. Alves and C.A. Duarte. [Validation of a 3-D adaptive stable generalized/eXtended finite element method for mixed-mode brittle fracture propagation](#). *International Journal of Fracture*, 225(2); 129-152, 2020
- F.M. Mukhtar and O. Arowojolu. [Recent Developments in Experimental and Computational Studies of Hygrothermal Effects on the FRP-Concrete Bond](#). *Journal of Reinforced Plastics & Composites*, 39(11-12); 422 – 442, 2020
- 2019 F.M. Mukhtar and H.J. Al-Gahtani. [Comprehensive evaluation of SCF for spherical pressure vessels intersected by radial cylindrical nozzles](#). *International Journal of Steel Structures*, 19(6); 1911 – 1929, 2019
- F.M. Mukhtar. [Customized shear test for bond-slip characterization of EBR FRP-concrete system: Influence of substrate aggregate type](#). *Composites Part B: Engineering*, 163; 606 – 621, 2019
- 2018 F.M. Mukhtar and R.M. Faysal. [A Review on test methods for studying the FRP-concrete interfacial bond behavior](#). *Construction and Building Materials*, 169; 877 – 887, 2018
- 2017 F.M. Mukhtar. [Relative Performance of Three Mesh-Reduction Methods in Predicting Mode III Crack-Tip Singularity](#). *Latin American Journal of Solids and Structures*, 14; 1226 – 1250, 2017
- F.M. Mukhtar. [Free Vibration Analysis of Orthotropic Plates by Differential Transform and Taylor Collocation Methods based on a Refined Plate Theory](#). *Archive of Applied Mechanics*, 87; 15 – 40, 2017

- 2016 F.M. Mukhtar and H.J. Al-Gahtani. [Design-Focused Stress Analysis of Cylindrical Pressure Vessels Intersected by Small-Diameter Nozzles](#). *Journal of Pressure Vessel Technology - Transactions of the ASME* 139(2); 021205, 2016
- F.M. Mukhtar and H.J. Al-Gahtani. [Finite element analysis and development of design charts for cylindrical vessel–nozzle junctures under internal pressure](#). *Arabian Journal for Science & Engineering*, 41; 4195 – 4206, 2016
- F.M. Mukhtar. [Generalized Taylor polynomials for axisymmetric plates and shells](#). *Applied Mathematics and Computation*, 276; 182 – 199, 2016
- H.J. Al-Gahtani and F.M. Mukhtar. [Simplified Formulation of Stress Concentration Factors for Spherical Pressure Vessel–Cylindrical Nozzle Junction](#). *Journal of Pressure Vessel Technology - Transactions of the ASME*, 138 (3); 031201, 2016
- F.M. Mukhtar and H.J. Al-Gahtani. [Application of Radial Basis Functions to the Problem of Elasto-Plastic Torsion of Prismatic Bars](#). *Applied Mathematical Modelling*, 40; 436 – 450, 2016
- 2014 H.J. Al-Gahtani and F.M. Mukhtar. [RBF-based meshless method for the free vibration of beams on elastic foundations](#). *Applied Mathematics and Computation*, 249; 198 – 208, 2014
- F.M. Mukhtar and A.H. Al-Gadhib. [Collocation Method for Elastoplastic Analysis of a Pressurized Functionally Graded Tube](#). *Arabian Journal for Science and Engineering*, 39(11); 7701 – 7716, 2014

Peer-Reviewed Conference Papers

- 2026 M.M. Khan, M. Al-Huri, M.A. Al-Osta, and F. Mukhtar. [Drop weight impact resistance and energy absorption capacity of ultra-high-performance concrete containing steel and polypropylene fibers](#). In *Proceedings of the 79th RILEM Annual Week & ICONS 2025 International Conference on Advances in Engineering and Technology for Sustainable Development*, Ha Noi, Vietnam, 24–25 August 2025, *RILEM Bookseries* (Vol. 72, pp. 646–653). Springer, 2026. https://doi.org/10.1007/978-3-032-27919-4_76
- I.B. Hanief, S. Rashid, F. Mukhtar, and A. Hanif. [Fly ash cenosphere incorporated structural lightweight cementitious composites: Enhancing durability and performance with SCMs](#). In *Proceedings of the Net-Zero Future Conference (NTZR 2025)*, Cape Town, South Africa, 5–7 November 2025, *Lecture Notes in Civil Engineering* (Vol. 873, pp. 57–67). Springer, 2026. https://doi.org/10.1007/978-3-032-27698-8_6
- 2025 F. Mukhtar, M.E. Shehadah, and C.A. Duarte. [Vulnerability assessment of CFRP-strengthened RC structures under blast loading: Applied element modeling](#). *5th Asian Concrete Federation (ACF) Symposium*, Singapore, 14–16 November 2025
- 2024 M.O. Osta and F. Mukhtar. [Buildability analysis of 3D concrete printing using finite element method](#). In *Supplementary Proceedings of the 4th RILEM International Conference on Concrete and Digital Fabrication (Digital Concrete 2024)*, Munich, Germany, 4–6 September 2024. <https://doi.org/10.24355/dbbs.084-202408191245-0>
- F. Mukhtar. [Convertible bond test apparatus for EB FRP, NSM FRP, FRCM, and allied systems: Proof of concept](#). In *Proceedings of the 16th International Symposium on Fiber-Reinforced Polymer (FRP) Reinforcement for Concrete Structures (FRPRCS-16)*, New Orleans, USA, 23–24 March 2024, ACI Special Publication (SP-360, pp. 254–273). American Concrete Institute, 2024. <https://doi.org/10.14359/51740629>
- 2022 F.M. Mukhtar and C.A. Duarte. [A 3-D Generalized/eXtended FEM Simulation of Hydraulic Fracture Experiments and Multiple Fracture Interactions](#). *15th World Congress on Computational Mechanics (WCCM 2022)*, Yokohama, Japan, 31 July–5 August 2022
- A. El-Tohfa and F.M. Mukhtar. [Application of an adaptive stable GFEM for fracture propagation in plain concrete](#). *8th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2022)*, Oslo, Norway, 5–9 June 2022

- 2018 F.M. Mukhtar. [Early-age bond performance in FRP-concrete system and the need for additional test protocol](#). *25th Australasian Conference on Mechanics of Structures and Materials (ACMSM25)*, Brisbane, Australia, 11–14 December 2018
- F.M. Mukhtar. [A Closed-Form Functional Differential Quadrature Method \(f-DQM\) with Applications in Computational Mechanics](#). *13th World Congress in Computational Mechanics (WCCM 2018)/2nd Pan American Congress on Computational Mechanics (PANACM II)*, New York City, USA, 22–27 July 2018
- 2017 F.M. Mukhtar. [Explicit RBF for chloride ingress into concrete with nonlinear diffusivity: Towards avoiding time-space RBF scheme](#). *20th International Conference on Composite Structures*, Paris, France, 4–6 September 2017
- F.M. Mukhtar and H.J. Al-Gahtani. [Coupling enriched RBF and MFS for anti-plane shear cracks](#). *25th UK Association for Computational Mechanics (UKACM) Conference on Computational Mechanics*, University of Birmingham, Birmingham, United Kingdom, 12–13 April 2017
- 2016 F.M. Mukhtar. [Domain Decomposition using BEM for seepage analysis beneath a dam underlain by non-homogeneous deposit](#). In *Proceedings of the Canadian Society for Civil Engineering Annual Conference 2016: Resilient Infrastructure*, London, Ontario, Canada, 1–4 June 2016, Vol. 1, pp. 459–467. Canadian Society for Civil Engineering, 2016
- 2013 M.H. Baluch, M.K. Rahman, and F.M. Mukhtar. [Simulation of flow and formwork pressure in self-consolidating concrete \(SCC\)](#). *Fifth North American Conference on the Design and Use of Self-Consolidating Concrete*, Chicago, USA, 12–15 May 2013
- F.M. Mukhtar, M.H. Baluch, and M.K. Rahman. [Numerical simulation of slump flow and L-box tests for self-compacting concrete \(SCC\)](#). *9th International Concrete Conference (9CONCRETE-2013)*, Manama, Bahrain, 11–13 February 2013
- 2012 M.H. Baluch, M.K. Rahman, F.M. Mukhtar, and N. Saleem. [Finite element modeling for predicting the evolution of formwork pressure by self-compacting concrete](#). *International Conference on Advanced Concrete Technology & Its Applications (ACTA-2012)*, NUST, Islamabad, Pakistan, November 2012
- A.H. Al-Gadhib, J. Wang, and F. Mukhtar. [Assessment and modeling of qualitative damage-induced chloride diffusivity on concrete durability](#). In *Proceedings of the International Congress on Durability of Concrete (ICDC-2012)*, Trondheim, Norway, 18–21 June 2012, Paper C1-3. NTNU Trondheim, 2012
- 2011 F. Mukhtar and A.H. Al-Gadhib. [Numerical Simulation of Chloride Front Movement into Stressed Reinforced Concrete](#). In *Proceedings of the 13th International Conference on Civil, Structural and Environmental Engineering Computing*, Chania, Greece, 6–9 September 2011. Civil-Comp Press, 2011.
- M.H. Baluch, M.K. Rahman, F. Mukhtar and M.A. Malik. [A 2-D computational fluid dynamics simulation of slump flow and L-box test on SCC using ANSYS/FLUENT](#). In *Proceedings of the Canadian Society for Civil Engineering Annual Conference 2011*, Ottawa, Ontario, Canada, 14–17 June 2011, Vol. 2, pp. 1331–1338. Canadian Society for Civil Engineering, 2011

Synergistic Activities & Services

University Service (KFUPM)

- 2025 Member, [Ad hoc Committee on Faculty Promotion for an Applicant from the Rank of Research Scientist to Senior Research Scientist](#).
- 2023 Member, [Ad hoc Committee on Faculty Promotion for an Applicant from the Rank of Assistant Professor to Associate Professor](#).
- 2022 - Member and Representative, [The University Graduate Council](#).

- 2021 Member, Ad hoc Committee on Faculty Promotion for an Applicant from the Rank of Assistant Professor to Associate Professor.
- 2021 Member, Ad hoc Committee on Faculty Promotion for an Applicant from the Rank of Assistant Professor to Associate Professor.
- 2021 Member, Ad hoc Committee on Faculty Promotion for an Applicant from the Rank of Assistant Professor to Associate Professor.
- 2019 - 20 Member, Environment, Health, Safety and Security Committee.
- 2015 - 16 Member, Ad hoc Committee for Part-Time Employment and Teaching Assistants.
- 2013 - 14 Member, Ad hoc Committee for University Website Management.

College Service (College of Design and Built Environments, KFUPM)

- 2022 - 23 Member, Ad hoc Committee on Teaching and Advising Awards.

Department Service (CEE Department, KFUPM)

- 2025 - Graduate Coordinator.
- 2025 - Member, Industrial Advisory Board.
- 2022 - 23 Chair, Ad hoc Committee on Teaching and Advising Awards.
- 2021 - Chair, Graduate Committee.
- 2018 - Coordinator, International Student Exchange Program.
- 2019 - 21 Chair, Laboratory Committee.
- 2018 - 20 Member, Cooperative Education Committee.
- 2017 - 18 Member, Program Assessment Committee.
- 2017 - 20 Member, Undergraduate Committee.
- 2015 - 18 Member, Undergraduate Curriculum Revision Committee.
- 2015 - 20 Member, Course Offering and Textbook Committee.
- 2015 - 18 Member, Laboratory & Safety Committee.
- 2015 - 16 Member, Department Assessment Committee.
- 2013 Chair, Administrative Committee on CEE Graduate Curriculum Review.
- 2013 - 14 Supervisor, Lecturer-Bs/Research Assistants/Grad. Assistants Workforce.
- 2013 - 14 Coordinator, Full-Time Graduate/Undergraduate Students Hiring.
- 2013 - 14 Webmaster, CEE Promotional Content Management and Updates.

Conference Organization

- 2018 Session Co-Chair, [Minisymposium on Numerical Simulation in Engineering and Sciences](#), [World Congress in Computational Mechanics \(WCCM 2018\)](#), [New York, USA](#).
- 2015 Scientific Committee, [Youth for Science & Engineering \(MDT2015\)](#), [Warsaw University of Technology - Branch in Plock, Plock, Poland](#).

Editorial Services

Grant & Award Evaluation

- 2022 Grant Reviewer, [USDOT National Center for Transportation Infrastructure Durability & Life-Extension \(TriDurLE\)](#), [USA](#).
- 2022 National Awards Evaluator, [Al-Kasabi Award for Excellence in Civil Engineering](#), [Saudi Arabia](#).

Journal Reviewer Contributions

- 2016– Peer Reviewer for 25+ ISI journals (140+ reviews tracked via Web of Science), including:
- [Composite Structures](#), [Elsevier](#)
 - [Construction and Building Materials](#), [Elsevier](#)
 - [Computers & Structures](#), [Elsevier](#)
 - [Engineering Structures](#), [Elsevier](#)
 - [Journal of Composites for Construction](#), [ASCE](#)
 - [Journal of Materials in Civil Engineering](#), [ASCE](#)
 - [Engineering Fracture Mechanics](#), [Elsevier](#)
 - [Engineering Failure Analysis](#), [Elsevier](#)
 - [Journal of Building Engineering](#), [Elsevier](#)
 - [Case Studies in Construction Materials](#), [Elsevier](#)
 - [Theoretical and Applied Fracture Mechanics](#), [Elsevier](#)
 - [Structural Concrete](#), [Wiley](#)
 - [Fatigue & Fracture of Engineering Materials & Structures](#), [Elsevier](#)
 - [Engineering Applications of Artificial Intelligence](#), [Elsevier](#)
 - ... and other ISI-indexed journals

Evaluator of External Academic Programs

- 2026 Evaluator for [MSc \(Civil Engineering\) Thesis](#), [Department of Civil Engineering](#), [Kuwait University, Kuwait](#).
- 2024 Evaluator for [New Program Development: Master of Science \(MSc\) Degree Program in Civil Engineering \(Structures and Materials\)](#), [Department of Civil Engineering](#), [University of Hafr Al Batin, Saudi Arabia](#).
- 2023 Evaluator for [New Course Development: CENG411-Concrete Design II](#), [Department of Civil Engineering](#), [University of Bahrain, Bahrain](#).

Advising & Recruiting

Postdoctoral Fellows and Visiting Scholars

- 2024– [Dr. Anwar Hosan](#), [Structures and Materials](#), *Postdoctoral researcher at the Adaptive Technologies Laboratory for Advanced Structures (ATLAS) and IRC-CBM, KFUPM*

2023- [Dr. Mohammad Khan](#), Structures and Materials, *Postdoctoral researcher at the Adaptive Technologies Laboratory for Advanced Structures (ATLAS) and IRC-CBM, KFUPM*

PhD Students

- 2016-19 [Abubakr Musa](#), Dissertation Title: *Buckling of axially loaded cylindrical shells*, Co-supervised with Prof. Husain Al-Gahtani, Funded by University Fellowship. Now, a Research Scientist, Interdisciplinary Research Center for Construction and Building Materials, KFUPM. Role: Co-Advisor
- 2021-25 [Mohammed Shehadah](#), Dissertation Title: *Structural performance of treated recycled aggregate concretes*, Funded by University Fellowship. Now, a Structural Engineer at Buro Happold Ltd., Riyadh. Role: Advisor
- 2024- [Muhammed Al-Adgham](#), Dissertation Title: *Self-prestressing flexural and shear strengthening of RC beams using heat-activated Fe-shape memory alloy plates*, Funded by University Fellowship. Role: Advisor
- 2024- [Mohammad Al-Osta](#), Dissertation Title: *Seasonal climate effects on shrinkage and mechanical performances of self-healing 3D-printed concrete with recycled fine aggregate*, Funded by University Fellowship. Role: Advisor
- 2025- [Teshome Reba](#), Dissertation Title: *Under development*, Funded by University Fellowship. Role: Advisor
- 2025- [Hassibullah Sadat](#), Dissertation Title: *Under development*, Funded by University Fellowship. Role: Advisor
- 2025- [Mohammad Khan](#), Dissertation Title: *Development of ultra-high-performance concrete using seawater and sea sand (UHP-SWSSC) and its application in GFRP-reinforced structural beams*, Funded by University Fellowship. Role: Committee Member
- 2026- [Hanan Shalata](#), Dissertation Title: *Under development*, Funded by University Fellowship. Role: Advisor
- 2026- [Hager Elshaer](#), Dissertation Title: *Under development*, Funded by University Fellowship. Role: Advisor
- 2026- [Mohamedalhag Mohamed](#), Dissertation Title: *Under development*, Funded by University Fellowship. Role: Advisor
- 2026- [Goshu Tujuba](#), Dissertation Title: *Under development*, Funded by University Fellowship. Role: Advisor

MS Students

- 2018-20 [Mohammed Shehadah](#), Thesis Title: *Modelling of interfacial bond behavior between externally bonded FRP and concrete*, Funded by University Fellowship. Now, a Structural Engineer at Buro Happold Ltd., Riyadh. Role: Advisor
- 2018-20 [Mohammad Al-Jawhary](#), Thesis Title: *Boundary-type Ritz method for the analysis of polygonal plates*, Funded by University Fellowship. Now, a PhD Student at Université Laval, Canada. Role: Committee Member
- 2019-22 [Maan Lardhi](#), Thesis Title: *Punching shear performance of steel fiber-reinforced recycled aggregate concrete slabs strengthened with near surface mounted composites*, Funded by University Fellowship. Now, Acting Managing Director, Debsa Built Environment, Riyadh. Role: Advisor
- 2019-22 [Mohammad Al-Osta](#), Thesis Title: *Evaluation of self-healing FRCM/concrete interfacial bond*, Funded by University Fellowship. Now, a PhD Student at KFUPM. Role: Advisor
- 2019-22 [Abdul-Rahman El-Tohfa](#), Thesis Title: *Fracture propagation in quasi-brittle materials using eXtended/Generalized finite element method*, Funded by University Fellowship. Now, a PhD Student at McMaster University, Canada. Role: Advisor
- 2020-22 [Ibrahim Faqih](#), Thesis Title: *Optimization of the stacking sequence of composite plates*, Funded by University Fellowship. Role: Committee Member
- 2022-24 [Ali Odeh](#), Thesis Title: *Automated Ritz method for the analysis of thick laminated composite plates*, Funded by University Fellowship. Role: Committee Member

2022-24	Mahmood Abdulazeez , Thesis Title: <i>Seismic performance of RC bridge piers retrofitted with Fe-based shape memory alloys and UHPC</i> , Funded by University Fellowship. Now, a PhD Student at the University of Adelaide, Australia. Role: Advisor
2022-25	Arqam Azeem , Thesis Title: <i>Effect of CO2 on the performance and sustainability of limestone calcined clay concrete</i> , Funded by University Fellowship. Role: Committee Member
2022-25	Faisal Muhammad , Thesis Title: <i>Analysis of the mechanical behavior of recycled aggregate concrete using 3D mesoscale modeling</i> , Funded by University Fellowship. Role: Committee Member
2022-25	Alfi Arifai , Thesis Title: <i>Ensemble Kalman filter for structural identification and vibration control of arch bridge under dynamic loads</i> , Funded by University Fellowship. Role: Committee Member
2023-25	Khalilullah Ansari , Thesis Title: <i>Utilization of major Aluminum by-products as supplementary cementitious materials in cement paste</i> , Funded by University Fellowship. Role: Committee Member
2023-25	Irfan Bhat , Thesis Title: <i>Development of structural lightweight cementitious composites incorporating cenosphere and scoria aggregates with carbon sequestration benefits</i> , Funded by University Fellowship. Role: Committee Member
2024-	Husain Al-Aliwat , Thesis Title: <i>Experimental and AI-based quality monitoring in 3D concrete printing</i> , Funded by University Fellowship. Role: Advisor
2025-	Paul Isu , Thesis Title: <i>Self-sensing 3D-printed concrete integrated with graphene derivatives</i> , Funded by University Fellowship. Role: Advisor
2025-26	Wijdane Kachach , Thesis Title: <i>Machine learning-based predictive modeling of fire resistance of FRP-strengthened concrete beams</i> , Funded by University Fellowship. Role: Committee Member
2025-	Hedayatullah Karimi , Thesis Title: <i>Multiphysics predictive modeling of composite hydrogen pressure vessels considering thermal, mechanical, and hydrogen diffusion effects</i> , Funded by University Fellowship. Role: Committee Member
2025-	Ssenyonjo Henry , Thesis Title: <i>Development of a novel self-sensing ultra-high-performance cementitious composite incorporating nonmetallic fibers</i> , Funded by University Fellowship. Role: Committee Member
2026-	Deus Irecho , Thesis Title: <i>An explainable physics-informed and causal machine learning framework for international roughness index prediction in flexible pavements under dry no-freeze conditions</i> , Funded by University Fellowship. Role: Committee Member

Undergraduate Design Students

2015-16	Ghazi Al-Anazi Hashim Al-Dabbagh Amro Ahmad	<i>Analysis and Design of KFUPM Faculty Mall</i>
2015-16	Suliman Al-Gafari Abdullatif AlQurayn	<i>Structural Design of Highrise Buildings and Effect of Slab Types</i>
2015-16	Mahmoud Al-Saini Mohammad Al-Salmi	<i>Code Variations in Buildings Analysis and Design</i>
2016-17	Thamer Al-Harthi	<i>Analysis and Design of KFUPM Building 59 and Service Life Prediction</i>
2017-18	Fehaid Al-Ajmi Omar Al-Mulla	<i>Analysis and Design of Buildings with Durability Effects</i>
2017-18	Ali Al-Thagafi	<i>Analysis and Design of Buildings and Decisions on Basement Parking Layouts</i>

2018-19	Ziyad Al-Hazmi Abdullah Qassas Sajad Al-Wahid	<i>Design of a Multipurpose Hall</i>
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Undergraduate Coop Students

2020-21	Ahmed Al-Kulli	<i>Saudi Aramco Udhailiyah Community Services Division, Dhahran, Saudi Arabia</i>
2020-21	Taher Al-Janoubi	<i>Saudi Aramco Marine Department, Dhahran, Saudi Arabia</i>
2019-20	Mohammed AlSaud	<i>Saudi Aramco Fire Protection Department, Dhahran, Saudi Arabia</i>
2019-20	Bilal Al-Amasi	<i>MAWA Foundation, Jubail, Saudi Arabia</i>
2018-19	Mishal Al-Balawy	<i>AZMEEL Contacting & Construction Corporation, Dammam, Saudi Arabia</i>
2018-19	Talal Al-Mutairi	<i>AZMEEL Contacting & Construction Corporation, Dammam, Saudi Arabia</i>
2017-18	Abdullah Al-Jedaani	<i>Engineering and Technical Services – ALYAMAMA Co., Dhahran, Saudi Arabia</i>
2016-17	Yousef Humdah	<i>ESPAC - Precast Aerated Concrete, Dammam, Saudi Arabia</i>

Teaching

KFUPM

Graduate Courses

2025-	CE 522 Prestressed Concrete
2023-	CE 613 Advanced Finite Element Methods
2022-	CE 701 PhD Directed Research 1
2022-	CE 701 PhD Directed Research 2
2018-	CE 606 MS Independent Research
2017-	CE 517 Finite Element Methods
2016-	CE 511 Advanced Structural Analysis and Vibrations

Undergraduate Courses

2021-	CE 315 Reinforced Concrete I
2020-	CE 406 Structural Mechanics II
2020-23	CE 202 Statics and Strength of Materials
2017-20	CE 305 Structural Analysis I
2017-23	CE 318 Numerical & Statistical Methods in Civil Engineering
2016	CE 201 Statics
2016	CE 490 Civil Engineering Seminar
2015-	CE 203 Structural Mechanics I
2015-19	CE 411 Capstone Design Project

Federal Polytechnic Idah, Nigeria

- 2008-09 Structures II
- 2008-09 Building Services
- 2008-09 Engineering Drawing
- 2008-09 Engineering Management

Invited Lectures and Presentations

Invited Lectures

- 2025 Structural Engineering Research Group of the Swiss Federal Laboratories for Material Science and Technology (EMPA), Zurich, Switzerland. Title: *Sustainable Structures, Materials, and Computations*, Apr. 14th

Department of Civil Engineering, University of North Dakota, Grand Forks, ND, USA. Title: *Smart and Sustainable Structural Systems: Innovations in Experimentation, Modeling, and Digital Construction*, Jul. 24th

Abaad Construction WLL, Manama, Bahrain. Title: *Sustainable Structural Engineering*, May 13th
- 2023 Polyhedral Structures Laboratory, University of Pennsylvania, Philadelphia, PA, USA. Title: *KFUPM ATLAS Lab and Research Initiatives: Past, Present, and the Future*, Jun. 23rd

Presentations

- 2025 5th Asian Concrete Federation (ACF) Symposium, Singapore. Title: *Vulnerability assessment of CFRP-strengthened RC structures under blast loading: Applied element modeling*. Nov. 15th
- 2025 Geneva International Inventions Exhibition, Geneva, Switzerland. Title: *Universal debonding test apparatus for carbon fiber reinforced polymer-concrete system and method for sequential multi-testing*. Apr. 9th - 13th
- 2024 4th RILEM International Conference on Concrete and Digital Fabrication (Digital Concrete 2024), Munich, Germany. Title: *Buildability analysis of 3D concrete printing using finite element method*. Sep. 5th
- 2024 American Concrete Institute (ACI) Convention and 16th International Symposium on Fiber-Reinforced Polymer (FRP) Reinforcement for Concrete Structures (FRPRCS), New Orleans, USA. Title: *Convertible bond test apparatus for EB FRP, NSM FRP, FRCM, and allied systems: Proof of concept*. Mar. 23th
- 2022 15th World Congress in Computational Mechanics (WCCM 2022), Yokohama, Japan. Title: *A 3-D Generalized/eXtended FEM Simulation of Hydraulic Fracture Experiments and Multiple Fracture Interactions*. Jul. 31st
- 2022 8th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2022), Oslo, Norway. Title: *Application of an adaptive stable GFEM for fracture propagation in plain concrete*. Jun. 6th
- 2018 25th Australasian Conference on the Mechanics of Structures and Materials (ACMSM25), Brisbane, Australia. Title: *Early-age bond performance in FRP-concrete and the need for additional test protocol*. Dec. 6th
- 2018 13th World Congress in Computational Mechanics (WCCM 2018), New York City, USA. Title: *A Closed-Form Functional Differential Quadrature Method (f-DQM) with Applications in Computational Mechanics*. Jul. 25th

- 2017 [25th UK Association for Computational Mechanics \(UKACM\) Conference on Computational Mechanics](#), Birmingham, UK. Title: *Coupling enriched RBF and MFS for anti-plane shear cracks*. Apr. 12th
- 2017 [20th International Conference on Composite Structures](#), Paris, France. Title: *Explicit RBF for chloride ingress into concrete with nonlinear diffusivity: Towards avoiding time-space RBF scheme*. Sep. 5th
- 2016 [Annual Conference - Canadian Society for Civil Engineering](#), London, Ontario, Canada. Title: *Domain Decomposition using BEM for seepage analysis beneath a dam underlain by non-homogeneous deposit*. Jun. 2nd
- 2013 [9th International Concrete Conference \(9CONCRETE-2013\)](#), Manama, Bahrain. Title: *Numerical simulation of slump flow and L-box tests for self-compacting concrete (SCC)*. Feb. 12th

Professional Association

- 2022- Member, [American Concrete Institute \(ACI\)](#), Farmington Hills, MI, USA.
- 2022- Member, [Saudi Council of Engineers \(SCE\)](#), Sahafah, Riyadh, Saudi Arabia.
- 2023- Member, [Nigerian Society of Engineers \(NSE\)](#), Central Business District, Abuja, Nigeria.
- 2023- Registered Engineer, [Council for the Regulation of Engineering \(COREN\)](#), Wuse, Abuja, Nigeria.

Professional Development and Certifications

Academic Leadership, Curriculum Development, and Accreditation

- 2021 - 22 [Academic Quality Assurance Framework Series](#), Deanship of Academic Development, KFUPM.
- 2021 - 25 [Program & Course File Automation](#), Deanship of Academic Development, KFUPM.
- 2016 [ABET IDEAL Scholar Certificate \(60-hour faculty development program\)](#), Institute for the Development of Excellence in Assessment Leadership (IDEAL), ABET Inc.

Active Learning & Educational Tech

- 2013 - 25 [Completed 40+ Faculty Development Modules via the KFUPM Teaching & Learning Center](#),
Focus Areas: Student-Centered & Inquiry-Based Learning (IBL), Flipped Classroom Methods, Authentic Assessment, Active Classroom Engagement, AI-Enhanced Instruction, Digital & Online Assessment Systems, Learning Management Platforms (Blackboard, GradeScope, ExamSoft), Interactive Feedback Tools, ABET Accreditation Alignment, and Academic Program Outcomes.

Selected Technical Training

- 2021 [Protective Design using Extreme Loading for Structures](#) — Applied Science International, LLC., USA.
- 2020 [Wolfram Custom Neural Networks](#) — Wolfram Research Europe Ltd.
- 2018 [Enriched Finite Element Methods](#) — WCCM Short Course, New York City, USA.

Entrepreneurship

- 2020 [Dhahran Techno Valley \(DTV\) Business Startup Challenge and 36-hour Boot-Camp for Technology Commercialization & Entrepreneurship](#), KFUPM.

