Ziad Abu El-Rub, Ph.D.

Dean, School of Applied Medical Sciences | Associate Professor of Pharmaceutical and Chemical Engineering
German Jordanian University, Amman, Jordan
Email: ziad.abuelrub@gju.edu.jo | Mobile: +962 78 768 7533 | ORCID: 0000-0003-4664-2132 | Scopus ID: 58672785800
Google Scholar | ResearchGate | LinkedIn

ACADEMIC PROFILE

Academic dean and associate professor with more than 20 years of experience spanning higher education, chemical and pharmaceutical engineering, sustainable energy research, industry, and international project leadership. Currently serving as Dean of the School of Applied Medical Sciences at the German Jordanian University and Principal Investigator of a major GIZ-funded international Labour-mobility project. Previous leadership roles include Director of the Center for E-Learning and Academic Performance Improvement, Vice Dean, Acting Department Head, and Assistant to the Dean for Industrial Relations. Experienced in academic program development, accreditation, university-industry collaboration, AI-enabled education, micro-credentials, externally funded projects, and multinational academic partnerships. Research expertise includes biomass gasification, catalytic tar removal, natural mineral catalysts, renewable energy systems, and applied sustainability technologies.

SELECTED ACADEMIC METRICS

- Peer-reviewed journal articles: 19| Book manuscript: 1 under submission | Selected conference papers and presentations: 25+
- Google Scholar citations: approximately 2,035+| h-index: 12 | i10-index: 15
- International and institutional project portfolio: leadership and participation in projects funded by GIZ, DAAD, Erasmus+, WHO, KADDB, KAFD, and GJU
- Teaching portfolio: 15+ undergraduate and postgraduate courses in chemical, pharmaceutical, and applied engineering
- Academic leadership: Dean, former center director, vice dean, acting department head, and international project leader
- Graduate and student research development: MSc thesis supervision and examination, funded BSc projects, and award-winning graduation projects

ACADEMIC APPOINTMENTS

2025-Present	Dean, School of Applied Medical Sciences, German Jordanian University, Jordan
2024-Present	Associate Professor, Pharmaceutical and Chemical Engineering Department, German Jordanian University, Jordan
2024-2026	Director, Center for E-Learning and Academic Performance Improvement (CeLAPI), German Jordanian University, Jordan
2024-2025	Vice Dean, School of Applied Medical Sciences, German Jordanian University, Jordan
2025-2026	Coordinator, DAAD Online GATE Program for the Pre-Year, German Jordanian University, Jordan
2022-2024	Associate Professor, Chemical Engineering Department, American University of the Middle East (AUM), Kuwait
2021-2023	Associate Professor, Pharmaceutical and Chemical Engineering Department, German Jordanian University, Jordan
2020-2022	Acting Department Head, Pharmaceutical and Chemical Engineering Department, German Jordanian University, Jordan
2016-2020	Dean Assistant for Industrial Relations, School of Applied Medical Sciences, German Jordanian University, Jordan
2012-2021	Assistant Professor, Pharmaceutical and Chemical Engineering Department, German Jordanian University, Jordan

EDUCATION

2002-2007	Ph.D. in Chemical Engineering, University of Twente, the Netherlands Dissertation: Biomass char as an in-situ catalyst for tar removal in gasification systems Supervisor: Prof. Gerrit Brem
2000-2002	Master of Technological Design, University of Twente, the Netherlands Thesis: High-temperature catalytic tar removal from producer gas of biomass-fueled gasifiers
1993-1998	B.Sc. in Chemical Engineering, University of Jordan, Jordan Thesis: Plant design for biogas production from Amman municipal solid waste GPA: 3.48/4.00 | Rank: 3rd

RESEARCH PROFILE

Research positioning: Dr. Abu El-Rub's research focuses on sustainable chemical and energy systems, particularly catalytic conversion processes for biomass gasification, tar removal, and low-cost natural mineral catalysts. His earlier work established a recognized research line on biomass char and catalytic tar elimination, while his recent work extends this line into natural zeolites, kaolinite, oil shale-derived materials, renewable-energy systems, membrane-related applications, and applied sustainability technologies. A parallel academic development track addresses AI-enabled learning, micro-credentials, and digital transformation in applied higher education.

Current Research Agenda

- Advance catalytic tar removal using biomass char, natural zeolite, kaolinite, and low-cost Jordanian minerals.
- Strengthen applied research on sustainable energy systems, oil shale characterization, renewable technologies, and circular materials.
- Develop externally funded applied research and capacity-building projects that connect engineering education, employability, and international labour-market readiness.
- Translate digital learning, AI, and micro-credential frameworks into institutional academic transformation models.

Research Interests

- Biomass gasification, catalytic tar removal, and biomass char catalysis
- Low-cost natural mineral catalysts, zeolites, kaolinite, and oil shale-derived materials
- Renewable and sustainable energy systems, including solar chimney power plants and phase change materials
- Oil shale pyrolysis, thermogravimetric analysis, kinetics, and material characterization
- Membrane-based wastewater treatment and separation technologies
- AI, digital learning, micro-credentials, and transformation of higher education

PUBLICATIONS

Peer-reviewed Journal Articles

1. Khayat, S., Petrucci, E., Abu El-Rub, Z., & Daragmeh, A. (2026). Micro-credentials and skills ecosystems in emerging contexts: Employer recognition, institutional readiness, and policy alignment in Palestine and Jordan. Higher Education, Skills and Work-Based Learning. Accepted June 2026.
2. Abu El-Rub, Z., Nassar, N., Shuqum, N., & Al-Juaniadi, R. (2025). Recycling technologies for lithium-ion batteries in electric vehicles: A critical review. Jordanian Journal of Engineering and Chemical Industries, 8(2), 176-190.
3. Abdelsalam, E., Abu El-Rub, Z., Alkasrawi, M., Ibrahim, D., Azzam, A., Salameh, T., & Abdul Ghani. (2023). A novel design of a twin-chimney solar power plant for power and distilled water production. Thermal Science and Engineering Progress, 46, 102231.
4. Abu El-Rub, Z., Halawa, D., Alqudah, I., Nasr, A., & Naqvi, M. (2023). Natural zeolite catalyst for tar removal in biomass gasification systems: Kinetics and effectiveness evaluation. Fuel, 346, 128393.
5. Abu El-Rub, Z., Abu Hassan, R., Alnajjar, R., & Alkasrawi, M. (2022). Kinetics of natural kaolinite as a catalyst for toluene dry reforming. Jordanian Journal of Engineering and Chemical Industries, 5(3), 71-77.
6. Al-Gharabli, S., Abu El-Rub, Z., Hamad, E. M., Kujawski, W., Flanc, Z., Pianka, K., Jankowski, W., & Kujawa, J. (2022). Toward anti-fouling properties and enhanced performance in separation process: Carbon nanotubes-PVDF hybrids. Applied Surface Science, 602, 154341.
7. Khanfar, M. F., Kopti, T. S., Gharaibeh, N. O., & Abu El-Rub, Z. (2021). Differential pulse voltammetry as an alternative method for tracking hydrochlorothiazide electrolytic degradation. Jordanian Journal of Engineering and Chemical Industries, 4(3), 70-77.
8. Al-Gharabli, S., Abu El-Rub, Z., Hamad, E. M., Kujawski, W., Flanc, Z., Pianka, K., & Kujawa, J. (2021). Surfaces with adjustable features: Effective and durable materials for water desalination. International Journal of Molecular Sciences, 22, 11743.
9. Hamad, E. M., Khaffaf, A., Yasin, O., Abu El-Rub, Z., Al-Gharabli, S., Al-Kouz, W., & Chamkha, A. (2021). Review of nanofluids and their biomedical applications. Journal of Nanofluids, 10, 463-480.
10. Tawalbeh, M., Al-Othman, A., Salameh, T., Alkasrawi, M., Martis, R., & Abu El-Rub, Z. (2021). A critical review on metal-based catalysts used in the pyrolysis of lignocellulosic biomass materials. Journal of Environmental Management, 299, 113597.
11. Abu El-Rub, Z., Kujawa, J., & Al-Gharabli, S. (2020). Pyrolysis kinetic parameters of Omari oil shale using thermogravimetric analysis. Energies, 13(16), 1-13.
12. Abu El-Rub, Z. (2019). TGA and BET characterization of spent oil shale as a catalyst in biomass tar removal applications. International Journal of Smart Grid and Clean Energy, 8(6), 680-687.
13. Abu El-Rub, Z., Kujawa, J., Albarahmiah, E., Rifai, N., Qaimari, F., & Al-Gharabli, S. (2019). High throughput screening and characterization methods of Jordanian oil shale as a case study. Energies, 12(16), 3148.
14. Abu El-Rub, Z., Bramer, E., Al-Gharabli, S., & Brem, G. (2019). Impact of char properties and reaction parameters on naphthalene conversion in a macro-TGA fixed char bed reactor. Catalysts, 9, 307.
15. Al-Gharabli, S., Hamad, E. M., Saket, M., Abu El-Rub, Z., Arafat, H., Kujawski, W., & Kujawa, J. (2018). Advanced material: Ordered nano-tubular ceramic membrane covalently capped with single wall carbon nanotubes. Materials, 11(5), 739.
16. Al-Gharabli, S., Kujawski, W., Abu El-Rub, Z., Hamad, E. M., & Kujawa, J. (2018). Enhancing membrane performance in removal of hazardous VOCs from water by modified fluorinated PVDF porous material. Journal of Membrane Science, 556, 214-226.
17. Abu El-Rub, Z., Brem, G., & Bramer, E. A. (2015). Single char particle model for naphthalene reduction in a biomass gasification system. Biomass and Bioenergy, 72, 19-27.
18. Abu El-Rub, Z., Bramer, E. A., & Brem, G. (2008). Experimental comparison of biomass chars with other catalysts for tar reduction. Fuel, 87(10-11), 2243-2252.
19. Abu El-Rub, Z., Bramer, E. A., & Brem, G. (2004). A review of catalysts for tar elimination in biomass gasification processes. Industrial & Engineering Chemistry Research, 43, 6911-6919.

Book Manuscript

Abu El-Rub, Z., & Al-halhouli, A. The Smart University: A Handbook for Higher Education in the Age of AI. Under submission.

Invited Keynotes and Talks

- Abu El-Rub, Z., & Khalifeh, A. (2025). From Experiment to Strategy: A University-Wide Model for Ethical Generative AI Integration in Smart Learning. Keynote speech, IEEE SCME 2025, Hebron, Palestine, delivered online.

Selected Conference Papers and Presentations

- Abu El-Rub, Z. (2018). Characterization of a spent-oil shale as a catalyst for tar removal. 3rd International Conference on New Energy and Applications, Singapore.
- Abu El-Rub, Z., Kähler, B., & Al-Khatib, J. (2017). University-industry collaboration: A case study from the German Jordanian University. 3rd MENA Higher Education Leadership Forum, Dubai, UAE.
- Abu El-Rub, Z., Bramer, E. A., & Brem, G. (2016). Parameters affecting the removal of naphthalene over fixed biomass char bed. Venice 2016, Sixth International Symposium on Energy from Biomass and Waste, Venice, Italy.
- Abu El-Rub, Z., Bramer, E. A., & Brem, G. (2015). Real tar removal over fixed bed of biomass char. 23rd European Biomass Conference and Exhibition, Vienna, Austria.
- Abu El-Rub, Z., Bramer, E. A., & Brem, G. (2004). Modeling of tar reduction in biomass gasification using biomass char as a catalyst. Science in Thermal and Chemical Biomass Conversion, Victoria, Canada.
- Abu El-Rub, Z., Bramer, E. A., & Brem, G. (2002). Removal of naphthalene as the model tar compound on calcined dolomites, olivine and commercial nickel catalyst in a fixed bed tubular reactor. 21st European Conference for Energy, Industry and Climate Protection, Amsterdam, the Netherlands.

Public Scholarship and Academic Commentary

Author of opinion and analysis articles on higher education, AI, university rankings, vocational education, micro-credentials, and academic development in Talaba News. Full list available upon request.

RESEARCH GRANTS AND FUNDED PROJECTS

Funding summary: Active and completed externally funded and institutionally supported projects represent more than USD 1.5 million in combined project value, based on the stated project budgets and GJU allocations.

Principal Investigator and Project Leadership

2025-2026	Empowering Jordanian Candidates for the International Labour Market (EJIM), GIZ, Principal Investigator, GJU-managed project budget: EUR 516,568.
2026-2027	Syrian Innovation in Academia Pilot (SyrIA), DAAD, Subproject Lead for Digitization, Activity M/A5, GJU allocation: EUR 800,000.
2026-2029	Collaborative Industry-Based Curriculum for Interdisciplinary Innovation in Nutrition (NOURISH), Agriculture, and Nutraceuticals, Erasmus+ Capacity Building in Higher Education, GJU Coordinator, GJU allocation: EUR 109,000.
2026-2028	International Network for Future Universal Skills Education (INFUSE), DAAD, GJU Institutional Lead and Expert on Micro-Credentials; responsible for institutional implementation support and mobility activities.
2025–2026	Diploma in Healthcare Supply Chain Management, World Health Organization, Curriculum Development Specialist and GJU Academic Team Member; contributed to the design and validation of a 270-hour, 16-course competency-based professional diploma in collaboration with Université de Montréal.
2024-2027	Bologna for Science Education in Palestine and Jordan (BASE), Erasmus+ Capacity Building in Higher Education, Senior Researcher and GJU Team Member, GJU allocation: EUR 80,000.
2016-2019	Elimination of Tar Produced from Biomass Gasification Using Low-Cost Jordanian Mineral Catalysts, German Jordanian University, Principal Investigator, research grant value: USD 100,000.
2015-2018	Vocational Training Center for Undergraduate University Students and Teachers in Jordan, Erasmus+, GJU Coordinator, total project budget: USD 783,000.

Selected Funded MSc and BSc Research Projects

2025–2026	Modified Natural Minerals as Dual-Applicability Catalysts for Biomass Tar Removal and Lignin Depolymerization, German Jordanian University, MSc thesis supervisor, institutional research funding: JOD 1,900.
2015-2016	Experimental and Economic Evaluation of a Designed Machine for Converting Waste Cooking Oil into Biodiesel, KADDB and KAFD, BSc graduation project supervisor, project funding: USD 7,000.
2017-2019	Investigation of the Effect of Heating Rates on the BET Surface Area of Jordanian Minerals, German Jordanian University, BSc graduation project supervisor, institutional research funding: USD 700.
2021-2022	Kinetics of Toluene Dry Reforming Using Jordanian Zeolite as a Catalyst, German Jordanian University, BSc graduation project supervisor, institutional research funding: USD 850.

GRADUATE SUPERVISION, EXAMINATION, AND STUDENT RESEARCH DEVELOPMENT

Institutional context: The Pharmaceutical and Chemical Engineering Department at GJU does not currently offer a PhD program. The MSc program was established only recently; therefore, graduate research supervision is represented through MSc thesis supervision

and examination, BSc research projects, student research outputs, and contribution to building graduate research capacity within a young MSc program.

MSc Thesis Supervision

- Esraa Alsaleh, Modified natural minerals as dual-applicability catalysts for biomass tar removal and lignin depolymerization, Pharmaceutical and Chemical Engineering Department, German Jordanian University, Oct. 2024-June 2026.
- Mathijs Snippert, Characterization of biomass char as a catalyst for tar reduction in a fixed bed reactor, Thermal Engineering Laboratory, University of Twente, 2004.
- Jorke Jellema, Catalytic Tar Reduction from Biomass Gasification Gas using Wood Char as a Catalyst, Thermal Engineering Laboratory, University of Twente, 2003.

MSc Thesis Examination

- Mays Ababneh, Melting Behavior of Phase Change Material During Heating and Cooling Processes, Chemical Engineering, Jordan University of Science and Technology, 2025.
- Hamzeh Al-Omari, Olive mill wastewater treatment using membrane technology, Chemical Engineering, Jordan University of Science and Technology, 2019.
- Fadi Alrawash, Treatment of olive mill wastewater using membrane distillation, Chemical Engineering, Jordan University of Science and Technology, 2019.

BSc Research Supervision and Student Outcomes

- Supervised multiple BSc graduation projects in catalysis, biomass energy, biodiesel production, oil shale, renewable energy, and applied chemical engineering.
- Supervised or supported award-winning graduation projects recognized by the Jordan Engineers Association, Amman Chamber of Industry, and AUM Innovation Fair.
- Supported student research development through project-based learning, funded BSc projects, industrially linked graduation projects, and research-oriented laboratory work.

TEACHING EXPERIENCE

Courses Taught

- Core Chemical Engineering: Chemical Reaction Engineering; Fluid Mechanics for Chemical and Medical Engineers; Principles of Chemical Engineering; Chemical Engineering Economics; Separation Processes Lab
- Design, Practice, and Industry: Pharmaceutical Plant Design; Industrial Processes Management; Graduation Project I; Graduation Project II; Design and Analysis of Processing Systems; Introduction to Oil and Gas Production; Shale Oil Production Processes
- Laboratories and Simulation: Fluid, Heat and Reaction Engineering Lab; Chemical Engineering Lab; Aspen HYSYS Simulation; General Chemistry and Lab
- Professional Skills and Innovation: Technical Writing; Transforming Ideas to Innovation I; Chemical Engineering Sophomore Seminar; Introduction to Pharmaceutical and Chemical Engineering

Teaching Innovation and Digital Learning

- Led institutional initiatives related to e-learning, academic performance improvement, digital course development, and professional video-based learning through CeLAPI.
- Contributed to university-wide initiatives on AI integration, micro-credentials, recognition of prior learning, and blended learning models.
- Developed and improved course materials, question banks, simulation-based activities, and project-based learning approaches in chemical engineering.

ACADEMIC LEADERSHIP, PROGRAM DEVELOPMENT, AND ACCREDITATION

- Dean of the School of Applied Medical Sciences, providing strategic, academic, and administrative leadership across the Biomedical Engineering and Pharmaceutical and Chemical Engineering departments, serving approximately 600 students, more than 20 faculty members, and over 20 teaching and research laboratories.
- Led or contributed to development of the MSc program in Pharmaceutical and Chemical Engineering and the BSc Dual Study track.
- Led departmental work related to ASIIN accreditation and contributed to study plan development, quality assurance, and academic performance improvement.
- Directed university-wide initiatives in digital learning and academic performance improvement, including faculty development, course digitization, E-Certificate, video-based learning, AI-in-education guidance, micro-credentials, and recognition of prior learning.
- Principal Investigator of the GIZ-funded EJIM project, connecting applied education, labour mobility, employability, and international labour market readiness.
- Contributed to institutional frameworks related to micro-credentials, recognition of prior learning, and digitally supported academic transformation.

UNIVERSITY SERVICE

2024-Present	Member, Students Evaluation of Teaching Committee, German Jordanian University
2024-Present	Member, University Regulations Committee, German Jordanian University
2024-2025	Member, University Council, German Jordanian University
2021-2022	Member, Study Plan Committee, BSc Pharmaceutical and Chemical Engineering Program, GJU
2020-2022	Member, Committee for Establishing MSc Program in Pharmaceutical and Chemical Engineering, GJU
2018-2021	Head, General Safety Committee, School of Applied Medical Sciences, GJU
2015-2018	GJU Coordinator, VTC Erasmus+ Project
2016-2021	Head, GJU Industrial Relations Committee
2014-2022	Liaison Officer, GJU Training Center
2014-2020	Graduation Projects Coordinator
2013-2014	Member, German Jordanian University Council
2023-2024	Head, Labs Committee, Chemical Engineering Department, AUM
2023	Head, Green Energy Club, AUM

HONORS AND RECOGNITION

2024	Supervisor, Third Place Award for Outstanding Graduation Projects in Chemical Engineering, AUM Innovation Fair, Kuwait
2019	Distinguished Industrial Professor Award of Excellence, German Jordanian University
2018	Best Presentation Award, 3rd International Conference on New Energy and Applications, Singapore
2017	Supervisor, Second Prize, Industrial Graduation Projects Competition, Chemical Engineering, Jordan Engineers Association and Amman Chamber of Industry
2017	Certificate of Excellence for Distinguished Academic Performance, German Jordanian University
2016	Supervisor, First Prize, Graduation Projects Competition, Chemical Engineering, Jordan Engineers Association and Amman Chamber of Industry
2016	Certificate of Excellence for Distinguished Academic Performance, German Jordanian University
2013-2016	Industrial Experience Allowance Award, German Jordanian University

PROFESSIONAL ACTIVITIES AND SERVICE TO THE PROFESSION

Editorial and Reviewing Activities

- Editorial Board Member, Jordanian Journal of Engineering and Chemical Industries, 2024-Present.
- Journal reviewer for Industrial & Engineering Chemistry Research, Energy & Fuels, Fuel Processing Technology, Biofuels, Thermal Science and Engineering Progress, and Jordanian Journal of Engineering and Chemical Industries.

Conference and Professional Service

2023	Member, International Advisory Board, 3rd BAU International Oil Shale Conference, Amman, Jordan
2020	Train the Trainer, Beuth Hochschule fuer Technik Berlin, Germany
2018, 2021	Member, Technical Program Committee, International Conference on New Energy and Applications; Member, Organizing Committee, International Oil Shale Conference
2013-2014	Vice President, Preparatory Committee, 7th Jordan International Chemical Engineering Conference, Amman, Jordan
2013	Chair, Workshop Oil Shale in Jordan: Reality, Potential, and Limitations, Jordan Engineers Association, Amman, Jordan
2012	Steering Committee Member, 2nd Annual Global Sand Management and Control Workshop, Dubai, UAE
2011	Steering Committee Member, 4th Annual Global Produced Water Management Workshop, Istanbul, Turkey
2018-2021	Board Member, Chemical Engineering Division, Jordan Engineers Association
2016-2017	Head, JEA Branches Committee for Workshops, Jordan Engineers Association
2016-2022	Advisory Board Member, Engineering Training Center, Jordan Engineers Association
2015-2018	Board Member, Chemical Engineering Division, Jordan Engineers Association
2013-2015	Head, Chemical Engineering Scientific Committee, Jordan Engineers Association
2014-Present	Advisory Board Member, Chemical Engineering Department, Jordan University of Science and Technology

INDUSTRY EXPERIENCE

2011-2012	Regional Manager for the Middle East and North Africa, ASCOM Separation Company, the Netherlands Led technical sales, process design, and qualification of separation technologies for crude oil, water, gas, and sand applications in the MENA region.

2007-2010	Business Development Manager, PetroLink Holding Company, Kuwait Managed technical and commercial studies for energy and petrochemical projects, including a proposed USD 120 million PET plant in Kuwait.
1998-1999	Quality Control Manager, National Paints Factories, Jordan Managed quality control laboratories and implemented testing procedures to support product quality and compliance.

LICENSES AND CERTIFICATIONS

2025	Certified Quality Evaluator, Higher Education Institutions Accreditation and Quality Assurance Commission, Jordan
2018	Consultant Engineer in Chemical Engineering, Jordan Engineers Association
2015	Professional Engineer in Bioenergy Engineering, Jordan Engineers Association

PROFESSIONAL MEMBERSHIPS

2006-Present	Jordan Engineers Association
2009	Former Member of Society of Petroleum Engineers

LANGUAGES AND SKILLS

- Languages: Arabic, native; English, fluent; Dutch, basic; German, basic.
- Engineering software: Aspen Plus, Aspen HYSYS.
- Digital and productivity tools: Microsoft Office, Microsoft Project, Microsoft Visio, Moodle, Microsoft Teams, and digital learning platforms.

REFERENCES

Available upon request.