

机械设计制造及其自动化专业本科培养计划 (留学生班)

Undergraduate Program for Specialty in Mechanical Design, Manufacturing and Automation

一、培养目标

I. Program Objective

培养具备机械设计制造基础知识及应用能力，能在工业生产第一线从事机械制造领域内的设计制造、科技开发、应用研究、运行管理等方面工作的高级工程技术人才。

This program is aimed at establishing the fundamental knowledge and application skills of mechanical design and manufacturing, and nurturing talents in production engineering who will be engaged in design and manufacturing, research and development, application study, production management in the field of mechanical manufacturing.

二、基本规格要求

II. Learning Outcomes

毕业生应获得以下几方面的知识和能力：

1. 具有数学、自然科学和机械工程科学知识的应用能力；
2. 具有制订实验方案、进行实验、分析和解释数据的能力；
3. 具有设计机械系统、部件和过程的能力；
4. 具有对于机械工程问题进行系统表达、建立模型、分析求解和论证的能力；
5. 具有在机械工程实践中初步掌握并使用各种技术、技能和现代化工程工具的能力；
6. 具有社会责任和对职业道德的认识；
7. 具有在多学科团队中发挥作用的能力和较强的人际交流能力；
8. 知识面宽广，并具有对现代社会问题的知识，进而足以认识机械工程对于世界和社会影响的能力；
9. 具有终生教育的意识和继续学习的能力。

Students of this degree will acquire:

1. application of knowledge in mathematics, natural science and mechanical engineering;
2. experimental scheme drafting, operating and data analysis;
3. design of mechanical parts, systems and processes;
4. systematic presentation, modeling, analyzing and demonstration of mechanical engineering problems;
5. preliminary understanding and using of technology, ability and modern tools in mechanical engineering practices;
6. understanding of social obligation and professional ethics;
7. advanced communication and team work;
8. understanding the influence of mechanical engineering on the world and society based on broad knowledge and understanding of modern society issues;
9. continuous studying and lifelong education.

三、培养特色

III. Program Highlights

将信息、计算机科学与技术的知识与机械学科知识相结合；拓宽专业方向，使培养的毕业生更加适应社会。

This program integrates the knowledge of information as well as computer science and technology with that of mechanical engineering. It also broadens the disciplinary span in order to produce visible graduates who are more adaptable to the society needs.

四、主干学科

IV. Main Disciplines

力学、机械工程

Mechanics, Mechanical Engineering

五、学制与学位

V. Program Length and Degree

修业年限：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

六、学时与学分

VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：144.5 学分

Minimum Credits of Curricula (Comprising course system and intensive practical training) : 144.5 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program.

1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学分比例 (%)
通识教育基础课程		必修	696/42.5	31.8
学科基础课程	学科大类基础课程	必修	784/49	36.7
	学科专业基础课程	必修	328/20	15.0
专业选修课程		选修	352/22	16.5
合计			2160/133.5	100

Course Type		Required/Elective	Hrs/Crs	Percentage (%)
General Education Core Curriculum		Required	696/42.5	31.8
Discipline-related course	Discipline-related General Courses	Required	36.7	36.4
	Basic Sub-disciplinary Course	Required	15.0	14.9
Elective Courses in Specialty		Elective	352/22	16.5
Total			2160/133.5	100

2. 集中性实践教学环节周数与学分

Practicum Credits

华中科技大学本科专业人才培养计划

实践教学环节名称	课程性质	周数/学分	占实践教学环节学分比例 (%)
金工实习	必修	2/1	9.1
电工实习	必修	1/0.5	4.5
课程设计	必修	3/1.5	13.7
毕业设计 (论文)	必修	16/8	72.7
合计		22/11	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Metal Working Practice (two weeks)	Required	2/1	9.1
Electrical Engineering Practice (one week)	Required	1/0.5	4.5
Course Project (three weeks)	Required	3/1.5	13.7
Undergraduate Thesis (sixteen weeks)	Required	16/8	72.7
Total		22/11	100

七、主要课程

VII. Main Courses

工程制图 Engineering Graphics、材料力学 Material Mechanics、理论力学 Theoretical Mechanics、机械原理 Theory of Machines and Mechanisms、机械设计 Machine Design、电路理论 Electrical & Magnetic Circuits、模拟电子技术 Analogue Electronics、数字电路 Digital Circuits、微机原理 Principle of Microcomputer、机电传动控制 Mechanical & Electrical Transmission Control、工程材料学 Engineering Materials、机械制造技术基础 Fundamentals of Mechanical Manufacturing Technology

八、主要实践教学环节

VIII. Practicum Module (Experiments Included)

金工实习 Metal Working Practice、电工实习 Electrical Engineering Practice、课程设计 Course Project、毕业设计 Undergraduate Thesis

九、教学进程计划表

IX. Course Schedule

院 (系): 机械科学与工程学院

专业: 机械设计制造及其自动化

School (Department): School of Mechanical Science and Automation Division: Mechanical Design, Manufacturing and Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including			设置学期 semester
						课外 extra-cur.	实验 exp.	上机 operation	
Basic Courses in General Education 通识教育基础课程	必修 Required	0700017	微积分 (六) Calculus (VI)	96	6				1
	必修 Required	0700018	微积分 (七) Calculus (VII)	96	6				2
	必修 Required	0700037	大学物理 (六) Physics (VI)	96	6				2
	必修 Required	0700041	物理实验 (一) Physical Experiments	32	1		32		2
	必修 Required	0800172	大学计算机基础 Introduction to Computer Technology	56	3.5			24	1
	必修 Required	0700057	线性代数 Linear Algebra	56	3.5				1

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including			设置学期 semester
						课外 extra-cur.	实验 exp.	上机 operation	
	必修 Required	0700073	复变函数与积分变换 Complex Function and Integral Transform	56	3.5				2
	必修 Required	0700074	概率论与数理统计 Probability and Mathematics Statistics	56	3.5				3
	必修 Required	0508961	初级汉语（上） Junior Chinese, The First Part	120	7.5				1
	必修 Required	0510112	中国概况 Introduction of China	32	2				2
学科基础课程· 学科大类基础 Basic Courses in General Discipline	必修 Required	0810013	C 语言程序设计 Advanced Programming Language (C)	64	4			24	3
	必修 Required	0826611	工程制图（五）上 Engineering Graphics (V), The First Part	40	2.5				1
	必修 Required	0827421	工程制图（五）下 Engineering Graphics (V), The Second Part	64	4				2
	必修 Required	0800089	理论力学（二） Theoretical Mechanics (II)	64	4				3
	必修 Required	0800115	电路理论 Electrical & Magnetic Circuit	64	4				3
	必修 Required	0800365	机械制造技术基础 Fundamentals of Mechanical Manufacturing Technology	40	2.5		4		4
	必修 Required	0807301	工程材料学 Engineering Materials	32	2		4		4
	必修 Required	0820941	工程控制基础 Fundamentals of Engineering Control	48	3				5
	必修 Required	080007a	材料力学（二） Material Mechanics (II)	64	4		4		4
	必修 Required	080012b	模拟电子技术（三） Analogue Electronics (III)	56	3.5		12		4
	必修 Required	0833523	机械原理（三） Theory of Machines and Mechanisms (III)	64	4		8		5
	必修 Required	0820961	工程测试技术 Engineering Measurement Technology	40	2.5				5
	必修 Required	0812301	工程传热学（一） Heat Transfer (I)	40	2.5				5
	必修 Required	0827231	流体力学（一） Fluid Mechanics (II)	40	2.5				5
	必修 Required	0821323	机械设计(三) Machine Design (III)	64	4		8		6
	必修 Required	0833902	计算机图形学与 CAD 技术 Computer Graphics and CAD	48	3			20	6
	必修 Required	0800304	微机原理 Principle of Microcomputer	40	2.5		4		5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including			设置学期 semester
						课外 extra-cur.	实验 exp.	上机 operation	
学科基础课程· 学科专业基础 Basic Courses in Discipline	必修 Required	0809991	数字电路 Digital Circuits	40	2.5		4		5
	必修 Required	0802081	工程热力学（一） Engineering Thermodynamics（I）	40	2.5				5
	必修 Required	0833911	综合测控实验 Comprehensive Experiments on Measurement and Control of Mechatronics	16	0.5		16		6
	必修 Required	0800873	互换性测量技术基础 Fundamentals of Interchangeability and Technical Measurement	48	3		8		6
	必修 Required	0800364	机械制造技术基础（二） Fundamentals of Mechanical Manufacturing Technology（II）	48	3				6
	必修 Required	0801296	系统动力学 System Dynamics	48	3				4
专业课程 Specialty-Oriented Courses			专业选修课程	352	22				
	选修 Elective	0800294	计算方法（二） Computational Methods（II）	40	2.5			12	7
	选修 Elective	0800392	液压与气压传动 Hydraulic and Pneumatic Transmission	48	3		4		6
	选修 Elective	0832912	机械制造装备技术 Machinery Manufacturing Equipment and Technology	48	3		4		6
	选修 Elective	0801041	数控技术 Numerical Control	48	3		4		6
	选修 Elective	0827711	机电创新决策与设计 Mechatronic Creative Decisions and Design	48	3				4
	选修 Elective	0802333	现代设计方法 Advanced Design Methodology	32	2			4	7
	选修 Elective	0814972	机器视觉及应用 Machine Vision and Applications	32	2				7
	选修 Elective	0811012	设备监测与诊断 Machine Condition Monitoring and Diagnosis	32	2				7
	选修 Elective	0807492	无损检测 Non-Destructive Test	32	2				7
	选修 Elective	0841981	纳米技术导论 Introduction to Nanotechnology	32	2				7
	选修 Elective	0801571	先进制造技术 Advanced Manufacturing Technology	32	2				7
	选修 Elective	0814042	微机电系统技术基础与应用 Basis and Application of Microelectromechanical Systems	32	2				7
	选修 Elective	0801051	机器人技术基础 Fundamentals of Robotics	32	2				7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including			设置学期 semester
						课外 extra-cur.	实验 exp.	上机 operation	
实践环节 Practical Training and Internship	必修 Required	1302331	金工实习 Metal Working Practice	2w	1				4
	必修 Required	1300031	电工实习 Electrical Engineering Practice	1w	0.5				3
	必修 Required	1300423	课程设计 Course Project	3w	1.5				6
	必修 Required	1300016	毕业设计 Undergraduate Thesis	16w	8				8