



### **KU FORWARD GLOBAL** 2021







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### Khalifa University Experience



"Khalifa University is providing me with the complex problem-solving skills, analytical thinking abilities, awareness of sustainability, and technical computing skills that I know will contribute to my successful future."

Marios Papadovasilakis, PhD Student in Electrical and Computer Engineering



"At Khalifa University, I enjoy the stimulating experience of collaborating with a brilliant and diverse mix of professors and students every day, and I'm constantly encouraged to push boundaries, adopt new ways of thinking, and innovate."

Ahmed Baobaid, BSc student in Industrial and Systems Engineering



"Khalifa University provides me with the perfect combination of deep technical skills through coursework and research, along with a breadth of knowledge through engaging campus activities and internships."

Layla Dawood Adnan Dawood Almardoud, BSc Student in Biomedical Engineering



"Khalifa University is emerging as a research hub with strong links to industry and government. It is immensely rewarding and gratifying to be part of a research community representing the nation's top talent that targets scientific excellence and stakeholder value creation"

**Dr. Nawaf Almoosa,** Director of Emirates ICT Innovation Centre (EBTIC) and Assistant Professor of Electrical and Computer Engineering



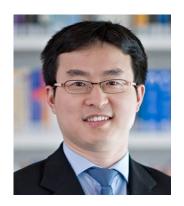
"Working on cutting edge health-related projects on issues that are important to the UAE, and being a mentor and teacher to the next generation of biomedical scientist, has been most rewarding. These opportunities provided by Khalifa University have enriched my research career as well as my personal life."

Dr. Habiba Alsafar, Acting Associate Dean for Student Affairs, College of Medicine and Health Sciences, Associate Professor of Genetics and Molecular Biology, and Director of Center for Biotechnology



"The new KU and its research environment is like nothing else in the UAE – bringing together the broadest and deepest scientific expertise and best quality research facilities across a diverse set of disciplines."

Dr. Steve Griffiths, Senior Vice President, Research and Development



"At Khalifa University, my students and I are partners as we learn together, brainstorm together, research together, fight together, excel and cheer together."

**Dr. Tiejun Zhang**, Associate Professor of Mechanical and Materials Engineering

## Executive Vice President's Message

### Continuing the Momentum



**Dr. Arif Sultan Al Hammadi**Executive Vice President
Khalifa University of Science
and Technology

At Khalifa University of Science and Technology, we have so much to celebrate. The collaborative efforts of our diverse group of renowned faculty and top students have led us to be placed in the top 30 out of 417 Asian universities in the latest 2019 Times Higher Education Asia University Rankings. Year on year, as we climb higher in the global rankings, we continue to validate Khalifa University's research capabilities, faculty expertise and modern cutting-edge facilities that encourage innovation.

We are committed to evolving with the UAE's changing strategic needs, and as such, we deliver pioneering research and innovations in key areas of strategic relevance, including clean and renewable energy, water and environment, hydrocarbon exploration, artificial intelligence and robotics, healthcare, aerospace and advanced materials.

Throughout the years, I have witnessed the continuous dedication of KU's faculty and staff to ensuring our graduates are fully equipped with the knowledge and skills needed to succeed in the professional world. And I believe that our collaborative efforts have resulted in an improvement in the caliber of our students' research outputs over the years.

Khalifa University is undoubtedly part of something unprecedented. As the top-ranked university in the country, we are at the forefront of the UAE's knowledge economy transformation, pushing the boundaries of science, research and education, and producing the next generation of leaders who will guide and nurture the UAE towards its next phase of prosperity.

I am confident that we will continue the momentum and engagement that has enabled our success and recognition over the years, and continue to answer the call of the UAE leadership.







"Education is like a lantern which lights your way in a dark alley."

Sheikh Zayed bin Sultan Al Nahyan, UAE Founding Father

### **History**

Khalifa University of Science and Technology can trace its origins back to 1989, when Etisalat University College was established by the Emirates Telecommunications Corporation, the UAE's telecommunication provider, in Sharjah, UAE, to develop a pipeline of human capital in the fields of engineering and applied sciences.

Eleven years later, the Petroleum Institute was established as an international educational and research center for the oil and gas industry. Funded by the Abu Dhabi National Oil Company (ADNOC) and its international partners, the Petroleum Institute graduated its first group of engineers in summer 2006 and witnessed the enrolment

of the first female students in the fall of the same year.

In 2007, Khalifa University of Science, Technology and Research (KUSTAR) was established by Presidential decree to offer a broader range of engineering programs to the nation's budding engineers. The same year, Etisalat University College was acquired by KUSTAR. Also in 2007, the Masdar Institute of Science and Technology was established by Presidential decree, as the region's first research-intensive, graduate-level university focused on advanced energy and sustainable technologies.

In 2017, UAE President and Ruler of Abu Dhabi, His Highness Sheikh



1989
Etisalat University
College Established



2000
Petroleum Institute
Established

Khalifa bin Zayed Al Nahyan, issued a decree to merge KUSTAR, Masdar Institute and Petroleum Institute under one university called the Khalifa University of Science and Technology.

Khalifa University is now a comprehensive research-intensive university with three colleges, three research institutes, 18 research centers, and 36 departments covering a broad range of disciplines in science, engineering, and medicine. It will continue to evolve with the UAE's rapidly developing national goals and needs and nurture the innovation ecosystem required for the country's targeted knowledge economy transformation.





2007

Khalifa University of Science, Technology and Research (KUSTAR) and Masdar Institute of Science and Technology Established



2017

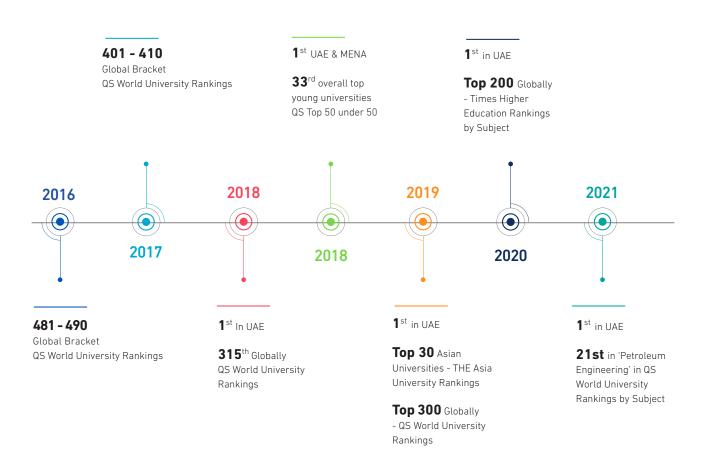
KUSTAR, Petroleum Institute and Masdar Institute merge into one university

### KU at a Glance

The internationally top-ranked Khalifa University is the one university in the UAE with the research and academic programs that address the entire range of strategic, scientific and industrial challenges facing the UAE's knowledge economy transformation and our rapidly evolving world.

Its world-class faculty and state-of-the-art research facilities provide an unparalleled learning experience to students from the UAE and around the world. The university brings together the best in science, engineering and medicine in the UAE, to offer specialized degrees that can take promising high school graduates all the way to top-rated doctorate degree holders.

### **Rankings**





### **Faculty**





Student to faculty ratio

### **Students**

Khalifa University is an international university, with enrolment from all over the world.



53+
Nationalities



**40%**Male



60% Female



5,000 +

### Research Impact

18

Research Centers

167+

Issued Patents

9,000 +

Articles

3,795+

Conference papers

310 +

Books and Book chapters

101,635+

Citations

10.1

Citations Per Publication

40%

of publications in top 10% of scientific journals (in 2019)

**1** st

Ranked 1st in the UAE for three years in row (2016-2019) by the Times Higher Education (THE) World University Rankings 2019



### **KU Strategy** 2018 – 2022

Khalifa University strives to be a catalyst to the growth of Abu Dhabi and the UAE's rapidly developing knowledge economy, an education destination of choice, and a global leader among research intensive universities of the 21st century.

The University has identified the following strategic priorities:

- Prepare future leaders to an internationally recognized standard
- Produce world-class research with local relevance and international impact
- Enrich the national economy through innovation and research commercialization.



### **Partnerships**

Khalifa University enjoys over 200 active relationships and strategic partnerships with a number of private, public and academic organizations from around the world. These partnerships provide academic opportunities, such as student exchanges, student sponsorships, and internship programs, and joint research opportunities, such as collaborations.

Collaborations with educational institutions include, but are not limited to: Georgia Tech, the University of Tokyo, the University of Western Australia, Korea Advanced Institute of Science and Technology (KAIST), Massachusetts Institute of Technology (MIT), Texas A&M University, Tsinghua University, and the University of Naples Federico II.

Partnerships with government and industry organizations include, but are not limited to: Alibaba Cloud, ADNOC, the International Atomic Energy Agency, Boeing, BP, Emirates Global Aluminum, Total, Yahsat and Etihad Airways.



#### RESEARCH COLLABORATIONS

- Agreement on a Joint Lab for Embodied Artificial Intelligence with the Universita Degli Studi di Milano / Scuola Superiore Sant'Anna
- Twinning Agreements with King Fahd University of Petroleum and Minerals and King Abdulaziz University
- Joint Research Collaboration with Tsinghua
  University
- Established the Korea-UAE Joint Technical Center (KUST) and KU-KAIST Joint Research Center
- Joint Research Collaboration with Moscow Power Engineering Institute (National Research University)
- Collaboration with Mayo Clinic to support College of Medicine and Health Sciences

#### STUDENT EXCHANGE PROGRAMS

- 7 Boston University 10 University of California
- 8 Colorado School of Mines 11 University of Maryland
- 9 Stanford University 12 China University of Petroleum









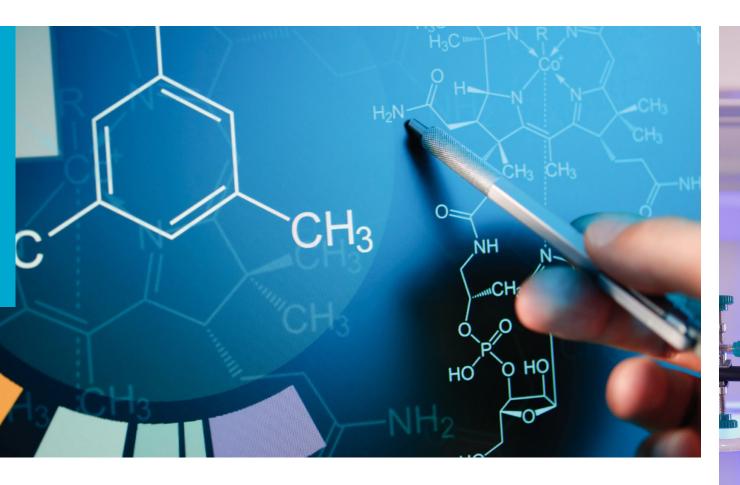
### College of Engineering

The College of Engineering serves Abu Dhabi, the nation, and the world by providing students with an education underpinned by the principle of engineering with a purpose, to empower them to be leaders in discovering new knowledge as a catalyst for business innovation. In support of this, the College conducts cutting-edge fundamental, multidisciplinary and translational research in strategic areas such as information and communication technology, aerospace, transport and logistics, healthcare, and energy and the environment.

The College of Engineering comprises the following 9 Academic Departments:

- Department of Aerospace Engineering
- Department of Biomedical Engineering
- Department of Chemical Engineering
- Department of Civil Infrastructure and Environmental Engineering
- Department of Electrical Engineering and Computer Science
- Department of Industrial and Systems Engineering
- Department of Mechanical Engineering
- Department of Nuclear Engineering
- Department of Petroleum Engineering

The College of Engineering offers 10 Bachelor's Degree Programs, 15 Master's Degree Programs and a PhD Program in Engineering, with 11 concentrations.



### College of Arts and Science

The College of Arts and Science works towards achieving a sustainable knowledge-based economy as outlined in Abu Dhabi Vision 2030, by advancing the discovery of new knowledge, its dissemination and exploitation. The College is a vibrant community of academic scholars, students and staff who are dedicated to science education and innovation for the ultimate benefit of society. It seeks to empower its students with a great sense of purposeful academic curiosity and appreciation of the social and environmental context within a rapidly changing world.

The College of Arts and Sciences comprises the following seven Academic Departments:

- Department of Chemistry
- Department of Earth Science
- Department of English
- Department of Humanities and Social Sciences
- Preparatory Program
- Department of Mathematics
- Department of Physics

The College of Arts and Sciences offers 6 Bachelor's Degree Programs, 3 Master's Degree Programs and 5 PhD Programs.







### College of Medicine and Health Sciences

The newly established College of Medicine and Health Sciences at Khalifa University, the first medical college based in Abu Dhabi and the first four-year, post-baccalaureate MD program in the UAE, is responding to the challenge of developing world-class healthcare in Abu Dhabi, the United Arab Emirates and the region. The College of Medicine and Health Sciences currently offers one Doctor of Medicine (MD) program.

The College of Medicine and Health Sciences comprises 20 Academic Departments.

- Department of Anatomy and Cellular Biology
- Department of Anesthesiology
- Department of Emergency Medicine and Critical Care
- Department of Epidemiology and Public Health
- Department of Family Medicine
- Department of Immunology and Physiology
- Department of Medicine
- Department of Molecular Biology and Genetics
- Department of Neurology
- Department of Neurosurgery
- Department of Obstetrics and Gynecology
- Department of Ophthalmology
- Department of Orthopedic Surgery
- Department of Pathology
- Department of Pediatrics
- Department of Pharmacology
- Department of Psychology and Behavioral Health
- · Department of Radiology and Medical Imaging
- Department of Surgery
- Department of Urology



### **Undergraduate Education**

Undergraduate degrees from Khalifa University of Science and Technology are designed to equip graduates with the necessary skills and knowledge that are highly sought-after in today's job market. Khalifa University has granted over 3,200 bachelor's degrees to qualifying undergraduate students.

Khalifa University offers 16 Bachelor's degree programs, some of which list optional concentrations.

### **UNDERGRADUATE PROGRAM**

### **College Of Engineering**



Bachelor of Science in Aerospace Engineering



Bachelor of Science in Chemical Engineering

Bachelor of Science in Civil Engineering

Bachelor of Science in Computer Engineering

Software Systems Concentration

- Bachelor of Science in Computer Science
  - Artificial Intelligence Concentration
  - Cybersecurity Concentration

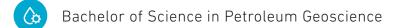
Bachelor of Science in Electrical Engineering





Bachelor of Science in Petroleum Engineering

### **College Of Arts And Sciences**





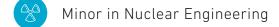
Σ Bachelor of Science in Applied Mathematics and Statistics



Bachelor of Science in Earth and Planetary Sciences

Bachelor of Science in Cell and Molecular Biology

### Minors Offered By Khalifa University



Minor in Artificial Intelligence

Minor in Mechatronics

Minor in General Business

Minor in Digital Media and Composition

#### Accreditation



All academic programs at KU are accredited with the Commission for Academic Accreditation of the UAE Ministry of Education and Accreditation Board for Engineering and Technology, Inc. (ABET) accreditation for the new programs is underway, with 86% of undergraduate programs having received or are eligible for ABET accreditation.

### **Graduate Education**

Khalifa University's interdisciplinary MSc and PhD programs are focused on the skills and sectors in greatest demand regionally and internationally. Our internationally-renowned faculty give students hands-on training and guidance to become world-class problem-solvers. Students work in our cutting-edge labs and on-site with our industry partners to hone their scientific and technical skills. To date, Khalifa University has awarded over 1,800 master's and doctoral degrees to qualifying students.

The University offers 17 Master's degree programs, of which some offer optional concentrations, and 6 PhD degree programs, one of which offers eleven optional concentrations, and one Doctor of Medicine program.

#### Master's Program



- Master of Science in Biomedical Engineering
- Master of Science in Chemical Engineering
- Master of Science in Computer Science
- Master of Science in Electrical and Computer Engineering
- Master of Science in Civil and Infrastructural Engineering Program
- Master of Science in Engineering Systems and Management
- Master of Science in Cyber Security
- Master of Science in Materials Science and Engineering
- Master of Science in Mechanical Engineering
- Master of Science in Nuclear Engineering (offered for UAE and Saudi nationals only)
- Master of Science in Petroleum Engineering



Master of Science in Sustainable Critical Infrastructure



Master of Science in Water and Environmental Engineering



Master of Engineering in Health, Safety and Environmental Engineering



Doctor of Philosophy in Engineering

- Aerospace Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Infrastructure and Environmental Engineering
- Electrical Engineering and Computer Science
- Engineering Systems and Management
- Material Science and Engineering
- Mechanical Engineering
- Nuclear Engineering (offered for UAE and Saudi nationals only)
- Petroleum Engineering
- Robotics

### **College Of Arts And Sciences**



Master of Arts in International and Civil Security (Program offered to UAE Nationals only.)



Master of Science in Applied Chemistry



Master of Science in Petroleum Geoscience



Doctor of Philosophy in Petroleum Geoscience



Doctor of Philosophy in Science \* Pending CAA/UAE Ministry of Education accreditation

- Physics
- Chemistry
- Mathematics
- Earth Sciences



### **PhD Programs**

### **College Of Engineering**



Doctor of Philosophy in Engineering

- Aerospace Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Infrastructure and Environmental Engineering
- Electrical Engineering and Computer Science
- Engineering Systems and Management
- Material Science and Engineering
- Mechanical Engineering
- Nuclear Engineering (offered for UAE and Saudi nationals only)
- Petroleum Engineering
- Robotics

### **College Of Arts And Sciences**



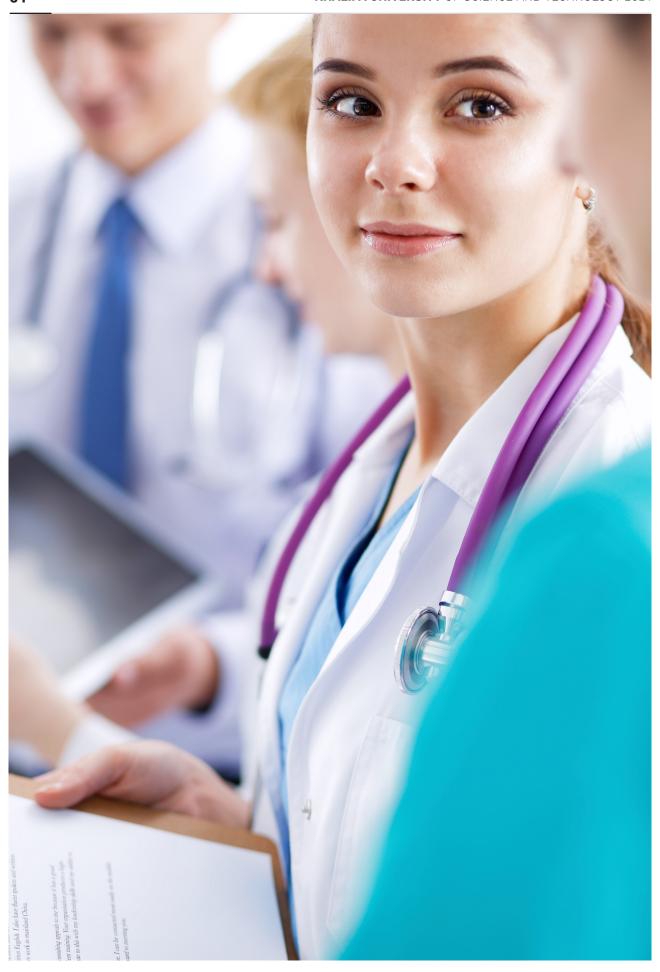
Doctor of Philosophy in Science \* Pending CAA/UAE Ministry of Education accreditation

- Physics
- Chemistry
- Mathematics
- Earth Sciences

### **College Of Medicine And Health Sciences**

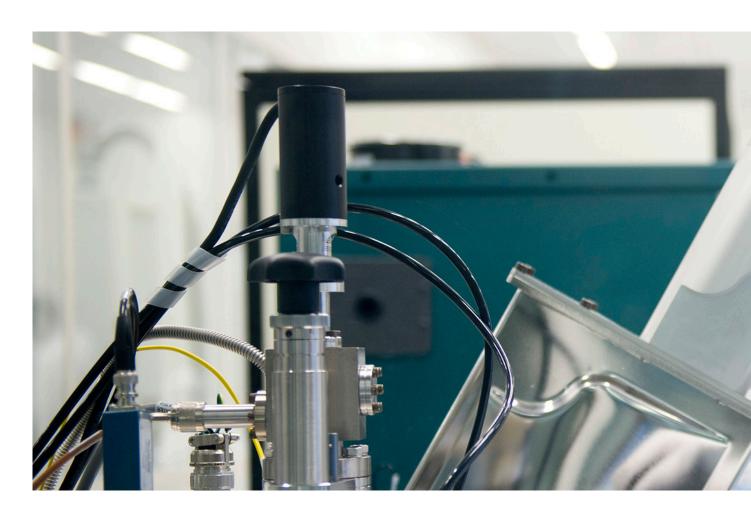


MD in Medicine









Khalifa University is home to the UAE's leading research centers, many of which are housed in the university's research institutes. KU research centers address regional and global challenges in a systematic and targeted manner via engagement of world-class researchers and facilities. These research centers are at the heart of KU's global leadership in use-inspired research.

Khalifa University has three flagship research institutes - the Masdar Institute, the Petroleum Institute, and the Robotics and Intelligent Systems Institute – that serve as interdisciplinary research units focused on long-term strategic priorities. The Masdar Institute focuses primarily on sustainable energy, water and the environment; the Petroleum Institute focuses primarily on upstream and downstream hydrocarbon exploration and production; and the Robotics and Intelligent Systems Institute focuses primarily on robotics, intelligent systems, data science, and information and communication technologies.

KU's focus sectors are Clean and Renewable Energy, Hydrocarbon Exploration and Production, Water and Environment, Health, Aerospace, and Supply Chain and Logistics. Research in these sectors is enhanced by our research platforms of Robotics, Intelligent Systems and Data Science, Information and Communication Technologies and Advanced Materials and Manufacturing.

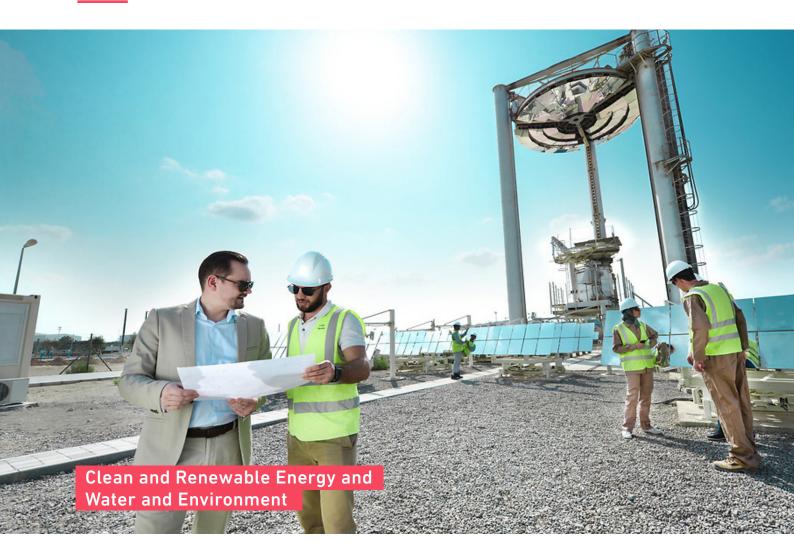


Addressing national priorities and building on established strenghs



# focused on cross-cutting critical enablers in which KU has competitive advantage Information and communication Technologies (ICT) Robotics, Intelligent Systems and data science Advanced materials and manufacturing

### Research Institutes at Khalifa University



### Masdar Institute

focused on clean energies, sustainability, and environmental research

Emirates Nuclear Technology Center (ENTC)

Providing risk-informed decision bases for safe operation of UAE's peaceful nuclear power plants.





Advanced Power and Energy Center (APEC)

Crafting the future of power systems; supporting hybrid AC/DC grids, and providing optimal architecture for smart grid and transportation electrification.



Sustainable Bioenergy Research Consortium (SBRC)













Advancing the development of sustainable aviation biofuels; deriving alternative fuels from halophytic (saltwater tolerant) plants.

Center for Membranes and Advanced Water Technology (CMAT)
 Advancing the development of water technologies and hybrid systems; nanomaterials and membranes; energy efficiency and sustainability of water processes; and tech transfer and capacity building in desalination & water technology.



## **Petroleum Institute**

focused on research for the oil and gas industry and with broader applications in energy and industry

- Center for Catalysis and Separation (CeCaS)

  Addressing broad industrial catalysis challenges in membranes, reactors, materials, and renewable energy.
- Research and Innovation Center on CO2 and Hydrogen (RICH)
  Researching and developing novel carbon capture and utilization (CCU) technologies as well as hydrogen production, storage and distribution.



### Robotics and Intelligent Systems Institute

focused on research for next generation digital technologies

### Center for Autonomous Robotic Systems (KUCARS)

Researching the three frontier robotics application themes: Robotics for Extreme Environments; Robotics for Industrial Applications; and Robotics for Infrastructure Inspection.

### Center for Cyber-Physical Systems (C2PS)

Researching the themes of Cybersecurity, Big Data Analytics and Machine Intelligence, Networks and Communication Technology, and Computation Architectures.

#### System-on-Chip Center (SoCC)

Researching and developing integrated SoC solutions for various applications targeting near market research.

#### • Emirates ICT Innovation Center (EBTIC)

Advancing intelligent systems technologies for Next Generation Networks (NGNs) and NGN-enabled ICT applications and services that enable the digital economy in the UAE.







Khalifa University – Korea Advanced Institute of Science and Technology (KU-KAIST)
 Center for 4th Industrial Revolution

Carrying out joint research on technologies that are shaping the Fourth Industrial Revolution, particularly in the areas of Smart Transportation and Smart Healthcare.

# **Other Research Centers**



### Healthcare

- Center for Biotechnology (BTC)
   Researching in the areas of genomics, bioinformatics and systems biology to understand and describe risk factors with impact on the major chronic diseases of the UAE population, in particular diabetes, cardiovascular disease and cancer.
- Healthcare Engineering Innovation Center (HEIC)
   Developing novel methodologies,

devices, and tools for the diagnosis, intervention/treatment, and rehabilitation of the wide spectrum of health challenges associated with cardiovascular disease.



## **Supply Chain and Logistics**

 Research Center for Digital Supply Chain and Operations Management (DSOM)

Researching digital supply chains and associated analytics, knowledge generation and knowledge management.



# Aerospace (Aero/Astro)

 Aerospace Research and Innovation Center (ARIC)

Engaging in cutting-edge research in advanced materials, robotics and digital technologies for aerospace manufacturing.



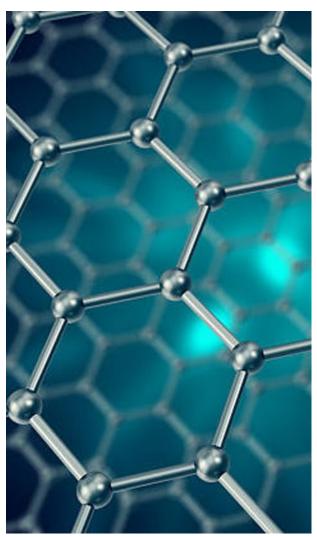


 Khalifa University Space Technology and Innovation Center (KUSTIC)
 Researching the space sector and critical applications, including space mission development, and enhancing satellite manufacturing capabilities in



the UAE.





# Advanced Materials and Manufacturing

Advanced Digital & Additive
 Manufacturing (ADAM) Center
 Developing advanced materials
 through fundamental and applied
 research directed toward additive
 manufacturing.

 UAE-Korea Joint R&D Technical Center (KUTC)

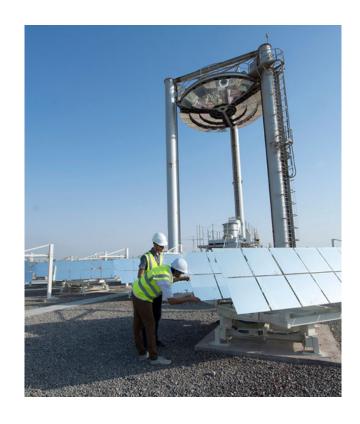
Developing advanced materials in energy, oil and gas, and catalysts.

# Research Facilities & Labs

As the UAE's top research university, Khalifa University has 228 labs and some of the region's most advanced research facilities. These include:

### Masdar Institute Solar Platform

Provides critical tools and expertise required to test concentrating solar power (CSP) and thermal energy storage (TES) systems at the one-of-a-kind 100 kW beam-down CSP facility.





### Region's First Cleanroom

Provides the ultra-clean environment and photolithography tools needed for advanced microelectronics research and small-scale production.



# ADNOC Research and Innovation Center (ADRIC)

39 discrete state-of-the-art topical laboratories, grouped under nine themes, to offer a multi-user environment for faculty, researchers and students.

### High Performance Computing Cluster Approximately 300 Teraflops of computing capability distributed between both CPU and GPU nodes.



### Microscopy Facility

World-class Electron Microscopes are critical for much of the research ongoing at Khalifa University and its world-class electron microscopy facility is one of the more widely utilized core laboratory facilities.







# Study Abroad Experiences

The study abroad program offers semester-abroad opportunities for UAE national Sophomore and Junior students at some of the most internationally recognized universities around the world.

Students who apply for a study abroad opportunity have the chance to:

- Experience life on other campuses
- Learn about new cultures and environments
- Add to their well-rounded education
- Develop professional opportunities

# **Internships**

All students at Khalifa University undertake an 8-week internship, where they get the opportunity to explore the different perspectives of their major outside of the classroom. KU students intern at large local and global companies, including IBM, Siemens and the Abu Dhabi National Oil Company (ANDOC).

Eligible students are offered international internship opportunities in Japan through the Japan International Collaboration Center (JICE) program. The program provides students with an exceptional technical and cultural learning experience, and offers internships at companies like Chiyoda Corporation and Mitsubishi Heavy Industries.





Khalifa University is a multi-campus, urban university, located across two campuses in the UAE's capital of Abu Dhabi making the entire city your campus. Life is very convenient and enjoyable in Abu Dhabi, one of the fastest growing cities, and the safest city in the world.

Abu Dhabi presents a fascinating mixture of tradition and progression. Tracing its rich history back to around 3000 BC, Abu Dhabi maintains a more distinctly Arabian ambiance, while offering fun and entertainment to people of all ages.

The emirate is filled with popular and exciting destinations and activities. Residents and visitors enjoy fine art at the Louvre Abu

Dhabi, formula one racing at Yas Marina Circuit, shopping at Marina Mall and dozens of other malls, beaches at the Corniche, afternoon tea at Emirates Palace, and a host of cultural experiences in Al Ain, which is one of the world's oldest permanently inhabited settlements, and a UNESCO World Heritage Site, and the Heritage Village, which offer glimpses into Bedouin life.

Abu Dhabi boasts one of the world's largest mosques – the Sheikh Zayed Grand Mosque – and one of the world's most sustainable cities – Masdar City. Abu Dhabi is a multicultural cosmopolitan city, with people from all cultures and religions living together in harmony.

