

Bachelor of Engineering in Mechanical Design, Manufacturing and Automation

Program Description and Curriculum Guide

Program Code: 080202
(Course conducted in English)

I. Educational Objectives

Cultivate students with humanities, social responsibility, global vision, innovation, professional ethics, team spirit and communication skills. They are capable of mastering the basic theory and professional knowledge of mechanical engineering design and manufacturing and its automation, and are able to engage in design and manufacturing, testing and analysis, management and decision-making, and scientific research in the field of mechanical engineering and vehicle engineering, as well as to develop their moral, intellectual, physical and aesthetic talents in a comprehensive manner.

The specific objectives are as follows.

1. Good professional ethics, humanities and science, willingness and ability to serve society, and have a sense of community with a shared future for mankind.
2. Good ability to make sound use of fundamental theory, professional knowledge and modern tools to solve complex engineering problems in the field of mechanical engineering.
3. Good presentation, knowledge transfer and project management skills in English project work plans and implement them effectively. Upon graduation, the Chinese proficiency should reach the Requirements of the *Higher Education Quality Standard for International Students in China(Trial)* .
4. Good capacity for self-directed, lifelong learning and innovation, and the ability to adapt quickly to the requirements of the international community and industry.
5. Familiar with the current state of development of the industry, able to track the cutting-edge technology in the relevant fields, with a global awareness and international perspective.

II. Attributes & Competencies

Upon graduation, students in this programme should meet the following requirements.

1. Language Proficiency: Reach Level 4 of *Chinese Proficiency Grading Standards for International Chinese Language Education*.
2. Professional ethics: have a strong sense of social responsibility, social morality and professional ethics; have the quality of hard work, dedication and cooperation, be able to abide by professional ethics and norms, and fulfill responsibilities.
3. Engineering knowledge: Be able to use mathematics, natural science, engineering foundation and mechanical engineering professional knowledge to solve complex engineering problems in the design, manufacturing, detection and control of mechanical equipment and its parts.
4. Problem analysis: Be able to apply the basic principles of mathematics, natural science and engineering science to identify, express and analyze complex engineering problems in the design, manufacturing, detection and control of mechanical equipment and its parts through literature research, so as to obtain effective conclusions.
5. Design / development solutions: Be able to propose solutions to complex engineering problems in the field of mechanical design, manufacturing and automation, design / develop mechanical equipment and parts and their manufacturing process to meet specific needs, reflect the sense of innovation in the design link, and consider social, health, safety, legal, cultural, environmental and other factors.
6. Research: Be able to study the complex engineering problems of design, manufacturing, detection and control of mechanical equipment and its parts based on scientific principles and scientific methods, including design experiments, analysis and interpretation of data, and obtain reasonable and effective conclusions through information synthesis.
7. Using modern tools: Be able to select, develop and use appropriate technologies, resources, modern tools and information technology tools to predict and simulate complex engineering problems in the design, manufacturing, detection and control of mechanical equipment and its parts, and understand their limitations.
8. Engineering and society: Be able to conduct reasonable analysis based on relevant knowledge of mechanical engineering, evaluate the impact of solutions to complex engineering problems of engineering practice activities and design, manufacturing, detection and control of mechanical parts on society, health, safety, law and culture, and understand the responsibilities to be undertaken.

9. Environment and sustainable development: Be able to understand and evaluate the impact of engineering practice on environmental and social sustainable development of complex engineering problems related to the design, manufacturing, testing and control of mechanical equipment and its parts.

10. Individual and team: Be able to assume the roles of individual, team member and leader in a team in a multidisciplinary context.

11. Project management: Understand and master engineering management principles and economic decision-making methods, and can be applied in a multidisciplinary environment.

12. Global vision and cooperation and exchange: have a certain global vision, be able to communicate and exchange in a cross-cultural context, have the ability to communicate and exchange effectively with peers in the industry and the public, and be willing and able to provide support for international cooperation and exchange.

III. Systems

4 years

IV. Discipline

Mechanical Engineering, Vehicle Engineering.

V. Degree Program

Bachelor of Engineering.

VI. Degree Courses

Mechanical Design, Modern Mechanical Design Methods, Automotive Design, Automotive Theory, Automotive Construction, Fundamentals of Mechanical Vibration, Mechanical Manufacturing Technology, Automotive Electronics, Foundation of Control Engineering.

VII. Course Credits & Hours

Table 1 Course Modules and Credits

Course modules	Course Type	Credit	Credit hours	%	Credits (T)	Hours (T)	Credits (P)	Hours (P)
General Studies and Liberal Studies	General Public Compulsory Courses	31.5	592	18.5	26	416	5.5	176
	General public elective courses	6	96	3.5	6	96	/	/

Academic specialties	Academic Foundation Courses	60.5	968	35.5	60.5	968	/	/
	Professional Core Courses	24	384	14.1	24	384	/	/
Open integration category	Professional Elective Courses	4	64	2.4	4	64	/	/
	Cross-curricular Open Classes	2	32	1.2	2	32	/	/
Creative Practice Category	Innovation and Entrepreneurship Education (not compulsory)	4	64	2.4	4	64	/	/
	Practical Teaching	38	1216	22.4	/	/	38	1216
Total		170	3416	100	126.5	2024	43.5	1392
T (Theoretical Lectures), P (Practice/Lab Sessions)								

VIII. Course System

Table 2 Available Courses for Each Semester

Semester	Course Name	credits	Credit Hours	Semester	Course Name	credits	Credit Hours
First Semester	Basic Chinese I	4	64	Second Semester	Basic Chinese II	4	64
	Introduction to China	4(0.5)	72		Physical Education II	1(1)	32
	Physical Education I	1(1)	32		Fundamental of Computer Science and Programming	4.5(1)	88
	Introduction Course of Computer Science	3	48		Advanced Mathematics A(Part II)	4	64
	Discipline Introduction	1	16		Engineering Graphics (Part II)	3	48
	Advanced Mathematics A(Part I)	6	96		College Physics A (Part II)	4	64
	Engineering Graphics (Part I)	3	48		Experiment of College Physics	1.5	48
	College Physics A (Part I)	2	32		Elective Course I	2	32
	Subtotal	24	408		Subtotal	24	440
Third Semester	Applied Chinese I	4	64	Fourth Semester	Applied Chinese II	4	64
	Physical Education III	1(1)	32		Physical Education IV	1(1)	32
	Probability Theory and Mathematical Statistics	4	64		Linear Algebra	3	48
	College Chemistry B	4	64		Mechanics of Materials	3	48
	Theoretical Mechanics	3	48		Electrical and Electronic Technology	3.5	56
	Foundation of Material Forming Technology	2	32		Mechanical Principle	3	48
	Professional Innovation Foundation	1	16		Engineering Thermodynamics and Heat Transfer Theory	2	32
	Engineering Materials and Heat Treatment	2	32		Professional Basic Experiment Course of Vehicle Engineering	1	32
	Experiment of College Chemistry B	1	32		Electrical and Electronic Experiments	0.5	16
	Professional Basic Experiment Course of	1	32		Metalworking Practice	2	64

	Vehicle Engineering				The Spirit and Practice of Professional Innovation	1	16
	Subtotal	23	416		Subtotal	24	426
Fifth Semester	Hydromechanics	2	32	Sixth Semester	Hydraulic and Pneumatic Transmission	2	32
	Foundation of Testing Technology	2	32		Production Practice	2	64
	Foundation of Control Engineering	2	32		Automotive Theory	3	48
	Mechanical Design	3	48		Automotive Structure	4	64
	Professional Experiments Course for Vehicle Engineering	1	32		Course Project for Hydraulic and Pneumatic	1	32
	Course Project for Mechanical Design	1.5	48		Mechanical Manufacturing Technology	4	64
	Modern Mechanical Design Method	2	32		Elective Course III	2	32
	Interchangeability and Measurement Technology	2	32		Cross-curricular Open Classes	2	32
	Elective Course II	2	32				
	Course Project Modern Mechanical Design Method	2	64				
	Subtotal	19.5	384		Subtotal	20	384
Seventh Semester	Automotive Design	2	32	Eighth Semester	Graduation Practice and Graduation Design	18	576
	Diesel Engine Management System/ Automotive Detection and Diagnosis Technology (choose one)	2	32				
	Green Manufacturing/ Structural Finite Element Analysis/Introduction to Intelligent Vehicle and Automatic Driving/ Electric Vehicle (choose one)	2	32				
	Automotive Electronics	2	32				
	Professional Innovative Thinking Training	1	16				
	Basic of Mechanical Vibration	2	32				

	Vehicle Lab Training	2	64				
	Course Project for Mechanical Manufacturing Technology	2	64				
	Course Project for Automotive Design	1.5	48				
	Entrepreneurship and Employment Guidance for College Students	2	32				
	Subtotal	18.5	384		Subtotal	18	576

IX. Guidelines

1. Maximum number of years of study: 8 years
2. Minimum credit requirement for graduation: 170 credits