Mechanical Engineering

Educational Objectives

The bachelor's degree program provides a professional and application-oriented scientific education, and enables students to gain fundamentals of mathematics, natural sciences and engineering, as well as the in-depth knowledge of specific subjects in Mechanical Engineering. Students can use engineering principles, tools and technologies to identify, formulate and solve engineering problems in mechanical engineering facing the challenges in the future, with the understanding of the impacts in a global and societal context. Students are educated to improve the competence in scientific methodology, research skills, problem solving, creativity, leadership and communication skills in multidisciplinary team, and ability to engage in lifelong learning, with global vision and social responsibility.

The curriculum emphases on fundamental aspects of design, mechanics, materials science, thermal and fluid mechanics, and manufacturing. The program also incorporates courses in electronics, computer programming, automatic control, computer-aided design, research methodology, and multicultural communication. There are also in-depth courses in design and application technologies of vehicle, engine, and energy systems. These courses are taught in theory and also in practice using the experiment and practice platforms in school of mechanical engineering.

The program prepares students to become problem solvers and leaders to contribute to a wide range of industries and businesses, government, and academia. Students will be adaptive learners who continue to grow professionally by obtaining professional registration or certification, or by earning post-graduate degrees.

Core Courses

The curriculum covers the fundamental aspects of design, analysis, and manufacturing in mechanical engineering.

- Courses in natural sciences and mathematics: calculus, chemistry, physics, linear algebra, probability and statistics, and life science.
- Engineering fundamentals: engineering graphics, introduction to engineering, computational methods, research methods, computer-aided design, computer science and programming, electrical and electronics.
- Fundamentals in Mechanical Engineering: static and dynamics, kinematics, materials science, mechanics of materials, electrical and electronics, machine and mechanism design, fluid mechanics, thermodynamics and heat transfer, vibrations, control and instrumentation.
- Major specific courses: energy system, manufacturing, vehicle structure and design, internal combustion engine, engineering economics and management.
- Essential skills in language and communications: international English communication, academic writing, multicultural communication.

Program Outcomes

By the time of graduation, our graduates will have:

1. the ability to use applied scientific knowledge and fundamental engineering knowledge to solve problems in mechanical engineering and related fields.
2. the ability to design and conduct experiments, as well as to analyse and interpret experimental data for mechanical engineering and related applications.
3. the technical ability to design mechanical devices or systems to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. the ability to develop and assess alternative designs of both mechanical and thermal engineering systems based on technical and non-technical criteria including their impact in a global, economic, environmental, and societal context.
5. the ability to use the relevant tools necessary for practice in mechanical engineering and related fields.
6. the ability to recognise and achieve high levels of professionalism in their work.
7. the ability to assume leadership roles, function on multidisciplinary teams, and communicate effectively and persuasively.
8. a critical understanding of ethical responsibility.
9. a knowledge of global and contemporary issues.
10. a recognition of the need for an ability to engage in lifelong learning and development.

Duration and Degree

4 years. Bachelor of Science in Mechanical Engineering

Mechanical Engineering Curriculum

Semester 1			Credit
100172103	工科数学分析 I	Mathematical Analysis for Engineering I	6
100172002	线性代数 B	Linear AlgebraB	3
101190003	大学化学 C （全英文）	General Chemistry C	2
101160504	生命科学基础 B（全英文）	Principle of Life Science B	1
101080081	计算机技术与编程（全英文）	Computer Science and Programming	3
100245105	国际英语交流 I	International English Communication I	2
100270024	思想道德与法治	Morals, Ethics and Law	3
100930005	大学生心理素质发展	Psychological Quality Development of College Students	0
100320001	体育 I	PE I	0.5
101037333	机械工程专业导论（英文）	Introduction to Mechanical Engineering	0
100980003	军事理论	Military Theory	2
100980004	军事技能	Military Training	2
100270014	形势与政策 I	Situation and Policy I	0.25
Total Hours			**24.75**

Semester 2			Credit
100172203	工科数学分析 II	Mathematical Analysis for Engineering II	6
101180111	大学物理 I（全英文）	College Physics I	4
100180116	物理实验 B I	Physics Laboratory B I	1
101037302	工程制图（英文）	Engineering Graphics	4
101080082	C 语言编程实践（英文）	C Programming Practice	1
100245106	国际英语交流 II	International English Communication II	2
100270013	中国近现代史纲要	Modern Chinese History	3
100270030	习近平新时代中国特色社会主义思想概论	Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	3
100740001	国家安全概论	Introduction to National Security	1
100320002	体育 II	PE II	0.5
100270015	形势与政策 II	Situation and Policy II	0.25
	通识教育选修课	General Elective	2
Total Hours			**27.75**

Semester 3			**Credit**
100172003	概率与数理统计	Probability Theory and Mathematical Statistics	3
101037327	复变函数与积分变换（全英文）	Complex Variables and Integral Transform	2
101180121	大学物理 II（全英文）	College Physics II	4
100180125	物理实验 B II	Physics Laboratory B II	1
101013001	理论力学（全英文）	Theoretical Mechanics	4
101037344	工程概论与伦理（英文）	Engineering Fundamentals and Ethics	2
101051245	电工和电子技术 I （全英文）	Electrical & Electronics (I)	3.5
101037324	工程设计实践（英文）	Engineering Design Practice	1
101037334	工程创新实践（双语）	Engineering Innovative Practice	1
100270025	马克思主义基本原理	Basic Theory of Marxism	3
100320003	体育 III	PE III	0.5
100270016	形势与政策 III	Situation and Policy III	0.25
	通识教育选修课	General Elective	2
Total Hours			**26.25**

Semester 4			**Credit**
100033415	计算方法（英文）	Computational Methods	2
101037304	机械原理（英文）	Theory of Machines and Mechanisms	3
101051246	电工和电子技术Ⅱ（全英文）	Electrical & Electronics(II)	3.5
101037305	工程材料与应用（英文）	Principle and Application of Engineering materials	3
101014001	材料力学（全英文）	Mechanics of Materials	3.5
101037306	热力学（英文）	Thermodynamics	3
100270022	毛泽东思想和中国特色社会主义理论体系概论	General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	3
100320004	体育 IV	PE IV	0.5
100270017	形势与政策 IV	Situation and Policy IV	0.25
	通识教育选修课	General Elective	2
Total Hours			**23.75**

Semester 5			**Credit**
101037307	机械设计（英文）	Machine Design	3
101037343	机械设计综合课程设计（英文）	Mechanical Design Project	1
101037309	传热学（英文）	Hear Transfer	2
101037310	机械振动（英文）	Mechanical Vibrations	3
101037311	系统建模与仿真（英文）	Modelling and Simulation of Systems	3
101037325	计算机辅助设计与工程（英文）	Computer -Aided Design and Engineering	3
101037341	ROS 系统开发与实践（英文）	Development and Practice of ROS System	1
101037303	科学研究与写作（英文）	Research Methods and Academic Writing	1
101037313	制造技术基础训练（双语）	Basic Training of Manufacturing Technology	2
100270018	形势与政策 V	Situation and Policy V	0.25
100270005	社会实践	Social Practice	2
	通识教育选修课	General Elective	2
Total Hours			**23.25**

Semester 6			**Credit**
101037315	控制原理与测试（英文）	Principle of Control and Instrumentation	3
101037316	流体力学（英文）	Fluid Mechanics	3
101037317	机械制造与装备（英文）	Manufacturing and Machine Tools	4
101037318	内燃机构造与原理（英文）	Internal Combustion Engine Fundamentals	4
101037319	汽车结构与设计（英文）	Automotive Structure and Design	4
101037312	中国文化与跨文化交流（英文）	Chinese Culture & Cross-Cultural Communications	1
100270019	形势与政策 VI	Situation and Policy VI	0.25
Total Hours			**19.25**

Semester 7			**Credit**
101037322	能源系统及设计（英文）	Energy System and Design	3
101037320	工程管理（英文）	Engineering Management	3
101037321	专业课程设计（英文）	Engineering Design Project	3
100035402	机械工程专业生产实习	Internship in Industry	3
100270020	形势与政策 VII	Situation and Policy VII	0.25

Total Hours			**12.25**

Semester 8			**Credit**
101037323	毕业设计（全英文）	Bachelor's Thesis	12
100270021	形势与政策 VIII	Situation and Policy VIII	0.25
Total Hours			**12.25**

Total Credit Hours	**169.5**