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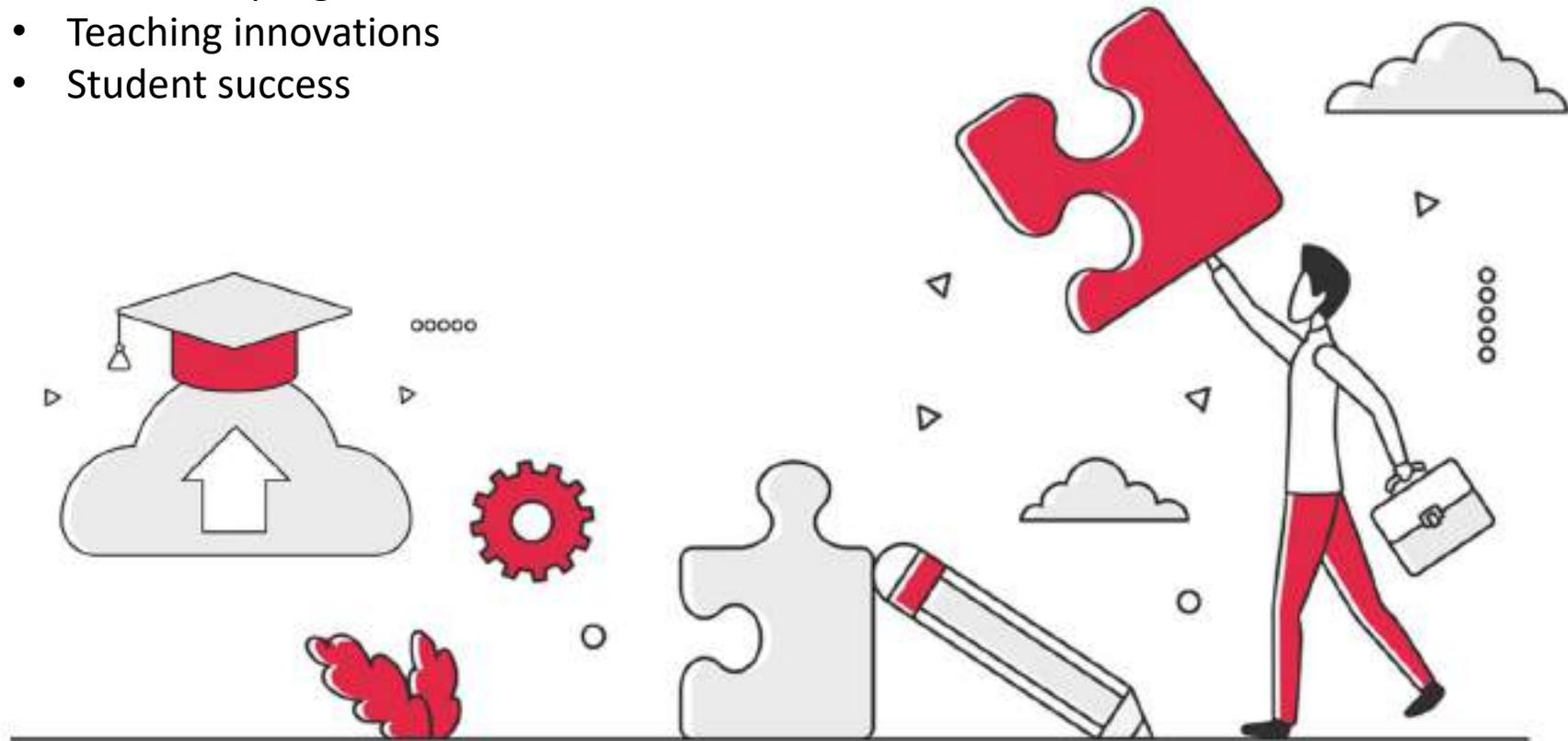


QUALITY
EDUCATION

SDG 4: QUALITY EDUCATION

Educational Excellence

- Academic programs
- Teaching innovations
- Student success



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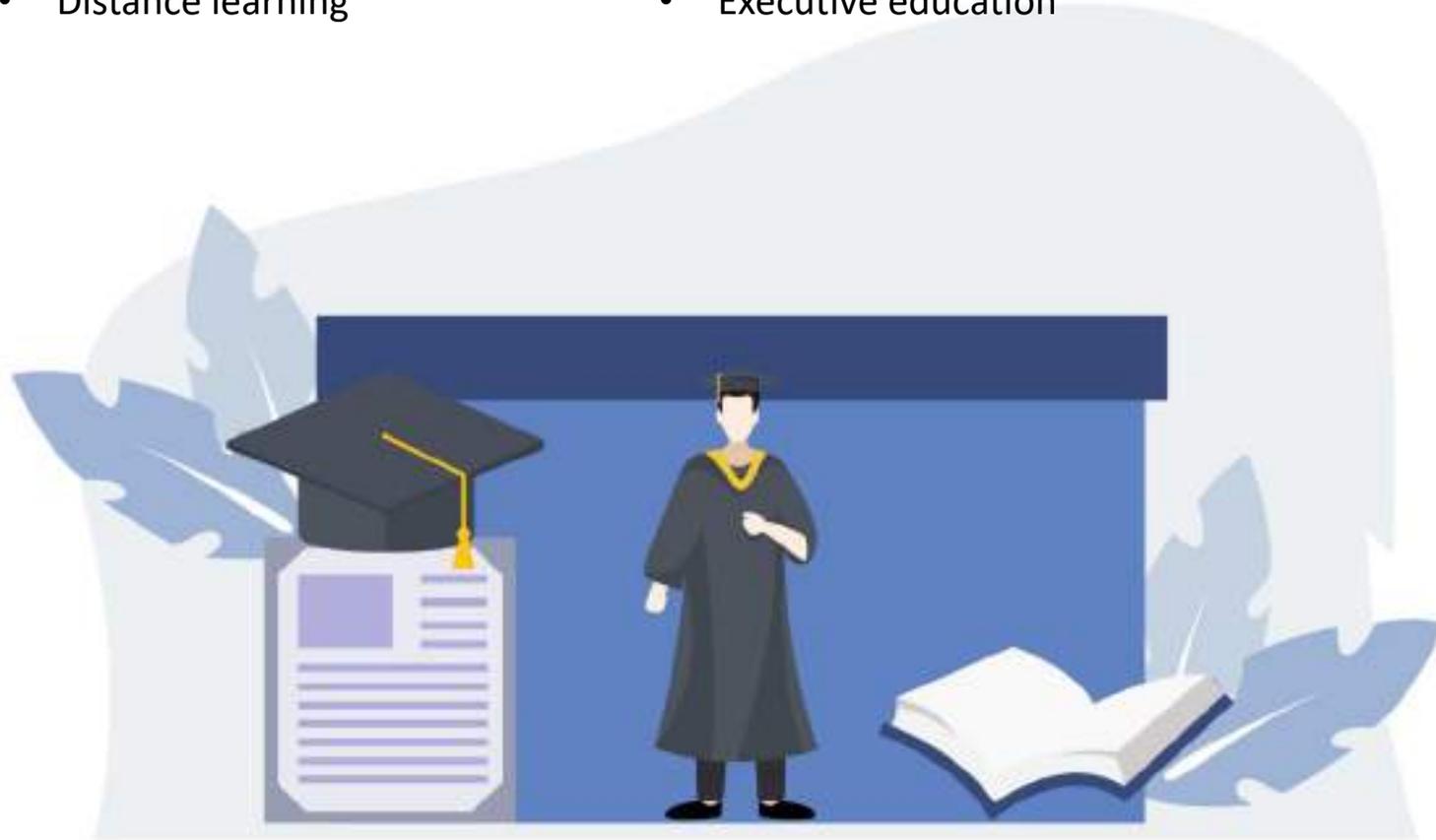
QUALITY
EDUCATION

Educational Access

- Scholarship programs
- Inclusive education
- Distance learning

Lifelong Learning

- Professional development
- Community education
- Executive education





EDUCATIONAL EXCELLENCE

ACADEMIC PROGRAMS

- KU offers high-quality undergraduate (<https://www.ku.ac.ae/academics/undergraduate-programs#programs>) and postgraduate programs at the Master’s and PhD levels (<https://www.ku.ac.ae/academics/graduate-programs#programs>). The programs are offered through the College of Engineering & Physical Sciences (<https://www.ku.ac.ae/academics/college-of-engineering#deans-message>), the College of Computing and Mathematical Sciences (<https://www.ku.ac.ae/college-of-computing-and-mathematical-sciences#deans-message>), and the College of Medicine and Health Sciences (<https://www.ku.ac.ae/academics/college-of-medicine-and-health-sciences>)
- KU recently launched a BSc in Energy Engineering. This is an interdisciplinary program that addresses various aspects of energy, including renewable energy.
- KU offers minors in (1) Renewable and Sustainable Energy and (2) Energy Transition.
- Sustainable Chemistry Integration: 52% of undergraduate (16/34) and 50% of graduate (9/18) courses offered in 2022-2024 incorporate sustainability topics, such as green chemistry, alternative energies, and pollution control
- The Management Science & Engineering Department has partnered with Siemens Energy to introduce a new Energy Transitions and Sustainability for Global Markets concentration, within the MSc Engineering Systems and Management program.

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EDUCATIONAL EXCELLENCE

ACADEMIC PROGRAMS

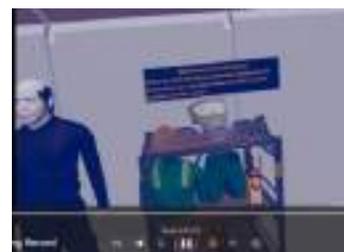
- All undergraduate students take the GENS 101 Grand Challenges courses in their freshman year. This course focuses on interdisciplinary, real-world applications, especially addressing Grand Challenge problems facing humanity. Students discuss ethical, social, economic, environmental, and technical aspects of Grand Challenges, and they contribute to collaborative and project-based activities.
- All undergraduate programs, in particular, integrate critical thinking, ethics, and sustainability principles throughout the curriculum. All undergraduate programs integrate artificial intelligence and data science.
- The senior design projects, in particular, emphasize an interdisciplinary approach that addresses real-world challenges, including various aspects of sustainability.
- All students have access to a variety of digital libraries, research databases, and virtual learning environments (<https://library.ku.ac.ae/lib>). Some examples include Academic Search Ultimate, Business Source Elite, IEEE Xplore Digital Library ... etc.



EDUCATIONAL EXCELLENCE

Teaching innovations

- 2024 First Annual Solar Car Race, Bridging Theory and Practice: Integrating Engineering Courses Through a Solar Challenge (<https://www.linkedin.com/feed/update/urn:li:activity:7265354279341752320/>)
- Workshop organized on “Develop your own Digital Thermometer using Labview Software”, Nov 15,2024
- MEng in Health, Safety, and Environments Engineering (HSEG): integrates interdisciplinary learning by forming collaborative teams that include professionals from various industries such as engineering, healthcare, safety, and environmental science. The teams work on hands-on practical projects.
- MEng in HSEG: integrates modern educational technologies to enhance learning and accessibility. This includes the use of online learning platforms, virtual labs, and simulation tools.



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Teaching innovations

Some of the teaching innovations that the Biomedical Engineering and Biotechnology Department uses include:

- **Flipped Classroom:** Students review lectures at home and engage in interactive activities in class.
- **Gamification:** Incorporates game elements like points and badges to motivate students.
- **Microlearning:** Breaks down complex topics into smaller, manageable chunks.
- **VR/AR/AI in Education:** Establishment of the MetaHub Lab as an immersive educational environment that uses VR/AR/AI to personalize learning experiences and provide immersive pathways with hands-on experiences and instant feedback.
- **Design Thinking:** Encourages solving real-world problems through structured processes.
- **Blended Learning:** Combines online digital media with traditional classroom methods.
- **Experiential Learning:** Involves learning through project-based learning and direct experience like internships and lab work (e.g., Mubadala-funded)
- **Personalized Learning:** Tailors education to meet individual student needs.
- **Active Learning:** Engages students in activities like discussions and group work during class.
- **Collaborative Learning:** Encourages teamwork and peer-to-peer teaching and learning.

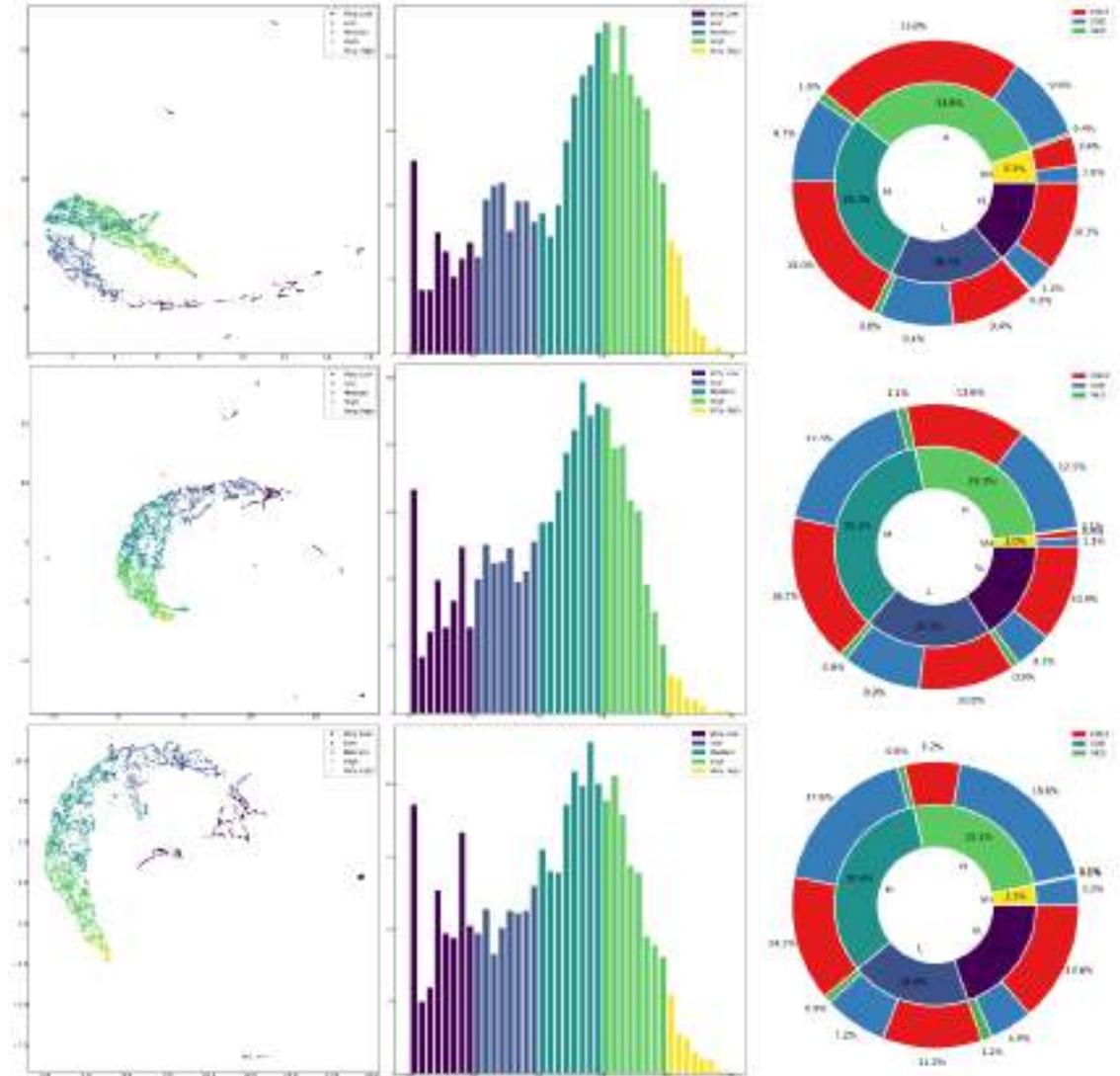
Modeling the students' quality of interaction (QoI) with the Blackboard LMS, the quality of collaboration (QoC), and their affective state (AS) during learning provides tangible metrics for personalized feedback and optimization of the learning experience



EDUCATIONAL EXCELLENCE

Teaching innovations

Innovations-Students' Quality of Interaction (QoI) with Blackboard across three academic years



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Teaching innovations

MetaHub Lab Concept



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Teaching innovations

Novel use of structural magnetic kits for in-class hands-on student learning of the principles of economical and stable design of truss-like structures in the second-year CIVE/AERO/MEEN200 Statics course.



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Student Success

- Dr. Nayfeh published with undergraduate student “ Fatima Al Hosani” a paper entitled Synthesis, Characterization and Antibiofilm Activity Against Pseudomonas Aeruginosa of ZnO-Ag Nanocomposite in the 2024 MRS meeting.
- The undergraduate project “Smart laptop stand with hybrid flywheel battery exercise bike” won 1st prize in the IEEE Student Day 2024. Supervisors are Drs. Tarek Elfouly and Ameena Al Sumaiti.
- 2024 Second Prize Paper Award for an article published in the IEEE Transactions on Industry Applications: A. A. Saafan, V. Khadkikar, M. S. E. Moursi and H. H. Zeineldin, "A New Multiport DC-DC Converter for DC Microgrid Applications," in IEEE Transactions on Industry Applications

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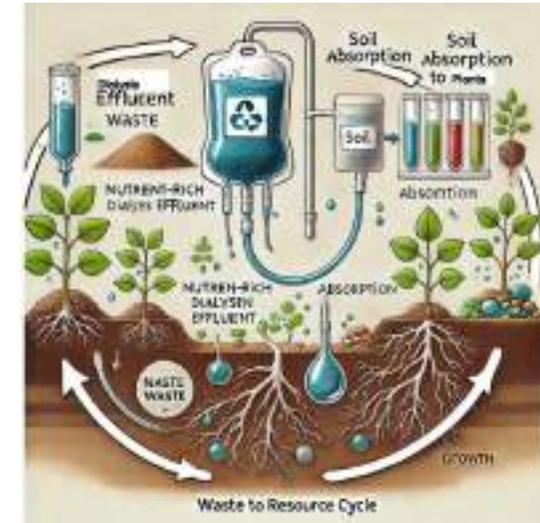
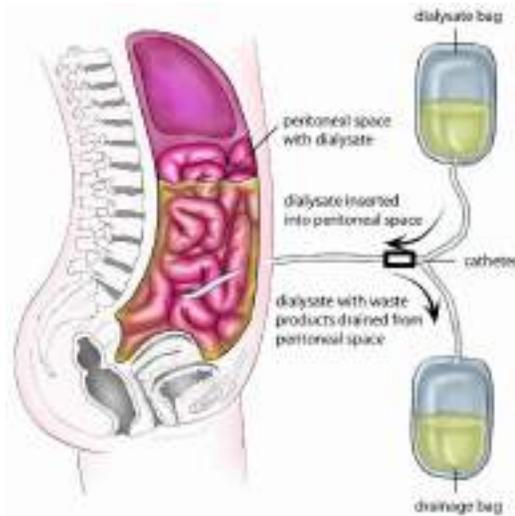


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Student Success

Undergraduate Student Activities: 5 BMED UG students (supervised by Prof. Khandoker) took an initiative on health technology sustainability for Hemodialysis, which is essential for sustaining life but has a high environmental impact due to its carbon footprint and significant water usage. They proposed repurposing spent dialysate fluid, which contains valuable nutrients, as plant fertilizer instead of discarding it, though challenges like high salt and glucose content must be addressed. SEHA Kidney Care in Abu Dhabi accepted the proposal and wants to start the project in June 2025.



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Student Success

Doua Kosaji, PhD student (supervision by Dr Khalaf and Dr Domingues): Competition Science Pitch @ Xpanse 2024, for early-career scientists and graduate students working at the edge of current scientific knowledge with impactful research. Pitch presented at the Science Lightning Pitch session during XPANSE 2024 in Abu Dhabi. Winner (\$5000)



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Student Success

Student Mohammed Khaldoun Al-Zaghir (supervised by Dr AlShehhi) has been selected for showcasing at Research & Innovation Exhibition 2025 to present “IGenRare: An AI Assistant Tool for Rare Genetic Diseases: Early Diagnosis and Management”



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Student Success

Student Eymaan Alhammadi (supervised by Dr AlShehhi) has been selected to showcase "AID: An Intelligent Combat Medic" at IDEX 2025 under the Tawazun Council.



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Student Success

PhD Student Ferial Abu Hantash (supervised by Dr AlShehhi) was honored with the Outstanding Graduate Student Award 2024 for her groundbreaking research in applying Artificial Intelligence (AI) to Alzheimer's disease.



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Student Success

(Biomedical Engineering and Biotechnology)

Students Jawaher Alblooshi, Danah Alhammadi, Alya Alnuaimi, and Meزون Alblooshi (supervised by Dr AlShehhi) have been shortlisted to present at the Al Dhafra Health Forum 2024! They showcased their groundbreaking project, which utilizes Axivity AX3 wristbands for passive, remote functional assessment in neurodegenerative diseases



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Student Success

MedBio Hackathon Competition 2024, students supervised by Dr Elgendi won:
First Place – Moath Sabri and his team;
Second Place – Yousra and Amna;
Third Place – Layan Hattab, Dalya Ahmad, and their team.

Health 2.0 Conference – Young Achiever Award,
Student Aishah Alkindi (supervised by Dr Elgendi) was recognized as the only UAE recipient of the Young Achiever Award at the Health 2.0 Conference in Dubai for her contributions to healthcare innovation.

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Student Success

Deema Islayem (PhD student supervised by Dr Pappa) won 1st place for best oral presentation in The second AAU international conference on Pharmacy and Biomedical Sciences



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QUALITY EDUCATION

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Student Success

Aya Ghazal, ChE – USPTO application for Plasmonic Titanium Nitride-Containing Mixed Matrix Membranes and Related Membrane Distillation Methods

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION# 19/665,067 RECEIPT DATE / TIME 05/15/2024 04:21:06 PM Z ET ATTORNEY DOCKET# 097226-1438375 (008200US)

Title of Invention
PLASMONIC TITANIUM NITRIDE-CONTAINING MIXED MATRIX MEMBRANES AND RELATED MEMBRANE DISTILLATION METHODS

Application Information

APPLICATION TYPE Utility - Nonprovisional Application under 35 USC § 111(a) PATENT# -
CONFIRMATION# 3537 FILED BY Sarah Thompson

PT/APP/19/01/003
Approved for use throughout USPTO - OMB 2011-0002
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Project (No. 0-180), no information is required to be reported to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76 Attorney Docket Number 097226-1438375 (008200US)
Application Number

Title of Invention PLASMONIC TITANIUM NITRIDE-CONTAINING MIXED MATRIX MEMBRANES AND RELATED MEMBRANE DISTILLATION METHODS

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|--------|------------|-------------|-------------|--------|
| | Aya | Issa | GHAZAL | |

Residence Information (Select One) US Resident Non-US Resident Active US Military Service

City Abu Dhabi COUNTRY OF RESIDENCE Country of Residence AC

Mailing Address of Inventor:

Address 1 200 Khalifa University of Science and Technology
Address 2 P.O. Box 127710
City Abu Dhabi State/Province
Postal Code Country of Residence AC

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Student Success

Malak Mohammed Amin
Abu Zaid, ChE – Best
Student Oral Presentation
at UAEGSRC 2024



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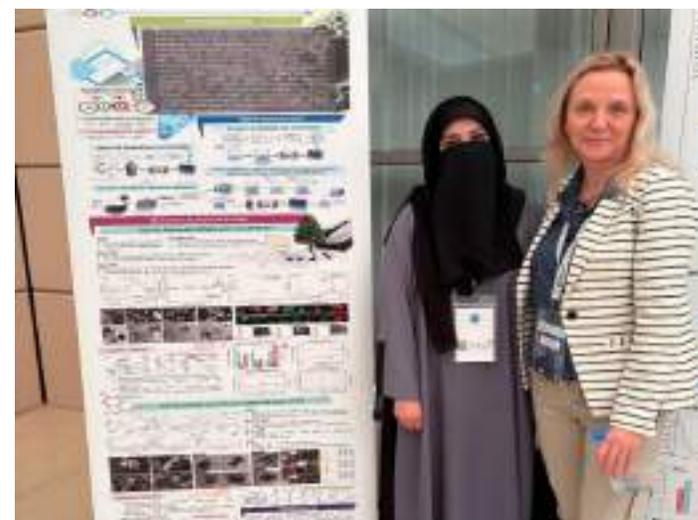


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Student Success

Sadiya Mushtaq, ChE – Best Poster Award during CCB 2025: International Workshop and Symposium on Carbon Capture & Beyond, Feb 26 to 26, 2025



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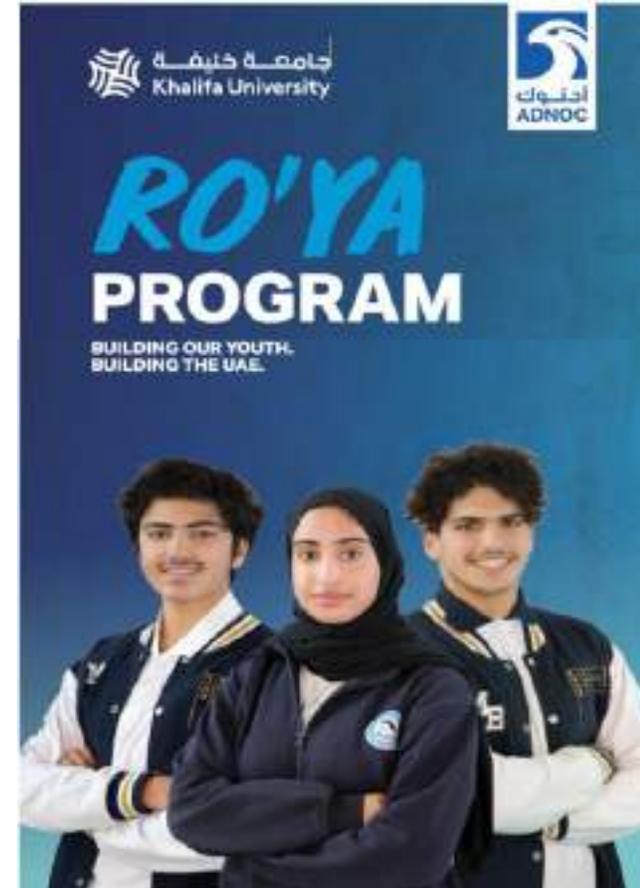
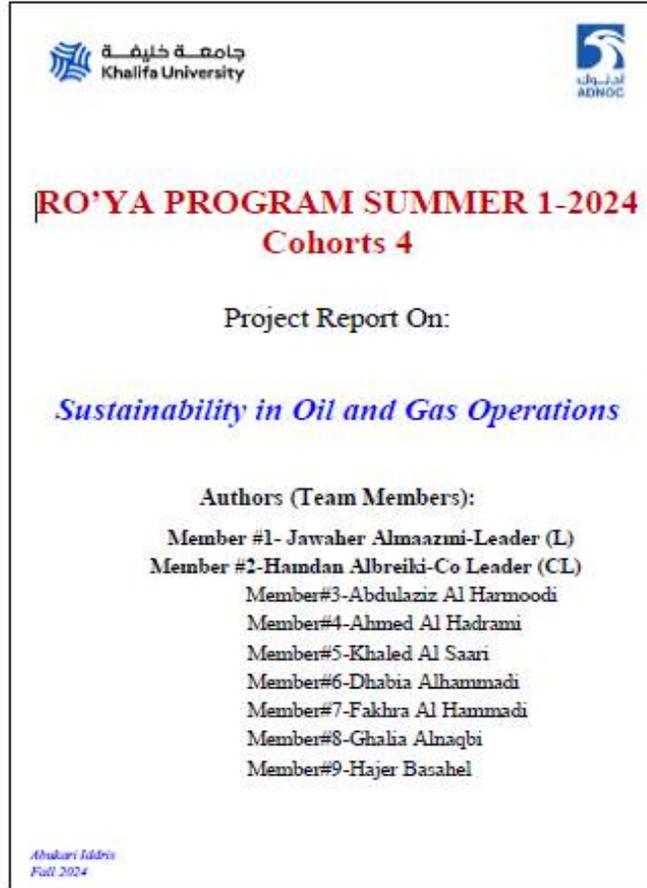
Student Success

- Adeel Ahmad, ChE – Outstanding Graduate Student Award from Khalifa University
- Waleed Diab, PE – Selected to represent the MENA region at the SLB Digital Forum 2024 in Monaco
- Johny Mouallem, PE - won the Experimental Learning Award at KU!
- Nine high school students as part of the KU-ADNOC Ro'ya Outreach Program, Summer 2024, SAN Campus, Khalifa University, participated in a project report work on “Sustainability in Oil and Gas Operations” supervised by PE program
- PE students of SPE KU Student Chapter arranged several initiatives for sustainability
- PE Students and Researchers Participations and winning in GOTECH Hackathon 2024 for AI and ML applications in energy



EDUCATIONAL EXCELLENCE

Student Success





EDUCATIONAL EXCELLENCE

Sustainability Activities



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EDUCATIONAL EXCELLENCE

Hackathon Competition in GOTECH





EDUCATIONAL EXCELLENCE

Student Success

Chemistry Undergraduate Research Projects:

- During the period 2022-2024, 5 Senior Research Projects (SRPs) focused on sustainability, contributing to 20 conference presentations (e.g., “Photocatalytic Degradation,” “Water Purification via Peptide Coacervates”).
- 8 publications linked to SDGs (e.g., clean water, climate action) and two awards won at the Undergraduate Research Competition (URC) organized by Abu Dhabi University.

Chemistry Graduate Research Projects

- 17 sustainability-related PG Chemistry theses (11 PhD, 6 MSc) were initiated from 2022-2024. They resulted in 6 publications, 32 conference presentations, and 4 awards involving Chemistry students, including the L’Oreal UNESCO Award for 2024, which was won by PhD Chemistry student Israa Othman.

Undergraduate and graduate projects contributed to green initiatives like sustainability posters, COP28 and potential IPs/startups.

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EDUCATIONAL EXCELLENCE

Student Success



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EDUCATIONAL EXCELLENCE

Scholarship programs

- KU offers scholarships for undergraduate and graduate studies for all students (<https://www.ku.ac.ae/scholarships>)
- KU undergraduate students, both national and international, can apply to receive full or partial scholarships depending on their qualifications (<https://www.ku.ac.ae/undergraduate-scholarships>)
- KU graduate students, both national and international, can apply to receive full or partial scholarships depending on their qualifications and level of the program (Master's/PhD) they would like to study (<https://www.ku.ac.ae/scholarships-postgraduate>)

Inclusive education

KU accepts students to its programs, both undergraduate and postgraduate, regardless of their nationality, gender, religion, ethnicity, faith, identity, disability, or background. (<https://www.ku.ac.ae/undergraduate-catalog>) & (<https://www.ku.ac.ae/graduate-catalog>)

Distance learning

Master's programs that are delivered completely or partially through distance learning are under development.

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EDUCATIONAL EXCELLENCE

Lifelong Learning

Professional Development

- Engaged students and Organized the 17th International Workshop on Variable Structure Systems (VSS2024) at KU on Oct 21,2024 (pictures attached).
- Engaged students and Organized 2024 6th International Conference on Smart Power & Internet Energy Systems, Dec 4-6,2024 (SPIES 2024).
- Coursera courses in AI and Biomedical Engineering
- 5th International Water Energy NEXUS Conference, hosted by the Center for Membranes and Advanced Water Technology (CMAT), Yas Conference Center from 17th to 19th Feb 2025
- 3rd International Greenering Conference, KU main campus from 12th to 14th Feb 2025
- 1st Middle East Chemical Engineering Symposium, KU main campus
- 1st IEEE International Middle East Conference on Communications and Networking-2024
- 18th International Conference on Nanostructured Materials (NANO 2024)
- IEEE International Conference of Artificial Intelligence Circuits and Systems (AICAS) 2024
- The 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024)



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Lifelong Learning

Professional Development Certified Carbon Literacy Program

- Organized the first Carbon Literacy Program, a certified training by the UK Carbon Literacy Project.
- The program equips students with knowledge, skills, and motivation to take meaningful action on climate change.
- Impact: 17 students completed the training and received official certification.



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Lifelong Learning

Community Education

- Field Trip for Undergraduate students to see DEWA solar system (pic attached).
- Course ECCE 426 Electric Drives and Renewable Energy Invited talk by Industry (Eng. Islam Y. Hegazy, Regional Product Line Manager, Industrial Control Division, Eaton)
- Course ELEN 421 Power System Analysis Invited talk by Industry (Dr Bruce Stedall, TRANSCO)
- SDP project “Powering Future Residences: Sustainable Energy Solutions for Female Accommodation” led by Dr. Khaled involved industry participation (Eng. Yasser Al Kuwaiti (Adnoc))
- SDP project “Small targets classification and position mapping using Thermal Camera Core with AI capabilities” led by Dr. Omar involved Dr Ilija Popadic (Vlatacom Institute)





EDUCATIONAL EXCELLENCE

Lifelong Learning

Community Education

- Biomedical Engineering INTERACTION series: This series includes seminars and exhibitions aligning academic programs with labor market needs and advances in Biomedical Engineering and Biotechnology.
- Biomedical Engineering Education Community (BEEC): An IEEE EMBS community supports BME educators through events and discussions to enhance skills in AI, technology, data visualization, and health research.
- RICH (Research and Innovation Center on CO2 and Hydrogen) Center Open Day on 11th February 2025, in conjunction with Women and Girls in Science and Inventors Day
- Desalination Hackathon, 7th Dec 2024, Khalifa University, Arzanah Building, co-organized with ACWA POWER and the International Desalination Association.
- KU-ADNOC Ro'ya Outreach Program, Summer 2024, SAN Campus, Khalifa University, Petroleum Engineering (PE) program participated in providing lectures and hands-on lab sessions on Introduction to PE and Energy, to elite 10-Grade UAE High school students
- PE arranged several awareness sessions at SAN Campus of Khalifa University to attract students to the petroleum engineering major
- PE and ChE students participated and volunteered in all Abu Dhabi municipality activities, such as beach cleaning, mangrove planting, and around the mosques planting to ensure a healthy and sustainable environment in Abu Dhabi



EDUCATIONAL EXCELLENCE



A promotional poster for the 'First Global Hackathon for Sustainable Water Desal and Reuse'. The background is a teal-to-blue gradient. At the top, logos for IDRA, ACWA POWER (كووا باور), and CMAT (Center for Membranes and Advanced Water Technology) are displayed. The main text reads 'First Global Hackathon for Sustainable Water Desal and Reuse' and 'Addressing Water Scarcity'. Below this, it says 'Registrations are now open' with the URL 'https://desalhack.com/'. At the bottom, event details are listed: 'December 7th, 2024' and 'SAN Campus, Khalifa University, Abu Dhabi, United Arab Emirates'. On the right side, there is a photograph of a worker in a hard hat and safety gear looking out over an industrial facility.

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RICH CENTER OPEN DAY



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PE AWARENESS SESSIONS



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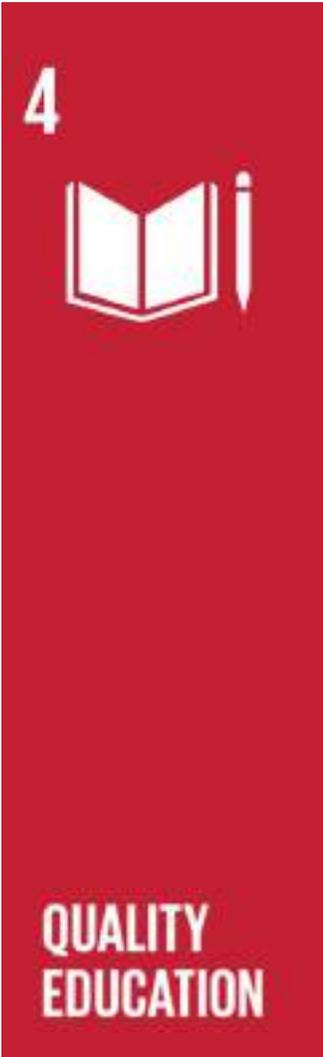
EDUCATIONAL EXCELLENCE

Lifelong Learning

Community Education

- AI for a Sustainable Future winter camp: it introduced fundamentals of AI to high school students. It had them engaged in practical sessions (Grand Challenge) to apply AI to classify objects as sustainable or non-sustainable, demonstrating real-world applications of AI for sustainability.
- Chemistry Department School Visit Program: Engaged 2,329 students across 10 schools in 2024 (e.g., Brighton College, Al Ittihad), with faculty showcasing chemistry careers and lab skills (e.g., IR spectroscopy).
- Chemistry Forensic Field Trips: Organized four trips (2021-2024), with the 2024 Dubai Police visit engaging 6 senior students in hands-on forensic experiments.
- Earth Science activities include:
 - Presentation at Yas Sea World (Dr. Ahmed Osman)
 - EAD Green Youth Majlis Talk (Dr. Aisha)
 - Arctic Circle Forum at Sustainability Week (Dr. Aisha)
 - Dr. Diana & Dr. Aisha are on the UAE Climate Task Force





EDUCATIONAL EXCELLENCE

Lifelong Learning

Executive Education

- Internships via Healthcare Industry Collaborations focused on practical skills and knowledge that can be immediately applied in the workplace. These opportunities connect the trainees with the industry to advance their careers, often into leadership or executive roles.
- Meet-the-experts: focused seminars/lectures from experts in healthcare business topics through biomedical engineering and biotech lens, including funding strategies, product development, and intellectual property protection, enhancing leadership role skills.