机械设计制造及其自动化专业本科培养计划
（卓越工程师教育培养计划实验班）

Undergraduate Program for Specialty in Mechanical Design, Manufacturing and Automation
(Undergraduate Experimental Program for Exemplary Engineer Education)

一、培养目标
Ⅰ. Program Objective

培养具有科学、工程和人文素养，具备机械设计制造基础知识及研究应用能力、工程实践能力、团队协作能力、创新意识和国际视野，能在机械制造领域从事设计制造、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 aims to cultivate students with science, engineering and humanity spirits. The students shall obtain primary knowledge on mechanical design and manufacturing. The following capabilities shall also be trained such as research and development skills, practical engineering skills and team cooperation mind. The students shall perceive innovative mind and international vision through this program. The graduates shall be able to handle senior engineering professional positions on design and manufacturing, research and development, and operational management in the area of mechanical design and 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.能够将数学、自然科学、工程基础和专业知识用于解决复杂工程问题。

2.能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析复杂工程问题，以获得有效结论。

3.能够设计针对复杂机械工程问题的解决方案，设计满足特定需求的机械系统、部件或过程，并能够在设计环节中体现创新意识，考虑法律、健康、安全、文化、社会以及环境等因素。

4.能够基于科学原理并采用科学方法对复杂机械工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

5.能够针对复杂机械工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括预测与模拟，并理解其局限性。

6.能够基于相关背景知识进行合理分析，评价机械工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

7.能够理解和评价机械工程实践对环境、社会可持续发展的影响。

8.具有人文社会科学素养、社会责任感，能够在工程实践中理解并遵守工程职业道德和规范，履行责任。

9.具有在多学科团队中发挥作用的能力。

10.能够就复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令，并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

11.理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。

12.具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

Students of this degree will acquire to:

1. Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to obtain the solution of complex engineering problems.

2. Identify, formulate, research on literature and analysis complex engineering problems to reach substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Find solutions for complex mechanical engineering problems and design innovative mechanical systems, components or processes that meet specific requirements. The solution and design shall factor in public health and safety, cultural, society, and environmental perspectives.

4. Conduct investigations of complex mechanical engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to formulate valid conclusions.

5. Create, select and apply appropriate techniques, resources, and modern engineering and information analytical tools, including prediction and modelling, to solve complex mechanical engineering problems within boundary conditions.

6. Assess appropriately on societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Understand and evaluate the sustainability and impact of professional engineering practice in the solution of complex engineering problems in societal and environmental conditions.

8. Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

9. Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary groups.

10. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write reports and documentation, make effective presentations, and give and receive clear instructions. Possess a certain degree of global outlook, and be able to communicate across different cultures.

11. Obtain knowledge and understanding of engineering management principles and economic decision-making, and apply these to work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Recognize the demand, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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 technology as well as computer science and technology with that of mechanical engineering. It broadens the disciplinary span in order to cultivate graduates to be adaptive to the engineering society.

四、主干学科

Ⅳ. Major 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：174.75 学分

Minimum Credits of Curricula (Comprising course system and intensive practical training) :174.75 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.

完成学业最低课外学分要求：5 学分

Minimum Extracurricular Credits：5 credits

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（%）
素质教育通识课程		必修	592/33	21.26
		选修	160/10	6.44
学科基础课程	学科（大类）基础课程	必修	1152/68.75	44.29
	学科（专业）基础课程	必修	248/15.5	9.98
专业课程	专业核心课程	选修	192/12	7.73
	专业方向课程	选修	144/9	5.8
跨专业选修课程		选修	112/7	4.5
合计			2600/155.25	100

Course Type		Required / Elective	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	592/33	21.26
		Elective	160/10	6.44
Discipline-related courses	Discipline-related General Courses	Required	1152/68.75	44.29
	Basic Sub -disclinary Courses	Required	248/15.5	9.98
Major-specific courses	Core	Elective	192/12	7.73
	Electives	Elective	144/9	5.8
Elective Courses in Cross-specialty		Elective	112/7	4.5
Total			2600/155.25	100

2．集中性实践教学环节周数与学分

Practicum Credits

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（%）
军事训练	必修	2/1	5.13
公益劳动	必修	1/0.5	2.57
大型集中 Project Ⅰ—形体与机构设计训练	必修	2/1	5.13
大型集中 Project Ⅱ—机械设计与制作训练	必修	4/2	10.26
金工实习	必修	4/2	10.26
电工实习	必修	2/1	5.13
认识实习	必修	1/0.5	2.57
学科交叉综合训练	必修	2/1	5.13
科技创新训练	必修	3/1.5	7.7
生产实习	必修	3/1.5	7.7
大型集中 Project Ⅲ— 机电测控综合训练	必修	3/1.5	7.7
毕业设计（论文）	必修	12/6	30.77
合计		39/19.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5.13
Laboring for Public Benefit	Required	1/0.5	2.57
Condensed Large Scale Project I-Training on Shape and Mechanism Design	Required	2/1	5.13
Condensed Large Scale Project II-Training on Machine Design and Manufacturing	Required	4/2	10.26
Metal Working Practice	Required	4/2	10.26
Electrical Engineering Practice	Required	2/1	5.13
Acquaintanceship Practice	Required	1/0.5	2.57
Comphrensive Training for Interdiscipline	Required	2/1	5.13
Practice for Innovation in Science and Technology	Required	3/1.5	7.7
Engineering Internship	Required	3/1.5	7.7
Condensed Large Scale Project Ⅲ-Comprehensive Training on Measurement and Control of Mechanotronics	Required	3/1.5	7.7
Undergraduate Thesis	Required	12/6	30.77
Total		39/19.5	100

3．课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告，通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
2	英语及计算机考试	全国大学英语六级考试	获六级证书者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 300 分以上者	3
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
3	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
3	竞赛	省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
4	论文	在全国性刊物发表论文	每篇论文	2~3
5	科研	视参与科研项目时间与科研能力	每项	1~3
6	实验	视创新情况	每项	1~3

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	300 Points or Higher	3
		National Computer Rank Examination	Win certificate of Band-3 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4
3	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win third prize	2
		National Level	Win first prize	6
			Win second prize	4
			Win third prize	3
4	Papers	Published in national-level journals	Per piece	2~3
5	Scientific Research	Depending on both the time spent in and ability demonstrated in scientific research project	Each item	1~3
6	Experiments	Depending on innovative extent	Each item	1~3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

七、主要课程

Ⅶ. Main Courses

工程制图 Engineering Graphics、理论力学 Theoretical Mechanics、材料力学 Material Mechanics、流体力学 Fluid Mechanics、工程热工基础 Fundamentals of Heat Transfer and Thermodynamics、电路理论 Circuits Theory、模拟电子技术 Analogue Electronics、微机原理 Principle of Microcomputer 数字电路 Digital Circuits、工程材料学 Engineering Materials、工程控制基础 Fundamentals of Engineering Control、工程测试技术 Engineering Measurement Technology；

机械原理 Theory of Machines and Mechanisms、机械设计 Machine Design、计算方法 Numberical Methods、机械制造技术基础 Fundamentals of Mechanical Manufacturing Technology、机械制造技术基础（二）Fundamentals of Mechanical Manufacturing Technology（II）互换性与测量技术基础 Fundamentals of Interchangeability and Technical Measurement、机电传动控制 Mechanical & Electrical Transmission Control。

八、主要实践教学环节

Ⅷ. Practicum Module（Experiments Included）

军事训练 Military Training、公益劳动 Laboring for Public Benefit、大型集中 Project Ⅰ—形体与机构设计训练 Condensed Large Scale Project I-Training on Shape and Mechanism Design、大型集中 Project Ⅱ— 机械设计与制作训练 Condensed Large Scale Project II-Training on Machine Design and Manufacturing、金工实习 Metal Working Practice、电工实习 Electrical Engineering Practice、生产实习 Engineering Internship、认识实习 Acquaintanceship Practice、学科交叉综合训练 Comphrensive Training for Interdiscipline 、科技创新训练 Practice for Innovation in Science and Technology、大型集中 Project Ⅲ—机电测控综合训练 Condensed Large Scale Project Ⅲ-Comprehensive Training on Measurement and Control of Mechanotronics、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 Engineering　　Division: Mechanical Design,Manufacturing and Automation

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
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必 修 Required	0301901	思想道德修养与法律基础 Morals & Ethics & Fundamentals of Law	48	3			1
	必 修 Required	0100721	中国近现代史纲要 Survey of Modern Chinese History	32	2			2
	必 修 Required	0100732	马克思主义基本原理 Basic Theory of Marxism	48	3			3
	必 修 Required	0100321	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	64	4			4
	必 修 Required	0100741	形势与政策 Current Affairs and Policy	32	2			5-7
	必 修 Required	0510071	中国语文 Chinese	32	2			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
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities- oriented Education General Courses	必 修 Required	0508454	综合英语（一） Comprehensive English （Ⅰ）	32	2			1
	必 修 Required	0508464	综合英语（二） Comprehensive English （Ⅱ）	32	2			2
	必 修 Required	0508472	综合英语（三） Comprehensive English （Ⅲ）	16	1			3
	必 修 Required	0508482	综合英语（四） Comprehensive English （Ⅳ）	16	1			4
	必 修 Required	0800033	软件技术基础 Software Programming Technology	64	4		自主上机 64	1
	必 修 Required	0400111	大学体育（一） Physical Education（Ⅰ）	32	1			1
	必 修 Required	0400121	大学体育（二） Physical Education（Ⅱ）	32	1			2
	必 修 Required	0400131	大学体育（三） Physical Education（Ⅲ）	32	1			3
	必 修 Required	0400141	大学体育（四） Physical Education（Ⅳ）	32	1			4
	必 修 Required	1100011	军事理论 Military Theory	16	1			1
	必 修 Required	0701732	科学思维与研究方法（新生研讨课） Method of Scientific Thinking and Research	16	1			1
	必 修 Required	0833031	工程导论 Introduction of Engineering	16	1			2
			人文社科类选修课程（艺术类课程至少 2 学分） Electives in Humanities and Social Science	160	10			
学科（大类）基础课程 Discipline-related General Courses	必 修 Required	0700011	微积分（一）上 Calculus（Ⅰ）	88	5.5			1
	必 修 Required	0700012	微积分（一）下 Calculus（Ⅰ）	88	5.5			2
	必 修 Required	0700051	线性代数（一） Linear Algebra（Ⅰ）	40	2.5			2
	必 修 Required	0700071	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必 修 Required	0700063	概率论与数理统计（三） Probability and Mathematics Statistic（Ⅲ）	40	2.5			3
	必 修 Required	0700048	大学物理（一） Physics（Ⅰ）	64	4			2
	必 修 Required	0700049	大学物理（二） Physics（Ⅱ）	64	4			3
	必 修 Required	0706891	物理实验（一） Physics Experiments（Ⅰ）	32	1	32		2

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
						实验 exp.	上机 operation	
学科（大类）基础课程 Discipline-related General Courses	必 修 Required	0706901	物理实验（二） Physics Experiments (Ⅱ)	24	0.75	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	0800118	电路理论 Circuits Theory	40	2.5	6		3
	必 修 Required	0800084	理论力学（二） Theoretical Mechanics (Ⅱ)	56	3.5			3
	必 修 Required	0806714	工程力学实验 Engineering Mechanics Lab.	16	0.5	12		4
	必 修 Required	0800073	材料力学（二） Material Mechanics (Ⅱ)	56	3.5			4
	必 修 Required	0800123	模拟电子技术（三） Analogue Electronics (Ⅲ)	40	2.5	8		4
	必 修 Required	0833521	机械原理（三） Theory of Machines and Mechanisms (Ⅲ)	56	3.5	6		4
	必 修 Required	0821321	机械设计(三) Machine Design (Ⅲ)	56	3.5	6		5
	必 修 Required	0820943	工程控制基础 Fundamentals of Engineering Control	32	2			3
	必 修 Required	0815672	工程控制实验(一) Experiments on Fundamentals of Engineering Control (Ⅰ)	8	0.25	8		3
	必 修 Required	0800363	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	0820962	工程测试技术 Engineering Measurement Technology	32	2			5
	必 修 Required	0815662	工程测试技术实验(一) Experiments on Engineering Measurement Technology (Ⅲ)	8	0.25	8		5
	必 修 Required	0844541	工程热工基础 Fundamentals of Heat Transfer and Thermodynamics	48	3	4		5
	必 修 Required	0800061	流体力学（一） Fluid Mechanics (Ⅰ)	32	2	4		5
	必 修 Required	0833912	综合测控实验 Comprehensive Experiments on Measurement and Control of Mechanotronics	16	0.5	16		6
	必 修 Required	0800294	计算方法（二） Numerical Methods (Ⅱ)	32	2		12	3

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
						实验 exp.	上机 operation	
学科（专业）基础课程 Basic Sub-disciplineary Courses	必 修 Required	0800871	互换性与测量技术基础 Fundamentals of Interchangeability and Technical Measurement	40	2.5	8		5
	必 修 Required	0400022	学科（专业）概论 An Introduction to Discipline (Mechanical Engineering)	16	1			4
	必 修 Required	0809991	数字电路 Digital Circuits	32	2	4		5
	必 修 Required	0800304	微机原理 Principle of Microcomputer	40	2.5	8		5
	必 修 Required	0800333	机电传动控制 Mechanical & Electrical Transmission Control	48	3	8		6
	必 修 Required	0800362	机械制造技术基础（二） Fundamentals of Mechanical Manufacturing Technology (∏)	40	2.5	4		6
专业核心课程 Major-specific0 Coure Courses	选 修 Elective	0800392	液压与气压传动 Hydraulic and Pneumatic Transmission	48	3	4		6
	两门课程选一 One out of Two	0802332	现代设计方法 Advanced Design Methodology	48	3		16	6
		0833902	计算机图形学与 CAD 技术 Computer Graphics and CAD	48	3		16	6
	两门课程选一 One out of Two	0801041	数控技术 Numerical Control	48	3	4		6
		0844791	机器人学 Robotics	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
专业方向课程 Major-specific Electives	选 修 Elective	0800982	机械系统创新设计 Creative Design of Mechanical System	24	1.5			7
	选 修 Elective	0833921	机械振动学 Mechanical Vibrations	24	1.5			7
	选 修 Elective	0819841	汽车构造基础 Structure of Automobile	24	1.5			7
	选 修 Elective	0814912	汽车电子技术 Automobile Electronic Technology	24	1.5			7
	选 修 Elective	0814922	汽车总体设计 Vehicle Design	24	1.5			7
	选 修 Elective	0814932	汽车动力学基础 Fundamentals of Vehicle Dynamics	24	1.5			7
	选 修 Elective	0811341	三维逆向工程技术 3D Reverse Engineering Technology	24	1.5			7
	选 修 Elective	0800992	有限元分析及应用 Fundamental Finite Element Analysis and Applications	24	1.5			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
						实验 exp.	上机 operation	
专业方向课程 Major-specific Electives	选 修 Elective	0842441	机电创新决策与设计方法 Mechantronic Creative Decisions and Design	32	2.0			4
	选 修 Elective	0801297	系统动力学 System Dynamics	24	1.5			7
	选 修 Elective	0841891	工程摩擦学基础 Fundamentals of Engineering Tribology	24	1.5			7
	选 修 Elective	0801072	电液控制工程 Electro-hydraulic Control Engineering	24	1.5			7
	选 修 Elective	0801083	液压元件与系统 Hydraulic Components and Systems	24	1.5	4		7
	选 修 Elective	0807122	气动控制技术 Pneumatic Control Technology	24	1.5			7
	选 修 Elective	0811391	汽车机电液控制技术 Automobile Mechano-electro-hydraulic Control Technology	24	1.5			7
	选 修 Elective	0821251	纯水液压传动技术 Water Hydraulic Power Transmission Technology	24	1.5			7
	选 修 Elective	0827751	电子气动技术 Electronic Pneumatics	24	1.5			7
	选 修 Elective	0827761	现代流体动力控制 Advanced Fluid Power Control	24	1.5			7
	两门课程选一 One out of Two	0080001	机器视觉及应用 Machine Vision and Applications	24	1.5			7
		0819111	机器视觉自动检测技术 Auto Inspection Technologies Based on Machine Vision	24	1.5			7
	选 修 Elective	0811991	设备监测与诊断 Machine Condition Monitoring and Diagnosis	24	1.5			7
	选 修 Elective	0814981	质量工程 Quality Engineering	24	1.5			7
	选 修 Elective	0827741	高速数字图像处理及应用 High-Speed Digital Image Processing and Its Applications	24	1.5			7
	选 修 Elective	0801095	误差理论与数据处理 Error Theory and Data Processing	24	1.5			7
	选 修 Elective	0810941	仪器智能技术 Intelligent Instrument Technology	24	1.5			7
	选 修 Elective	0841881	智能测控系统 Intelligent Measurement and Control System	24	1.5			7
	选 修 Elective	0801052	机器人技术基础 Fundamentals of Robotics	24	1.5			7
	选 修 Elective	0841901	柔性电子制造技术基础 Fundamentals of Flexible Electronic Manufacturing Technology	24	1.5			7

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						实验 exp.	上机 operation	
专业方向课程 Major-specific Electives	选 修 Elective	0833941	计算机辅助制造技术 Computer Aided Manufacturing	24	1.5			7
	选 修 Elective	0801032	计算机控制系统 Computer Control System	24	1.5		4	7
	选 修 Elective	0821221	Python 程序设计 Python Program Design	24	1.5			7
	选 修 Elective	0814061	数控加工工艺与编程技术 Numerical Control Machining Procedure and Programming Technology	24	1.5			7
	选 修 Elective	0814091	仿生机器人学概论 Introduction to Biomimetic Robotics	24	1.5			7
	选 修 Elective	0811361	交流伺服运动控制系统 AC Servo Motion Control System	24	1.5			7
	选 修 Elective	0833951	机电系统建模与仿真基础 Introduction to Modeling and Simulation of Mechanotronics	24	1.5			7
	选 修 Elective	0814071	机电产品数字化设计制造与管理 Design, Manufacturing and Management of Digital Mechatronic Products	24	1.5			7
	选 修 Elective	0800932	柔性制造自动化概论 Conspectus of Flexible Manufacturing Automation	24	1.5			7
	选 修 Elective	0811411	功能材料基础 Fundamentals of Functional Materials	24	1.5			7
	选 修 Elective	0821231	特种加工 Nonconventional Machining	24	1.5			7
	选 修 Elective	0801572	先进制造技术 Advanced Manufacturing Technology	24	1.5	2		7
	选 修 Elective	0841982	纳米技术导论 Introduction to Nanotechnology	24	1.5			7
	选 修 Elective	0814111	微细加工与纳米技术 Microfabrication and Nanotechnology	24	1.5			7
	选 修 Elective	0840021	微电子制造技术 Technology of Microelectronic Fabrication	24	1.5			7
	选 修 Elective	0814041	微机电系统技术基础及应用 Basis and Application of Microelectro Mechanical Systems	24	1.5			7
	选 修 Elective	0814051	微系统封装技术基础 Fundamentals of Microsystems Packaging Technology	24	1.5			7
	选 修 Elective	0810031	现代工业网络 Modern Industrial Networks	24	1.5			7
	选 修 Elective	0810961	网络信息安全概论 An Introduction to Network Information Security	24	1.5			7
			跨专业选修课程（须选修非本专业 3 门或 3 门以上课程且学分不少于 7 学分）请各专业在以下提供 3 门课程 Elective courses in Cross-specialty					

续表

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专业方向课程 Major-specific Electives	选 修 Elective	0805032	土木工程材料 Civil Engineering Materials	32	2	4		4
	选 修 Elective	0803972	房屋建筑学 Building Construction	32	2			5
	选 修 Elective	0805353	地基处理技术 Ground Improvement Techniques	24	1.5			6
	选 修 Elective	0804914	工程光学 Engineering Optics	48	3			4
	选 修 Elective	0804592	光电探测与信号处理 Optoelectronic Detect and Signal Processing	48	3			5
	选 修 Elective	0804161	光纤通信技术 Optical Fiber communication Technology	48	3			6
	选 修 Elective	0706201	化学与生物传感器 Chemical and Biological Sensor	32	2			5
	选 修 Elective	0716472	生物材料学 Introduction to Biomaterials Science	48	3			5
	选 修 Elective	0700932	医学影像系统原理 Principles of Medical Imaging Systems	32	2			6
实践环节 Practical Training Items	必 修 Required	1300013	军事训练 Military Training	2w	1			1
	必 修 Required	1300024	公益劳动 Laboring for Public Benefit	1w	0.5			3
	必 修 Required	1327462	大型集中 Project Ⅰ — 形体与机构设计训练 Condensed Large Scale Project I-Training on Shape and Mechanism Design	2w	1			5
	必 修 Required	1327472	大型集中 Project Ⅱ — 机械设计与制作训练 Condensed Large Scale Project II-Training on Machine Design and Manufacturing	4w	2			6
	必 修 Required	1302333	金工实习 Metal Working Practice	4w	2			4
	必 修 Required	1304411	电工实习 Electrical Engineering Practice	2w	1			3
	必 修 Required	1300536	认识实习 Acquaintanceship Practice	1w	0.5			4
	必 修 Required	1328221	学科交叉综合训练 Comphrensive Training for Interdiscipline	2w	1			2
	必 修 Required	1328231	科技创新训练 Practice for Innovation in Science and Technology	3w	1.5			5
	必 修 Required	130008a	生产实习 Engineering Internship	3w	1.5			6
	必 修 Required	1327482	大型集中 Project Ⅲ— 机电测控综合训练 Condensed Large Scale Project Ⅲ-Comprehensive Training on Measurement and Control of Mechanotronics	3w	1.5			7
	必 修 Required	130004g	毕业设计（论文） Undergraduate Thesis	12w	6			8