

# 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 emphasizes 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:

- the ability to use applied scientific knowledge and fundamental engineering knowledge to solve problems in mechanical engineering and related fields.
- the ability to design and conduct experiments, as well as to analyse and interpret experimental data for mechanical engineering and related applications.
- 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.
- the ability to develop and assess alternative designs of both mechanical and thermal

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engineering systems based on technical and non-technical criteria including their impact in a global, economic, environmental, and societal context.

- the ability to use the relevant tools necessary for practice in mechanical engineering and related fields.
- the ability to recognise and achieve high levels of professionalism in their work.
- the ability to assume leadership roles, function on multidisciplinary teams, and communicate effectively and persuasively.
- a critical understanding of ethical responsibility.
- a knowledge of global and contemporary issues.
- 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

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# Curriculum

Semester 1			Credits
100172103	工科数学分析 I	Mathematical Analysis for Engineering I	6
102172501	线性代数 A (双语)	Linear Algebra A	3.5
101190003	大学化学 C (全英文)	General Chemistry C	2
100160502	生命科学基础 B	Principle of Life Science B	1
101080081	计算机科学与编程 (全英文)	Computer Science and Programming	3
100245105	国际交流英语 I	International English Communication I	2
100270001	思想道德修养与法律基础	Ideological and Moral Cultivation and Basics of Law	3
100930001	大学生心理素质发展	Psychological Quality Development of College Students	0
100320001	体育 I	Physical Education I	0.5
100980001	军事理论	Military Theory	1
100980002	军事训练	Military Training	1.5
<b>Total Hours</b>			<b>23.5</b>

Semester 2			Credits
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 (全英文)	Engineering Graphics	4
101080082	C 语言编程实践 (全英文)	C Programming Practice	1
100245106	国际交流英语 II	International English Communication II	2
100270002	中国近现代史纲要	The History of Modern China	2
100320002	体育 II	Physical Education II	0.5
Elective	通识教育选修课	General Electives	2
<b>Total Hours</b>			<b>22.5</b>

<b>Semester 3</b>			<b>Credits</b>
100172003	概率与数理统计	Probability Theory and Mathematical Statistics	3
100172001	复变函数与积分变换	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
101037326	工程概论 (全英文)	Introduction to Engineering	1
101051238	电工与电子技术 I (全英文)	Electrical & Electronics I	2.5
101051295	电工和电子技术实验 I (全英文)	Experiment for Electrical & Electronics I	0.5
101037324	工程设计实践	Engineering Design Practice	2
100051294	电子实习	Electronic Practice (Radio Installation)	1
100270003	马克思主义基本原理概论	Introduction to Basic Principles of Marxism	3
100320003	体育 III	Physical Education III	0.5
Elective	通识教育选修课	General Electives	2
<b>Total Hours</b>			<b>26.5</b>
<b>Semester 4</b>			<b>Credits</b>
100031206	计算方法	Computational Methods	2
101037304	机械原理 (全英文)	Theory of Machines and Mechanisms	3
101051239	电工和电子技术 II (全英文)	Electrical & Electronics II	2.5
101051296	电工与电子技术实验 II (全英文)	Experiment for Electrical & Electronics II	0.5
101037305	工程材料与应用 (全英文)	Principle and Application of Engineering materials	3
101014001	材料力学 (全英文)	Mechanics of Materials	3.5
101037306	热力学 (全英文)	Thermodynamics	3
100270004	毛泽东思想与中国特色社会主义理论体系概论	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics	4
100320004	体育 IV	Physical Education IV	0.5
Elective	通识教育选修课	General Electives	2
<b>Total Hours</b>			<b>24</b>

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<b>Semester 5</b>			<b>Credits</b>
101037307	机械设计（全英文）	Machine Design	3
101037308	机械设计综合课程设计（全英文）	Machine Design Project	2
101037309	传热学（全英文）	Heat Transfer	2
101037310	机械振动（全英文）	Mechanical Vibrations	3
101037311	系统建模与仿真（全英文）	Modelling and Simulation of System	3
101037325	计算机辅助设计与工程（全英文）	Computer -Aided Design and Engineering	3
101037314	嵌入式系统开发（全英文）	Embedded Control System Design	2
101037312	中国文化与跨文化交流（全英文）	Chinese Culture & Cross-Cultural Communications	1
101037303	科学研究与写作（全英文）	Research Methods and Academic Writing	1
101037313	制造技术基础训练	Basic Training of Manufacturing Technology	2
100270005	社会实践	Social Practice	2
<b>Total Hours</b>			<b>24</b>

<b>Semester 6</b>			<b>Credits</b>
101037315	控制原理与测试（全英文）	Principle of Control and Instrumentation	3
101037316	流体力学（全英文）	Fluid Mechanics	3
101037317	机械制造与装备（全英文）	Manufacturing and Machine Tools	4
101037318	内燃机构造与原理（全英文）	Internal Combustion Engine Fundamentals	4
101037319	汽车结构与设计（全英文）	Automobile Structure and Design	4
100270006	形式与政策	Situation and Policy	2
<b>Total Hours</b>			<b>20</b>

<b>Semester 7</b>			<b>Credits</b>
101037322	能源系统及设计（全英文）	Energy System and Design	3
101037320	工程管理（全英文）	Engineering Management	3
101037321	专业课程设计（全英文）	Engineering Design Project	3
100035402	机械工程专业生产实习	Internship in Industry	3
<b>Total Hours</b>			<b>12</b>
<b>Semester 8</b>			<b>Credits</b>
101037323	毕业设计（全英文）	Graduation Design (Thesis)	12
<b>Total Hours</b>			<b>12</b>
<b>Total Credit Hours</b>			<b>164.5</b>