

Bachelor of Science in Mechanical Engineering

كلية العلوم والهندسة
College of Science & Engineering
جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY



Bachelor of Science in Mechanical Engineering

The Mechanical Engineering program offers a comprehensive approach that blends theoretical foundations with practical applications. This approach equips students to tackle contemporary challenges in areas such as mechanics, thermodynamics, materials science, and manufacturing processes.

With an emphasis on collaborative education, training, research, and capacity-building, the program aims to prepare adaptable engineers capable of meeting society's evolving needs and embracing leadership, social consciousness, integrity, and ethics.

Program mission

The Mechanical Engineering program aims to:

- ▶ provide students with a quality education grounded in fundamental principles and engineering practices, preparing them for real-world challenges.
- ▶ empower students with the knowledge, skill sets, and professional attributes to become leaders and innovators in the field of mechanical engineering.
- ▶ serve the industry, government agencies, and local community in Qatar through targeted outreach activities, innovative consulting, and research solutions.

Program structure

The curriculum begins with a strong foundation in mathematics, physical sciences, and core mechanical engineering principles, ensuring students grasp essential concepts. As they progress, they will delve into the fundamentals and methods applicable to analyzing, developing, designing, and operating various mechanical

systems and processes. They gain practical experience through hands-on projects, laboratory work, and industry partnerships, providing real-world insights into the design and analysis of mechanical systems.

The program emphasizes flexibility and interdisciplinary learning, allowing students to customize their education to align with their interests and career goals. As such, students must take at least two courses from their chosen concentration and at least one course from another technical area:

- ▶ Thermofluids and Energy
- ▶ Design, Materials, and Manufacturing
- ▶ Data Science and Applications for Mechanical Engineers

These concentrations provide in-depth expertise and prepare students for successful careers in their chosen fields.

Beyond technical skills, faculty emphasize teamwork, communication, and critical thinking. Through collaborative projects, internships, and experiential learning opportunities, students will learn to approach problems from multiple perspectives and develop innovative solutions.

Curriculum

A full-time program, taught in English over four years, comprising:

- ▶ General educational courses (in humanities, history, business, and creative arts)
- ▶ Mathematics and science courses
- ▶ Core mechanical engineering courses
- ▶ Core curriculum electives
- ▶ General engineering electives
- ▶ English communication electives

Learning pathways

The Mechanical Engineering program helps students tailor their education through three pathways that each leverage the strengths of HBKU's research institutes, the Qatar Foundation multiversity ecosystem, and partner universities:

- ▶ **Professional Pathway:** This pathway prepares students for careers in industry, focusing on the application of AI technologies. Students gain experience through internships, co-op programs, and industry projects, becoming professionals ready to utilize AI in engineering roles.
- ▶ **Innovation and Research Pathway:** This pathway develops students' research skills with an emphasis on AI research. Students have the opportunity to work on research projects with faculty in HBKU's research institutes. They also participate in undergraduate and graduate-level research, attend conferences, and contribute to academic publications.
- ▶ **Entrepreneurship Pathway:** This pathway prepares students to launch their own ventures. Students learn business management, startup development, and innovation strategies. They connect with mentors, incubators, and resources through the university and Qatar Foundation, including Qatar Science and Technology Park, to develop their business ideas.

These pathways allow students to align their education with their specific career goals. This contributes to the college's aim to prepare future leaders with entrepreneurial mindsets that shape novel solutions for positive, global impact.

Program objectives and outcomes

Program educational objectives

The objectives of the Mechanical Engineering program at Hamad Bin Khalifa University are for graduates to:

- ▶ Be successful mechanical engineers in diverse careers while upholding high ethical standards.
- ▶ Be actively involved in professional areas exceedingly critical to national and global progression.
- ▶ Demonstrate continuous improvement through graduate studies, continuing education, and professional development in their discipline or other fields.
- ▶ Continue developing effective teamwork, communication, and leadership skills.

Student learning outcomes

Graduates of the Mechanical Engineering Program from Hamad Bin Khalifa University will be able to:

- ▶ Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- ▶ Apply engineering design to produce solutions that meet specified needs while considering public health, safety, welfare, and global, cultural, social, environmental, and economic factors.
- ▶ Communicate effectively with a range of audiences.
- ▶ Recognize ethical and professional responsibilities in engineering situations and make informed judgments considering the impact of engineering solutions in global, economic, environmental, and societal contexts.
- ▶ Develop and conduct high-impact research, analyze and interpret data, and draw conclusions based on their judgment as engineers.
- ▶ Function effectively on a team, providing leadership, fostering a collaborative and inclusive environment, establishing goals, planning tasks, and meeting objectives.
- ▶ Acquire and apply new knowledge as needed, using appropriate learning strategies.

Study plan

The Mechanical Engineering program consists of 129 credits, designed to equip students with a solid grounding in mathematics, physical sciences, and engineering principles, ensuring they master the essential concepts of mechanical engineering.

Admission and application requirements

Applicants seeking admission to the Bachelor of Science in Mechanical Engineering should have a strong high school academic record with evidence of advanced coursework in math and science. Applicants are required to take the IELTS or TOEFL exam in order to demonstrate their proficiency in the English language. Applicants are highly encouraged to take the SAT or ACT exam.

Application requirements

A completed online application form:
admissions.hbku.edu.qa

Academic transcripts

Final transcripts of all high school years (grades 10, 11, and 12) that are available at the time of application. Transcripts in languages other than Arabic or English must be accompanied by an official translation. Applicants should submit a copy of their high school transcripts as part of the online application. Applicants who are admitted to the program based on copies of or incomplete transcripts will be required to provide original transcripts upon enrollment in order to register for classes.

Standardized test results

Official copies of standardized test results must be sent directly to HBKU. Please refer to the institutional codes below:

- ▶ SAT: 7675
- ▶ ACT: 7019
- ▶ TOEFL: 4981

- ▶ IELTS: No code required. Students should ask the IELTS center where they tested to send the IELTS TRF to Hamad Bin Khalifa University.

Applicants should also submit copies of their test scores as part of the online application.

Letters of recommendation

Applicants should provide two letters of recommendation, including one from the school counselor, and one from a math or science teacher. Applicants should include their referees' names and email addresses in the online application. Referees will receive an email requesting them to complete their references.

Personal statement of interest

Applicants should submit a personal statement as part of the online application. The personal statement should explain why the student is applying for the undergraduate major in Mechanical Engineering, and how this will contribute to their future goals (minimum of 300, maximum of 500 words).

Resume/Curriculum vitae

Applicants should submit their resume or CV as part of the online application, including academic and extracurricular achievements, such as honors, awards, leadership, volunteer work, athletic involvement or any other relevant activities. Applicants are highly encouraged to mention hobbies and personal talents as well.

Identification document

All applicants should submit an electronic copy of their passport as part of the online application. Nationals and Residents of Qatar should also submit their valid Qatari ID.

Student funding

For information about student funding opportunities, please visit: <https://www.qf.org.qa/education/higher-education/financial-aid>