

武汉理工大学机电工程学院
School of Mechanical & Electronic Engineering of
Wuhan University of Technology

2015 版本本科培养方案

Undergraduate Education Plan (2015)

武汉理工大学教务处
Academic Affairs Office of Wuhan University of Technology

目 录

工业工程	4-1
Industrial Engineering	4-1
机械工程	4-11
Mechanical Engineering	4-11
过程装备与控制工程	4-23
Industrial Equipment and Control Engineering	4-23
测控技术与仪器	4-33
Measuring & Control Technology and Instrumentation	4-33
包装工程	4-46
Packaging Engineering	4-46
机械工程专业（国际班）	4-58
Mechanical Engineering (International 2+2 Program)	4-58
机械工程（学硕班）	4-69
Mechanical Engineering (Bachelor+Master Class)	4-69
机械工程（卓越工程师班）	4-80
Mechanical Engineering (Excellent Engineer Class)	4-80
过程装备与控制工程（卓越工程师班）	4-91
Industrial Equipment and Control Engineering(Excellent Engineer Class)	4-91
测控技术与仪器（卓越工程师班）	4-101
Measuring & Control Technology and Instrumentation(Excellent Engineer Class)	4-101
包装工程（卓越工程师班）	4-113
Packaging Engineering(Excellent Engineer Class)	4-113

【工业工程专业】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Industrial Engineering (2015)

专业名称	工业工程	主干学科	工业工程、管理科学与工程、物流管理与工程
Major	Industrial Engineering	Major Disciplines	Industrial Engineering, Management Science and Engineering, Logistics Management and Engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Engineer

最低毕业学分规定

Graduation Credit Criteria

课程类别 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科基础类课程 Basic Engineering Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	42.5	38.5	\	32	\	190
选修课 Elective Courses	9	\	13	10	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

(一) 培养目标

- (1) 具有系统管理思想和管理科学、工程科学素质；
- (2) 掌握坚实的自然科学、社会科学的基础理论和工程相关的技术与管理知识；
- (3) 具备综合运用专业知识分析和解决生产与服务系统的效率、质量、成本及环境友好等管理与工程综合性问题的能力；
- (4) 具备职业道德、创新意识、社会责任感和国际视野，满足国家建设和社会发展需要。

- (1) Having the system management ideology, management science and engineering science diathesis.
- (2) Mastering the basic theories of natural science, social science and knowledge related to engineering technology and management.
- (3) Ability of using professional knowledge to analyze and solve the comprehensive problems of management and engineering related to the efficiency, quality, cost and environmental friendly in the production and service system.
- (4) Having occupation morals, innovative consciousness, social responsibility and international perspective to meet the requirements of national construction and social development.

(二) 毕业要求

- (1) 掌握并能应用本专业类所需的自然科学、社会科学及相关工程科学与管理科学的基础知识；

- (2) 掌握并能应用工业工程类专业的基本理论和基本方法，了解相关专业的发 展现状与趋势；
 - (3) 掌握并能有效利用相关专业的最新技术和工具，并形成合理的整体性知识结构；
 - (4) 具备综合运用所学理论和方法进行工业工程类专业领域问题的分析、规划、设计、实施、评价和改善的能力；
 - (5) 良好的组织协调并发挥作用的能力；良好的沟通表达、人际交往与合作的能力；
 - (6) 了解与本专业相关的职业和行业的生产、设计、研究与开发的法律、法规，具备正确分析和评估工程和管理方案对客观世界和社会影响的能力；
 - (7) 具备辩证、逻辑、形象的创新性科学思维和持续改善的基本能力；具备独立学习、适应发展的能力和宽广的视野；
 - (8) 具有良好的思想政治素质和正确的世界观、人生观、价值观；高度的社会责任感、诚信意识和良好的职业道德；较高的人文素质和科学与专业素养；健康的心理和体魄。
- (1) Grasping and using the profession required basic knowledge of natural science, social science, relevant engineering science and management science;
 - (2) Grasping the basic theories and methods of industrial engineering. Understanding the current status and development trend of relevant professions.
 - (3) Mastering and effectively using the new techniques and tools of relevant professions. Building the reasonable integrated knowledge structure.
 - (4) Ability of synthetically using relevant theories and methods to analyze, plan, design, implement, evaluate and improve the problems of industrial engineering.
 - (5) Good ability of organization and coordination, and the ability of communication, expression and cooperation.
 - (6) Having the knowledge of laws and regulations about manufacturing, design, research and development of the careers and industrials related to the major. Having the ability of correctly analyzing and assessing the influence of the engineering and management schemes on the objective world and society.
 - (7) Having dialectic, logical and imaging innovative scientific thinking and the basic ability of continuous improvement; Having the ability of independent learning as well as development adapting and broad vision;
 - (8) Having a good ideological and political diathesis and correct world-view, life-view and value-view; Having a high degree of social responsibility, sense of integrity, higher professional ethics, humanity diathesis, scientific and professional accomplishment ; Having mental and physical healthy.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4
毕业要求 1	✓	✓	✓	
毕业要求 2	✓	✓	✓	
毕业要求 3	✓	✓	✓	
毕业要求 4	✓	✓	✓	
毕业要求 5				✓
毕业要求 6	✓	✓	✓	
毕业要求 7	✓		✓	✓
毕业要求 8				✓

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程:

运筹学、工程经济分析、供应链管理、制造信息系统、基础工业工程、生产计划与控制、生产系统建模与仿真、物流工程学、设施规划、统计质量控制、人因工程等。

Operational Research, Engineering Economical Analysis, Supply Chain Management, Manufacturing Information System, Fundamental Industrial Engineering, Operations Management, Production System Modeling and Simulation, Logistics Engineering, Facility Layout, Statistical Quality Control, Human Factors Engineering.

(二) 专业特色课程:

生产计划与控制、统计质量控制、生产系统建模与仿真、物流工程学、设施规划、人因工程

Operations Management, Statistical Quality Control, Production System Modeling and Simulation, Logistics, Facility Layout, Human Factors Engineering.

附：毕业要求实现矩阵:

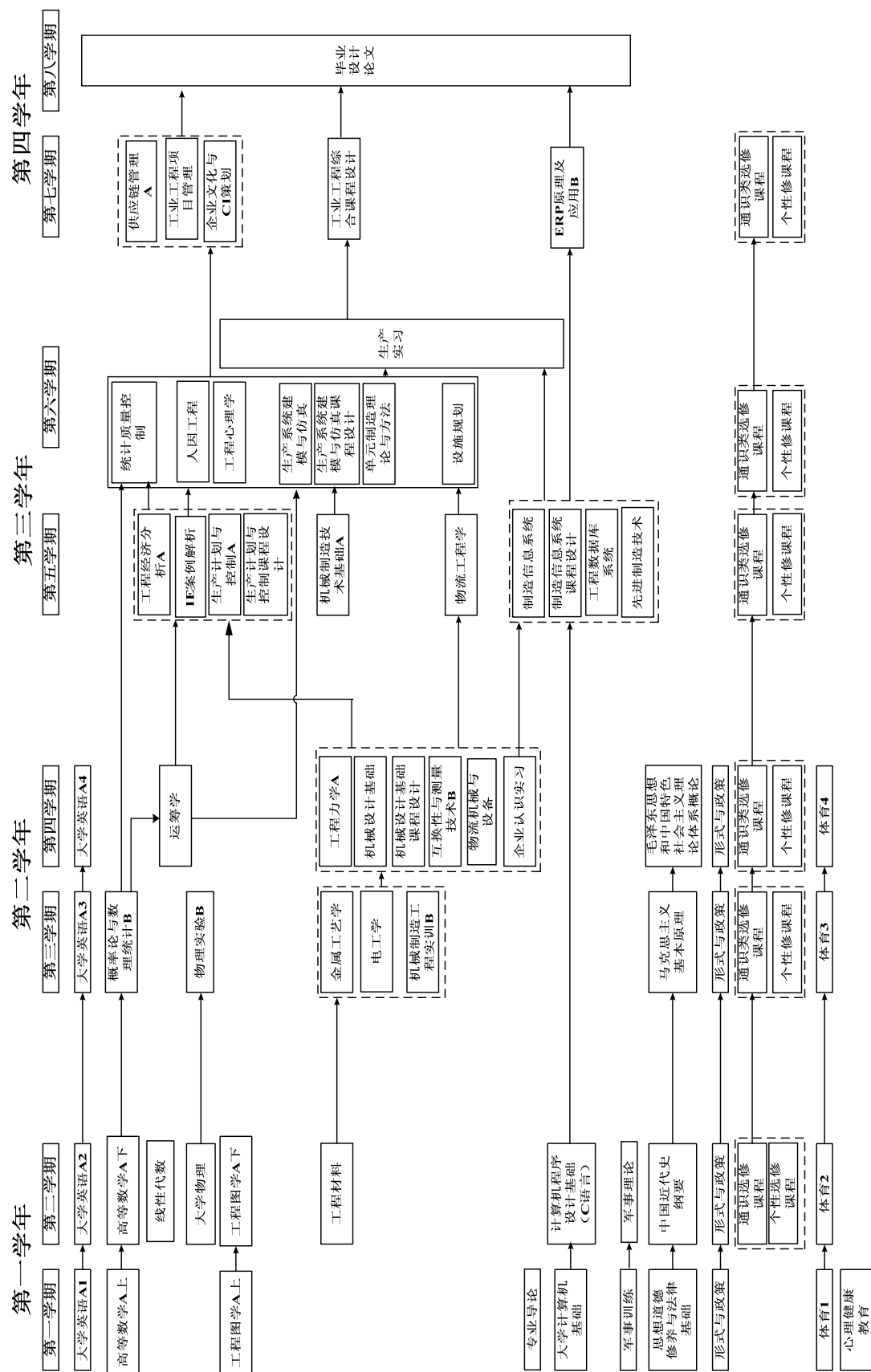
专业核心课程	专业特色课程	课程名称	工业工程专业毕业要求							
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		思想道德修养与法律基础								√
		中国近现代史纲要								√
		毛泽东思想和中国特色社会主义理论体系概论								√
		马克思主义基本原理								√
		军事理论								√
		体育								√
		心理健康教育					√			√
		大学英语			√		√			
		大学计算机基础	√		√					
		计算机程序设计基础(C 语言)	√		√					
		专业导论	√	√	√			√		√
		工程材料	√	√	√			√		
		高等数学	√	√	√			√		
		工程图学	√	√	√			√		
		线性代数	√	√	√			√		

专业核 心课程	专业特 色课程	课程名称	工业工程专业毕业要求							
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		大学物理	√	√	√			√		
		物理实验 B	√	√	√			√		
		概率论与数理统计 B	√	√	√			√		
√		基础工业工程	√	√	√			√	√	
		电工学	√	√	√			√		
		互换性与测量技术 B	√	√	√			√		
		金属工艺学 B	√	√	√			√		
		工程力学 A	√	√	√			√		
		机械设计基础	√	√	√			√		
√		运筹学	√	√	√	√		√	√	
		先进制造技术	√	√	√			√		
		机械制造技术基础 A	√	√	√			√		
√		工程经济分析 A	√	√	√	√		√	√	
√		制造信息系统	√	√	√	√		√		
√	√	生产计划与控制 A	√	√	√	√		√	·	
√	√	物流工程学	√	√		√		√		
√	√	人因工程	√	√	√	√		√		
√	√	设施规划	√	√		√			·	
√	√	生产系统建模与仿真	√	√	√	√		√	·	
√	√	统计质量控制	√	√	√	√		√	·√	
		工程数据库系统	√	√	√	√		√		
		IE 案例解析	√	√	√	√		√	·√	
		工程心理学	√	√	√	√				
		单元制造理论与方法	√	√	√	√		√	·√	
√		供应链管理 A	√	√	√	√		√		

专业核 心课程	专业特 色课程	课程名称	工业工程专业毕业要求							
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		物流机械与设备	√	√	√			√		
		ERP 原理及应用 B	√	√	√	√		√	·√	
		工业工程项目管理	√	√			√	√		
		企业文化与 CI 策划	√				√	√	·√	√
		军事训练					√			√
		机械制造工程实训 B			√		√	√	√	√
		企业认识实习	√				√			√
		机械设计基础课程设计	√	√	√	√		√	·√	
		生产计划与控制课程设计	√	√	√	√		√		
		制造信息系统课程设计	√	√	√	√		√	√	
		生产实习	√	√	√	√	√	√	·√	√
		生产系统建模与仿真课程设计	√	√	√	√		√	·√	
		工业工程综合课程设计	√	√	√	√		√	√	
		毕业设计	√	√	√	√	√	√	√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crts	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course	
						实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
通 识 课 程 Public Basic Courses	必修课 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060003130	军事理论 Military Theory	1	32			16		2-4		
		4210001110	体育 1 Physical Education I	1	32					1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		1050001130	心理健康教育 Mental Health Education	1	16					1		
		4030002110	大学英语 A1 College English A 1	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120017110	大学计算机基础 Foundation of Computer	2	32		12			1		
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C Language)	3	48		12			2		
		小 计 Subtotal				35	736		24	64	64	
	选修课 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分,且必须选修艺术体育类课程中的艺术类相关课程,取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程,其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from <i>Art and Physical Education Courses</i> to obtain at least 2 credits. Science and engineering students should select at least one course from <i>Arts and Social Science Courses</i> or <i>Economy and Management Courses</i> , and other students should select at least one course from <i>Science and Technology Courses</i> .							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crts	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 基 础 类 课 程 Basic Engineering Courses	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学上 Advanced Mathematics A I	5	80					1	
		4050064110	高等数学下 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050024110	大学物理 Physics	5	80					2	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		4100009110	电工学 Electrical Engineering	3	48	8				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		4050071110	工程力学 A Engineering Mechanics	4	64	4				4	
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				4	
		小 计 Subtotal		42.5	696	56	4				
专 业 课 程 Specialized Courses	必修课程 Required Courses	4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2	
		4080061110	机械设计基础 Mechanical Designing	3.5	56	6				4	
		4050254110	运筹学 Operational Research	3	48					4	
		4080109110	先进制造技术 Advanced Manufacturing Technology	2.5	40					5	
		4080064110	机械制造技术基础 A Fundamentals of Mechanical Manufacturing Technology	4	64	6				5	
		4080036110	工程经济分析 A Engineering Economical Analysis A	3	48		6			5	
		4080119110	制造信息系统 Manufacturing Information Systems	2.5	40					5	
		4080096110	生产计划与控制 A Operations Management A	3.5	56	6				5	
		4080106110	物流工程学 Logistics Engineering	2.5	40					5	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080094110	人因工程 Human Factor Engineering	3	48	6				6	
		4080095110	设施规划 Facility Layout	2.5	40					6	
		4080097110	生产系统建模与仿真 Production System Modeling and Simulation	3.5	56		8			6	
		4080099110	统计质量控制 Statistical Quality Control	3	48		4			6	
		小 计 Subtotal		38.5	616	32	18				
	选修课 Elective Courses	4080107110	物流机械与设备 Logistics Machines and Facilities	2.5	40					4	
		4080201120	工程数据库系统 Engineering Database System	2.5	40		8			5	
		4080081110	IE 案例解析 IE Cases Analysis	2	32					5	
		4080044110	工程心理学 Engineering Psychology	2.5	40					6	
		4080029110	单元制造理论与方法 Cellular Manufacturing Theory and Method	2	32					6	
		4170043110	供应链管理 A Supply Chain Management A	2.5	40					7	
		4080003110	ERP 原理及应用 B ERP Principles & Application B	2	32					7	
		4080046110	工业工程项目管理 Industrial Engineering Project Management	2	32					7	
		4080089110	企业文化与 CI 策划 Enterprise Culture & CI Design	2	32					7	
		小 计 Subtotal		20	320		8				
		修读说明：要求至少选修 13 学分 Study shows : Subtotal credits at least: 13									
个性化课程 Personalized Course	选修课 Elective Courses	4080294130	工业工程前沿 Industrial Engineering Frontier	1	16					4	
		4080295130	工业工程研究方法与实践 Research Method and Pactice of Industrial	1	16					4	
		小 计 Subtotal		2	32						
		修读说明：学生可跨专业自主选择修读全校其他专业的课程，建议修读以上课程。要求至少选修 10 学分。 NOTE: Students can choose any courses from the other specialties, and are especially suggested to choose the courses above. Minimum subtotal credits: 10.									

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term
1060002110	军事训练 Military Training	3	1.5	1
4080150110	机械制造工程实训 B Machinery Manufacturing Engineering Practice B	4	4	3
4080324140	企业认识实习 Enterprise Practice	1.5	1.5	4
4080146110	机械设计基础课程设计 Course Practice of Machinery Design	2	2	4
4080158110	生产计划与控制课程设计 Course Practice of Production Plan and Control	2	2	5
4080170110	制造信息系统课程设计 Course Practice of Manufacturing Information Systems	2	2	5
4080162110	生产实习 Production Practice	3	3	6
4080165110	生产系统建模与仿真课程设计 Course Practice of Production System Modeling and	2	2	6
4080140110	工业工程综合课程设计 Synthesis Course Design of Industrial Engineering	3	3	7
4080221120	毕业设计 Graduation Design	17	11	8
小 计 Subtotal		39.5	32	

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：丁国平

【机械工程专业】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Mechanical Engineering (2015)

专业名称	机械工程	主干学科	机械工程
Major	Mechanical Engineering	Major Disciplines	Mechanical Engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Mechanical Engineering
所属大类	机械类（机电）	大类培养年限	1 年
Disciplinary	Mechanical(Electromechanical)	Mechanical Duration	1 years

最低毕业学分规定

Graduation Credit Criteria

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	36.5	45.5	\	32	\	190
选修课 Elective Courses	9	\	12	10	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

（一）培养目标

- （1） 具有科学精神与创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
- （2） 具备机械工程领域内设计制造的基础理论和专门知识；
- （3） 具备知识应用、工程实践、组织管理、团队合作以及自主学习和适应发展的能力；
- （4） 能从事机械工程领域内的设计制造、科研开发、应用研究和运行管理等工作；
- （5） 毕业生未来几年能在各自所工作的领域成为工程技术人才或管理人才。

- （1） The graduates should have the sense of innovation, international cooperation, humanistic quality, professional ethics and responsibility for society;
- （2） The graduates should master the fundamental theories about the design and manufacture of mechanical engineering and some specialized knowledge;
- （3） The graduates should have the capabilities to apply theory, practice in projects, organize and manage and the abilities to self-study and get adapt to new development ;
- （4） The graduates should be qualified in designing and manufacture, scientific and technological development, research for application and operational management.
- （5） The graduates should be able to grow to senior engineering and technical personnel or senior management personnel in the next a few years after graduation.

(二) 毕业要求

机械工程专业学生主要学习机械设计、制造的基础知识，受到现代机械工程师的基本训练，具有从事机构设计、制造及控制的基本能力；

- (1) 较好的人文社会科学素养、较强的社会责任感和良好的工程职业道德。
- (2) 从事工程工作所需的相关数理学科基础、自然科学知识和一定的经济管理知识。
- (3) 掌握扎实的机械工程基本理论知识和专业基础知识，具有系统的机械工程实践训练，了解本专业的前沿发展现状和趋势。
- (4) 较系统地掌握本专业领域宽广的技术理论基础知识，主要包括力学、机械学、电子与电工学、流体力学等基础知识；
- (5) 具备创新意识和对机械行业新产品、新设备进行研究、开发和设计的初步能力，初步具有本专业机械设计开发能力和一定的技术组织管理能力。
- (6) 掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，能通过互联网、期刊资料等渠道了解相关的器件、产品、系统及技术的进展与前沿，能有效地运用各种资源找到解决具体的机械专业技术问题的方法。
- (7) 了解国家有关机械工程专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规，正确认识工程实际对客观世界和社会的影响，把握国内外相关的标准、规范和技术变化。
- (8) 具有初步科学研究、技术开发和工程设计的组织管理能力、表达能力和人际交往能力，能够在团队中发挥作用。
- (9) 具有适应社会发展能力以及终身学习能力。
- (10) 具有国际视野和跨文化交流、竞争与合作能力。

The students majoring in Mechanical Engineering will learn fundamental theory of machine design and manufacturing processes, and should be trained to become qualified modern mechanical engineers who are able to design product and have the capabilities to manufacture and control.

- (1) The graduates should have good quality of humanities and social sciences, strong sense of responsibility for society and proper engineering profession ethics.
- (2) The graduates should master related mathematical theory to conduct engineering work and the relevant knowledge about natural science and economic management.
- (3) The graduates should master the fundamental theories of mechanical engineering and have systematic engineering practice training of mechanical engineering technology, understanding the forefront of the development and trends of their major.
- (4) The graduates should master extensive knowledge related to major fields including mechanics of materials, mechanical design theory, electricity and electronics, fluid power and hydromechanics.
- (5) The graduates should have the sense of innovation and preliminary capability to research, develop and design new products; have the ability to design and develop mechanical products and the capabilities to organize and manage techniques.
- (6) The graduates should master the basic method of literature search, data inquiry and the use of modern information technology to obtain relevant information, and be able to understand the progress and forefront of related devices, products, systems and technologies via the Internet, journals and other ways, and be able to solve specific technical problems with mechanical techniques via various of resources.

- (7) The graduates should know laws, regulations relevant to work of production, design, research and development in the scope of mechanical engineering, understand the relevant guidelines, policies, laws and regulations of environmental protection and sustainable development, understand accurately the actual impact of the project on the objective world and society, keep pace with domestic and foreign related standards, specifications and technical changes.
- (8) The graduates should have the preliminary capability to organize, manage, present works, communicate and function well in a team.
- (9) The graduates should be able to adapt to social development and can study in a lifelong term.
- (10) The graduates should have international perspectives and the ability to communicate, compete and cooperate in different cultures.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4	培养目标 5
毕业要求 1	√		√	√	
毕业要求 2		√			
毕业要求 3	√	√			
毕业要求 4		√			√
毕业要求 5		√			√
毕业要求 6			√	√	√
毕业要求 7	√		√	√	
毕业要求 8			√	√	√
毕业要求 9			√	√	√
毕业要求 10	√		√	√	

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程：

理论力学、材料力学、工程材料、机械原理、机械设计、控制工程基础、测试技术、机械制造技术基础、数控技术、CAD/CAM 及数控加工技术综合实践、机械制造装备与设计。

Core Courses: Theoretical Mechanics, Mechanics of Materials, Engineering Materials, Principle of Mechanics, Mechanical Design, Fundamental of Control Engineering, Measuring and Testing Technique, Foundation of Mechanical Manufacturing Technology, Numerical Control Technology, Practice of CAD/CAM and NC Machining, Machine Equipment Design.

(二) 专业特色课程：

机械制造技术基础、测试技术、数控技术、CAD/CAM 及数控加工技术综合实践、机械制造装备与设计。

Characteristic Courses: Foundation of Mechanical Manufacturing Technology, Measuring and Testing Technique, Numerical Control Technology, Practice of CAD/CAM and NC Machining, Machine Equipment Design.

附：毕业要求实现矩阵：

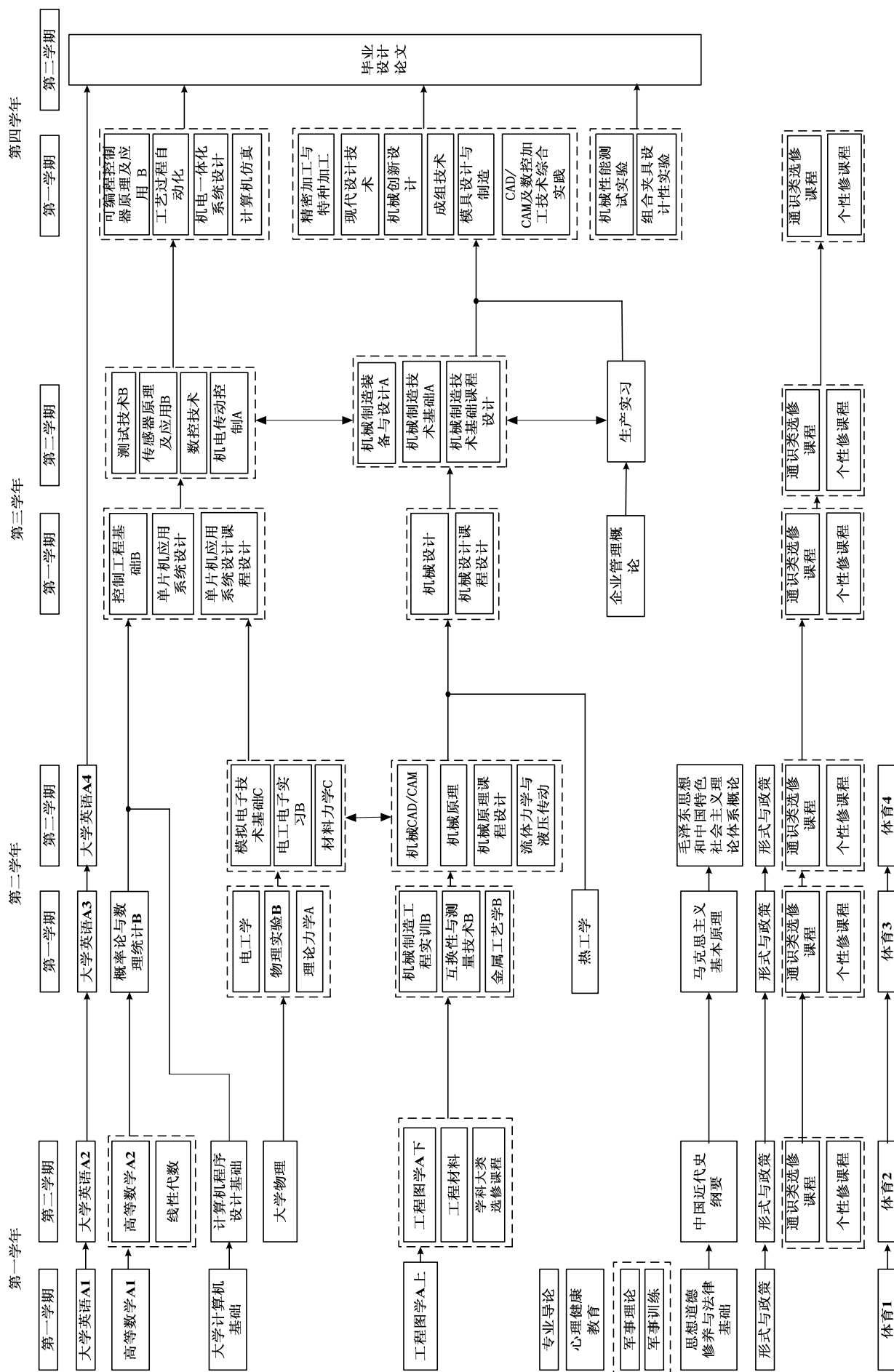
专业核 心课程	专业特 色课程	课程名称	机械工程专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√						√		√	
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义理论体系概论	√								√	
		马克思主义基本原理	√								√	
		军事理论	√									
		体育	√							√		
		大学英语	√					√				√
		大学计算机基础			√			√				
		计算机程序设计基础			√							
		心理健康教育	√								√	
		专业导论				√	√					√
		高等数学		√								
		线性代数		√								
		概率论与数理统计 B		√								
		大学物理		√								
		物理实验 B		√	√							
		工程图学 A			√							
√		工程材料			√							
		学科大类选修课程			√	√						
		互换性与测量技术 B			√	√						
		机械制造工程实训 B			√				√	√		
		电工学			√							

专业核 心课程	专业特 色课程	课程名称	机械工程专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		电工电子实习 B			√							
√		理论力学 A			√							
		金属工艺学 B			√							
√		机械原理			√							
		机械原理课程设计								√	√	
		流体力学与液压传动			√	√						
		模拟电子技术基础 C			√					√	√	
√		材料力学 C			√					√	√	
√		机械设计			√					√	√	
		机械设计课程设计								√	√	
		热工学			√							
√		控制工程基础 B				√	√	√				
		单片机应用系统设计				√						
		单片机应用系统设计课程设计				√						
√	√	机械制造技术基础 A				√						
		机械制造技术基础课程设计				√						
		机械 CAD/CAM			√	√	√	√				
		机电传动控制 A				√						
	√	测试技术 B		√	√		√					
		可编程控制器原理及应用 B				√		√		√		
		传感器原理及应用 B				√						
		现代设计技术				√		√				
		成组技术			√	√	√	√				
		生产实习	√	√					√	√		
√	√	数控技术				√						

专业核 心课程	专业特 色课程	课程名称	机械工程专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
√	√	CAD/CAM 及数控加工技术综合实践				√						
√	√	机械制造装备与设计 A				√						
		企业管理概论	√		√	√	√	√	√			
		机电一体化系统设计			√	√	√	√	√			
		机械性能测试实验				√						
		组合夹具设计性实验				√						
		模具设计与制造			√		√					
		机械创新设计				√	√	√				
		精密加工与特种加工			√	√						
		工艺过程自动化				√						
		计算机仿真				√						
		毕业设计（论文）				√	√	√	√	√	√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学 分 Cr	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur		
通 识 课 程 											

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Cs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 大 类 课 程 Basic Disciplinary Courses	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A1 Advanced Mathematics A I	5	80					1	
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4050064110	高等数学 A2 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4050460130	大学物理 Physics	5	80					2	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	大学物理
		4100008110	电工学 Electrical Engineering	3	48	8				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		小 计 Subtotal		36.5	600	48	4				
专 业 课 程 Specialized Courses	必修课程 Required Courses	4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3	
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3	
		4090177140	热工学 Heat and Thermodynamics	1.5	24					3	
		4110050110	模拟电子技术基础 C Fundamentals of Analog Electronic Circuit C	3	48	8				4	
		4050018110	材料力学 C Mechanics of Materials C	4	64	4				4	理论力学 A
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4	
		4080087110	流体力学与液压传动 Fluid Mechanics and Hydraulic	2.5	40	4				4	
		4080060110	机械设计 Mechanical Designing	4	64	6				5	机械原理
		4080085110	控制工程基础 B Fundamentals of Control B	2.5	40	4				5	
		4080053110	单片机应用系统设计 Micro-Controller Unit Application System Design	3	48	6				5	
		4080325140	企业管理概论 Introduction to Business Management	1	16					5	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学 分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Prac-tice	课外 Extra-cur		
		4080023110	测试技术 B Measuring & Testing Technology B	2.5	40	4				6	控制工程基础 B
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4				6	
		4080065110	机械制造技术基础 B Fundamentals of Mechanical Manufacturing Technology B	3.5	56	6				6	
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				6	
		4080314140	机械制造装备设计 Machine Equipment Design	2	32					6	
		4080209120	机械性能测试实验 Testing Experiment of Mechanical Properties	0.5	16	16				7	
		4080214120	组合夹具设计性实验 Experiment of Modular Fixture Design	0.5	16	16				7	
		小 计 Subtotal		45.5	744	90					
	选修课 Elective Courses	4080058110	机械 CAD/CAM Machinery CAD/CAM	2	32		6			4	
		4080027110	传感器原理及应用 B Fundamentals & Application of Sensors B	2	32	6				6	
		4080110110	现代设计技术 Modern Design Technology	2	32					7	
		4080025110	成组技术 Group Technology	2	32					7	
		4080083110	可编程控制器原理及应用 B Fundamentals & Application of Programmable Logic Controller B	2	32	4				7	
		4080057110	机电一体化系统设计 Mechatronics System Design	2	32					7	
		4080048110	工艺过程自动化 Process Automation	2	32					7	
		4080073110	计算机仿真 Computer Simulation	2	32		6			7	
		4080211120	模具设计与制造 Mould Design and Manufacture	2.5	40					7	
		4080059110	机械创新设计 Innovative Mechanical Design	2	32					7	
		4080080110	精密加工与特种加工 Technology of Special Machining and Precision Machining	2	32					7	
		小 计 Subtotal		22.5	360	10	12				
		修读说明：要求至少选修 12 学分。 NOTE: Minimum subtotal credits:12									

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学 分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
个 性 课 程 Personalized Course	选 修 课 Elective Courses	4080287130	机械制造中的信息技术 Information Technology in Mechanical Manufacturing	2	32	4				5	
		4080285130	智能机械装备技术及应用 Intelligent Machinery Equipment Technology and Application	2	32	10		6		5	
		4080286130	机电设备电气控制 Electrical control of Mechanical and Electrical Equipment	2	32	6		2		6	
		4080284130	振动与噪声基础 Fundamentals of Vibration and Noise	2	32			16		6	
		小 计 Subtotal		8	128	20		24			
		修读说明：学生可跨专业自主选择修读全校其他专业的课程，建议修读以上课程。要求至少选修 10 学分。 NOTE: Students can choose any courses from the other specialties, and are especially suggested to choose the courses above. Minimum subtotal credits: 10.									

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term	第二专业 Second Major
1060002110	军事训练 Military Training	3	1.5	1	
4080150110	机械制造工程实训 B Machinery Manufacturing Engineering Practice B	4	4	3	
4100069110	电工电子实习 B Practice in Electrical Engineering & Electronics B	1	1	4	
4080149110	机械原理课程设计 Curricula Design of Mechanical Principles	1.5	1.5	4	
4080139110	单片机应用系统设计课程设计 Curricula Design of Micro-Controller Unit Application System Design	2	2	5	
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5	
4080161110	生产实习 Production Practice	3	3	6	
4080154110	机械制造技术基础课程设计 Curricula Design of Foundation on Mechanical Manufacturing Technology	3	3	6	
4080122110	CAD/CAM 及数控加工技术综合实践 Practice of CAD/CAM and NC Machining	2	2	7	
4080218120	毕业设计 Graduation Design	17	11	8	
小 计 Subtotal		39.5	32		

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：李益兵

【过程装备与控制工程专业】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Industrial Equipment and Control Engineering (2015)

专业名称	过程装备与控制工程	主干学科	过程装备与控制工程
Major	Industrial Equipment and Control Engineering	Major Disciplines	Industrial Equipment and Control Engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Industrial Equipment and Control Engineering
所属大类	机械类（机电类）	大类培养年限	1 年
Disciplinary	Mechanical(Electromechanical)	Mechanical Duration	1 years

最低毕业学分规定

Graduation Credit Criteria

课程类别 课程性质	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	36.5	49	\	30.5	\	190
选修课 Elective Courses	9	\	10	10	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

（一）培养目标

- （1）具有现代科学创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
- （2）既具备扎实的机械工程技术基础，又掌握现代过程控制装备与控制工程系统科学的理论和方法，能够综合运用自然科学、机械工程与现代过程控制的方法与技术，对过程工业系统进行规划、设计、控制、持续改善与创新；
- （3）具有良好的科学文化素质、知识更新能力、创新思维能力，能在生产和服务领域从事技术和管理的应用研究型复合人才。

（1）With modern science and innovation consciousness, international exchanges and competition consciousness, humanistic and scientific literacy, occupation ethics and social responsibility;

（2）Both have a solid foundation in mechanical engineering technique, and with process equipment and control engineering system scientific theory and method of modern process control, to make comprehensive use of the technique and method of natural science, mechanical engineering and modern process control, and to make comprehensive use of the technique and method of natural science, mechanical engineering and modern process control, planning, design, control, continuous improvement and innovation of process industry system;

（3）With good quality of science and culture, knowledge renewal ability, creative thinking ability, which can be engaged in applied research talents of technology and management in the field of production and services.

（二）毕业要求

为了达到培养目标要求，毕业生应达到以下方面的知识、能力和素质要求：

In order to achieve the graduation goal request, graduates should meet the requirements of knowledge, ability and quality in the following aspects:

(1) 较好的人文社会科学素养、较强的社会责任感和良好的工程职业道德；

Good sense of humanities and social science literacy, strong social responsibility better and owns good engineering occupation moral

(2) 从事工程工作所需的相关数理学科基础和一定的项目管理知识；

Required in the engineering work related mathematical discipline foundation and certain knowledge of project management

(3) 掌握扎实的过程装备与控制工程专业基本理论知识和专业基础知识，具有系统的过程工业系统实践训练，了解本专业的前沿发展现状和趋势；

Grasp of the major of process equipment and control engineering basic theory knowledge and professional basic knowledge, practical training system in process industry with system, understand the latest development status and trend of the professional

(4) 综合运用自然科学、机械工程与现代过程控制的方法与技术，对过程工业系统进行规划、设计、控制、持续改善与创新；

Adopt technical methods and techniques of natural science, mechanical engineering and modern process control, planning, design, control, continuous improvement and innovation of process industry system

(5) 具备创新意识和对过程工业新产品、新设备进行研究、开发和设计的初步能力，初步具有本专业过程装备设计开发能力和一定的技术组织管理能力；

Have the sense of innovation and the process of industrial new products, new equipment research, development and design of the preliminary ability, initially with the professional process equipment design and development capability and certain technical ability of organization and management;

(6) 掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，能通过互联网、期刊资料等渠道了解相关的器件、产品、系统及技术的进展与前沿，能有效地运用各种资源找到解决具体的过控专业技术问题的方法；

Master the basic methods of literature search, data query and use of modern information technology to obtain relevant information, can through the Internet, journal data channels understand the devices, products, systems and technologies related to the progress and frontier, effective use of various resources to find solutions to problems of specific process control major;

(7) 了解国家有关过控专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规，正确认识工程实际对客观世界和社会的影响，把握国内外相关的标准、规范和技术变化；

Understand the relevant national laws on control engineering related occupation and industry production, design, research and development, regulations and relevant environmental protection and sustainable development and other aspects of the guidelines, policies and laws and regulations, the correct understanding of the objective world and the actual effect of engineering society, grasp the standards, norms and technical changes associated with both at home and abroad;

(8) 具有初步科学研究、技术开发和工程设计的组织管理能力、表达能力和人际交往能力，能够在团队中发挥作用；

With the preliminary scientific research, technology development and engineering design management ability, expression ability and interpersonal skills, can play a role in the research team

(9) 具有适应社会发展能力以及终身学习能力；

Adapt to the social development ability and the ability of lifelong learning

(10) 具有国际视野和跨文化交流、竞争与合作能力。

With international vision and cross cultural communication, competition and cooperation ability.

附：培养目标实现矩阵

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3
毕业要求 1	√		
毕业要求 2		√	√
毕业要求 3		√	
毕业要求 4		√	

	培养目标 1	培养目标 2	培养目标 3
毕业要求 5	√		
毕业要求 6		√	
毕业要求 7		√	
毕业要求 8			√
毕业要求 9			√
毕业要求 10	√		

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

专业核心课程：理论力学、材料力学、机械原理、机械设计、机械制造技术基础、流体力学与流体机械、过程原理与设备、粉体力学与设备、过程控制技术、建材设备设计。

Core Courses: Theoretical Mechanics, Materials Mechanics, Principle of Mechanics, Mechanical Design, Fundamentals of Mechanical Manufacturing Technology, Fluid Mechanics and Fluid Machinery, Process Principles and Equipment Engineering, Powder Mechanics and Equipment, Process Control Engineering, , Design of Building Materials Equipment.

专业特色课程：过程控制技术、建材设备设计。

Characteristic Courses: Process Control Engineering, Design of Building Materials Equipment.

附：毕业要求实现矩阵：

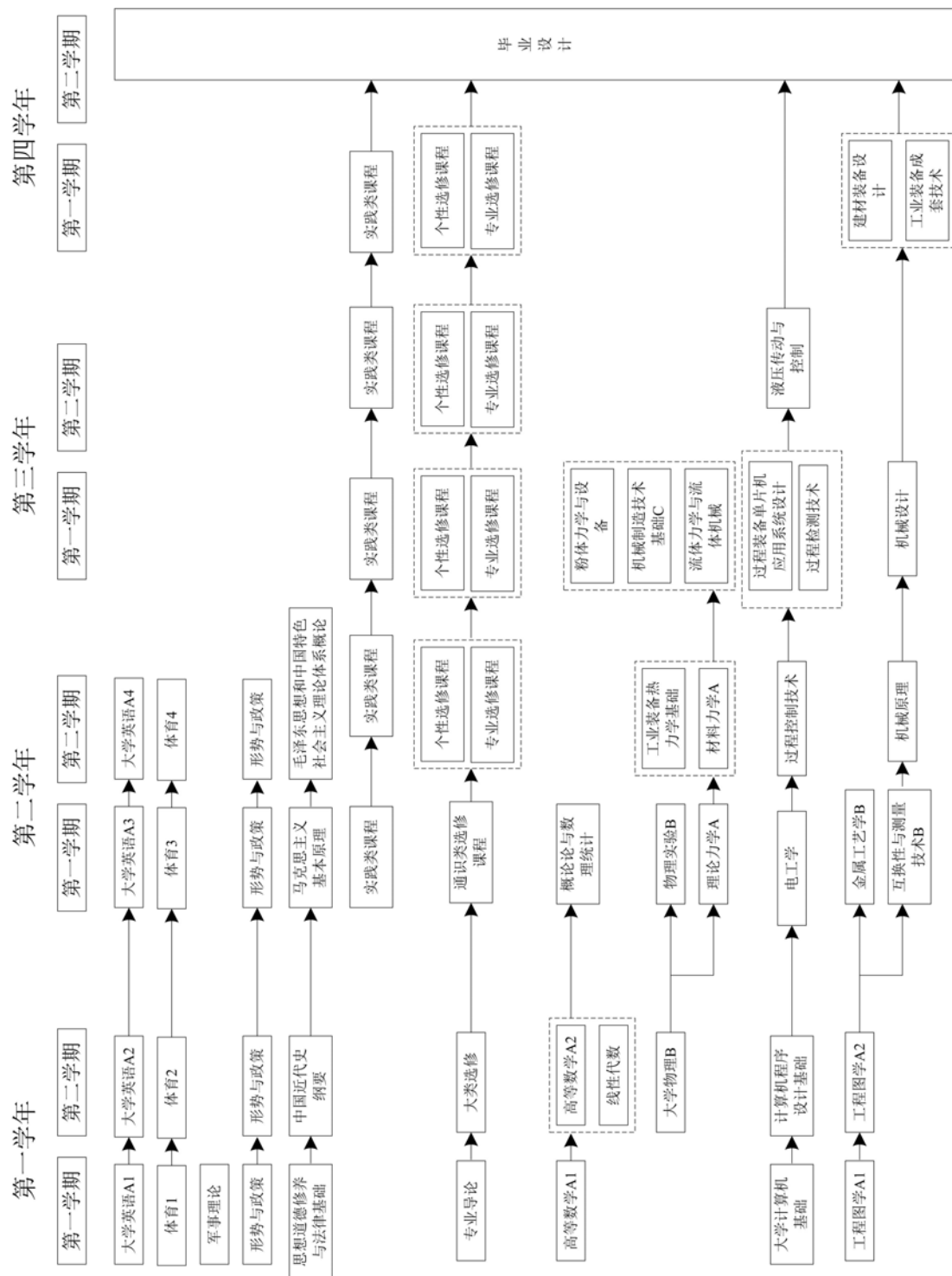
专业 核心 课程	专业 特色 课程	课程名称	过程装备与控制工程专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√									
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义理论体系概论	√									
		马克思主义基本原理	√									
		军事理论	√									
		体育	√									
		大学英语						√				
		大学计算机基础		√								
		计算机程序设计基础(C 语言)				√						
		专业导论							√	√		
		工程材料				√						
		高等数学 A1		√								
		高等数学 A2		√								
		工程图学 A1			√							

		工程图学 A2			√							
		线性代数		√								
		大学物理 C		√								
		物理实验 B		√								
		概率论与数理统计 B		√								
		造型设计基础			√							
		基础工业工程			√							
√		理论力学 A		√								
		电工学		√								
		互换性与测量技术 B			√							
		金属工艺学 B			√							
√		材料力学 A		√								
		工业装备热力学基础				√						
√	√	过程控制技术				√						
		过程检测技术				√						
√		机械原理					√					
√		机械设计					√					
		过程装备单片机应用系统设计					√					
√		流体力学与流体机械			√							
		液压传动与控制			√							
√		机械制造技术基础 C					√					
√		过程原理与设备					√					
√		粉体力学与设备					√					
		工业装备成套技术					√					
√	√	建材装备设计							√			
		CAD/CAM					√					
		机电工程软件					√					
		可编程控制器原理及应用 A					√					
		机电传动控制 A					√					
		光机电测控技术基础					√					
		机电一体化系统设计							√			
		成型机械与模具设计					√					

		数控技术					√					
		工业装备网络控制技术					√					
		机械振动与噪声技术					√					
		新型材料装备前沿			√							
		微机电系统应用技术			√							
		过程制造业信息化			√							
		军事训练									√	
		机械制造工程实训 B								√		
		过程计算机控制综合课程设计								√		
		机械原理课程设计								√		
		过程装备单片机应用系统设计课程设计								√		
		机械设计课程设计								√		
		生产实习									√	
		工业装备成套技术综合课程设计								√		
		毕业设计									√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course	
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur			
通 识 课 程 Public Basic Courses	必修课程 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060001110	军事理论 Military Theory	1	32			16		1		
		4210001110	体育 1 Physical Education I	1	32					1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		1050001110	心理健康教育 Mental Health Education	1	16					1		
		4030002110	大学英语 A1 College English A I	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120017110	大学计算机基础 Foundation of Computer	2	32			12		1		
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C Language)	3	48			12		2		
		小 计 Subtotal				35	736		24	64	64	
	选修课程 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from <i>Art and Physical Education Courses</i> to obtain at least 2 credits. Science and engineering students should select at least one course from <i>Arts and Social Science Courses</i> or <i>Economy and Management Courses</i> , and other students should select at least one course from <i>Science and Technology Courses</i> .							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 大 类 课 程 Basic Disciplinary Courses	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A1 Advanced Mathematics A I	5	80					1	
		4050064110	高等数学 A2 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4050024110	大学物理 Physics	5	80					2	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		4100008110	电工学 Electrotechnology	3	48	10				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		小 计 Subtotal		36.5	600	50	4				
专 业 课 程 Specialized Courses	必修课程 Required Courses	4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3	
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3	
		4050015110	材料力学 A Mechanics of Materials A	5	80	8				4	理论力学 A
		4080206120	过程控制技术 Process Control Engineering	2.5	40	4				4	
		4080205120	过程检测技术 Process Measuring & Testing Technology	2.5	40	4				5	
		4080102110	工业装备热力学基础 Industrial Equipment Thermal Theory	2	32					4	
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4	
		4080060110	机械设计 Mechanical Designing	4	64	6				5	
		4080053110	过程装备单片机应用系统设计 Design of Industry Equipments Single-Chip Computer Application System	3	48	6				5	
		4080086110	流体力学与流体机械 Fluid Mechanics and Fluid Machines	2.5	40	2				5	
		4080066110	机械制造技术基础 C Fundamentals of Mechanical Manufacturing Technology C	3	48	6				5	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080207120	过程原理与设备 Process Principles and Equipment	3	48	6				5	
		4080033110	粉体力学与设备 Powder Mechanics and Power Machines	3	48					5	流体力学与流体机械
		4080213120	液压传动与控制 Hydraulic Transmission and Control	2.5	40	2				6	流体力学与流体机械
		4080047110	工业装备成套技术 Complete Sets of Process Equipment Technology	3	48					7	
		4080077110	建材装备设计 Designs of Building Materials Equipment	3	48					7	粉体力学与设备
		小 计 Subtotal		49	784	52					
	选修课 Elective Courses	4080199120	CAD/CAM CAD/CAM	2.5	40		10			4	
		4080208120	机电工程软件 Engineering Software of Electric Machine	2.5	40		12			4	
		4080082110	可编程控制器原理及应用 A Fundamentals & Application of Programmable Controllers A	2.5	40	6				5	
		4080121110	工业装备网络控制技术 Networks Control Technology of Industry Equipments	2.5	40	4				7	
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4				7	
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				7	
		4080127120	机电一体化系统设计 Mechatronics System Design	2.5	40					7	
		4080050110	光机电测控技术基础 Measurement Technology of Ray and Electro-mechanics	2.5	40					7	
		4080024030	成型机械与模具设计 Tool and Mould Design	2.5	40					7	
		小 计 Subtotal		22.5	360	18	22				
		修读说明：要求至少选修 10 学分。 NOTE: Minimum subtotal credits:10.									
个性化课程 Personalized Course	选修课 Elective Courses	4080288130	机械振动与噪声技术 Mechanical vibration and noise	2	32					6	
		4080289130	新型材料装备前沿 New material equipment frontier	2	32					6	
		4080290130	微机电系统应用技术 Application Technology of Micro Electro Mechanical System	2	32					6	
		4080291130	过程制造业信息化 Process of Manufacturing Industry Informationization	2	32					6	
		小 计 Subtotal		8	128						
		修读说明：学生可跨专业自主选择修读全校其他专业的课程，建议修读以上课程。要求至少选修 10 学分。 NOTE: Students can choose any courses from the other specialties, and are especially suggested to choose the courses above. Minimum subtotal credits: 10.									

五、集中性实践教学环节

V Practice Schedule

课程编号	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term
1060002110	军事训练 Military Training	3	1.5	1
4080150110	机械制造工程实训 B Training on Mechanical Manufacturing Engineering B	4	4	3
4080149110	机械原理课程设计 Curricula Design of Mechanical Principles	1.5	1.5	4
4080344160	过程计算机控制综合课程设计 A Course Practice of Process Computer Control A	1.5	1.5	4
4080346160	过程装备单片机应用系统设计课程设计 B Curricula Design of Computer Interface Technology B	3	3	5
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5
4080159110	生产实习 Production Practice	2	2	6
4080141110	工业装备成套技术综合课程设计 A Curricula Design of Complete Sets of Process Equipment Technology A	3	3	7
4080219120	毕业设计 Graduation Design	17	11	8
小 计 Subtotal		38	30.5	

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：胥 军

【测控技术与仪器专业】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Measuring & Control Technology and Instrument(2015)

专业名称	测控技术与仪器	主干学科	仪器科学与技术
Major	Measuring&Control Technology and Instrument	Major Disciplines	Instrument Science and Technology
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Mechanical Engineering

最低毕业学分规定

Graduation Credit Criteria

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	43.5	38	\	32.5	\	190
选修课 Elective Courses	9	\	12	10	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

(一) 培养目标

- (1) 具有现代科学创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
 - (2) 具有从事测控技术与仪器领域科学研究、工程设计和技术服务等工作所需的数理知识和专业知识，以及综合运用科学理论、专业技术和工具分析解决测控领域复杂工程问题，具备设计、开发、测试、应用复杂测控系统的能力；
 - (3) 具有质量意识、环境意识和安全意识，能综合考虑社会制约因素及相关政策法规完成工程设计；
 - (4) 具备一定的组织管理、人际交往、团队合作能力以及不断学习和适应发展的能力；
 - (5) 毕业生在仪器及相关领域具有就业竞争力或有能力进入研究生阶段学习；能在国民经济各部门从事测量与控制相关技术、仪器与系统的设计制造、科研开发、应用研究、运行管理等方面工作；毕业 5 年左右能在各自所工作的领域作为骨干成员或者领导发挥作用。
- (1) Have modern science innovation consciousness, international communication and competition consciousness, humanities quality, professional ethics and sense of social responsibility.
 - (2) Have required mathematical, physical and professional knowledge of engaged in scientific research, engineering designation and technical service in the field of

measurement & control technology and instrument. Have the ability of analysis, design, development, testing and application complex measurement & control system by the synthetic application of scientific theory, specialty technology and instrument.

- (3) Have quality, environment and safety consciousness. Can comprehensive consideration social constraint factors and relevant policies and regulations to complete engineering design.
- (4) Have the ability of organization and management, interpersonal communication, teamwork, continuous learning and adapt to development.
- (5) The graduate have competitive power of obtaining employment or have ability of entering postgraduate stage; have ability of doing measurement and control technology work, can design and manufacture instruments and system, research on scientific and application, operation management in the national economy departments. Graduate can become senior engineering and technical personnel or senior management personnel in about five years.

(二) 毕业要求

- (1) 身心健康，具有良好的人文社会科学素养、较强的社会责任感，能够在工程实践中理解并遵守工程职业道德和规范；
- (2) 能够将数学、自然科学、工程基础和专业知识用于解决复杂测控系统的工程问题；
- (3) 能够应用数学、自然科学和测控专业知识，通过文献研究，识别、表达并分析复杂测控系统的工程问题；
- (4) 能够针对复杂测控系统的工程问题，考虑社会、健康、安全、法律、文化以及环境等因素，提出合理设计方案，设计满足特定需求的系统、单元（部件）或工艺流程，并能够在设计环节中体现创新意识；
- (5) 能够基于自然科学基本原理和测控专业知识，采用科学方法对测控系统的复杂工程问题进行研究，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；
- (6) 能够针对测控系统的复杂工程问题，开发、选择与使用恰当的技术、工程应用软件、电子仪器设备和信息技术工具，对复杂工程问题进行预测与模拟，并能够理解其局限性；
- (7) 理解国家有关测控技术专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规，合理分析、评价专业工程实践和复杂工程问题解决方案对客观世界和社会的影响，并理解应承担的责任；
- (8) 具备一定的国际视野，能够就测控系统的复杂工程问题与国内外业界同行及社会公

众进行有效沟通和交流，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色，撰写报告和设计文稿、陈述发言、清晰表达或回应指令；

(9) 理解并掌握工程管理原理与经济决策方法，并能应用于解决复杂测控工程问题；

(10) 具有适应社会发展能力以及终身学习能力。

(1) Healthy spirit and body, good quality of humanities and social sciences, strong sense of social responsibility and good engineering profession ethics. Understand and abide by professional ethics and norms in the engineering practice.

(2) Have the ability of applying mathematics, natural science and engineering foundation and professional knowledge to solve the engineering problem of complex measurement and control system.

(3) Have the ability of identification, expression and analysis engineering problem of complex measurement and control system through literature research.

(4) Have the ability of putting forward rational design scheme, designing specific needs system, unit or process to solve the engineering problem of complex measurement and control system, in considering the social, health, safety, legal, cultural, and environmental factors, and can reflect innovation consciousness in the design process.

(5) Have the ability of basing on natural science knowledge and Measurement and control professional knowledge, using scientific methods to study the engineering problem of complex measurement and control system, to design experiments, analyze and interpret data, and get the conclusion of reasonable and effective through comprehensive information.

(6) Have the ability of developing, selecting and using appropriate technology, engineering application software, electronic equipment and information technology tools to predict and simulate the engineering problem of complex measurement and control system, and to understand its limitations.

(7) Understand the related state laws and regulations of related work of measurement and control technology professional and production, design, research and development of industry, understand the related guidelines, policies, laws and regulations of environmental protection and sustainable development, correct understand the actual impact of the project on the objective world and society, and understand the responsibility.

(8) Have a certain international vision. Have the ability of effectively communicating engineering problem of complex measurement and control system with industry colleagues, social public at home or abroad. Have the ability of playing role of team member, or the head in a team under the background of the multidisciplinary. Have the ability of writing reports and design documents, presentation speech, clear expression or responding to commands.

(9) To understand and to grasp the method of project management theory and economic decision-making, and can be applied to solve the engineering problem of complex measurement and control system.

(10) Have the ability to adapt to social development and lifelong learning.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4	培养目标 5
毕业要求 1	√				√
毕业要求 2		√			√
毕业要求 3		√			√
毕业要求 4	√	√	√		√
毕业要求 5		√			√
毕业要求 6		√			
毕业要求 7	√		√		
毕业要求 8	√			√	√
毕业要求 9				√	√
毕业要求 10	√			√	

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程：

测试信号分析与处理、误差理论与数据处理、精密机械设计、测控仪器电子技术基础、仪器仪表电路、测控系统微处理器原理及应用、传感器原理及应用、控制工程基础、仪器制造技术、仪器光学基础、现代仪器设计。

Signal Analysis and Processing, Error Theory and Data Processing, Precision Mechanism Design, Basic Electronic Technology of Measure and Control Instrument, Instrument Circuit, Microcontroller Principle and Its Application of Measure and Control System, Principle and Application of Sensors, Fundamentals of Control Engineering, Instrument Manufacture Technology, Fundamentals of Optical Instrument, Modern Instrument Design.

(二) 专业特色课程：

测控系统微处理器原理及应用、传感器原理及应用、控制工程基础、现代仪器设计、光纤传感器、无损检测技术、图像检测与处理技术、嵌入式系统设计、可编程控制器原理及应用。

Microcontroller Principle and Its Application of Measure and Control System, Principle and Application of Sensors, Fundamentals of Control Engineering, Modern Instrument Design, Optical Fiber Sensor, Nondestructive Testing Technique, Image Detection and Processing Technique, Design of Embedded System, Fundamentals & Application of Programmable Logic Controller.

附：毕业要求实现矩阵：

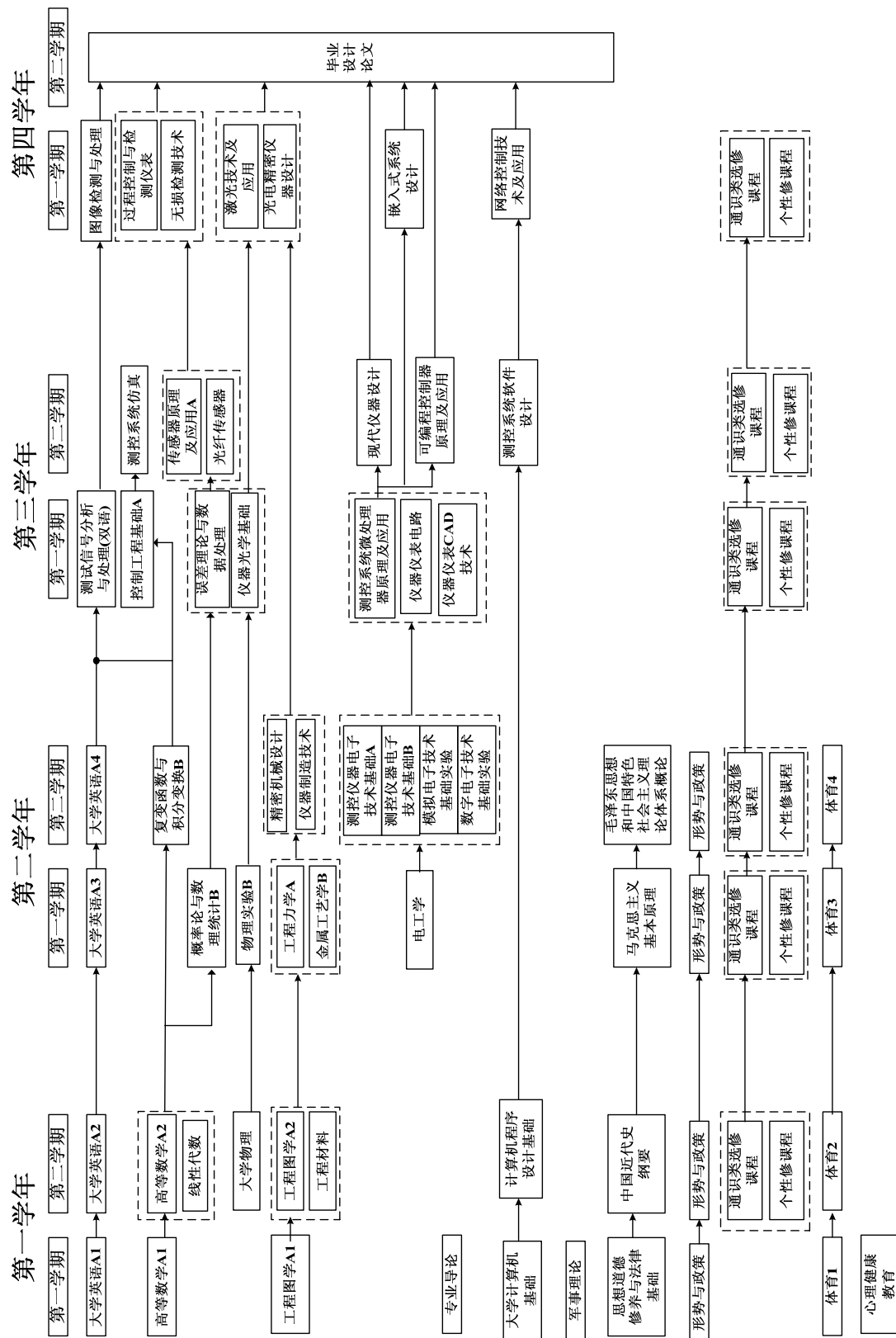
专业 核心 课程	专业 特色 课程	课程名称	测控技术与仪器专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√									
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义理论体系概论	√									
		马克思主义基本原理	√									
		军事理论	√									
		体育	√									
		大学英语								√		
		大学计算机基础		√								
		计算机程序设计基础(C 语言)		√				√				
		心理健康教育	√									
		专业导论	√						√			
		高等数学		√								
		线性代数		√								
		概率论与数理统计 B		√								
		大学物理 B		√								
		物理实验 B					√					
		工程材料		√					√			
		工程图学		√	√	√						
		电工学		√		√						
		工程力学 A		√								
		金属工艺学 B						√				
√		测控仪器电子技术基础 1		√		√						
√		测控仪器电子技术基础 2		√		√						
		模拟电子技术基础实验					√					
		数字电子技术基础实验					√					
		复变函数与积分变换 B		√								

专业 核心 课程	专业 特色 课程	课程名称	测控技术与仪器专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
√		测试信号分析与处理		√	√		√			√		
√		精密机械设计		√	√							
√		仪器仪表电路		√	√	√						
√	√	控制工程基础 A		√	√			√				
√		误差理论与数据处理		√			√					
√	√	测控系统微处理器原理及应用		√			√	√				
√	√	传感器原理及应用 A		√	√							
√	√	现代仪器设计		√	√				√			
√		仪器光学基础		√	√							
√		仪器制造技术				√			√		√	
		测控系统软件设计						√				
		仪器仪表 CAD 技术				√		√				
		测控系统仿真		√			√	√				
	√	光纤传感器			√	√						
	√	图像检测与处理技术			√		√					
	√	可编程控制器原理及应用			√	√						
	√	嵌入式系统设计				√		√				
		过程控制与检测仪表		√	√							
		激光技术及应用			√							
	√	无损检测技术 A						√	√			
		网络控制技术及应用				√		√	√			
		光电精密仪器设计			√	√			√			
		军事训练	√									
		机械制造工程实训 B						√			√	
		仪器仪表电路课程设计				√	√	√				
		测控系统微处理器应用课程设计			√	√	√	√				

专业 核心 课程	专业 特色 课程	课程名称	测控技术与仪器专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		传感器原理及应用课程设计				√					√	
		现代仪器设计课程设计				√	√					
		测控系统应用软件设计						√				
		生产实习	√						√	√		
		仪器仪表机构零件及工艺课程设计	√			√			√			
		测控系统综合课程设计				√	√	√		√	√	
		毕业设计				√	√	√	√	√	√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Cr	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course	
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
通识课程 Public Basic Courses	必修课 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060001110	军事理论 Military Theory	1	32			16		1		
		4210001110	体育 1 Physical Education I	1	32					1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical EducationIII	1	32					3	体育 2	
		4210004110	体育 4 Physical EducationIV	1	32					4	体育 3	
		1050001110	心理健康教育 Mental Health Education	1	16					1		
		4030002110	大学英语 A1 College English A 1	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120017110	大学计算机基础 Foundation of Computer	2	32			12		1		
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C)	3	48			12		2		
		小计 Subtotal			35	736			24	64	64	
	选修课 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from Art and Physical Education Coursestoobtain at least 2 credits. Science and engineering students should select at least one course from Arts and Social Science CoursesorEconomy and Management Courses, and other students should select at least one course from Science and Technology Courses.							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学科大类课程 BasicDisciplinary Courses	必修课 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A1 Advanced Mathematics A I	5	80					1	
		4050064110	高等数学 A2 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4050460130	大学物理 B Physics	5	80					2	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		4050071110	工程力学 A Engineering Mechanics A	4	64	4				3	高等数学 A 大学物理 B
		4100008110	电工学 Electrical Engineering	3	48	8				3	大学物理 B
		4050052110	复变函数与积分变换 B Complex Function and Integral Transform B	3	48					4	高等数学 A
		小计 Subtotal		43.5	712	52	4				
专业课程 Specialized Courses	必修课 Required Courses	4080265130	精密机械设计 Precision Mechanism Design	4	64	8				4	工程图学 A 工程材料
		4080347150	测控仪器电子技术基础 1 Basic Electronic Technology of Measure & ControlInstrument I	3	48					4	大学物理 B 电工学
		4080348150	测控仪器电子技术基础 2 Basic Electronic Technology of Measure& ControlInstrument II	3	48					4	大学物理 B 电工学
		4110051110	模拟电子技术基础实验 Basic Analog Electronic Technology Experiments	0.5	16	16				4	测控仪器电子技术基础 A
		4110068110	数字电子技术基础实验 Basic Digital Electronic Technology Experiments	0.5	16	16				4	测控仪器电子技术基础 B
		4080267130	仪器制造技术 Instrument Manufacture Technology	2	32					4	金属工艺学
		4080315140	测试信号分析与处理 Signal Analysis and Processing	2.5	40		4			5	高等数学 线性代数 概率论与数理统计 B

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 CrS	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080316140	误差理论与数据处理 Error Theory and Data Processing	1.5	24					5	概率论与数理统计 B
		4080258130	仪器光学基础 Fundamentals of Optical Instrument	2.5	40	4				5	大学物理
		4080115110	仪器仪表电路 Instrument Circuit	2	32	4				5	测控仪器电子技术基础 A
		4080266130	控制工程基础 Fundamentals of Control Engineering	3	48	8				5	复变函数与积分变换 B
		4080349150	测控系统微处理器原理及应用 B Microcontroller Principle and Application of Measure and Control System B	4	64	24				5	测控仪器电子技术基础 B
		4080350150	传感器原理及应用 D Principle and Application of Sensors D	3.5	56	16				6	大学物理 仪器仪表电路
		4080351150	现代仪器设计 B Modern Instrument Design B	3.5	56	24				6	仪器仪表电路 测控系统微处理器原理及应用
		4080352150	测控系统软件设计 C Software Design of Measure and Control System C	2.5	40		12			6	计算机程序设计基础 (C 语言)
		小计 Subtotal		38	624	120	16				
	选修课 Elective Courses	4080114110	仪器仪表 CAD 技术 The CAD Technique for Circuit	2	32		4			5	仪器仪表电路
		4080020110	测控系统仿真 Simulation for Measure and Control System	2	32		4			6	控制工程基础
		4080051110	光纤传感器 Optical Fiber Sensor	1.5	24	4				6	仪器光学基础
		4080253130	可编程控制器原理及应用 Fundamentals & Application of Programmable Logic Controller	2	32	4				6	测控系统微处理器原理及应用
		4080101110	图像检测与处理技术 Image Detection and Processing Technique	2	32		4			7	测试信号分析与处理
		4080093110	嵌入式系统设计 Design of Embedded System	2	32	4				7	测控系统微处理器原理及应用
		4080052110	过程控制与检测仪表 Process Control and Meter	2	32	4				7	控制工程基础 传感器原理及应用
		4080071110	激光技术及应用 Principle and Applications of Laser	2	32	4				7	仪器光学基础
		4080104110	无损检测技术 A Nondestructive Testing Technique A	3	48	8				7	工程材料 金属工艺学
		4080256130	网络控制技术及应用 Networked Control Technology and Its Application	2	32	4				7	测控系统软件设计
		4080049110	光电精密仪器设计 Design of Photoelectric Precision Instrument	2	32					7	精密机械设计 仪器光学基础 传感器原理及应用
		小计 Subtotal		22.5	360	32	12				

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
					修读说明：要求至少选修 12 学分。 NOTE: Minimum subtotal credits: 12						
个性化课程 Personalized Course	选修课 Elective Courses	4050506130	计算方法 Calculation Method	1.5	24					5	
		4050460120	数学实验 Mathematics Experiment	1	32	32				5	
		4050507130	数学模型 Mathematical Model	2	32					5	
		4050508130	电磁学 Electromagnetics	2	32					7	
		4050509130	现代物理与高新技术 Modern Physics and Hi-tech	1.5	24					7	
		4050510130	量子物理学 Quantum Physics	2	32					7	
		小计 Subtotal									
		修读说明：学生可跨专业自主选择修读全校其他专业的课程，要求至少选修 10 学分，其中数学、物理类课程至少选修 5 学分。表中课程为推荐修读的数学、物理类课程，学生修读时可以在学校提供的数理类课程中自选。 NOTE: Students can choose any courses from the other specialties. Minimum subtotal credits: 10.Minimum,in which mathematics, physics subtotal credits: 5. The courses above are especially suggested to choose. Students can choose any other mathematics and physics courses from the list offered .									

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term
1060002110	军事训练 Military Training	3	1.5	1
4080150110	机械制造工程实训 B Practice of Mechanical Manufacturing Engineering B	4	4	3
4080233120	仪器仪表机构零件及工艺课程设计 Course Design on Part, Mechanism and Technics of Instrument and Meter	2	2	4
4080232120	仪器仪表电路课程设计 Course Design on Instrument Circuit	2	2	5
4080243130	测控系统微处理器应用课程设计 Course Design on Microcontroller Application of Measure and Control System	2	2	5
4080138110	传感器原理及应用课程设计 Course Design on Principle and Application of	2	2	6
4080231120	现代仪器设计课程设计 Course Design on Modern Instrument Design	2	2	6
4080137110	测控系统应用软件设计 Design on Application Software of Measure and Control System	2	2	6
4080160110	生产实习 Production Practice	2	2	7

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crts	建议修读学期 Suggested Term
4080245130	测控系统综合课程设计 Course Design on Measure and Control System	2	2	7
4080220120	毕业设计 Graduation Design	17	11	8
小计 Subtotal		40	32.5	

六、修读指导

VI Recommendations on Course Studies

1. 《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

2. 测控专业学生必须参加“测控技术与仪器创意技能大赛”，计 2 个课外学分，具体由测控技术与仪器系负责组织和考核。

1. Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term . The course will be arranged by the University Students' Affairs' Department in each school.

2. Students of the specialty must participate in “Creative & skill competition of Measuring & control technology and instrument”, count 2 credits. The activities will be organized and assessed by the measuring & control technology and instrument department .

学院教学责任人：胡剑
专业培养方案责任人：戴蓉

【包装工程专业】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Packaging Engineering (2015)

专业名称	包装工程	主干学科	包装工程
Major	Packaging Engineering	Major Disciplines	Packaging Engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Mechanical Engineering

最低毕业学分规定

Graduation Credit Criteria

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科基础课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	36.5	47.5	\	32.5	\	190
选修课 Elective Courses	9	\	9.5	10	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

(一) 培养目标

包装工程专业学生毕业时以及毕业后几年内应达到下列培养目标要求：

- (1) 具有现代科学创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
- (2) 具备较强的数理、包装工程理论、包装工艺研究及系统实现等方面基础理论知识与应用实践能力；初步建立以包装系统设计为主线，包装机械设计、包装材料研究、包装测试相互支撑的知识结构；
- (3) 能综合考虑社会制约因素及相关政策法规完成工程设计，具备人际交往、团队合作能力以及不断学习和适应发展的能力；
- (4) 毕业生在包装工程、材料、机械及相关领域具有就业竞争力或有能力进入研究生阶段学习；能在国民经济各部门从事包装工程领域的产品开发、生产及应用、工艺设计及控制、新技术开发及工程服务等方面的工作，也可承担企业管理、生产技术管理及企业市场营销等工作；未来几年能在各自所工作的领域作为骨干成员或者领导发挥作用。

Our school's students in the major of Packaging Engineering should reach the following cultivating targets when they graduate or after several years since graduation:

- (1) Students will have innovative sense of modern science, international exchange and

competition consciousness, humanistic and scientific literacy, professional ethics and social responsibility;

- (2) Students will master the basic theoretical knowledge and practical application ability about mathematical, packaging engineering theory, packaging machinery, packaging technology and packaging system. They will initially establish the knowledge structure taking packaging system design as the main line and taking packaging machinery design, packaging material research and packaging test as assistant.
- (3) Students can complete engineering design considering social restricting factors and related policies. They will possess the ability of interpersonal, teamwork, continuous learning and adapting to the development.
- (4) Graduates will have employment competence in packaging engineering, machinery and related fields or the ability to be graduate students. They can work for product development, production and application, technology design and control, the new technology development and engineering services in the field of packaging engineering and packaging machinery in national economic departments. They will be the key members or leaders with playing important roles in their work fields in the next years.

(二) 毕业要求

为了达到培养目标要求，毕业生应达到以下 10 项知识、能力和素质要求：

- (1) 较好的人文社会科学素养、较强的社会责任感和良好的工程职业道德；
- (2) 从事工程工作所需的相关数理学科基础和一定的经济管理知识；
- (3) 具有本专业必需的包装技术、机械工程基础、电工与电子技术、包装设计、材料、测试、计算机应用技术的基本知识和技能，了解本专业的前沿发展现状和趋势；
- (4) 系统地掌握本专业领域技术基础理论，具有本专业领域 1-2 个专业方向的专业知识和技能，能够根据产品和工程要求优化、设计有关包装产品、工艺系统，具有一定的包装工程实践训练。
- (5) 具有较强的知识迁移能力，能够集成包装工程中设计、应用、测试等方面知识并应用于实际进行创新，具备较强的工程创新意识、工程创新的基本能力；
- (6) 具备系统思维和初步的工程推理能力，具有对工程问题的基本认知和初步判断能力，包装产品的创意、设计、应用的初步能力。
- (7) 掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，能通过互联网、期刊资料等渠道了解相关的器件、产品、系统及技术的进展与前沿，能有效地运用各种资源找到解决具体的包装专业技术问题的方法；
- (8) 了解国家有关包装工程专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规，正确认识工程实际对客观世界和社会的影响，把握国内外相关的标准、规范和技术变化；

- (9) 具有初步科学研究、技术开发能力、表达能力和人际交往能力，能够在团队中发挥作用；
- (10) 具有较强的交流和沟通能力、团队合作的能力，能够参与跨专业及国际性的竞争与合作。

To meet the training goal, the graduates should achieve following 10 requirements:

- (1) Students will have the good humanities and social science quality, the strong sense of social responsibility and the good occupation moral of engineering.
- (2) Students will master mathematical discipline and economic management knowledge in engineering work.
- (3) Students will possess basic theory and basic knowledge of packing technique, mechanical engineering, electrical and electronic technology, packaging design, material, test, computer applications technology and understand the academic foreground, industry development and trend.
- (4) Students will systematically master extensive basic knowledge of technology and theory with knowledge and skills of 1-2 professional direction. The graduates are qualified to engage in design and optimization in packaging products and processing, have the systematic training of packaging engineering.
- (5) Students will have strong ability of transferring knowledge. They can integrate the knowledge about design, application, and test in packaging engineering and apply it to practice. They will possess aggressive engineering innovative sense and basic ability.
- (6) Students will possess system thinking and engineering reasoning ability. They will have basic cognition and judgment ability to engineering problems and preliminary ability of design, practice, and control in the packaging engineering.
- (7) Students will master the basic methods to search literature, query data and get information using modern information technology. They can understand the development and the frontier about the related device, product, system and technology through the internet, periodicals and other channels. They can find solutions to specific technical questions in packaging engineering by using all resources effective.
- (8) Students will understand the laws, regulations and relevant environmental protection and sustainable development of guidelines, policies and laws and regulations about packaging engineering related profession and industry production, design, research and development, and understanding of the engineering practice of the objective world and social influence correctly, seize the domestic and foreign related standards, specifications and technical changes.
- (9) Students will have the preliminary scientific research, technology development ability, expression ability and interpersonal skills, and can play a role in the team.
- (10) Students will have strong communication skills and team cooperation ability and can participate in professional and international competition and cooperation.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4
毕业要求 1	√			√
毕业要求 2		√		
毕业要求 3		√		
毕业要求 4		√		√

	培养目标 1	培养目标 2	培养目标 3	培养目标 4
毕业要求 5	√	√		√
毕业要求 6	√		√	√
毕业要求 7	√	√	√	√
毕业要求 8	√		√	√
毕业要求 9	√		√	√
毕业要求 10	√		√	√

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程:

专业核心课程: 工程力学、机械设计、包装材料学、包装结构设计、包装技术、运输包装、包装测试、包装工艺及设备、包装印刷技术、包装自动控制、包装造型与装潢设计、包装系统设计。

Core Courses: Engineering Mechanics, Mechanical Design, Packaging Materials, Packaging Structure Design, Packaging Technology, Transport Packaging, Packaging Test and Measurement Technology, Packaging Technology and Equipment, Packaging Printing, Packaging Automatic Control, Packaging Modeling and Decorating Design, Packaging System Design.

(二) 专业特色课程:

专业特色课程: 包装结构设计、包装技术、运输包装、包装测试、包装自动控制、包装系统设计、包装造型与装潢设计、包装机构设计

Characteristic Courses: Packaging Structure Design, Packaging Technology, Transport Packaging, Packaging Test and Measurement Technology, Packaging Automatic Control, Packaging System Design, Packaging Modeling and Decorating Design, Packaging Mechanism Design.

附: 毕业要求实现矩阵:

专业 核心 课程	专业 特色 课程	课程名称	包装工程专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√	√						√		√
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义理论体系概论	√									
		马克思主义基本原理	√	√								
		军事理论	√									
		体育 1										√
		体育 2										√
		体育 3										√
		体育 4										√

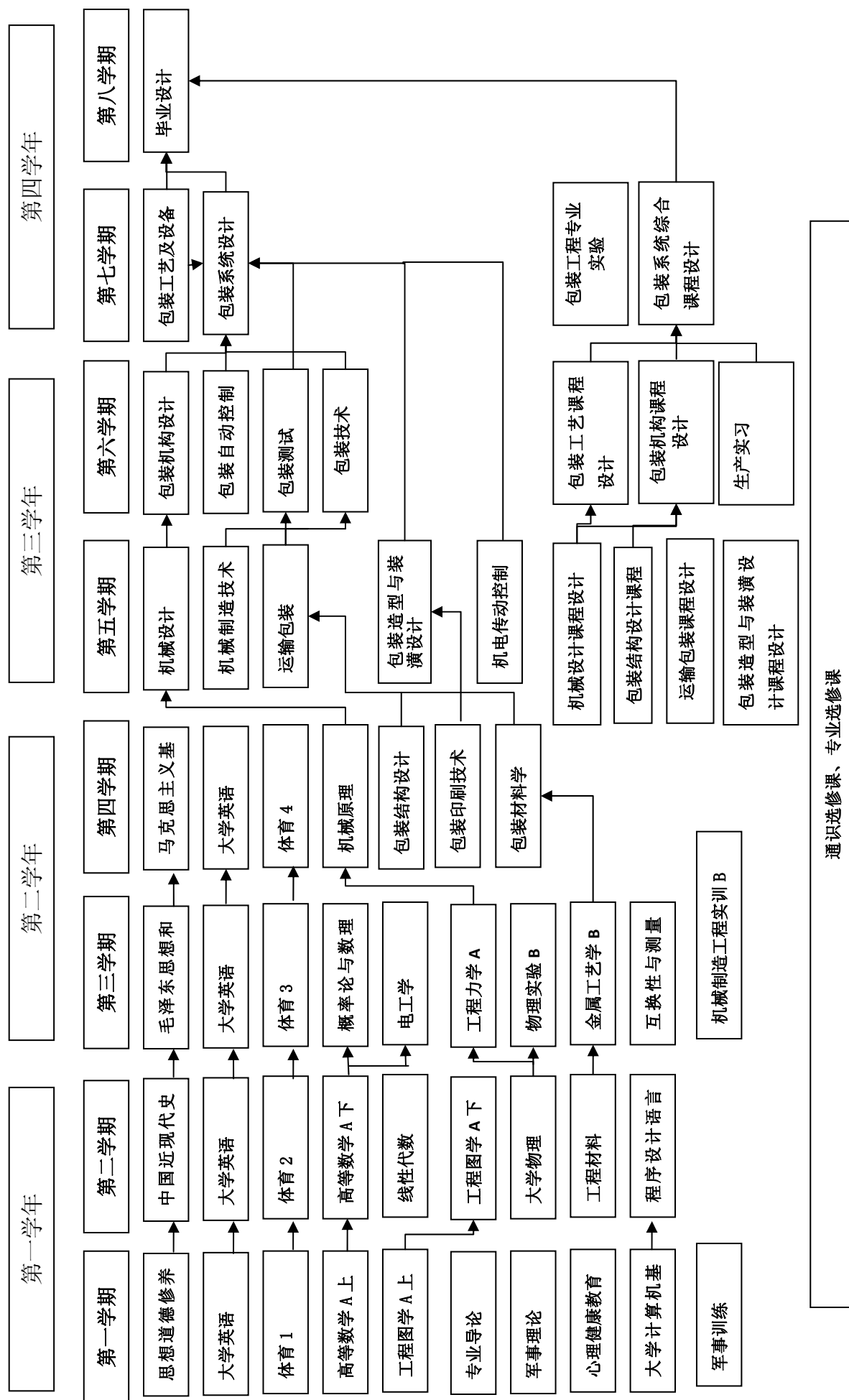
专业 核心 课程	专业 特色 课程	课程名称	包装工程专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		心理健康教育	√									√
		大学英语 A1	√						√			
		大学英语 A2	√						√			
		大学英语 A3	√						√			
		大学英语 A4	√						√			
		大学计算机基础			√				√			
		计算机程序设计基础(C 语言)			√				√			
		专业导论			√				√	√		
		工程材料					√					
		高等数学 A 上		√								
		高等数学 A 下		√								
		工程图学 A 上				√						
		工程图学 A 下				√						
		线性代数		√								
		大学物理		√								
		物理实验 B					√					
		概率论与数理统计 B		√								
		造型设计基础			√	√	√					
		基础工业工程			√	√	√					
		电工学		√								
		互换性与测量技术 B				√						
		金属工艺学 B				√	√					
√		工程力学 A		√								
		机械原理				√						
√		包装材料学				√	√					

专业 核心 课程	专业 特色 课程	课程名称	包装工程专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
√		包装印刷技术				√	√					
√		机械设计				√						
√	√	包装结构设计 B				√	√					
√	√	运输包装				√	√					
√	√	包装造型与装潢设计				√	√					
		机电传动控制 A			√	√						
		机械制造技术基础 B				√						
√	√	包装技术				√	√					
√	√	包装自动控制 A				√	√					
√	√	包装测试				√	√					
	√	包装机构设计				√	√					
√		包装工艺及设备				√	√					
√	√	包装系统设计				√	√	√	√	√		
		包装辅助设计软件应用				√	√					
		图文处理与印前设计				√	√					
		气压传动设计				√	√					
		防伪包装技术				√	√					
		包装质量控制				√	√		√	√		
		包装物流技术				√	√					
		包装心理与人性化设计				√			√	√		
		包装管理与安全法规				√			√	√		
		包装艺术设计				√	√					
		绿色包装				√	√			√		
		包装上的传统图案设计				√						
		包装工程前沿技术				√	√					

专业 核心 课程	专业 特色 课程	课程名称	包装工程专业毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		创新设计方法与案例					√	√		√		
		军事训练	√									√
		机械制造工程实训 B	√									√
		机械设计课程设计				√	√	√	√			
		包装结构设计课程设计				√	√	√	√			
		运输包装课程设计				√	√	√	√	√		
		包装造型与装潢设计课程设 计					√		√			
		包装工艺课程设计				√	√	√	√			
		包装机构课程设计				√	√	√	√			
		生产实习						√	√	√	√	√
		包装工程专业实验				√	√					
		包装系统综合课程设计				√	√	√	√	√		
		毕业设计		√	√	√	√	√	√	√	√	

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course	
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
通 识 课 程 Public Basic Courses	必修课 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060003130	军事理论 Military Theory	1	32			16		1		
		1050001130	心理健康教育 Mental Health Education	1	16					1		
		4210001110	体育 1 Physical Education I	1	32					1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		4030002110	大学英语 A1 College English A I	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120017110	大学计算机基础 Foundation of Computer	2	32			12		1		
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C)	3	48			12		2		
		小 计 Subtotal			35	736		24	64	64		
	选修课 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分,且必须选修艺术体育类课程中的艺术类相关课程,取得至少 2 个学分。 理工科专业学生至少选修一门人文社科类或经济管理类课程,其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from <i>Art and Physical Education Courses</i> to obtain at least 2 credits. Science and engineering students should select at least one course from <i>Arts and Social Science Courses</i> or <i>Economy and Management Courses</i> , and other students should select at least one course from <i>Science and Technology Courses</i> .							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 基 础 课 Basic Courses of Disciplines	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A 上 Advanced Mathematics A I	5	80					1	
		4050064110	高等数学 A 下 Advanced Mathematics A II	5	80					2	高等数学 A 上
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050024110	大学物理 Physics	5.0	80					2	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		4100008110	电工学 Electrical Engineering A	3	48	8				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		小 计 Subtotal		36.5	600	48	4				
专 业 课 程 Specialized Courses	必修课程 Required Course	4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3	
		4050071110	工程力学 A Engineering Mechanics A	4	64	4				3	
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4	
		4080004110	包装材料学 Packaging Materials	2.5	40	4				4	
		4080016110	包装印刷技术 Introduction of Packaging Printing	2.5	40					4	
		4080011110	包装结构设计 B Packaging Structure Design B	2.5	40	4				4	
		4080060110	机械设计 Mechanical Designing	4	64	6				5	
		4080117110	运输包装 Transport Packaging	2.5	40	4				5	
		4080065110	机械制造技术基础 B Machinery Manufacturing Technology Basis B	3.5	56	6				5	
		4080055110	机电传动控制 A Transmission and Control of Electric	2.5	40	4				5	
		4080017110	包装造型与装潢设计 Packaging Modelling and Decorating Design	3.5	56		20			6	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080010110	包装技术 Packaging Technology	2.5	40	4				6	
		4080184110	包装自动控制 B Packaging Automatic Control B	2.5	40	6				6	
		4080005110	包装测试 Packaging Test and Measurement	2.5	40	10				6	
		4080009110	包装机构设计 Packaging Mechanism Design	2	32	4				6	
		4080007110	包装工艺及设备 Packaging Technology and Equipment	2.5	40	4				7	
		4080013110	包装系统设计 Packaging System Design	1.5	24		12			7	
		4080353150	包装工程专业实验 Packaging Engineering Specialty Experiment	1	32	32				7	
		小 计 Subtotal		47.5	776	100	32				
	选修课 Elective Courses	4080318140	包装辅助设计软件应用 Aided Design Software Application of Packaging	2.5	40		24			4	
		4080118110	造型设计基础 Fundamentals of Contour Design	2	32					4	
		4080319140	图文处理与印前设计 Image & Word Process and Chromatic Theory	2.5	40		24			5	
		4080091110	气压传动设计 Design of Pneumatic Transmission	2	32	6				5	
		4080032110	防伪包装技术 Anti-counterfeiting Packaging and Bar Code	1.5	24					7	
		4080018110	包装质量控制 Packaging Quality Control	1.5	24					7	
		4080012110	包装物流技术 Technology of Packaging Logistics	2	32					7	
		4080008110	包装管理与安全法规 Packaging Management and Safety Regulations	1.5	24					7	
		4080236120	包装艺术设计 Art Design of Packaging	2	32					7	
		4080210120	绿色包装 Green Packaging	2	32					7	
		4080320140	单片机应用系统设计 Micro-Controller Unit Application System Design	2.5	40	6				7	
		小 计 Subtotal		22	352	12	48				
		修读说明：要求至少选修 9.5 学分。 NOTE: Minimum subtotal credits:9.5									
个性化课程 Personalized Course	选修课 Elective Courses	4080292130	包装工程前沿技术 Advanced Technology of Packaging	2	32					3	
		4080293130	创新设计方法与案例 case of Innovation Design Method	2	32					4	
		小 计 Subtotal		4	64						

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
修读说明：学生从以上个性课程和学校发布的其它专业的个性课程列表中选课，要求至少选修 10 学分。 NOTE: Students can choose any courses from above courses or other majors' personalized courses released by the university. Minimum subtotal credits: 10.											

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term
1060002110	军事训练 Military Training	3	1.5	1
4080150110	机械制造工程实训 B Machinery Manufacturing Engineering Practice B	4	4	3
4080127110	包装结构设计课程设计 Course Design of Packaging Structure	1	1	4
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5
4080169110	运输包装课程设计 Course Design of Transport Packaging	1	1	5
4080129110	包装造型与装潢设计课程设计 Course Design of Packaging Modelling and Decorating Design	2	2	6
4080125110	包装工艺课程设计 Course Design of Packaging Technology	1	1	6
4080126110	包装机构课程设计 Course Design of Packaging Mechanism	2	2	6
4080163110	生产实习 Production Practice	3	3	6
4080128110	包装系统综合课程设计 Synthesis Practice of Packaging System	3	3	7
4080222120	毕业设计 Graduation Design	17	11	8
小 计 Subtotal		40	32.5	

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：卢 杰

【机械工程专业（国际班）】2015 版本本科培养方案

Undergraduate Program for Specialty in Mechanical Engineering (International Class) (2015)

专业名称	机械工程	主干学科	机械工程
Major	Mechanical Engineering	Major Disciplines	Mechanical Engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Mechanical Engineering
所属大类	机械类（机电）	大类培养年限	1 年
Disciplinary	Mechanical(Electromechanical)	Mechanical Duration	1 years

最低毕业学分规定

Graduation Credit Criteria

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	36.5	45.5	\	32	\	190
选修课 Elective Courses	9	\	12	10	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirements

（一）培养目标

- （1） 具有科学精神与创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
- （2） 具备机械工程领域内设计制造的基础理论和专门知识；
- （3） 具备知识应用、工程实践、组织管理、团队合作以及自主学习和适应发展的能力；
- （4） 能从事机械工程领域内的设计制造、科研开发、应用研究和运行管理等工作；
- （5） 毕业生未来几年能在各自所工作的领域成为工程技术人才或管理人才。

- （1） The graduates should have the sense of innovation, international cooperation, humanistic quality, professional ethics and responsibility for society;
- （2） The graduates should master the fundamental theories about the design and manufacture of mechanical engineering and some specialized knowledge;
- （3） The graduates should have the capabilities to apply theory, practice in projects, organize and manage and the abilities to self-study and get adapt to new development ;
- （4） The graduates should be qualified in designing and manufacture, scientific and technological development, research for application and operational management.
- （5） The graduates should be able to grow to senior engineering and technical personnel or senior management personnel in the next a few years after graduation.

(二) 毕业要求

机械工程专业学生主要学习机械设计、制造的基础知识，受到现代机械工程师的基本训练，具有从事机构设计、制造及控制的基本能力；

- (1) 较好的人文社会科学素养、较强的社会责任感和良好的工程职业道德。
- (2) 从事工程工作所需的相关数理学科基础、自然科学知识和一定的经济管理知识。
- (3) 掌握扎实的机械工程基本理论知识和专业基础知识，具有系统的机械工程实践训练，了解本专业的前沿发展现状和趋势。
- (4) 较系统地掌握本专业领域宽广的技术理论基础知识，主要包括力学、机械学、电子与电工学、流体力学等基础知识；
- (5) 具备创新意识和对机械行业新产品、新设备进行研究、开发和设计的初步能力，初步具有本专业机械设计开发能力和一定的技术组织管理能力。
- (6) 掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，能通过互联网、期刊资料等渠道了解相关的器件、产品、系统及技术的进展与前沿，能有效地运用各种资源找到解决具体的机械专业技术问题的方法。
- (7) 了解国家有关机械工程专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规，正确认识工程实际对客观世界和社会的影响，把握国内外相关的标准、规范和技术变化。
- (8) 具有初步科学研究、技术开发和工程设计的组织管理能力、表达能力和人际交往能力，能够在团队中发挥作用。
- (9) 具有适应社会发展能力以及终身学习能力。
- (10) 具有国际视野和跨文化交流、竞争与合作能力。

The students majoring in Mechanical Engineering will learn fundamental theory of machine design and manufacturing processes, and should be trained to become qualified modern mechanical engineers who are able to design product and have the capabilities to manufacture and control.

- (1) The graduates should have good quality of humanities and social sciences, strong sense of responsibility for society and proper engineering profession ethics.
- (2) The graduates should master related mathematical theory to conduct engineering work and the relevant knowledge about natural science and economic management.
- (3) The graduates should master the fundamental theories of mechanical engineering and have systematic engineering practice training of mechanical engineering technology, understanding the forefront of the development and trends of their major.
- (4) The graduates should master extensive knowledge related to major fields including mechanics of materials, mechanical design theory, electricity and electronics, fluid power and hydromechanics.
- (5) The graduates should have the sense of innovation and preliminary capability to research, develop and design new products; have the ability to design and develop mechanical products and the capabilities to organize and manage techniques.
- (6) The graduates should master the basic method of literature search, data inquiry and the use of modern information technology to obtain relevant information, and be able to understand the progress and forefront of related devices, products, systems and technologies via the Internet, journals and other ways, and be able to solve specific technical problems with mechanical techniques via various of resources.
- (7) The graduates should know laws, regulations relevant to work of production, design,

research and development in the scope of mechanical engineering, understand the relevant guidelines, policies, laws and regulations of environmental protection and sustainable development, understand accurately the actual impact of the project on the objective world and society, keep pace with domestic and foreign related standards, specifications and technical changes.

- (8) The graduates should have the preliminary capability to organize, manage, present works, communicate and function well in a team.
- (9) The graduates should be able to adapt to social development and can study in a lifelong term.
- (10) The graduates should have international perspectives and the ability to communicate, compete and cooperate in different cultures.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4	培养目标 5
毕业要求 1	√		√	√	
毕业要求 2		√			
毕业要求 3	√	√			
毕业要求 4		√			√
毕业要求 5		√			√
毕业要求 6			√	√	√
毕业要求 7	√		√	√	
毕业要求 8			√	√	√
毕业要求 9			√	√	√
毕业要求 10	√		√	√	

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程:

理论力学、材料力学、工程材料、机械原理、机械设计、控制工程基础、机械制造技术基础、数控技术、CAD/CAM 及数控加工技术综合实践、机械制造装备与设计。

Core Courses: Theoretical Mechanics, Mechanics of Materials, Engineering Materials, Principle of Mechanics, Mechanical Design, Fundamental of Control Engineering, Foundation of Mechanical Manufacturing Technology, Numerical Control Technology, Practice of CAD/CAM and NC Machining, Machine Equipment Design.

(二) 专业特色课程:

机械制造技术基础、测试技术、数控技术、CAD/CAM 及数控加工技术综合实践、机械制造装备与设计。

Characteristic Courses: Foundation of Mechanical Manufacturing Technology, Measuring and Testing Technique, Numerical Control Technology, Practice of CAD/CAM

and NC Machining, Machine Equipment Design.

附：毕业要求实现矩阵：

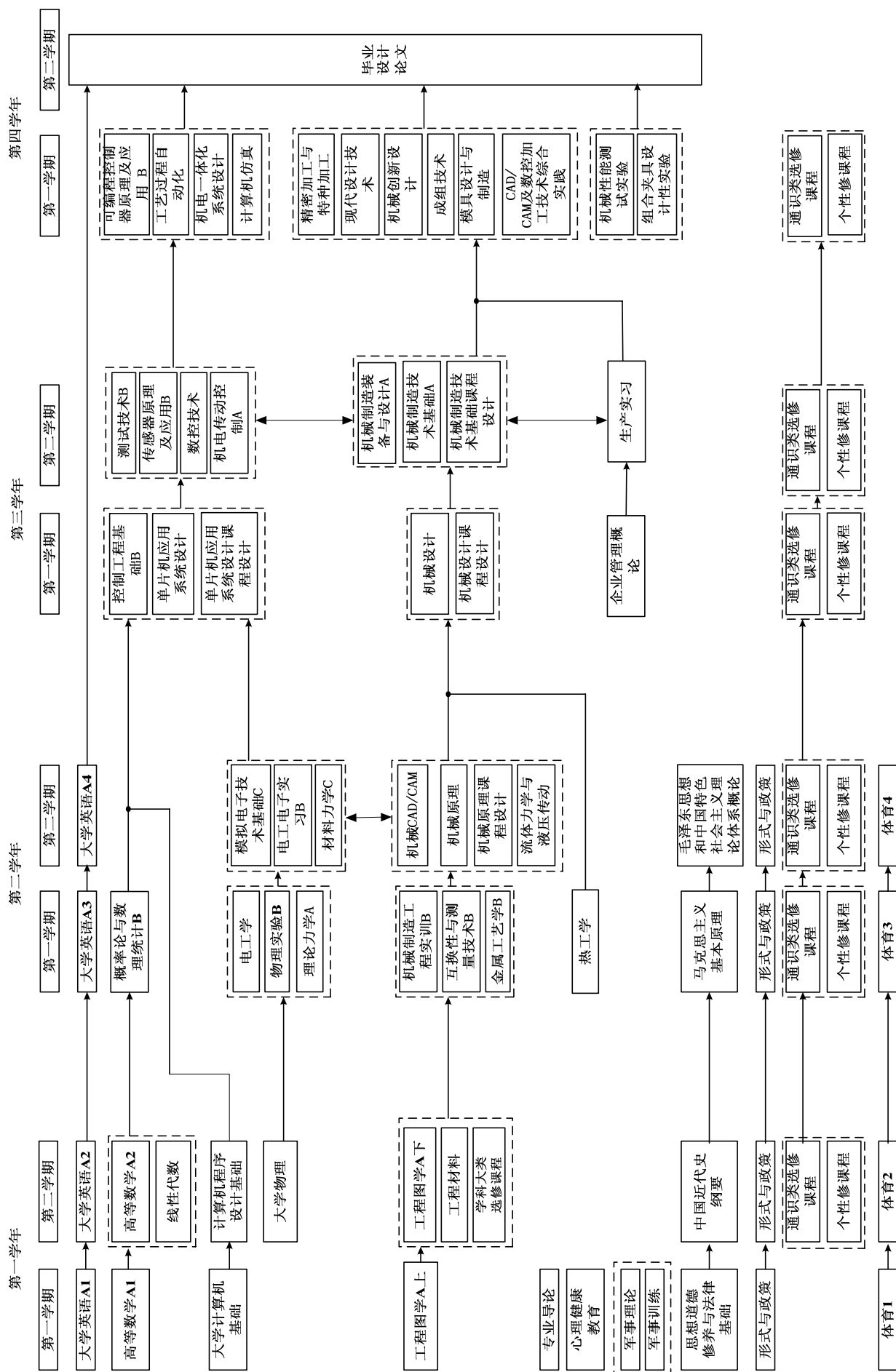
专业核 心课程	专业特 色课程	课程名称	机械工程专业（国际班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√						√		√	
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义 理论体系概论	√								√	
		马克思主义基本原理	√								√	
		军事理论	√									
		体育	√							√		
		大学英语	√					√				√
		大学计算机基础			√			√				
		计算机程序设计基础			√							
		心理健康教育	√								√	
		专业导论				√	√					√
		高等数学		√								
		线性代数		√								
		概率论与数理统计 B		√								
		大学物理		√								
		物理实验 B		√	√							
		工程图学 A			√							
√		工程材料			√							
		学科大类选修课程			√	√						
		互换性与测量技术 B			√	√						
		机械制造工程实训 B			√				√	√		
		电工学			√							
		电工电子实习 B			√							
√		理论力学 A			√							
		金属工艺学 B			√							
√		机械原理			√							

专业核 心课程	专业特 色课程	课程名称	机械工程专业（国际班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		机械原理课程设计								√	√	
		流体力学与液压传动			√	√						
		模拟电子技术基础 C			√					√	√	
√		材料力学 C			√					√	√	
√		机械设计			√					√	√	
		机械设计课程设计								√	√	
		热工学			√							
√		控制工程基础 B				√	√	√				
		单片机应用系统设计				√						
		单片机应用系统设计课程设计				√						
√	√	机械制造技术基础 A				√						
		机械制造技术基础课程设计				√						
		机械 CAD/CAM			√	√	√	√				
		机电传动控制 A				√						
	√	测试技术 B		√	√		√					
		可编程控制器原理及应用 B				√		√		√		
		传感器原理及应用 B				√						
		现代设计技术				√		√				
		成组技术			√	√	√	√				
		生产实习	√	√					√	√		
√	√	数控技术				√						
√	√	CAD/CAM 及数控加工技术综合实践				√						
√	√	机械制造装备与设计 A				√						
		企业管理概论	√		√	√	√	√	√			
		机电一体化系统设计			√	√	√	√	√			
		机械性能测试实验				√						
		组合夹具设计性实验				√						
		模具设计与制造			√		√					

专业核 心课程	专业特 色课程	课程名称	机械工程专业（国际班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		机械创新设计				√	√	√				
		精密加工与特种加工			√	√						
		工艺过程自动化				√						
		计算机仿真				√						
		毕业设计（论文）				√	√	√	√	√	√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学 分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course	
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur			
通 识 课 程 Public Basic Courses	必修课 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060001110	军事理论 Military Theory	1	32			16		1		
		1050001110	心理健康教育 Mental Health Education	1	16					1		
		4210001110	体育 1 Physical Education I	1	32					1		
		4120017110	大学计算机基础 Foundation of Computer	2	32		12			1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		4030002110	大学英语 A1 College English A 1	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design (C Language)	3	48		12			2		
		小 计 Subtotal			35	736		24	64	64		
	选修课 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from <i>Art and Physical Education Courses</i> to obtain at least 2 credits. Science and engineering students should select at least one course from <i>Arts and Social Science Courses</i> or <i>Economy and Management Courses</i> , and other students should select at least one course from <i>Science and Technology Courses</i> .							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学 分 CrS	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 大 类 课 程 Basic Disciplinary Courses	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A1 Advanced Mathematics A I	5	80					1	
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4050064110	高等数学 A2 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4050460130	大学物理 Physics	5	80					2	
		4050224130	物理实验 B Physics Lab. B	1	32	32				3	大学物理
		4100008110	电工学 Electrical Engineering	3	48	8				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		小 计 Subtotal		36.5	600	48	4				
专 业 课 程 Specialized Courses	必修课程 Required Courses	4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3	
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3	
		4090177140	热工学 Heat and Thermodynamics	1.5	24					3	
		4110050110	模拟电子技术基础 C Fundamentals of Analog Electronic Circuit C	3	48	8				4	
		4050018110	材料力学 C Mechanics of Materials C	4	64	4				4	理论力学 A
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4	
		4080087110	流体力学与液压传动 Fluid Mechanics and Hydraulic	2.5	40	4				4	
		4080060110	机械设计 Mechanical Designing	4	64	6				5	机械原理
		4080085110	控制工程基础 B Fundamentals of Control B	2.5	40	4				5	
		4080028110	单片机应用系统设计 Micro-Controller Unit Application System Design	3	48	6				5	
		4170492140	企业管理概论 Introduction to Business Management	1	16					5	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学 分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course	
						实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur			
		4080023110	测试技术 B Measuring & Testing Technology B	2.5	40	4				6	控制工程基础 B	
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4				6		
		4080064110	机械制造技术基础 A Fundamentals of Mechanical Manufacturing Technology A	3.5	56	6				6		
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				6		
		4080068110	机械制造装备设计 A Machine Equipment Design A	2	32					6		
		4080209120	机械性能测试实验 Testing Experiment of Mechanical Properties	0.5	16	16				7		
		4080214120	组合夹具设计性实验 Experiment of Modular Fixture Design	0.5	16	16				7		
		小 计 Subtotal			45.5	744	90					
		选 修 课 Elective Courses	4080058110	机械 CAD/CAM Machinery CAD/CAM	2	32		6			4	
	4080027110		传感器原理及应用 B Fundamentals & Application of Sensors B	2	32	6				6		
	4080110110		现代设计技术 Modern Design Technology	2	32					7		
	4080025110		成组技术 Group Technology	2	32					7		
	4080083110		可编程控制器原理及应用 B Fundamentals & Application of Programmable	2	32	4				7		
	4080057110		机电一体化系统设计 Mechatronics System Design	2	32					7		
	4080048110		工艺过程自动化 Process Automation	2	32					7		
	4080073110		计算机仿真 Computer Simulation	2	32		6			7		
	4080211120		模具设计与制造 Mould Design and Manufacture	2.5	40					7		
	4080059110		机械创新设计 Innovative Mechanical Design	2	32					7		
	4080080110		精密加工与特种加工 Technology of Special Machining and Precision Machining	2	32					7		
	小 计 Subtotal			22.5	360	10	12					
	修读说明：要求至少选修 12 学分。 NOTE: Minimum subtotal credits:12											
个 性 课 程 Personalized Course	选 修 课 Elective Courses	4080285130	智能机械装备技术及应用 Intelligent Machinery Equipment Technology and Application	2	32	10		6		5		
		4080287130	机械制造中的信息技术 Information Technology in Mechanical Manufacturing	2	32	4				5		
		4080286130	机电设备电气控制 Electrical control of Mechanical and Electrical Equipment	2	32	6		2		6		

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学 分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
				实验 Exp.		上机 Operation	实践 Practice	课外 Extra-cur			
		4080284130	振动与噪声基础 Fundamentals of Vibration and Noise	2	32			16		6	
		小 计 Subtotal		8	128	20		24			
修读说明：学生可跨专业自主选择修读全校其他专业的课程，建议修读以上课程。要求至少选修 10 学分。 NOTE: Students can choose any courses from the other specialties, and are especially suggested to choose the courses above. Minimum subtotal credits: 10.											

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term	第二专业 Second Major
1060002110	军事训练 Military Training	3	1.5	1	
4080150110	机械制造工程实训 B Machinery Manufacturing Engineering Practice B	4	4	3	
4100069110	电工电子实习 B Practice in Electrical Engineering & Electronics B	1	1	4	
4080149110	机械原理课程设计 Curricula Design of Mechanical Principles	1.5	1.5	4	
4080139110	单片机应用系统设计课程设计 Curricula Design of Micro-Controller Unit Application System Design	2	2	5	
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5	
4080161110	生产实习 Production Practice	3	3	6	
4080154110	机械制造技术基础课程设计 Curricula Design of Foundation on Mechanical Manufacturing Technology	3	3	6	
4080122110	CAD/CAM 及数控加工技术综合实践 Practice of CAD/CAM and NC Machining	2	2	7	
4080218120	毕业设计 Graduation Design	17	11	8	
小 计 Subtotal		39.5	32		

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：李益兵

【机械工程专业(学硕班)】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Mechanical Engineering (Bachelor +Master Class) (2015)

专业名称	机械工程	主干学科	机械工程
Major	Mechanical Engineering	Major Disciplines	Mechanical Engineering
计划学制	四年	授予学位	机械工程学士
Duration	4 Years	Degree Granted	Bachelor of Mechanical Engineering
所属大类	机械类（机电）	大类培养年限	1 年
Disciplinary	Mechanical(Electromechanical)	Mechanical Duration	1 years

最低毕业学分规定

Graduation Credit Criteria

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	36.5	45.5	\	32	\	190
选修课 Elective Courses	9	\	12	10	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

（一）培养目标

- (1) 具有科学精神与创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
- (2) 具备机械工程领域内设计制造的基础理论和专门知识；
- (3) 具备知识应用、工程实践、组织管理、团队合作以及自主学习和适应发展的能力；
- (4) 能从事机械工程领域内的设计制造、科研开发、应用研究和运行管理等工作；
- (5) 毕业生未来几年能在各自所工作的领域成为学术研究人才或管理人才。

(1) The graduates should have the sense of innovation, international cooperation, humanistic quality, professional ethics and responsibility for society;

(2) The graduates should master the basic theories about the design and manufacture of mechanical engineering and some specialized knowledge;

(3) The graduates should have the capabilities to apply learned theory, practice in projects, organize and management and the abilities to self-study and get adapt to new development ;

(4) The graduates should be qualified in designing and manufacture, scientific and technological development, research for application and operational management.

(5) The graduates should be able to grow to senior engineering and technical personnel or senior management personnel in the next a few years after graduation.

(二) 毕业要求

- (1) 学生具有良好的思想素质、身体素质、心理素质、文化修养、社会道德和责任担当等人文素养。
- (2) 学生具有逻辑思维和辩证思维的能力，具有批判意识和求真务实的科学思维方法，具有创新意识，掌握基本的创新方法。学生掌握从事机械工程领域工作所需的数理基础、相关自然科学知识和经济管理知识。
- (3) 掌握扎实的机械工程专业理论知识和专业基础知识，具有系统的机械工程实践训练。学生具备有效进行实验和模拟仿真设计与操作的能力，并能够对实验结果进行分析和解释。
- (4) 学生掌握本专业的基本理论知识和工程基础知识，能够综合利用原理性知识进行自主发现、自主设计和自主解决与机械工程相关的科学问题。
- (5) 学生掌握机械系统的设计规范和开发平台，能理解机械系统的设计方法和步骤。学生能够设计和制造机械系统以及对其运动控制。
- (6) 学生掌握运用现代信息技术跟踪并获取信息的方法，熟练进行文献检索和资料查询。学生了解本专业的发展动态和前沿，熟悉机械工程领域的最新开发工具种类和发展方向。
- (7) 学生了解当代全球问题和社会问题，在工程设计中综合考虑经济、环境、法律、安全和伦理等制约因素。
- (8) 学生能够胜任本专业入门级的职业岗位，具备研究生课程学习所需的认知和基础能力。
- (9) 学生具有进行终身学习的愿望和能力，具有适应机械工程技术不断发展的能力。
- (10) 学生具有良好的口头和书面表达和交流能力，至少熟练掌握一门外语进行技术沟通和交流能力。具有良好的团队意识和合作精神。

- (1) The graduates should have good mental quality, physical and psychology quality, cultural accomplishment, social morality and the sense of responsibility.
- (2) The graduates should have the capability to think logically and dialectically, the sense of judgement and innovation, mastering the methods for scientific thinking and basic innovation. They should master related mathematical theory to conduct engineering work and the relevant knowledge about natural science and economic management.
- (3) The graduates should master the basic theories of mechanical engineering and have systematic engineering practice training of mechanical engineering technology. The students should be able to conduct experiments, simulation and operate, and can analyze and explain the test results.
- (4) The students should master the fundamental theory of their major and the engineering, and can discover, design and solve problems of mechanical engineering with the reference to principle knowledge.
- (5) The students should be familiar with the standards for the designing and development of mechanical system and master the design methods and process of mechanical system. The students should be able to design, manufacture and control the mechanical system.
- (6) The graduates should master the basic method of literature search, data inquiry and the use of modern information technology to obtain relevant information, and be able to understand the progress and forefront of their major, knowing the new development

tools and development directions of mechanical engineering.

- (7) The students should know the current global and social problem, integrating the effect from economy, environment, law, security and ethics into the design of engineering.
- (8) The students should be qualified for preliminary positions of their major, equipped with basic capabilities as postgraduate students.
- (9) The students should have the willingness and capability to learn in a life-long term and be able to adapt to the developing technology of mechanical engineering.
- (10) The students should be able to communicate orally and in a written form, and master at least a foreign language. They should also have the sense of team working and cooperation.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4	培养目标 5
毕业要求 1	✓				
毕业要求 2	✓				
毕业要求 3		✓			
毕业要求 4		✓	✓	✓	
毕业要求 5			✓	✓	
毕业要求 6				✓	
毕业要求 7	✓			✓	
毕业要求 8			✓	✓	
毕业要求 9					✓
毕业要求 10					✓

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程：

理论力学、材料力学、工程材料、机械原理、机械设计、控制工程基础、单片机应用系统设计、机械制造技术基础、数控技术、CAD/CAM 及数控加工技术综合实践、机械制造装备与设计。

Core Courses: Theoretical Mechanics, Mechanics of Materials, Engineering Materials, Principle of Mechanics, Mechanical Design, Fundamental of Control Engineering, Micro-Controller Unit Application System Design, Foundation of Mechanical Manufacturing Technology, Numerical Control Technology, Practice of CAD/CAM and NC Machining, Machine Equipment Design.

(二) 专业特色课程：

机械制造技术基础、测试技术、数控技术、CAD/CAM 及数控加工技术综合实践、机械制造装备与设计。

Characteristic Courses: Foundation of Mechanical Manufacturing Technology, Measuring and Testing Technique, Numerical Control Technology, Practice of CAD/CAM and NC Machining, Machine Equipment Design.

附：毕业要求实现矩阵：

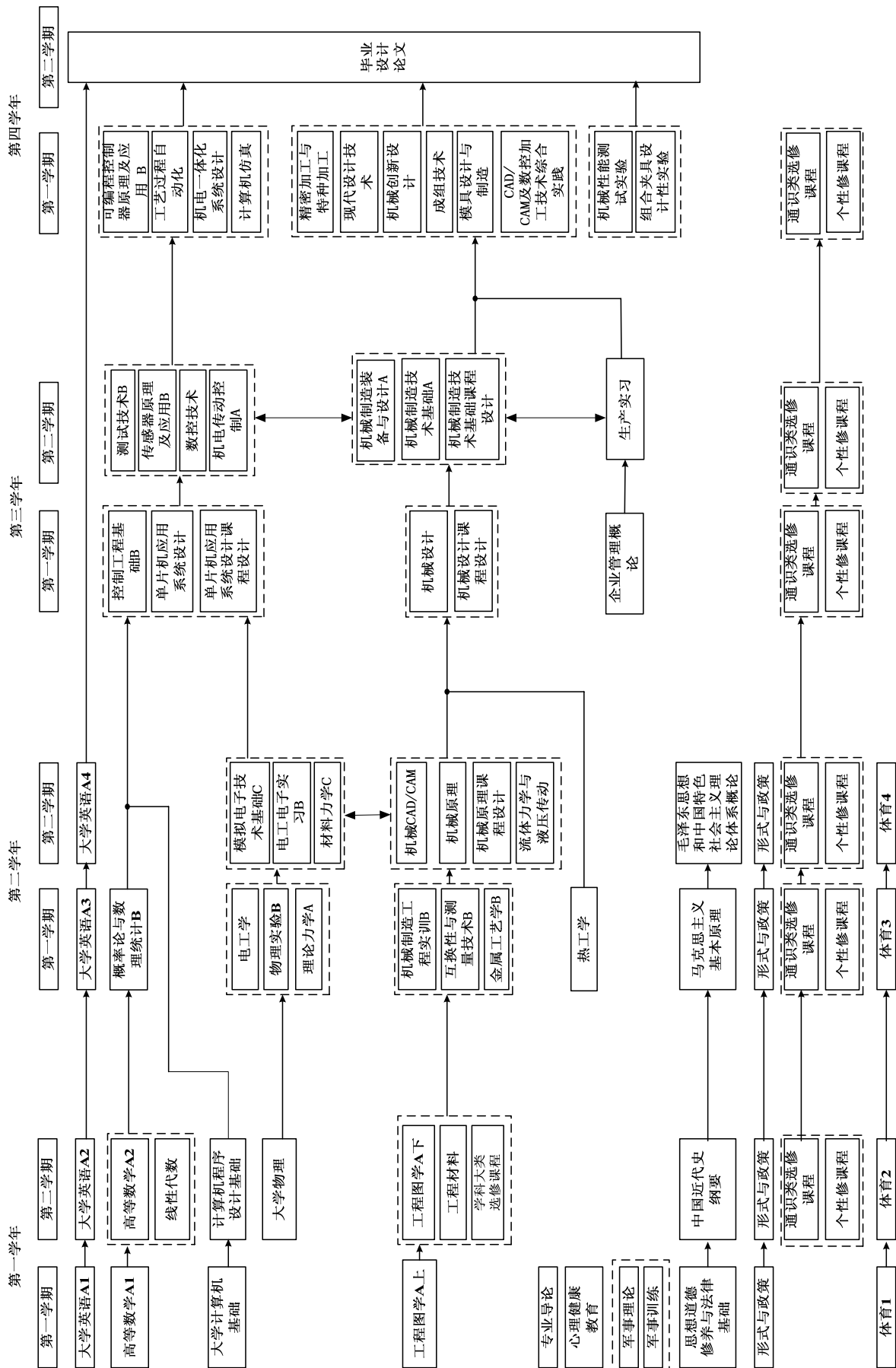
专业核 心课程	专业特 色课程	课程名称	机械工程专业（学硕班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√						√		√	
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主 义理论体系概论	√								√	
		马克思主义基本原理	√								√	
		军事理论	√									
		体育	√							√		
		大学英语	√					√				√
		大学计算机基础			√			√				
		计算机程序设计基础			√							
		心理健康教育	√								√	
		专业导论				√	√					√
		高等数学		√								
		线性代数		√								
		概率论与数理统计 B		√								
		大学物理 B		√								
		物理实验 B		√	√							
		工程图学 A			√							
√		工程材料			√							
		学科大类选修课程			√	√						
		互换性与测量技术 B			√	√						
		机械制造工程实训 B			√				√	√		
		电工学			√							
		电工电子实习 B			√							

专业核 心课程	专业特 色课程	课程名称	机械工程专业（学硕班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
√		理论力学 A			√							
		金属工艺学 B			√							
√		机械原理			√							
		机械原理课程设计								√	√	
		流体力学与液压传动			√	√						
		模拟电子技术基础 C			√					√	√	
√		材料力学 C			√					√	√	
√		机械设计			√					√	√	
		机械设计课程设计								√	√	
		热工学			√							
√		控制工程基础 B				√	√	√				
√		单片机应用系统设计				√						
		单片机应用系统设计课程设计				√						
√	√	机械制造技术基础 A				√						
		机械制造技术基础课程设计				√						
		机械 CAD/CAM			√	√	√	√				
		机电传动控制 A				√						
	√	测试技术 B		√	√		√					
		可编程控制器原理及应用 B				√		√		√		
		传感器原理及应用 B				√						
		现代设计技术				√		√				
		成组技术			√	√	√	√				
		生产实习	√	√					√	√		
√	√	数控技术				√						
√	√	CAD/CAM 及数控加工技术综合实践				√						

专业核 心课程	专业特 色课程	课程名称	机械工程专业（学硕班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
√	√	机械制造装备与设计 A				√						
		企业管理概论	√		√	√	√	√	√			
		机电一体化系统设计			√	√	√	√	√			
		机械性能测试实验				√						
		组合夹具设计性实验				√						
		模具设计与制造			√		√					
		机械创新设计				√	√	√				
		精密加工与特种加工			√	√						
		工艺过程自动化				√						
		计算机仿真				√						
		毕业设计（论文）				√	√	√	√	√	√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crts	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course	
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur			
通 识 课 程 Public Basic Courses	必修课 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060001110	军事理论 Military Theory	1	32			16		1		
		1050001110	心理健康教育 Mental Health Education	1	16					1		
		4210001110	体育 1 Physical Education I	1	32					1		
		4120017110	大学计算机基础 Foundation of Computer	2	32		12			1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		4030002110	大学英语 A1 College English A 1	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C Language)	3	48		12			2		
			小 计 Subtotal			35	736		24	64	64	
	选修课 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from Art and Physical Education Courses to obtain at least 2 credits. Science and engineering students should select at least one course from Arts and Social Science Courses or Economy and Management Courses, and other students should select at least one course from Science and Technology Courses.							
		人文社科类 Arts and Social Science Courses										
经济管理类 Economy and Management Courses												
科学技术类 Science and Technology Courses												
艺术体育类 Art and Physical Education Courses												

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 CrS	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur		
学 科 大 类 课 程 Basic Disciplinary Courses	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A1 Advanced Mathematics A I	5	80					1	
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4050064110	高等数学 A2 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4050460130	大学物理 Physics B	5	80					2	
		4050224130	物理实验 B Physics Lab. B	1	32	32				3	大学物理
		4100008110	电工学 Electrical Engineering	3	48	8				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		小 计 Subtotal		36.5	600	48	4				
专 业 课 程 Specialized Courses	必修课程 Required Courses	4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3	
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3	
		4090177140	热工学 Heat and Thermodynamics	1.5	24					3	
		4110050110	模拟电子技术基础 C Fundamentals of Analog Electronic Circuit C	3	48	8				4	
		4050018110	材料力学 C Mechanics of Materials C	4	64	4				4	理论力学 A
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4	
		4080087110	流体力学与液压传动 Fluid Mechanics and Hydraulic	2.5	40	4				4	
		4080060110	机械设计 Mechanical Designing	4	64	6				5	机械原理
		4080085110	控制工程基础 B Fundamentals of Control B	2.5	40	4				5	
		4080053110	单片机应用系统设计 Micro-Controller Unit Application System Design	3	48	6				5	
		4080325140	企业管理概论 Introduction to Business Management	1	16					5	
		4080023110	测试技术 B Measuring & Testing Technology B	2.5	40	4				6	控制工程基础 B

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4				6	
		4080065110	机械制造技术基础 B Fundamentals of Mechanical Manufacturing Technology B	3.5	56	6				6	
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				6	
		4080314140	机械制造装备设计 Machine Equipment Design	2	32					6	
		4080209120	机械性能测试实验 Testing Experiment of Mechanical Properties	0.5	16	16				7	
		4080214120	组合夹具设计性实验 Experiment of Modular Fixture Design	0.5	16	16				7	
		小 计 Subtotal		45.5	744	90					
	选修课 Elective Courses	4080058110	机械 CAD/CAM Machinery CAD/CAM	2	32		6			4	
		4080027110	传感器原理及应用 B Fundamentals & Application of Sensors B	2	32	6				6	
		4080110110	现代设计技术 Modern Design Technology	2	32					7	
		4080025110	成组技术 Group Technology	2	32					7	
		4080083110	可编程控制器原理及应用 B Fundamentals & Application of Programmable Logic Controller B	2	32	4				7	
		4080057110	机电一体化系统设计 Mechatronics System Design	2	32					7	
		4080048110	工艺过程自动化 Process Automation	2	32					7	
		4080073110	计算机仿真 Computer Simulation	2	32		6			7	
		4080211120	模具设计与制造 Mould Design and Manufacture	2.5	40					7	
		4080059110	机械创新设计 Innovative Mechanical Design	2	32					7	
		4080080110	精密加工与特种加工 Technology of Special Machining and Precision Machining	2	32					7	
		小 计 Subtotal		22.5	360	10	12				
		修读说明：要求至少选修 12 学分。 NOTE: Minimum subtotal credits:12									
个性化课程 Personalized Course	选修课 Elective Courses	4080285130	智能机械装备技术及应用 Intelligent Machinery Equipment Technology and Application	2	32	10		6		5	
		4080287130	机械制造中的信息技术 Information Technology in Mechanical Manufacturing	2	32	4				5	
		4080286130	机电设备电气控制 Electrical control of Mechanical and Electrical Equipment	2	32	6		2		6	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crts	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080284130	振动与噪声基础 Fundamentals of Vibration and Noise	2	32			16		6	
		小 计 Subtotal		8	128	20		24			
		修读说明：学生可跨专业自主选择修读全校其他专业的课程，建议修读以上课程。要求至少选修 10 学分。 NOTE: Students can choose any courses from the other specialties, and are especially suggested to choose the courses above. Minimum subtotal credits: 10.									

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crts	建议修读学期 Suggested Term	第二专业 Second Major
1060002110	军事训练 Military Training	3	1.5	1	
4080150110	机械制造工程实训 B Machinery Manufacturing Engineering Practice B	4	4	3	
4100069110	电工电子实习 B Practice in Electrical Engineering & Electronics B	1	1	4	
4080149110	机械原理课程设计 Curricula Design of Mechanical Principles	1.5	1.5	4	
4080139110	单片机应用系统设计课程设计 Curricula Design of Micro-Controller Unit Application System Design	2	2	5	
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5	
4080161110	生产实习 Production Practice	3	3	6	
4080154110	机械制造技术基础课程设计 Curricula Design of Foundation on Mechanical Manufacturing Technology	3	3	6	
4080122110	CAD/CAM 及数控加工技术综合实践 Practice of CAD/CAM and NC Machining	2	2	7	
4080218120	毕业设计 Graduation Design	17	11	8	
小 计 Subtotal		39.5	32		

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：李益兵

【机械工程专业（卓越工程师班）】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Mechanical Engineering (Excellent Engineer Class) (2015)

专业名称	机械工程（卓越）	主干学科	机械工程
Major	Mechanical Engineering	Major Disciplines	Mechanical Engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Mechanical Engineering
所属大类	机械类（机电）	大类培养年限	1 年
Disciplinary	Mechanical(Electromechanical)	Duration	1 years

最低毕业学分规定

Graduation Credit Criteria

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	36.5	47	\	34	\	190
选修课 Elective Courses	9	\	18.5	\	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

（一）培养目标

- （1） 具有科学精神与创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
- （2） 具备机械工程领域内（特别是汽车、建材建工和通用机械）设计制造的基础理论和专门知识；
- （3） 具备知识应用、工程实践、组织管理、团队合作以及自主学习和适应发展的能力；
- （4） 能从事机械工程领域内的设计制造、维护应用和运行管理等工作的应用型工程师；
- （5） 毕业生能在各自所工作的领域成长为工程设计型、技术型人才或管理人才。

- （1） The graduates should have the sense of innovation, international cooperation, humanistic quality, professional ethics and responsibility for society;
- （2） The graduates should master the fundamental theories about the design and manufacture of mechanical engineering and some specialized knowledge;
- （3） The graduates should have the capabilities to apply theory, practice in projects, organize and manage and the abilities to self-study and get adapt to new development ;
- （4） The graduates should be qualified in designing and manufacture, scientific and technological development, research for application and operational management.
- （5） The graduates should be able to grow to senior engineering and technical personnel or senior management personnel in the next a few years after graduation.

（二）毕业要求

机械工程专业学生主要学习机械设计、制造的基础知识，受到现代机械工程师的基本训

练，具有从事机构设计、制造及控制的基本能力；

- (1) 较好的人文社会科学素养、较强的社会责任感和良好的工程职业道德。
- (2) 从事工程工作所需的相关数理学科基础、自然科学知识和一定的经济管理知识及一定的人文和社会科学知识。
- (3) 掌握扎实的机械工程基本理论知识和专业基础知识，具有系统的机械工程实践训练，了解本专业的前沿发展现状和趋势。
- (4) 较系统地掌握本专业领域宽广的技术理论基础知识，主要包括力学、机械学、电子与电工学、流体力学等基础知识，具备基本的设备（特别是汽车零部件、建材建工机械产品和机械制造设备）运行、管理、改进、维护方面的能力；
- (5) 具备对机械行业新产品、新设备进行研究、开发和设计的初步能力，初步具有机械产品（特别是汽车零部件、建材建工机械产品、机械制造设备）设计开发能力和一定的成本核算、组织管理和生产管理能力，具有团队协作精神，参与团队管理、协调团队工作，确保工作进度。
- (6) 掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，能通过互联网、期刊资料等渠道了解相关的器件、产品、系统及技术的进展与前沿，能有效地运用各种资源找到解决具体的机械专业技术问题的方法。
- (7) 了解国家有关机械工程专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规，正确认识工程实际对客观世界和社会的影响，熟悉机械工程领域的技术标准，了解相关的政策、法律和法规。
- (8) 具有初步技术开发和工程设计的组织管理能力、表达能力和人际交往能力，能够在团队中发挥作用。
- (9) 具有适应社会发展能力、应对危机与突发事件能力以及终身学习能力。
- (10) 具有国际视野和跨文化交流、竞争与合作能力。

The students majoring in Mechanical Engineering will learn basic theory of machine design and manufacturing processes, and should be trained to become qualified modern mechanical engineers who are able to design product, and have the capabilities to manufacture and control.

- (1) The graduates should have good quality of humanities and social sciences, strong sense of responsibility for society and proper engineering profession ethics.
- (2) The graduates should master related mathematical theory to conduct engineering work and the relevant knowledge about natural science and economic management.
- (3) The graduates should master the basic theories of mechanical engineering and have systematic engineering practice training of mechanical engineering technology, understanding the forefront of the development and trends of their major.
- (4) The graduates should master extensive knowledge related to major fields including mechanics of materials, mechanical design theory, electricity and electronics, fluid power and hydromechanics, having the capability to operate, manage, retrofit and maintain basic equipment (especially components for cars, mechanical products for building and equipment for mechanical manufacture).
- (5) The graduates should have the preliminary capability to research, develop and design new mechanical products and equipment and the ability to design and develop mechanical products (especially components for cars, mechanical products for building

and equipment for mechanical manufacture) and the ability for cost calculation, organization management and production management, having the sense of team cooperation, taking part in team management, coordinating team work, ensuring work process.

- (6) The graduates should master the basic method of literature search, data inquiry and the use of modern information technology to obtain relevant information, and be able to understand the progress and forefront of related devices, products, systems and technologies via the Internet, journals and other channels to, and be able to solve specific technical problems with mechanical techniques via various of resources.
- (7) The graduates should know state laws, regulations relevant to work of production, design, research and development in the scope of mechanical engineering, understand the relevant guidelines, policies, laws and regulations of environmental protection and sustainable development, understand accurately the actual impact of the project on the objective world and society, being familiar with technical standards, specifications of mechanical engineering, understanding relevant policies, law and regulations.
- (8) The graduates should have the preliminary capability to organize, manage, present works, communicate and function well in a team.
- (9) The graduates should be able to adapt to social development and can study in a lifelong term.
- (10) The graduates should have international perspectives and the ability to communicate, compete and cooperate in different cultures.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4	培养目标 5
毕业要求 1	√		√	√	
毕业要求 2		√			
毕业要求 3	√	√			
毕业要求 4		√			
毕业要求 5		√			√
毕业要求 6			√	√	√
毕业要求 7	√		√	√	
毕业要求 8			√	√	√
毕业要求 9			√	√	√
毕业要求 10	√		√	√	

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程：

理论力学、材料力学、工程材料、机械原理、机械设计、控制工程基础、测试技术、机械制造技术基础。

Core Courses: Theoretical Mechanics, Mechanics of Materials, Engineering Materials, Principle of Mechanics, Mechanical Design, Fundamental of Control Engineering, Measuring and Testing Technique, Foundation of Mechanical Manufacturing Technology.

(二) 专业特色课程：

机械制造技术基础、测试技术、数控技术、机械制造装备与设计。

Characteristic Courses: Foundation of Mechanical Manufacturing Technology, Measuring and Testing Technique, Numerical Control Technology, Machine Equipment Design.

附：毕业要求实现矩阵：

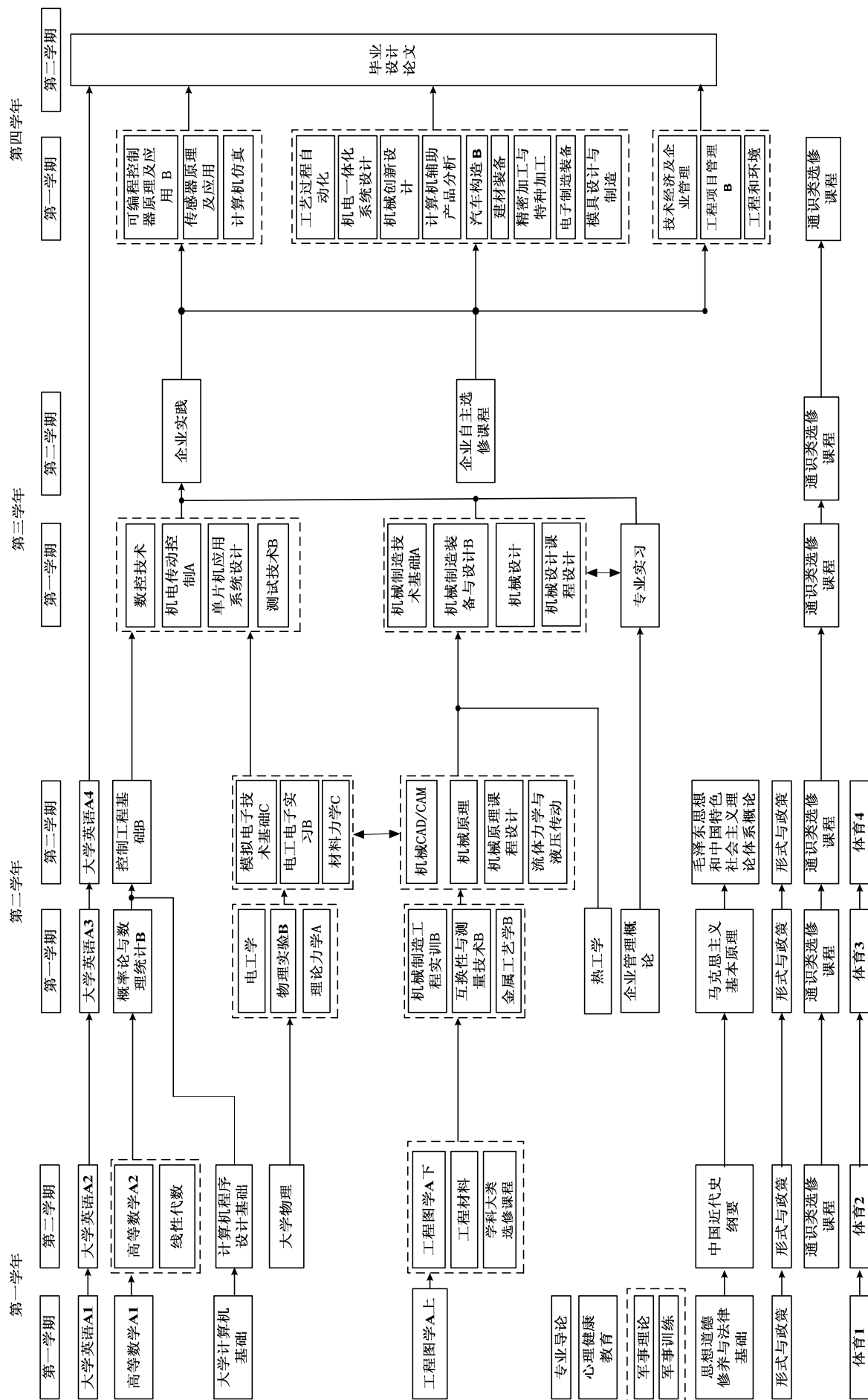
专业 核心 课程	专业 特色 课程	课程名称	机械工程专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√						√		√	
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义理论体系概论	√								√	
		马克思主义基本原理	√								√	
		军事理论	√									
		体育	√							√		
		大学英语	√					√				√
		大学计算机基础			√			√				
		计算机程序设计基础			√							
		心理健康教育	√								√	
		专业导论				√	√					√
		高等数学		√								
		线性代数		√								
		概率论与数理统计 B		√								
		大学物理		√								
		物理实验 B		√	√							
		工程图学 A			√							
√		工程材料			√							
		学科大类选修课程			√	√						
		互换性与测量技术 B			√	√						
		机械制造工程实训 B			√				√	√		
		电工学			√							
		电工电子实习 B			√							

专业 核心 课程	专业 特色 课程	课程名称	机械工程专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
√		理论力学 A			√							
		金属工艺学 B			√							
√		机械原理			√							
		机械原理课程设计								√	√	
		流体力学与液压传动			√	√						
		模拟电子技术基础 C			√					√	√	
√		材料力学 C			√					√	√	
√		机械设计			√					√	√	
		机械设计课程设计								√	√	
		热工学			√							
√		控制工程基础 B				√	√	√				
		单片机应用系统设计				√						
√	√	机械制造技术基础 A				√						
		机械 CAD/CAM			√	√	√	√				
		机电传动控制 A				√						
		企业管理概论	√		√	√	√	√	√			
√	√	测试技术 B		√	√		√					
		可编程控制器原理及应用 B				√		√		√		
		传感器原理及应用 B				√						
		专业实习	√	√					√	√		
	√	数控技术				√						
	√	机械制造装备与设计 B				√						
		机电一体化系统设计			√	√	√	√	√			
		模具设计与制造			√		√					
		机械创新设计				√	√	√				

专业 核心 课程	专业 特色 课程	课程名称	机械工程专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		精密加工与特种加工			√	√						
		工艺过程自动化				√						
		计算机仿真				√						
		计算机辅助产品分析（有限元，优化设计）				√						
		电子制造装备				√			√			
		建材装备				√			√			
		汽车构造 B				√			√			
		工程项目管理 B				√	√			√		
		技术经济及企业管理				√				√		
		企业自主选修课程			√	√				√		
		工程和环境				√	√		√	√		
		毕业设计（论文）			√	√	√	√	√	√	√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course	
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur			
通 识 课 程 Public Basic Courses	必修课程 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060001110	军事理论 Military Theory	1	32			16		1		
		4210001110	体育 1 Physical Education I	1	32					1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		4030002110	大学英语 A1 College English A 1	3	64				16	1		
		1050001110	心理健康教育 Mental Health Education	1	16					1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120017110	大学计算机基础 Foundation of Computer	2	32		12			1		
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C	3	48		12			2		
		小 计 Subtotal			35	736		24	64	64		
	选修课程 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。 理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from Art and Physical Education Courses to obtain at least 2 credits. Science and engineering students should select at least one course from Arts and Social Science Courses or Economy and Management Courses, and other students should select at least one course from Science and Technology Courses.							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Cr	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 大 类 课 程 Basic Disciplinary Courses	必 修 课 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A1 Advanced Mathematics A I	5	80					1	
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050064110	高等数学 A2 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4050460130	大学物理 Physics	5	80					2	
		4100008110	电工学 Electrical Engineering B	3	48	8				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	
		小 计 Subtotal		36.5	600	48	4				
专 业 课 程 Specialized Courses	必 修 课 Required Courses	4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3	
		4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3	
		4080326140	企业管理概论 Introduction to Business Management	1.5	24					3	
		4090177140	热工学 Heat and Thermodynamics	1.5	24					3	
		4110050110	模拟电子技术基础 C Fundamentals of Analog Electronic Circuit C	3	48	8				4	
		4050018110	材料力学 C Mechanics of Materials A	4	64	4				4	理论力学 A
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4	
		4080087110	流体力学与液压传动 Fluid Mechanics and Hydraulic	2.5	40	4				4	
		4080085110	控制工程基础 B Fundamentals of Control B	2.5	40	4				4	
		4080058110	机械 CAD/CAM Machinery CAD/CAM	2	32		6			4	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080060110	机械设计 Mechanical Designing	4	64	6				5	机械原理
		4080065110	机械制造技术基础 A Fundamentals of Mechanical Manufacturing	3.5	56	6				5	
		4080023110	测试技术 B Measuring & Testing Technology B	2.5	40	4				5	控制工程基础 B
		4080053110	单片机应用系统设计 Micro-Controller Unit Application System Design	3	48	6				5	
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				5	
		4080314140	机械制造装备与设计 Machine Equipment and Design	2	32					5	
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4				5	
		小 计 Subtotal		47	752	58	6				
	选修课 Elective Courses	4080090110	企业自主选修课程 Self-elective Courses in Enterprises	2	32					6 (企业)	
		4170075110	技术经济及企业管理 Enterprise Management	2	32					7 (3 选 1)	
		4080043110	工程项目管理 B Engineering Project Management B	2	32						
		4080035110	工程和环境 Engineering and Environment	2	32						
		4090038110	汽车构造 B Construction of Automobile B	2	32					7 (3 选 1)	
		4080076110	建材装备 Building Materials Equipment	2	32						
		4080031110	电子制造装备 Electronic manufacturing Equipment	2	32						
		4080080110	精密加工与特种加工 Technology of Special Machining and Precision Machining	2	32					7 (9 选 5)	
		4080211120	模具设计与制造 Mould Design and Manufacture	2.5	40						
		4080048110	工艺过程自动化 Process Automation	2	32						
		4080074110	计算机辅助产品分析（有限元，优化设计） Computer-Aided Product Analysis (Finite	2	32						
		4080073110	计算机仿真 Computer Simulation	2	32		6				
		4080059110	机械创新设计 Mechanical Innovation Design	2	32						
		4080057110	机电一体化系统设计 Mechatronics System Design	2	32						

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crts	总学时 Tot hrs.	学时分配 Including				建议修读学期 Suggested Term	先修课程 Prerequisite Course
						实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080083110	可编程控制器原理及应用 B Fundamentals & Application of Programmable Logic Controller B	2	32	4					
		4080027110	传感器原理及应用 B Fundamentals & Application of Sensors B	2	32	6					
		小 计 Subtotal		32.5	520	10	6				
		修读说明：要求至少选修 18.5 学分。 NOTE: Minimum subtotal credits:18.5.									

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crts	建议修读学期 Suggested Term	第二专业 Second Major
1060002110	军事训练 Military Training	3	1.5	1	
4080150110	机械制造工程实训 B Machinery Manufacturing Engineering Practice B	4	4	3	
4100069110	电工电子实习 B Practice in Electrical Engineering & Electronics B	1	1	4	
4080149110	机械原理课程设计 Curricula Design of Mechanical Principles	1.5	1.5	4	
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5	
4080261130	专业实习 Profession Practice	2	2	5（企业）	
4080254130	企业实践 Enterprise Practice	20	10	6（企业）（暑假）	
4080218120	毕业设计 Graduation Design	17	11	8（企业）	
小 计 Subtotal		51.5	34		

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：李益兵

【过程装备与控制工程专业（卓越工程师班）】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Industrial Equipment and Control Engineering (Excellent Engineer Class) (2015)

专业名称	过程装备与控制工程	主干学科	过程装备与控制工程
Major	Industrial Equipment and Control Engineering	Major Disciplines	Industrial Equipment and Control Engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Mechanical Engineering
所属大类	机械类（机电类）	大类培养年限	1 年
Disciplinary	Mechanical(Electromechanical)	Duration	1 years

最低毕业学分规定

VI Graduation Credit Criteria

课程类别 课程性质	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	36.5	46.5	\	40.5	\	190
选修课 Elective Courses	9	\	12.5	\	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

（一）培养目标

- （1）具有现代科学创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
- （2）既具备扎实的机械工程技术基础，又掌握现代过程控制装备与控制工程系统科学的理论和方法，能够综合运用自然科学、机械工程与现代过程控制的方法与技术，对过程工业系统进行规划、设计、控制、持续改善与创新；
- （3）具有良好的科学文化素质、知识更新能力、创新思维能力，熟练的专业技能，能在生产和服务领域从事技术和管理的应用研究型复合人才。

（1） With modern science and innovation consciousness, international exchanges and competition consciousness, humanistic and scientific literacy, occupation ethics and social responsibility;

（2） Both have a solid foundation in mechanical engineering technique, and with process equipment and control engineering system scientific theory and method of modern process control, to make comprehensive use of the technique and method of natural science, mechanical engineering and modern process control, and to make comprehensive use of the technique and method of natural science, mechanical engineering and modern process control, planning, design, control, continuous improvement and innovation of process industry system;

（3） With good quality of science & culture, knowledge renewal ability, creative thinking ability, and skillful technical ability, which can be engaged in applied research talents of technology and management in the field of production and services.

（二）毕业要求

为了达到培养目标要求，毕业生应达到以下方面的知识、能力和素质要求：

In order to achieve the graduation goal request, graduates should meet the requirements of knowledge, ability and quality in the following aspects:

(1) 较好的人文社会科学素养、较强的社会责任感和良好的工程职业道德；

Good sense of humanities and social science literacy, strong social responsibility better and owns good engineering occupation moral

(2) 从事工程工作所需的相关数理学科基础和电气控制基础；

Required in the engineering work related mathematical discipline foundation and basic knowledge of electrical control;

(3) 掌握扎实的过程装备与控制工程专业基本理论知识和专业基础知识，具有系统的过程工业系统实践训练，了解本专业的前沿发展现状和趋势；

Grasp of the major of process equipment and control engineering basic theory knowledge and professional basic knowledge, practical training system in process industry with system, understand the latest development status and trend of the professional;

(4) 综合运用自然科学、机械工程与现代过程控制的方法与技术，对过程工业系统进行规划、设计、控制、持续改善与创新，并具备相应的实验技能；

Adopt technical methods and techniques of natural science, mechanical engineering and modern process control, planning, design, control, continuous improvement and innovation of process industry system, as well as corresponding Experimental skills;

(5) 具备创新意识和对过程工业新产品、新设备进行研究、开发和设计的初步能力，初步具有本专业过程装备设计开发能力和初步的工程项目实施的能力；

Have the sense of innovation and the process of industrial new products, new equipment research, development and design of the preliminary ability, initially with the professional process equipment design & development capability and with the basic ability of practical project implementation;

(6) 掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，能通过互联网、期刊资料等渠道了解相关的器件、产品、系统及技术的进展与前沿，能有效地运用各种资源找到解决具体的过控专业技术问题的方法；

Master the basic methods of literature search, data query and use of modern information technology to obtain relevant information, can through the Internet, journal data channels understand the devices, products, systems and technologies related to the progress and frontier, effective use of various resources to find solutions to problems of specific process control major;

(7) 了解国家有关过控专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规，正确认识工程实际对客观世界和社会的影响，把握国内外相关的标准、规范和技术变化；

Understand the relevant national laws on control engineering related occupation and industry production, design, research and development, regulations and relevant environmental protection and sustainable development and other aspects of the guidelines, policies and laws and regulations, the correct understanding of the objective world and the actual effect of engineering society, grasp the standards, norms and technical changes associated with both at home and abroad;

(8) 经历过过控系统的设计、运行和维护或解决实际工程问题的系统化训练；

With the experience systematic training of the design, running and maintenance of measurement and control system or solving practical engineering problem;

(9) 具有适应社会发展能力以及终身学习能力；

Adapt to the social development ability and the ability of lifelong learning

(10) 具有国际视野和跨文化交流、竞争与合作能力。

With international vision and cross cultural communication, competition and cooperation ability.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3
毕业要求 1	√		
毕业要求 2		√	√
毕业要求 3		√	
毕业要求 4		√	

	培养目标 1	培养目标 2	培养目标 3
毕业要求 5	√		
毕业要求 6		√	
毕业要求 7		√	
毕业要求 8			√
毕业要求 9			√
毕业要求 10	√		

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

专业核心课程：理论力学、材料力学、机械原理、机械设计、机械制造技术基础、流体力学与流体机械、过程原理与设备、粉体力学与设备、过程控制技术、建材设备设计。

Core Courses: Theoretical Mechanics, Materials Mechanics, Principle of Mechanics, Mechanical Design, Fundamentals of Mechanical Manufacturing Technology, Fluid Mechanics and Fluid Machinery, Process Principles and Equipment Engineering, Powder Mechanics and Equipment, Process Control Engineering, , Design of Building Materials Equipment.

专业特色课程：过程控制技术、建材设备设计。

Characteristic Courses: Process Control Engineering, Design of Building Materials Equipment, .

附：毕业要求实现矩阵：

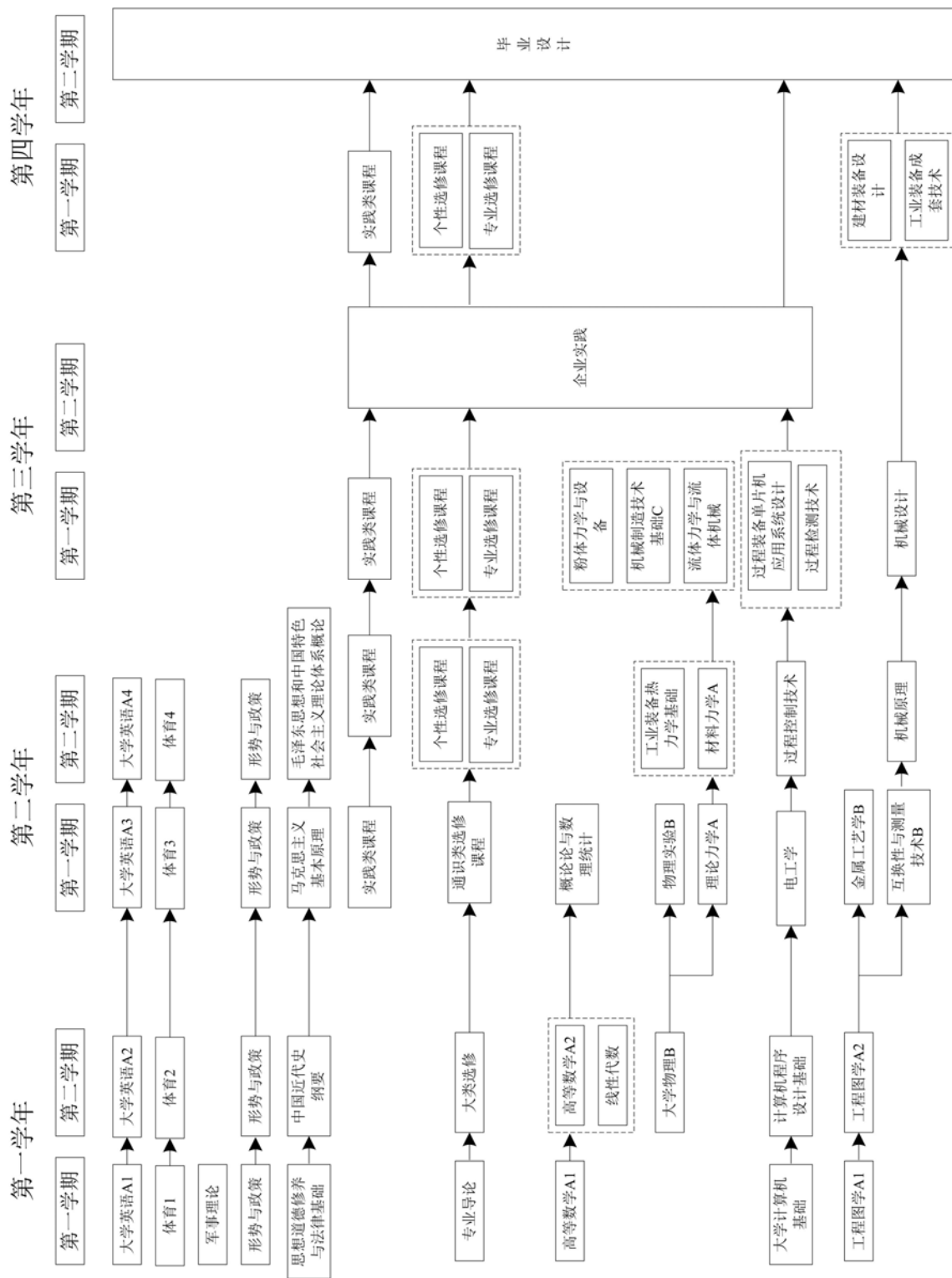
专业 核心 课程	专业 特色 课程	课程名称	过程装备与控制工程专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√									
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义理论体系概论	√									
		马克思主义基本原理	√									
		军事理论	√									
		体育	√									
		大学英语						√				
		大学计算机基础						√				
		计算机程序设计基础(C 语言)						√				
		专业导论							√			
		工程材料			√							
		高等数学 A1		√								
		高等数学 A2		√								

		工程图学 A1			√							
		工程图学 A2			√							
		线性代数		√								
		大学物理 C		√								
		物理实验 B		√								
		概率论与数理统计 B		√								
		造型设计基础			√							
		基础工业工程			√							
√		理论力学 A		√								
		电工学		√								
		互换性与测量技术 B			√							
		金属工艺学 B			√							
√		材料力学 A		√								
		工业装备热力学基础				√						
√	√	过程控制技术		√								
		过程检测技术		√								
√		机械原理					√					
√		机械设计					√					
		过程装备单片机应用系统设计		√								
√		流体力学与流体机械			√							
		液压传动与控制		√								
√		机械制造技术基础 C					√					
√		过程原理与设备					√					
√		粉体力学与设备					√					
		工业装备成套技术					√					
√	√	建材装备设计								√		
		CAD/CAM					√					
		机电工程软件					√					
		可编程控制器原理及应用 A		√								
		机电传动控制 A		√								
		光机电测控技术基础		√								
		机电一体化系统设计								√		

	成型机械与模具设计					√					
	数控技术		√								
	工业装备网络控制技术					√					
	军事训练									√	
	机械制造工程实训 B			√							
	过程计算机控制综合课程设计			√							
	机械原理课程设计			√							
	过程装备单片机应用系统设计课程设计		√								
	机械设计课程设计			√							
	企业实践								√		
	工业装备成套技术综合课程设计			√							
	组态编程开发与应用课程设计		√								
	毕业设计									√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course	
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur			
通 识 课 程 Public Basic Courses	必修课 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060001110	军事理论 Military Theory	1	32			16		1		
		4210001110	体育 1 Physical Education I	1	32					1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		1050001110	心理健康教育 Mental Health Education	1	16					1		
		4030002110	大学英语 A1 College English A I	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120017110	大学计算机基础 Foundation of Computer	2	32		12			1		
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C Language)	3	48		12			2		
		小 计 Subtotal				35	736		24	64	64	
	选修课 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from Art and Physical Education Courses to obtain at least 2 credits. Science and engineering students should select at least one course from Arts and Social Science Courses or Economy and Management Courses, and other students should select at least one course from Science and Technology Courses.							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 大 类 课 程 Basic Disciplinary Courses	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A1 Advanced Mathematics A I	5	80					1	
		4050064110	高等数学 A2 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4050024110	大学物理 Physics	5	80					2	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		4100008110	电工学 Electrotechnology	3	48	10				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		小 计 Subtotal		36.5	600	50	4				
专 业 课 程 Specialized Courses	必修课程 Required Courses	4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3	
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3	
		4050015110	材料力学 A Mechanics of Materials A	5	80	8				4	理论力学 A
		4080206120	过程控制技术 Process Control Engineering	2.5	40	4				4	
		4080205120	过程检测技术 Process Measuring & Testing Technology	2.5	40	4				5	
		4080102110	工业装备热力学基础 Industrial Equipment Thermal Theory	2	32					4	
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4	
		4080060110	机械设计 Mechanical Designing	4	64	6				5	
		4080053110	过程装备单片机应用系统设计 Design of Industry Equipments Single-Chip Computer Application System	3	48	6				5	
		4080086110	流体力学与流体机械 Fluid Mechanics and Fluid Machines	2.5	40	2				5	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
课程类别 Course Classification		4080066110	机械制造技术基础 C Fundamentals of Mechanical Manufacturing Technology C	3	48	6				5	
		4080207120	过程原理与设备 Process Principles and Equipment	3	48	6				5	
		4080033110	粉体力学与设备 Powder Mechanics and Power Machines	3	48					5	流体力学与 流体机械
		4080047110	工业装备成套技术 Complete Sets of Process Equipment Technology	3	48					7	
		4080077110	建材装备设计 Designs of Building Materials Equipment	3	48					7	粉体力学与 设备
		小 计 Subtotal		46.5	744	50					
	选修课 Elective Courses	4080199120	CAD/CAM CAD/CAM	2.5	40		10			4	
		4080208120	机电工程软件 Engineering Software of Electric Machine	2.5	40		12			4	
		4080082110	可编程控制器原理及应用 A Fundamentals & Application of Programmable Controllers A	2.5	40	6				5	
		4080121110	工业装备网络控制技术 Networks Control Technology of Industry Equipments	2.5	40	4				7	
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4				7	
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				7	
		4080127120	机电一体化系统设计 Mechatronics System Design	2.5	40					7	
		4080050110	光机电测控技术基础 Measurement Technology of Ray and Electro-mechanics	2.5	40					7	
		4080024030	成型机械与模具设计 Tool and Mould Design	2.5	40					7	
		小 计 Subtotal		22.5	360	18	22				
		修读说明：要求至少选修 12.5 学分。 NOTE: Minimum subtotal credits:12.5									

五、集中性实践教学环节

V Practice Schedule

课程编号	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term
1060002110	军事训练 Military Training	3	1.5	1
4080150110	机械制造工程实训 B Training on Mechanical Manufacturing Engineering B	4	4	3
4080149110	机械原理课程设计 Curricula Design of Mechanical Principles	1.5	1.5	4
4080345160	过程计算机控制综合课程设计 D Course Practice of Process Computer Control D	1	1	4

课程编号	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term
4080347160	组态编程开发与应用课程设计 B Curricula Design of Configuration Programming Development and Practice B	2.5	2.5	4
4080346160	过程装备单片机应用系统设计课程设计 B Curricula Design of Computer Interface Technology B	3	3	5
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5
4080323140	企业实践 Enterprise Practice	20	10	6（企业）
4080141110	工业装备成套技术综合课程设计 A Curricula Design of Complete Sets of Process Equipment Technology A	3	3	7
4080219120	毕业设计 Graduation Design	17	11	8（企业）
小 计 Subtotal		58	40.5	

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：胥 军

【测控技术与仪器专业（卓越工程师班）】

2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Measuring & Control Technology and Instrument (Excellent Engineer Class) (2015)

专业名称	测控技术与仪器	主干学科	仪器科学与技术
Major	Measuring & Control Technology and Instrument	Major Disciplines	Instrument Science and Technology
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Mechanical Engineering

最低毕业学分规定

Graduation Credit Criteria

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	43.5	38	\	36.5	\	190
选修课 Elective Courses	9	\	18	\	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

（一）培养目标

- （1）具有现代科学创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；
 - （2）具有从事测控技术与仪器领域科学研究、工程设计和技术服务等工作所需的数理知识和专业知识，以及综合运用科学理论、专业技术和工具分析解决测控领域复杂工程问题，具备设计、开发、测试、应用复杂测控系统的能力；
 - （3）具有质量意识、环境意识和安全意识，能综合考虑社会制约因素及相关政策法规完成工程设计；
 - （4）具备一定的组织管理、人际交往、团队合作能力以及不断学习和适应发展的能力；
 - （5）毕业生在仪器及相关领域具有就业竞争力或有能力进入研究生阶段学习；能在国民经济各部门从事测量与控制相关技术、仪器与系统的设计制造、科研开发、应用研究、运行管理等方面工作；毕业 5 年左右能在各自所工作的领域作为骨干成员或者领导发挥作用。
- （1） Have modern science innovation consciousness, international communication and competition consciousness, humanities quality, professional ethics and sense of social responsibility.

- (2) Have required mathematical, physical and professional knowledge of engaged in scientific research, engineering designation and technical service in the field of measurement & control technology and instrument. Have the ability of analysis, design, development, testing and application complex measurement & control system by the synthetic application of scientific theory, specialty technology and instrument.
- (3) Have quality, environment and safety consciousness. Can comprehensive consideration social constraint factors and relevant policies and regulations to complete engineering design.
- (4) Have the ability of organization and management, interpersonal communication, teamwork, continuous learning and adapt to development.
- (5) The graduate have competitive power of obtaining employment or have ability of entering postgraduate stage; have ability of doing measurement and control technology work, can design and manufacture instruments and system, research on scientific and application, operation management in the national economy departments. Graduate can become senior engineering and technical personnel or senior management personnel in about five years.

(二) 毕业要求

- (1) 身心健康, 具有良好的人文社会科学素养、较强的社会责任感, 能够在工程实践中理解并遵守工程职业道德和规范;
- (2) 能够将数学、自然科学、工程基础和专业知用于解决复杂测控系统的工程问题;
- (3) 能够应用数学、自然科学和测控专业知识, 通过文献研究, 识别、表达并分析复杂测控系统的工程问题;
- (4) 能够针对复杂测控系统的工程问题, 考虑社会、健康、安全、法律、文化以及环境等因素, 提出合理设计方案, 设计满足特定需求的系统、单元(部件)或工艺流程, 并能够在设计环节中体现创新意识;
- (5) 能够基于自然科学基本原理和测控专业知识, 采用科学方法对测控系统的复杂工程问题进行研究, 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;
- (6) 能够针对测控系统的复杂工程问题, 开发、选择与使用恰当的技术、工程应用软件、电子仪器设备和信息技术工具, 对复杂工程问题进行预测与模拟, 并能够理解其局限性;
- (7) 理解国家有关测控技术专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规, 合理分析、评价专业工程实践和复杂工程问题解决方案对客观世界和社会的影响, 并理解应承担的责任;

- (8) 具备一定的国际视野，能够就测控系统的复杂工程问题与国内外业界同行及社会公众进行有效沟通和交流，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色，撰写报告和设计文稿、陈述发言、清晰表达或回应指令；
- (9) 理解并掌握工程管理原理与经济决策方法，并能应用于解决复杂测控工程问题；
- (10) 具有适应社会发展能力以及终身学习能力。
- (1) Healthy spirit and body, good quality of humanities and social sciences, strong sense of social responsibility and good engineering profession ethics. Understand and abide by professional ethics and norms in the engineering practice.
- (2) Have the ability of applying mathematics, natural science and engineering foundation and professional knowledge to solve the engineering problem of complex measurement and control system.
- (3) Have the ability of identification, expression and analysis engineering problem of complex measurement and control system through literature research.
- (4) Have the ability of putting forward rational design scheme ,designing specific needs system, unit or process to solve the engineering problem of complex measurement and control system, in considering the social, health, safety, legal, cultural, and environmental factors, and can reflect innovation consciousness in the design process.
- (5) Have the ability of basing on natural science knowledge and Measurement and control professional knowledge, using scientific methods to study the engineering problem of complex measurement and control system, to design experiments, analyze and interpret data, and get the conclusion of reasonable and effective through comprehensive information.
- (6) Have the ability of developing ,selecting and using appropriate technology , engineering application software, electronic equipment and information technology tools to predict and simulate the engineering problem of complex measurement and control system , and to understand its limitations.
- (7) Understand the related state laws and regulations of related work of measurement and control technology professional and production, design, research and development of industry, understand the related guidelines, policies, laws and regulations of environmental protection and sustainable development, correct understand the actual impact of the project on the objective world and society, and understand the responsibility .
- (8) Have a certain international vision. Have the ability of effectively communicating engineering problem of complex measurement and control system with industry colleagues, social public at home or abroad. Have the ability of playing role of team member, or the head in a team under the background of the multidisciplinary. Have the ability of writing reports and design documents, presentation speech, clear expression or responding to commands.
- (9) To understand and to grasp the method of project management theory and economic decision-making, and can be applied to solve the engineering problem of complex measurement and control system.
- (10) Have the ability to adapt to social development and lifelong learning.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4	培养目标 5
毕业要求 1	√				√
毕业要求 2		√			√
毕业要求 3		√			√
毕业要求 4	√	√	√		√
毕业要求 5		√			√
毕业要求 6		√			
毕业要求 7	√		√		
毕业要求 8	√			√	√
毕业要求 9				√	√
毕业要求 10	√			√	

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程：

测试信号分析与处理、误差理论与数据处理、精密机械设计、测控仪器电子技术基础、仪器仪表电路、测控系统微处理器原理及应用、传感器原理及应用、控制工程基础、仪器制造技术、仪器光学基础、现代仪器设计。

Signal Analysis and Processing, Error Theory and Data Processing, Precision Mechanism Design, Basic Electronic Technology of Measure and Control Instrument, Instrument Circuit, Microcontroller Principle and Its Application of Measure and Control System, Principle and Application of Sensors, Fundamentals of Control Engineering, Instrument Manufacture Technology, Fundamentals of Optical Instrument, Modern Instrument Design.

(二) 专业特色课程：

测控系统微处理器原理及应用、传感器原理及应用、控制工程基础、现代仪器设计、光纤传感器、无损检测技术、图像检测与处理技术、嵌入式系统设计、可编程控制器原理及应用。

Microcontroller Principle and Its Application of Measure and Control System, Principle and Application of Sensors A, Fundamentals of Control Engineering, Modern Instrument Design, Optical Fiber Sensor, Nondestructive Testing Technique, Image Detection and Processing Technique, Design of Embedded System, Fundamentals & Application of Programmable Logic Controller.

附：毕业要求实现矩阵：

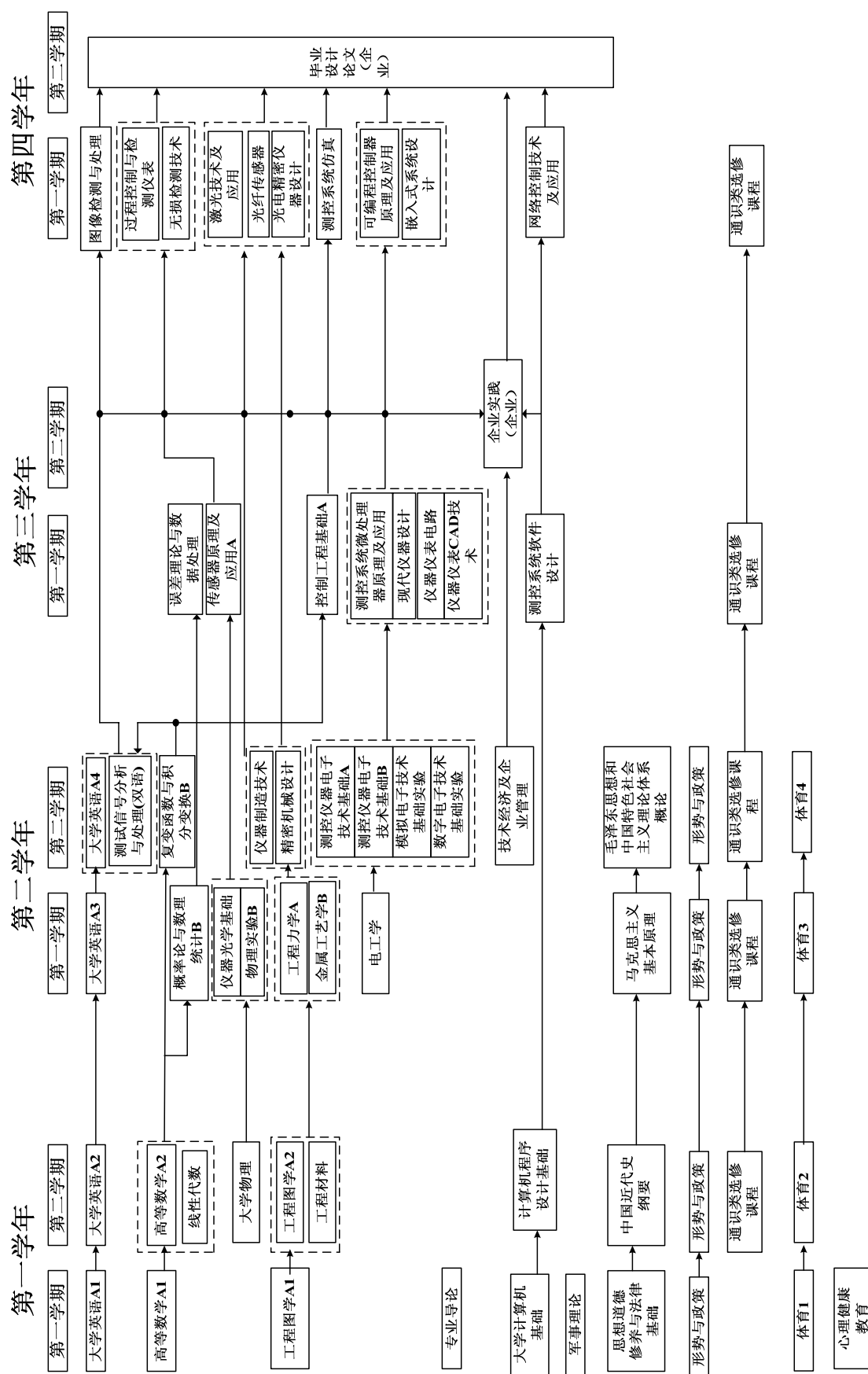
专业 核心 课程	专业 特色 课程	课程名称	测控技术与仪器专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√									
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义理论体系概论	√									
		马克思主义基本原理	√									
		军事理论	√									
		体育	√									
		大学英语								√		
		大学计算机基础		√								
		计算机程序设计基础(C 语言)		√				√				
		心理健康教育	√									
		专业导论	√						√			
		高等数学		√								
		线性代数		√								
		概率论与数理统计 B		√								
		大学物理 B		√								
		物理实验 B					√					
		工程材料		√					√			
		工程图学		√	√	√						
		电工学		√		√						
		工程力学 A		√								
		金属工艺学 B						√				
√		测控仪器电子技术基础 1		√		√						
√		测控仪器电子技术基础 2		√		√						
		模拟电子技术基础实验					√					
		数字电子技术基础实验					√					
		复变函数与积分变换 B		√								
√		测试信号分析与处理		√	√		√			√		

专业 核心 课程	专业 特色 课程	课程名称	测控技术与仪器专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
√		精密机械设计		√	√							
√		仪器仪表电路		√	√	√						
√	√	控制工程基础 A		√	√			√				
√		误差理论与数据处理		√			√					
√	√	测控系统微处理器原理及应用		√			√	√				
√	√	传感器原理及应用 A		√	√							
√	√	现代仪器设计		√	√				√			
√		仪器光学基础		√	√							
√		仪器制造技术				√			√		√	
		测控系统软件设计						√				
		仪器仪表 CAD 技术				√		√				
		测控系统仿真		√			√	√				
	√	光纤传感器			√	√						
	√	图像检测与处理技术			√		√					
	√	可编程控制器原理及应用			√	√						
	√	嵌入式系统设计				√		√				
		过程控制与检测仪表		√	√							
		激光技术及应用			√							
	√	无损检测技术 A						√	√			
		网络控制技术及应用				√		√	√			
		光电精密仪器设计			√	√			√			
		军事训练	√									
		机械制造工程实训 B						√			√	
		仪器仪表电路课程设计				√	√	√				
		测控系统微处理器应用课程设计			√	√	√	√				
		传感器原理及应用课程设计				√					√	
		现代仪器设计课程设计				√	√					
		测控系统应用软件设计						√				

专业 核心 课程	专业 特色 课程	课程名称	测控技术与仪器专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		生产实习	√						√	√		
		仪器仪表机构零件及工艺课程设计	√			√			√			
		测控系统综合课程设计				√	√	√		√	√	
		毕业设计				√	√	√	√	√	√	√

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表

IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course	
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur			
通 识 课 程 Public Basic Courses	必修课程 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060001110	军事理论 Military Theory	1	32			16		1		
		4210001110	体育 1 Physical Education I	1	32					1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		1050001110	心理健康教育 Mental Health Education	1	16					1		
		4030002110	大学英语 A1 College English A 1	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120017110	大学计算机基础 Foundation of Computer	2	32			12		1		
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C)	3	48			12		2		
		小 计 Subtotal				35	736		24	64	64	
	选修课程 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分,且必须选修艺术体育类课程中的艺术类相关课程,取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程,其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from <i>Art and Physical Education Courses</i> to obtain at least 2 credits. Science and engineering students should select at least one course from <i>Arts and Social Science Courses</i> or <i>Economy and Management Courses</i> , and other students should select at least one course from <i>Science and Technology Courses</i> .							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 CrS	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 大 类 课 程 Basic Disciplinary Courses	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A1 Advanced Mathematics A I	5	80					1	
		4050064110	高等数学 A2 Advanced Mathematics A II	5	80					2	高等数学 A1
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4050460130	大学物理 Physics	5	80					2	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		4050071110	工程力学 A Engineering Mechanics A	4	64	4				3	高等数学 大学物理
		4100008110	电工学 Electrical Engineering	3	48	8				3	大学物理
		4050052110	复变函数与积分变换 B Complex Function and Integral Transform B	3	48					4	高等数学
		小 计 Subtotal		43.5	712	52	4				
专 业 课 程 Specialized Courses	必修课程 Required Course	4080258130	仪器光学基础 Fundamentals of Optical Instrument	2.5	40	4				3	大学物理
		4080265130	精密机械设计 Precision Mechanism Design	4	64	8				4	工程图学 A 工程材料
		4080347160	测控仪器电子技术基础 1 Basic Electronic Technology of Measure & Control Instrument I	3	48					4	大学物理 电工学
		4080348160	测控仪器电子技术基础 2 Basic Electronic Technology of Measure & Control Instrument II	3	48					4	大学物理 电工学
		4110051110	模拟电子技术基础实验 Basic Analog Electronic Technology Experiments	0.5	16	16				4	测控仪器电子技术基础 A
		4110068110	数字电子技术基础实验 Basic Digital Electronic Technology Experiments	0.5	16	16				4	测控仪器电子技术基础 B
		4080267130	仪器制造技术 Instrument Manufacture Technology	2	32					4	金属工艺学
		4080315140	测试信号分析与处理 Signal Analysis and Processing	2.5	40		4			4	高等数学 线性代数
		4080316140	误差理论与数据处理 Error Theory and Data Processing	1.5	24					5	概率论与数理统计 B
		4080115110	仪器仪表电路 Instrument Circuit	2	32	4				5	测控仪器电子技术基础 A

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080266130	控制工程基础 Fundamentals of Control Engineering	3	48	8				5	复变函数与积分变换 B
		4080349150	测控系统微处理器原理及应用 B Microcontroller Principle and Its Application of Measure and Control System B	4	64	24				5	测控仪器电子技术基础 B
		4080350150	传感器原理及应用 D Principle and Application of Sensors D	3.5	56	16				5	大学物理 仪器仪表电路
		4080268130	测控系统软件设计 C Software Design of Measure and Control System C	2.5	40		12			5	计算机程序设计基础 (C 语言)
		4080111110	现代仪器设计 Modern Instrument Design	3.5	56	24				5	仪器仪表电路 测控系统微处理器
		小 计 Subtotal		38	624	120	16				
	选修课 Elective Courses	4170075110	技术经济及企业管理 Technical Economics and Enterprise Management	2	32					4	
		4050506130	计算方法 Calculation Method	1.5	24					5	
		4050460120	数学实验 Mathematics Experiment	1	16					5	
		4050507130	数学模型 Mathematical Model	2	32					5	
		4080114110	仪器仪表 CAD 技术 The CAD Technique for Circuit	2	32		4			5	仪器仪表电路
		4050508130	电磁学 Electromagnetics	2	32					7	
		4050509130	现代物理与高新技术 Modern Physics and Hi-teeh	1.5	24					7	
		4050510130	量子物理学 Quantum Physics	2	32					7	
		4080020110	测控系统仿真 Simulation for Measure and Control System	2	32		4			7	控制工程基础
		4080051110	光纤传感器 Optical Fiber Sensor	1.5	24	4				7	仪器光学基础
		4080101110	图像检测与处理技术 Image Detection and Processing Technique	2	32		4			7	测试信号分析与处理
		4080253130	可编程控制器原理及应用 Fundamentals & Application of Programmable Logic Controller	2	32	4				7	测控系统微处理器原理及应用
		4080093110	嵌入式系统设计 Design of Embedded System	2	32	4				7	测控系统微处理器原理及应用
		4080052110	过程控制与检测仪表 Process Control and Meter	2	32	4				7	控制工程基础, 传感器原理及应用
		4080071110	激光技术及应用 Principle and Applications of Laser	2	32	4				7	仪器光学基础
		4080104110	无损检测技术 A Nondestructive Testing Technique A	3	48	8				7	工程材料 金属工艺学
		4080256130	网络控制技术及应用 Networked Control Technology and Its Application	2	32	4				7	测控系统软件设计

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Cr	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080049110	光电精密仪器设计 Design of Photoelectric Precision Instrument	2	32					7	精密机械设计 仪器光学基础, 传感器原理及应
		小 计 Subtotal		34.5	552	32	12				
修读说明: 要求至少选修 18 学分, 其中数学、物理类课程至少选修 5 学分。 NOTE: Minimum subtotal credits: 18.Minimum mathematics, physics subtotal credits: 5 .											

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Cr	建议修读学期 Suggested Term
1060002110	军事训练 Military Training	3	1.5	1
4080150110	机械制造工程实训 B Practice of Mechanical Manufacturing Engineering B	4	4	3
4080232120	仪器仪表机构零件及工艺课程设计 Course Design on Part, Mechanism and Technics of	2	2	4
4080243130	测控系统微处理器应用课程设计 Course Design on Microcontroller Application of Measure and Control System	2	2	5
4080138110	仪器仪表电路课程设计 Course Design on Instrument Circuit	2	2	5
4080231120	现代仪器设计课程设计 Course Design on Modern Instrument Design	2	2	6 (企业)
4080233120	企业实践 Enterprise Practice	20	10	6 (企业)
4080245130	测控系统综合课程设计 Course Design on Measure and Control System	2	2	7
4080220120	毕业设计 Graduation Design	17	11	8 (企业)
小 计 Subtotal		54	36.5	

六、修读指导

VI Recommendations on Course Studies

1. 《形势与政策》课程, 平均每学期 16 学时, 一般按专题进行, 在第七学期末考核, 计 2 个课外学分, 具体由学校学生发展指导中心负责组织落实。

2. 测控专业学生必须参加“测控技术与仪器创意技能大赛”, 计 2 个课外学分, 具体由测控技术与仪器系负责组织和考核。

1. Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

2. Students of the specialty must participate in "Creative & skill competition of Measuring & control technology and instrument", count 2 credits. The activities will be organized and assessed by the measuring & control technology and instrument department.

学院教学责任人: 胡 剑
专业培养方案责任人: 戴 蓉

【包装工程专业（卓越工程师班）】2015 版本本科培养方案

Undergraduate Education Plan for Specialty in Packaging Engineering(Excellent Engineer Class)(2015)

专业名称	包装工程	主干学科	包装工程
Major	Packaging Engineering	Major Disciplines	Packaging Engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Packaging Engineering

最低毕业学分规定

Graduation Credit Criteria

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科基础课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	36.5	47.5	\	37.5	\	190
选修课 Elective Courses	9	\	14.5	\	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

(一) 培养目标

按照武汉理工大学提出的“厚基础、宽口径、高素质、善创新”的人才培养目标指导思想，秉承以培养和造就“适应能力强、实干精神强、创新意识强”的“三强人才”培养特色，本校包装工程(卓越)专业学生毕业时以及毕业后几年内应达到下列培养目标要求：

- (1) 掌握包装工程基础技术知识、操作技能和工程方法，了解包装工程领域的新产品、新技术、新工艺以及技术发展趋势。
- (2) 具备较强的数理、包装工程理论、包装机械及工艺研究及系统实现等方面基础理论知识与应用实践能力；初步建立以包装机械装备制造为主线，包装系统设计、包装材料研究、包装测试相互支撑的知识结构；具备运用适当的理论和实践方法解决包装工程实际问题的能力，在包装产品系统设计，包装机械装备设计、制造、运行和维护或解决实际工程问题方面得到系统化训练。
- (3) 具有初步的项目和工程管理能力。能在法律法规规定的范畴内，按确定的相关标准和程序要求开展工作。能运用经济管理知识，具有项目预算和机械产品成本核算的初步能力。能运用生产管理知识，具有制定包装产品生产计划和进行生产管理的初步能力。
- (4) 具有现代科学创新意识、国际化交流与竞争意识、人文科学素养、职业道德和社会责任感；具备一定的组织管理、人际交往、团队合作能力以及不断学习和适应发展的能力；
- (5) 毕业生在包装工程、机械及相关领域具有就业竞争力或有能力进入研究生阶段学习；能在国民经济各部门从事包装工程及包装机械领域的产品开发、生产及应用、工艺设计及控制、新技术开发及工程服务等方面的工作，也可承担企业管理、生产技术

管理及企业市场营销等工作；未来几年能在各自所工作的领域作为骨干成员或者领导发挥作用。

According to the guiding ideology of the talent cultivating goal, "thick foundation, wide caliber, high quality, good innovation", which Wuhan University of Technology proposed, and adhering to the cultivation characteristic that cultivating and bringing up "three strong talents" including "strong adaptive ability, strong practical spirit, aggressive innovative sense ", our school's students in the major of Packaging Engineering should reach the following cultivating targets when they graduate or after several years since graduation:

- (1) Students will master basic technical knowledge, operation skill and engineering method, and learn about new products, new technologies, new processes and technology development trend of packaging engineering;
- (2) Students will master the basic theoretical knowledge and practical application ability about mathematical, packaging engineering theory, packaging machinery, packaging technology and packaging system. They will initially establish the knowledge structure taking packaging machinery and equipment manufacturing as the main line and taking packaging machinery design, packaging material research and packaging test as assistant. They have the ability to solve the problems about packaging engineering using the appropriate theory and practical method. In the systematic design of packaging product, they will be trained systematic in the side of packaging machinery and equipment design, manufacture, operation and maintenance and solving the practical problems;
- (3) Students will own initial ability of engineering management. They can work under the relevant standards and program requirements in the scope of laws. They are able to use the knowledge of economic management, have the preliminary ability of project budget and mechanical product cost accounting. They are able to use the knowledge of production management, have the preliminary ability of formulating packaging production plan and production management;
- (4) Students will have innovative sense of modern science, international exchange and competition consciousness, humanistic and scientific literacy, professional ethics and social responsibility. They will possess the ability of organization management, interpersonal, teamwork, continuous learning and adapting to the development;
- (5) Graduates will have employment competence in packaging engineering, machinery and related fields or the ability to be graduate students. They can work for product development, production and application, technology design and control, the new technology development and engineering services in the field of packaging engineering and packaging machinery in national economic departments. They will be the key members or leaders with playing important roles in their work fields in the next years.

(二) 毕业要求

为了达到培养目标要求，毕业生应达到以下 10 项知识、能力和素质要求：

- (1) 较好的人文社会科学素养、较强的社会责任感和良好的工程职业道德；
- (2) 从事工程工作所需的相关数理学科基础和一定的经济管理知识；
- (3) 具有本专业必需的包装技术、机械设计、电工与电子技术、设计学基础、计算机应用技术的基本知识和技能，了解本专业的前沿发展现状和趋势；
- (4) 系统地掌握本专业领域技术基础理论，具有本专业领域 1-2 个专业方向的专业知识和技能，能够根据产品和工程要求优化、设计有关包装机械设备，包装产品系统，具有扎实系统的包装工程实践训练。
- (5) 具有较强的知识迁移能力，能够集成包装系统设计、包装机械装备设计、制造等方面知识并应用于实际进行创新，具备较强的工程创新意识、工程创新的基本能力；
- (6) 具备系统思维和工程推理能力，具有对工程问题的认知和判断能力，具有包装工程项目的组织、设计、实施和控制初步能力。
- (7) 掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，能通过互联网、期刊资料等渠道了解相关的器件、产品、系统及技术的进展与前沿，能有效地运用各种资源找到解决具体的包装专业技术问题的方法；
- (8) 了解国家有关包装工程专业相关的职业和行业的生产、设计、研究与开发的法律、法规以及有关环境保护和可持续发展等方面的方针、政策和法律、法规，正确认识工程实际对客观世界和社会的影响，把握国内外相关的标准、规范和技术变化；
- (9) 具有初步科学研究、技术开发和工程设计的组织管理能力、表达能力和人际交往能力，能够在团队中发挥作用；
- (10) 具有较强的交流和沟通能力、团队合作的能力，具有一定的组织管理能力、价值效益意识，能够参与跨专业及国际性的竞争与合作。

To meet the training goal, the graduates should achieve following 10 requirements:

- (1) Students will have the good humanities and social science quality, the strong sense of social responsibility and the good occupation moral of engineering.
- (2) Students will master mathematical discipline and economic management knowledge in engineering work.
- (3) Students will possess basic theory and basic knowledge of packing technique, machinery, electrical and electronic technology, design foundation, computer applications technology and understand the academic foreground, industry development and trend.
- (4) Students will systematically master extensive basic knowledge of technology and theory with knowledge and skills of 1-2 professional direction. The graduates are qualified to engage in design and optimization in packaging processing and equipment, have the systematic training of packaging engineering.
- (5) Students will have strong ability of transferring knowledge. They can integrate the knowledge about packaging system design, packaging machinery and equipment design and manufacturing and apply it to practice. They will possess aggressive engineering innovative sense and basic ability.
- (6) Students will possess system thinking and engineering reasoning ability. They will have basic cognition and judgment ability to engineering problems and preliminary ability of design, practice, and control in the packaging engineering.
- (7) Students will master the basic methods to search literature, query data and get information using modern information technology. They can understand the development and the frontier about the related device, product, system and technology through the internet, periodicals and other channels. They can find solutions to specific technical questions in

- packaging engineering by using all resources effective.
- (8) Students will understand the laws, regulations and relevant environmental protection and sustainable development of guidelines, policies and laws and regulations about packaging engineering related profession and industry production, design, research and development, and understanding of the engineering practice of the objective world and social influence correctly, seize the domestic and foreign related standards, specifications and technical changes.
 - (9) Students will have the preliminary scientific research, technology development and engineering design of organization and management ability, expression ability and interpersonal skills, and can play a role in the team.
 - (10) Students will have strong communication skills and team cooperation ability, certain organization management ability, value benefit consciousness, to participate in professional and international competition and cooperation.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4	培养目标 5
毕业要求 1				√	
毕业要求 2		√			√
毕业要求 3	√	√			
毕业要求 4	√	√			√
毕业要求 5		√			√
毕业要求 6		√	√		√
毕业要求 7	√	√			√
毕业要求 8	√	√	√	√	√
毕业要求 9			√	√	√
毕业要求 10			√	√	√

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程：

专业核心课程：包装结构设计、包装技术、包装材料学、包装印刷技术、运输包装、包装测试、包装自动控制、包装造型与装潢设计、包装工艺及设备、包装系统设计

Core Courses: Packaging Structure Design, Packaging Technology, Packaging Materials, Packaging Printing, Transport Packaging, Packaging Test and Measurement Technology, Packaging Automatic Control, Packaging Modeling and Decorating Design, Packaging Technology and Equipment, Packaging System Design..

(二) 专业特色课程：

专业特色课程：工程力学、机械设计、包装材料学、包装结构设计、包装技术、运输包装、包装测试、包装工艺及设备、包装印刷技术、包装自动控制

Characteristic Courses: Engineering Mechanics, Mechanical Design, Packaging Materials, Packaging Structure Design, Packaging Technology, Transport Packaging, Packaging Test and Measurement Technology, Packaging Technology and Equipment, Packaging Printing, Packaging Automatic Control.

附：毕业要求实现矩阵：

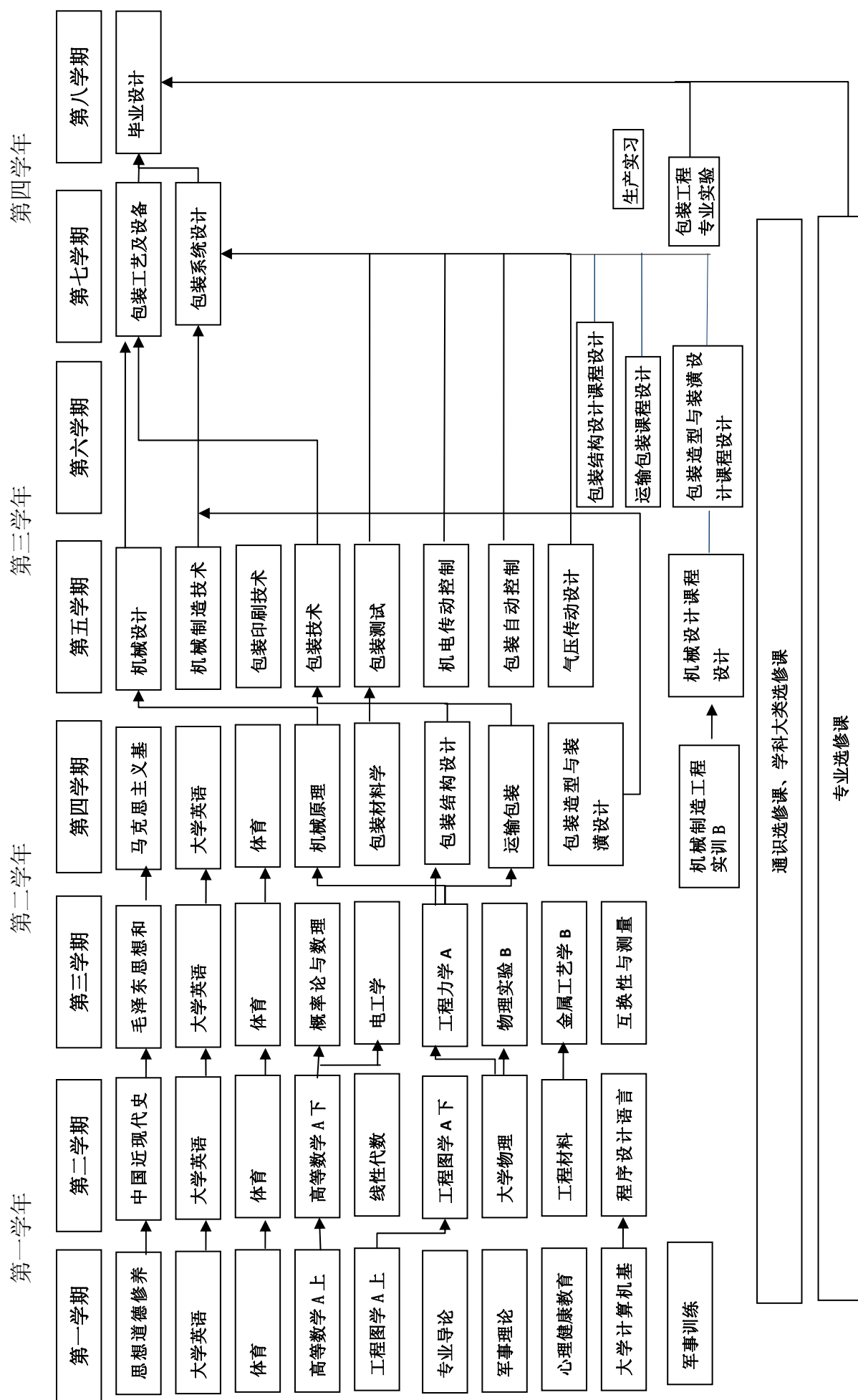
专业 核心 课程	专业 特色 课程	课程名称	包装工程专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		思想道德修养与法律基础	√	√						√		√
		中国近现代史纲要	√									
		毛泽东思想和中国特色社会主义理论体系概论	√									
		马克思主义基本原理	√	√								
		军事理论	√									
		体育 1										√
		体育 2										√
		体育 3										√
		体育 4										√
		心理健康教育	√									√
		大学英语 A1	√						√			
		大学英语 A2	√						√			
		大学英语 A3	√						√			
		大学英语 A4	√						√			
		大学计算机基础			√				√			
		计算机程序设计基础(C 语言)			√				√			
		专业导论			√				√	√		
		工程材料					√					
		高等数学 A 上		√								
		高等数学 A 下		√								
		工程图学 A 上				√						
		工程图学 A 下				√						
		线性代数		√								
		大学物理		√								

专业 核心 课程	专业 特色 课程	课程名称	包装工程专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		物理实验 B					√					
		概率论与数理统计 B		√								
		造型设计基础			√	√	√					
		基础工业工程			√	√	√					
		电工学		√								
		互换性与测量技术 B				√						
		金属工艺学 B				√	√					
	√	工程力学 A		√								
√	√	包装材料学				√	√					
√	√	包装结构设计 B				√	√					
√	√	运输包装				√	√					
√		机械原理				√						
√		包装造型与装潢设计				√	√					
	√	机械设计				√						
√	√	包装印刷技术				√	√					
√	√	包装技术				√	√					
√	√	包装测试				√	√					
		机械制造技术基础 B				√						
		机电传动控制 A				√						
√	√	包装自动控制 A				√	√					
		气压传动设计				√	√					
√	√	包装工艺及设备				√	√					
√		包装系统设计				√	√	√	√	√		
		包装辅助设计软件应用				√	√					
		图文处理与印前设计				√	√					

专业 核心 课程	专业 特色 课程	课程名称	包装工程专业（卓越工程师班）毕业要求									
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		包装机构设计				√	√					
		包装质量控制				√	√		√	√		
		包装物流技术				√	√					
		包装艺术设计				√	√					
		包装心理与人性化设计				√			√	√		
		包装管理与安全法规				√			√	√		
		可编程逻辑控制器原理及应用				√	√					
		单片机应用系统设计				√	√					
		工业机器人				√	√					
		计算机仿真				√	√					
		军事训练	√									√
		机械制造工程实训 B	√									√
		包装结构设计课程设计				√	√	√	√			
		运输包装课程设计				√	√	√	√	√		
		包装造型与装潢设计课程设计					√		√			
		机械设计课程设计				√	√	√	√			
		企业实践					√	√	√	√	√	√
		包装工程专业实验				√	√					
		包装系统（含包装结构、运输及装潢）综合设计				√	√	√	√	√		
		毕业设计		√	√	√	√	√	√	√	√	

三、课程教学进程图

III Teaching Process Map



四、理论教学建议进程表
IV Theory Course Schedule

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course	
					总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur			
通 识 课 程 Public Basic Courses	必修课程 Required Courses	4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060003130	军事理论 Military Theory	1	32			16		1		
		1050001130	心理健康教育 Mental Health Education	1	16					2		
		4210001110	体育 1 Physical Education I	1	32					1		
		4210002110	体育 2 Physical Education II	1	32					2	体育 1	
		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
		4210004110	体育 4 Physical Education IV	1	32					4	体育 3	
		4030002110	大学英语 A1 College English A I	3	64				16	1		
		4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
		4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
		4120017110	大学计算机基础 Foundation of Computer	2	32		12			1		
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C)	3	48		12			2		
		小 计 Subtotal				35	736		24	64	64	
	选修课程 Elective Courses	创新创业类 Innovation and Entrepreneurship Courses			全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from Art and Physical Education Courses to obtain at least 2 credits. Science and engineering students should select at least one course from Arts and Social Science Courses or Economy and Management Courses, and other students should select at least one course from Science and Technology Courses.							
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management Courses										
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
学 科 基 础 课 Basic Courses of Disciplines	必修课程 Required Courses	4080120110	专业导论 Introduction to Specialty	1	16					1	
		4050063110	高等数学 A 上 Advanced Mathematics A I	5	80					1	
		4050064110	高等数学 A 下 Advanced Mathematics A II	5	80					2	高等数学 A 上
		4080039110	工程图学 A 上 Engineering Graphics A I	3.5	56					1	
		4080040110	工程图学 A 下 Engineering Graphics A II	2.5	40		4			2	工程图学 A 上
		4050229110	线性代数 Linear Algebra	2.5	40					2	
		4080034110	工程材料 Engineering Material	2.5	40	4				2	
		4050024110	大学物理 Physics	5.0	80					2	
		4050224110	物理实验 B Physics Lab. B	1	32	32				3	
		4050058110	概率论与数理统计 B Probability and Mathematics Statistic B	3	48					3	
		4100008110	电工学 Electrical Engineering A	3	48	8				3	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3	
		小 计 Subtotal		36.5	600	48	4				
专 业 课 程 Specialized Courses	必修课程 Required Courses	4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3	
		4050071110	工程力学 A Engineering Mechanics A	4	64	4				3	
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4	
		4080004110	包装材料学 Packaging Materials	2.5	40	4				4	
		4080011110	包装结构设计 B Packaging Structure Design B	2.5	40	4				4	
		4080117110	运输包装 Transport Packaging	2.5	40	4				4	
		4080016110	包装印刷技术 Introduction of Packaging Printing	2.5	40					4	
		4080060110	机械设计 Mechanical Designing	4	64	6				5	
		4080017110	包装造型与装潢设计 Packaging Modelling and Decorating Design	3.5	56		20			5	
		4080010110	包装技术 Packaging Technology	2.5	40	4				5	
		4080005110	包装测试 Packaging Test and Measurement	2.5	40	10				5	

课程类别 Course Classification	课程性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议修读学期 Suggested Term	先修课程 Prerequisite Course
					总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur		
		4080065110	机械制造技术基础 B Machinery Manufacturing Technology Basis B	3.5	56	6				5	
		4080055110	机电传动控制 A Transmission and Control of Electric	2.5	40	4				5	
		4080184110	包装自动控制 B Packaging Automatic Control B	2.5	40	6				5	
		4080091110	气压传动设计 Design of Pneumatic Transmission	2	32	6				5	
		4080007110	包装工艺及设备 Packaging Technology and Equipment	2.5	40	4				7	
		4080013110	包装系统设计 Packaging System Design	1.5	24		12			7	
		4080353150	包装工程专业实验 Packaging Engineering Specialty Experiment	1	32	32				7	
		小 计 Subtotal		47.5	776	102	32				
	选修课 Elective Courses	4080318140	包装辅助设计软件应用 Aided Design Software Application of Packaging	2.5	40		24			3	
		4080118110	造型设计基础 Fundamentals of Contour Design	2	32					4	
		4080319140	图文处理与印前设计 Image & Word Process and Chromatic Theory	2.5	40		24			4	
		4080320140	单片机应用系统设计 Micro-Controller Unit Application System Design	2.5	40	6				7	
		4080009110	包装机构设计 Packaging Mechanism Design	2	32	4				7	
		4080018110	包装质量控制 Packaging Quality Control	1.5	24					7	
		4080012110	包装物流技术 Technology of Packaging Logistics	2	32					7	
		4080236120	包装艺术设计 Art Design of Packaging	2	32					7	
		4080014110	包装心理与人性化设计 Packaging Design Psychology and Human Nature	1.5	24					7	
		4080008110	包装管理与安全法规 Packaging Management and Safety Regulations	1.5	24					7	
		4080186110	可编程逻辑控制器原理及应用 Principle and Application of Programmable Logic Controllers	2	32	4				7	
		4080202120	工业机器人 Industrial robots	2	32					7	
		4080251130	计算机仿真 Computer Simulation	3	48		16			7	
		小 计 Subtotal		27	432	14	64				
		修读说明：要求至少选修 14.5 学分。 NOTE: Minimum subtotal credits: 14.5									

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	周数 Weeks	学分 Crs	建议修读学期 Suggested Term
1060002110	军事训练 Military Training	3	1.5	1
4080150110	机械制造工程实训 B Machinery Manufacturing Engineering Practice B	4	4	3
4080127110	包装结构设计课程设计 Course Design of Packaging Structure	1	1	4
4080169110	运输包装课程设计 Course Design of Transport Packaging	1	1	4
4080129110	包装造型与装潢设计课程设计 Course Design of Packaging Modelling and Decorating Design	2	2	5
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5
4080283130	企业实践 Enterprise Practice	20	10	6（企业）
4080242130	包装系统（含包装结构、运输及装潢）综合设计 Synthesis Course Design of Packaging system (including the packaging structure, transport and Decorating)	4	4	7
4080222120	毕业设计 Graduation Design	17	11	8（企业）
小 计 Subtotal		55	37.5	

六、修读指导

VI Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：胡 剑
专业培养方案责任人：周 斌