武汉理工大学机电工程学院

School of Mechanical & Electronic Engineering of Wuhan University of Technology

本科专业培养方案

Undergraduate Program

（Grade 2013）

武汉理工大学教务处

Academic Affairs Office of Wuhan University of Technology

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机械工程专业本科培养方案
Undergraduate Program for Specialty in Mechanical Engineering

一、业务培养目标

Ⅰ Educational Objectives

机械工程专业培养具备机械装备设计、制造、自动化和计算机的基础知识与应用能力，能在工业企业或科研设计单位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方面工作的高级工程技术人才。

Specialty in Mechanical Engineering Program aims at training the students who will demonstrate the knowledge and ability in machine design, manufacturing processes, automation, and computer technology application. Students are qualified in design, process, scientific and technological development, applied research, and operational management in industrial departments, enterprise organizations and R&D institutes.

二、业务培养要求

Ⅱ Educational Requirement

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. 具有较扎实的自然科学基础，较好的人文、艺术和社会科学基础；
2. 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；
3. 具有本专业必需的制图、计算、测试、文献检索和基本工艺操作等基本技能；
4. 具有较强的计算机能力和外语应用能力；
5. 具有本专业领域内某个专业方向所必需的专业知识，了解其科学前沿及发展趋势；
6. 具有较强的自学能力、研究能力、创新意识和较高的综合素质。

The students specializing in Mechanical Engineering will learn basic theory of machine design and manufacturing processes, and will be trained to become qualified modern mechanical engineers who are able to design product, manufacture parts, and control key elements or optimize manufacturing system by applying concepts of science, mathematics, engineering, and technology.

1. Students will demonstrate knowledge in natural science and social science, and demonstrate understanding of human factors and professional code of ethics.
2. Students will have a broad knowledge in discipline related fields including mechanics of materials, mechanical design theory, electricity and electronics, fluid power and hydromechanics, and design analysis.
3. Students will demonstrate application of science, mathematics, engineering, and technology to perform engineering drawing, design calculations, testing, literature retrieval and process operation for designing system, component, or process.
4. Students will demonstrate proficiency in the applications of computers, appropriate software, and computer aided tools, and instrumentation to solve technical problems. Additionally, students will demonstrate the proficiency in using foreign language.
5. Students will demonstrate necessary expertise in certain specialty and understand the scientific frontier and developing trend.
6. Students will demonstrate strong self-learning ability and research ability; and demonstrate creativity and critical thinking for design and problem solving activities.

三、主干学科

Ⅲ Major Disciplines

机械工程专业主干学科：力学、机械工程

Major Disciplines：Mechanics and Mechanical Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

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、电工学、模拟电子技术基础、数控技术、控制工程基础、机械制造技术基础、单片机应用系统设计、机械制造装备与设计、CAD/CAM 及数控加工技术综合实践

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

专业特色课程：机械制造技术基础、单片机应用系统设计、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, Micro-Controller Unit Application System , Numerical Control Technology , Practice of CAD/CAM and NC Machining , Machine Equipment Design

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	51.5	\	32	\	190
选修课 Elective Courses	9	2	10	10	\	10	

第二专业要求修满 50 学分，其中含毕业设计 7.5 学分。

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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		
		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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C Language)	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN Language)	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB 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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.									
		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										

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		艺术体育类 Art and Physical Education Courses										
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		*
		4050063110	高等数学 A 上 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学 A 下 Advanced Mathematics AⅡ	5	80					2	高等数学 A 上	
		4080039110	工程图学 A 上 Engineering Graphics AⅠ	3.5	56					1		*
		4080040110	工程图学 A 下 Engineering Graphics AⅡ	2.5	40					2	工程图学 A 上	*
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					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		
		小 计 Subtotal		30.5	504	36						
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal class credits: 2										
专业课程 Specialized Courses	必修课 Required Courses	4100008110	电工学 Electrical Engineering	3	48	8				3		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3		
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3		*
		4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3		*
		4110050110	模拟电子技术基础 C Fundamentals of Analog Electronic Circuit	3	48	8				4		
		4050015110	材料力学 A Mechanics of Materials A	5	80	8				4		*
		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				5		*

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		4080060110	机械设计 Mechanical Designing	4	64	6				5		*
		4080028110	单片机应用系统设计 Micro-Controller Unit Application System Design	3.5	56	6				5		
		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	4	64	6				6		*
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				7		*
		4080068110	机械制造装备与设计 A Machine Equipment Design A	3	48					7		*
		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		51.5	840	108						31.5
	选修课 Elective Courses	4080058110	机械 CAD/CAM Machinery CAD/CAM	2	32		6			6		
		4080110110	现代设计技术 Modern Design Technology	2	32					6		
		4080025110	成组技术 Group Technology	2	32					6		
		4080083110	可编程控制器原理及应用 B Fundamentals & Application of Programmable Logic Controller B	2	32	4				6		
		4080027110	传感器原理及应用 B Fundamentals & Application of Sensors B	2	32	6				6		
		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 10 学分。 NOTE：Minimum subtotal credits:10										

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
个性课程 Personalized Course	选修课 Elective Courses	4080284130	振动与噪声基础 Fundamentals of Vibration and Noise	2	32			16		6		
		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		
		4080287130	机械制造中的信息技术 Information Technology in Mechanical Manufacturing	2	32	4				5		
		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.										

九、集中性实践教学环节建议进程表

Ⅸ 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		7.5

十、其它要求

Ⅹ Other Demands

《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.

过程装备与控制工程专业本科培养方案

Undergraduate Program for Specialty in Industrial Equipment and Control Engineering

一、业务培养目标

Ⅰ Educational Objectives

本专业是以成套工业设备数字化为主体，培养兼具机械、计算机、控制、力学、材料、化工等多学科交叉知识，具备扎实的机械设计基础、较强的计算机、控制及信息工程应用能力；具备研究开发、设计制造、运行控制等综合能力，适应并参与国际竞争能力的高级技术人才。注重创新设计与综合能力的培养。

The major focuses on designing digital equipment sets for process industry and manufacturing companies. Students will demonstrate knowledge in mechanical design, computer application, process control, mechanics of materials, and chemistry engineering; be proficient in using contemporary techniques, skills, and/or computer aided tools to design, research, and control or optimize system components or processes; demonstrate awareness and knowledge of contemporary issues and global competition; be able to apply creativity and critical thinking in innovative design and synthetic application.

二、业务培养要求

Ⅱ Educational Requirement

过程装备与控制工程专业学生主要学习过程装备、机械设计、控制工程等方面的基本理论和基础知识，受到工程设计、测控技能和工程科学研究的基本训练，掌握对机电设备及成套设备的数字化设计制造和控制、优化设计、功能设计、创新改造和开发研究新型工业装备技术的基本能力。

经过本专业的学习，毕业生应获得以下几方面知识的能力：

1.掌握机械、计算机、控制、力学、材料、化工等学科的基本理论、基本知识；

2.掌握成套过程工业设备数字设计、数字制造与数字控制的综合知识；

3.具有扎实的机械设计基础、较强的计算机、控制及信息工程应用能力

4.具有对成套新装备、新技术进行开发研究与创新设计的能力；

5.具有工学专业必需的制图、计算、测试、设计、研究、工艺操作等基本技能；

6.掌握文献检索、资料查询的基本方法，具有一定的科学研究和实际工作的能力；

7.具有较强的计算机能力和外语应用能力；

8.具有创新意识和独立获取知识的能力。

The students specializing in Industrial Equipment and Control Engineering will learn basic theory of industrial equipment, machine design and control engineering, ect. Students will be trained to become qualified modern mechanical engineers who are specialized in digital design, digital manufacturing, and digital control to functionally and optimally operate industrial equipment.

Upon completion, students will be able to have:

1. A broad understanding of theoretical and technical foundation in machine design, computer hardware and software, control engineering, mechanics, materials, and chemistry engineering;
2. A broad understanding of synthetic knowledge of mechanic and equipment digitalization design, digitalization manufacturing and digitalization control;
3. The ability of performance analyzing, designing and optimizing of engineering equipments;
4. Skill of developing the new equipment set and innovation of designs by using new technology;
5. Skill of mechanical drawing, calculating, testing, researching, literature searching and technical processing;

6. A broad understanding of theoretical and technical foundation in looking up datum, checking up literature;
7. Proficiency in computer application and foreign-language;
8. Self-learning ability and innovative consciousness.

三、主干学科

Ⅲ Major Disciplines

主干学科：机械工程、控制工程、材料科学与工程

Major Disciplines: Mechanical Engineering, Control Engineering, Material Science and Engineering

四、专业核心课程与专业特色课程

Ⅳ 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、电工电子技术基础、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、过程检测技术、工业装备成套技术等。

Core Courses: Theoretical Mechanics, Materials Mechanics，Principle of Mechanics, Mechanical Design，Fundamentals of Mechanical Manufacturing Technology，Fundamentals of Electrical Engineering & Electronic Technology, Fluid Mechanics and Fluid Machinery, Process Principles and Equipment Engineering，Powder Mechanics and Equipment，Process Control Engineering, Process Measuring & Testing Technology, Industrial Equipment Packaging Technology.

专业特色课程：建材设备设计、粉体力学与设备、工业装备成套技术、过程控制技术、过程检测技术

Characteristic Courses: Design of Building Materials Equipment，Powder Mechanics and Equipment，Process Measuring & Testing Technology, Process Control Engineering, Process Measuring & Testing Technology,

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	54.5	\	29	\	190
选修课 Elective Courses	9	2	10	10	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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 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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C)	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN)	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB 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 学分，建议在每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.									
		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										

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		艺术体育类 Art and Physical Education Courses										
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		*
		4050063110	高等数学 A1 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学 A2 Advanced Mathematics AⅡ	5	80					2	高等数学 A1	
		4080039110	工程图学 A1 Engineering Graphics AⅠ	3.5	56					1		*
		4080040110	工程图学 A2 Engineering Graphics AⅡ	2.5	40					2	工程图学 A1	*
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					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		
		小　计 Subtotal		30.5	504	36						
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小　计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal credits: 2.										
专业课程 Specialized Courses	必修课 Required Courses	4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3		
		4100008110	电工学 Electrotechnology	3	48	8				3		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3		
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				4		
		4050015110	材料力学 A Mechanics of Materials A	5	80	8				4	理论力学 A	
		4080102110	工业装备热力学基础 Industrial Equipment Thermal Theory	2	32					4		
		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				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	机械原理	

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		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		
		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		
		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 Complte Sets of Process Equipment Technology	3	48					7		
		4080077110	建材装备设计 Designs of Building Materials Equipment	3	48					7	工业装备成套技术	
		小 计 Subtotal		54.5	872	66						
	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		
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4				6		
		4080204120	光机电测控技术基础 Measurement Technology of Ray and Electro-mechanics	2.5	40					6		
		4080217120	机电一体化系统设计 Mechatronics System Design	2.5	40					6		
		40800200120	成型机械与模具设计 Tools and Mould Design	2.5	40					7		
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				7		
		4080203120	工业装备网络控制技术 Networks Control Technology of Industry Equipments	2.5	40	4				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					3		
		4080290130	微机电系统应用技术 Application Technology of Micro Electro Mechanical System	2	32					4		
		4080291130	过程制造业信息化 Process of Manufacturing Industry Informatization	2	32					4		

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
		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.										

九、集中性实践教学环节建议进程表

Ⅸ Practice Training Table

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	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 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	
4100069110	过程计算机控制综合课程设计 Coure Practice of Process Computer Control	1.5	1.5	5	
4080143110	过程装备单片机应用系统设计课程设计 Curricula Design of Computer Interface Technology	2	2	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	
4080226120	工业装备成套技术综合课程设计 Curricula Design of Complete Sets of Process Equipment Technology	2.5	2.5	7	
4080219120	毕业设计 Graduation Design	17	11	8	*
小 计 Subtotal		36.5	29		

十、其它要求

Ⅹ Other Demands

《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.

测控技术与仪器专业本科培养方案
Undergraduate Program for Specialty in Measuring & Control Technology and Instrumentation

一、培养目标

Ⅰ Educational Objectives

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；具备较强的数理、测控信息理论、传感与测控技术研究及系统实现等方面基础理论知识与应用实践能力；初步建立以精密测控为主线，测量及仪器、控制和测试系统相互支撑的知识结构；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；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。毕业生未来几年能在各自所工作的领域成为高级工程技术人才或高级管理人才。

Cultivate the talents have modern science innovation consciousness, international communication and competition consciousness, humanities quality, professional ethics and sense of social responsibility; have strong basic theoretical knowledge and application of practical ability of mathematics, measurement and control information theory, sensing and measurement and control technology research and system implementation; initially build the knowledge structure which takes precision measurement and control as major, and measurement, instrument, control, test system support each other; can comprehensive consideration social constraint factors and relevant policies and regulations to complete engineering design, have the ability of organization and management, interpersonal communication, teamwork, continuous learning and adapt to development; do 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 future few years.

二、毕业要求

Ⅱ Graduation Requirements

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. 掌握扎实的测控技术与仪器专业基本理论知识和专业基础知识，具有系统的测控技术工程实践训练，了解本专业的前沿发展现状和趋势。

4. 掌握测量理论与数据处理、信号分析与处理、控制工程、计算机测控系统设计理论的基本原理和方法，掌握一定的精密仪器仪表结构设计方法，具有一定的计算机软、硬件综合运用能力以及系统分析和综合应用能力，基本掌握光、机、电、计算机相结合的当代测控技术和系统设计能力。

5. 具备创新意识和对仪器行业新产品、新设备进行研究、开发和设计的初步能力，初步具有本专业仪器仪表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测控专业技术问题的方法。

7. 了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，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。

1. Good quality of humanities and social sciences, strong sense of social responsibility and good engineering profession ethics.

2. Have the related required mathematical basement of engaged in engineering work and the certain knowledge of economic management.

3. Solidly master the basic theory knowledge of measurement and control technology and instrument specialty, have system engineering practice training of measurement and control technology, understanding the forefront of the development and trends of this professional domain.

4. Master the basic theory and method of measurement theory and data processing, signal analysis and processing, control engineering, computer control system design theory, master certain precision instrument design method, have the certain ability of integrated use computer software and hardware and the ability of system analysis and integrated applications, basic master modern control technology and system design capabilities of combination of optical, mechanical, electrical, computer.

5. Have the innovation consciousness and the initial ability of researching development and design on new products, new equipment in instrument industry, initially have the development ability of this professional instrument design and the certain technical organization and management ability.

6. Master the basic method of literature search, data inquiry and the use of modern information technology to obtain relevant information, through the Internet, journals and other channels to understand the progress and forefront of related devices, products, systems and technologies, effective use of resources to find methods to solve specific technical problems of measurement and control of professional.

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, seize domestic and foreign related standards, specifications and technical changes.

8. Have the initial organization and management ability, presentation skills and interpersonal skills of scientific research, technology development and engineering design, can play a role in the team.

9. Have the ability to adapt to social development and lifelong learning

10. Have an international perspective and intercultural communication, competition and collaboration ability.

三、主干学科

Ⅲ Major Disciplines

测控技术与仪器专业主干学科：仪器科学与技术、控制科学与工程、光学工程、信息与通信工程

Major Disciplines of Measuring & Control Technology and Instrumentations: Instrumental Science and Technology, Mechanical Engineering, Optical Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

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、模拟电子技术基础、数字电子技术基础、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、光纤传感器等。

Core Courses: Signal Analysis and Processing, Error Theory and Data Processing, Precision Mechanism

Design, Basic Analog Electronic Technology, Basic Digital Electronic Technology, Instrument Circuit, Microcontroller Principle and Its Application of Measure and Control System, Principle and Application of Sensors A, Fundamentals of Control Engineering A, Instrument Manufacture Technology, Fundamentals of Optical Instrument, Modern Instrument Design, Optical Fiber Sensor and so on.

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 A、控制工程基础 A、仪器光学基础、现代仪器设计、光纤传感器。

Characteristic Courses: Microcontroller Principle and Its Application of Measure and Control System, Principle and Application of Sensors A, Fundamentals of Control Engineering A, Fundamentals of Optical Instrument, Modern Instrument Design, Optical Fiber Sensor.

五、学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bacheclor of Engineer

六、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	30.5	51	\	32.5	\	190
选修课 Elective Courses	9	2	10	10	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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	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		

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C)	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN)	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB)	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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.									
		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										
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		
		4050063110	高等数学 A1 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学 A2 Advanced Mathematics AⅡ	5	80					2	高等数学 A1	
		4080039110	工程图学 A1 Engineering Graphics AⅠ	3.5	56					1		*
		4080040110	工程图学 A2 Engineering Graphics AⅡ	2.5	40					2	工程图学 A1	*
		4050229110	线性代数 Linear Algebra	2.5	40					2		

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		4050024110	大学物理 C Physics C	4.5	72					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		
		小 计 Subtotal		30.5	504	36						6
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal credits: 2.										
专业课程 Specialized Courses	必修课 Required Courses	4100008110	电工学 Electrical Engineering	3	48	8				3	大学物理 C	
		4050071110	工程力学 A Engineering Mechanics A	4	64	4				3	高等数学 A2 大学物理 C	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3		
		4110049110	模拟电子技术基础 B Basic Analog Electronic Technology B	3.5	56					3	大学物理 C	*
		4110051110	模拟电子技术基础实验 Basic Analog Electronic Technology Experiments	0.5	16	16				3	大学物理 C	*
		4050052110	复变函数与积分变换 B Complex Function and Integral Transform B	3	48					4	高等数学 A2	*
		4080246130	测试信号分析与处理 Signal Analysis and Processing	2	32		4			4	高等数学 A2 线性代数	*
		4080265130	精密机械设计 Precision Mechanism Design	4	64	8				4	工程图学 A2 工程材料	*
		4110066110	数字电子技术基础 A Basic Digital Electronic Technology A	4	64					4	电工学	*
		4110068110	数字电子技术基础实验 Basic Digital Electronic Technology Experiments	0.5	16	16				4	电工学	
		4080115110	仪器仪表电路 Instrument Circuit	2	32	4				4	模拟电子技术基础 B	*
		4080266130	控制工程基础 Fundamentals of Control Engineering	3	48	8				4	高等数学 A2 大学物理 C	*
		4080257130	误差理论与数据处理 Error Theory and Data Processing	2	32					5	概率论与数理统计 B	
		4080244130	测控系统微处理器原理及应用 Microcontroller Principle and Its Application of Measure and Control System	3.5	56	4				5	数字电子技术基础 A	*
		4080026110	传感器原理及应用 A Principle and Application of Sensors A	3.5	56	12				5	工程力学 A 仪器仪表电路	*
		4080111110	现代仪器设计 Modern Instrument Design	3.5	56	8				5	仪器仪表电路 数字电子技术基础 A	*

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		4080258130	仪器光学基础 Fundamentals of Optical Instrument	2.5	40	4				5	大学物理 C	*
		4080267130	仪器制造技术 Instrument Manufacture Technology	2	32					6	精密机械设计	
		4080268130	测控系统软件设计 Software Design of Measure and Control System	2	32		2			6	大学计算机基础 线性代数	*
		小 计 Subtotal		51	832	102	6					37
	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			5	大学计算机基础 线性代数	
		4080051110	光纤传感器 Optical Fiber Sensor	1.5	24	4				6	大学物理 C	
		4080101110	图像检测与处理技术 Imagine Detection and Processing Technique	2	32		4			6	测控系统仿真	
		4080253130	可编程控制器原理及应用 Fundamentals & Application of Programmable Logic Controller	2	32	4				6	传感器原理及应用 A	
		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	
		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	传感器原理及应用 A	
		4080256130	网络控制技术及应用 Networked Control Technology and Its Application	2	32	4				7	数字电子技术基础 A	
		4080049110	光电精密仪器设计 Design of Photoelectric Precision Instrument	2	32					7	传感器原理及应用 A	
		小 计 Subtotal		22.5	360	32	12					
		修读说明：要求至少选修 10 学分。 NOTE：Minimum subtotal credits: 10.										
个性课程 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-teeh	1.5	24					7		
		4050510130	量子物理学 Quantum Physics	2	32					7		
		小 计 Subtotal		10	176	32						

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
		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，其中数学、物理类课程至少选修 5 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.Minimum mathematics, physics subtotal credits: 5.										

九、集中性实践教学环节建议进程表

Ⅸ 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 Practice of Mechanical Manufacturing Engineering B	4	4	3	
4080232120	仪器仪表电路设计与实训 Design and Training on Instrument Circuit	2	2	4	
4080243130	测控系统微处理器应用实训 Microcontroller Application Training 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	5	
4080231120	现代仪器设计与实训 Training on Modern Instrument Design	2	2	5	
4080137110	测控系统应用软件实训 Training on Application Software of Measure and Control System	2	2	6	
4080160110	生产实习 Production Practice	2	2	6	
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	6	
4080245130	测控系统综合技能实训 Integrating Skills Training of Measure and Control System	2	2	7	
4080220120	毕业设计 Graduation Design	17	11	8	7*
小 计 Subtotal		40	32.5		7*

十、其它要求

Ⅹ Other Demands

《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.

包装工程专业本科培养方案
Undergraduate Program for Specialty in Packaging Engineering

一、业务培养目标

Ⅰ Educational Objectives

包装工程专业培养具备包装系统设计与管理等方面的能力，能在商品生产与流通部门、包装企业、科研机构、外贸、商检等部门从事产品包装、质量检测、技术管理和科学研究的高级工程技术人才。

The major of Packaging Engineering intends to cultivate the students to be the advanced engineering technology talented persons in packaging system design and management. Students will successfully work at manufacturing company and supply chain industry for the product packaging, quality inspection, and technology management, and perform the science research in these areas as well.

二、业务培养要求

Ⅱ Educational Requirement

包装工程专业学生主要学习包装工程领域的基础理论和基本知识，系统掌握产品包装设计的原理与方法，受到现代包装专业技术的训练，具有综合运用所学专业知识进行包装系统设计、包装质量控制和管理等方面的能力。

毕业生应获得以下几方面的知识和能力：

1.掌握工程力学、包装材料学、机械设计、包装造型与装潢设计、包装结构设计等包装工程的基础理论；

2.掌握包装技术、包装测试、运输包装、包装工艺及设备等包装工程专业知识；

3.具有设计包装机械、制订包装工艺、合理选择包装材料和包装设备的初步能力以及计算机和外语的应用能力；

4.熟悉国家有关包装的方针、政策和法规；

5.了解包装学前沿和发展趋势；

6.掌握文献检索、资料查询的基本方法，具有分析解决包装工程技术问题，研究、开发包装新材料、新结构、新工艺、新设备和技术管理的初步能力。

The students majoring in Packaging Engineering mainly learn the basic theories and knowledge of packaging and master the basic principles and methods of products' packaging design. They are trained on the professional skills of modern packaging. By the program training, students will use the professional knowledge synthesized and obtain the abilities of packaging system design, packaging quality control and management.

The graduates will obtain the knowledge and talents in following aspects:

1. Grasping the basic packaging theories of engineering mechanics, packaging material science, mechanical design, packaging modeling and decorating design and packaging structure design.

2. Mastering the special packaging knowledge of packaging technique, packaging test and measurement technology, transport packaging, packaging technology and Equipment.

3. Having the ability of designing packaging machine, designing packaging process, selecting proper packaging materials and packaging equipments, and demonstrating the application ability of computer and foreign languages.

4. Being familiar with the nation's packaging guidelines, policies and regulations.

5. Understanding the cutting edge technology in this field and the global development for the packaging industry.

6. Proficient in data collection and literature review. Being able to analyze, and solve the problems of packaging engineering technology. Demonstrating the ability to do research and develop new packaging materials, new packaging techniques, new packaging tools and equipments, and new packaging management technologies.

三、主干学科

Ⅲ Major Disciplines

主干学科：包装工程、材料科学与工程、机械工程

Major Disciplines: Packaging Engineering, Mechanical Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

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

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

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	50	\	33.5	\	190
选修课 Elective Courses	9	2	10	10	\	10	

第二专业要求修满 59.5 学分，其中含毕业设计 11 学分。

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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	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		
		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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB 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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.								
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		*
		4050063110	高等数学 A 上 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学 A 下 Advanced Mathematics AⅡ	5	80					2	高等数学 A 上	
		4080039110	工程图学 A 上 Engineering Graphics AⅠ	3.5	56					1		*
		4080040110	工程图学 A 下 Engineering Graphics AⅡ	2.5	40					2	工程图学 A 上	*
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					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		
		小 计 Subtotal		30.5	504	36						
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal class credits: 2										
专业课程 Specialized Courses	必修课 Required Courses	4100008110	电工学 Electrical Engineering A	3	48	8				3		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				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		*
		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		*
		4080060110	机械设计 Mechanical Designing	4	64	6				5		*

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
		4080011110	包装结构设计 B Packaging Structure Design B	2.5	40	4				5		*
		4080117110	运输包装 Transport Packaging	2.5	40	4				5		*
		4080017110	包装造型与装潢设计 Packaging Modelling and Decorating Design	3.5	56		20			5		*
		4080065110	机械制造技术基础 B Machinery Manufacturing Technology Basis B	3.5	56	6				5		
		4080010110	包装技术 Packaging Technology	2.5	40	4				6		*
		4080019110	包装自动控制 A Packaging Automatic Control A	3	48	8				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		
		小 计 Subtotal		50	800	80	32					
	选修课 Elective Courses	4080237120	包装辅助设计软件应用 Aided Design Software Application of Packaging	2.5	40		20			4		
		4080100110	图文处理与印前设计 Image & Word Process and Chromatic Theory	3	48		16			5		
		4080091110	气压传动设计 Design of Pneumatic Transmission	2	32	6				6		
		4080032110	防伪包装技术 Anti-counterfeiting Packaging and Bar Code Technology	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		
		4080014110	包装心理与人性化设计 Packaging Design Psychology and Human	1.5	24					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		
		4080241130	包装上的传统图案设计 Traditional Pattern Design of Packaging	2	32					7		

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
		小 计 Subtotal		21.5	344	6	36					
		修读说明：要求至少选修 10 学分。 NOTE：Minimum subtotal credits:10.										
个性课程 Personalized Course	选修课 Elective Courses	4080292130	包装工程前沿技术 Advanced Technology of Packaging Engineering	2	32					3		
		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.										

九、集中性实践教学环节建议进程表

Ⅸ 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	
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5	
4080127110	包装结构设计课程设计 Course Design of Packaging Structure	1	1	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	5	
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	
4080189110	包装工程专业实验 Packaging Engineering Specialty Experiment	1	1	7	
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		41	33.5		

十、其它要求

Ⅹ Other Demands

《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.

工业工程专业本科培养方案
Undergraduate Program for Specialty in Industrial Engineering

一、业务培养目标

Ⅰ Educational Objectives

培养具备现代工业工程和系统管理等方面的知识、素质和能力，能在工商企业从事生产、经营、服务等管理系统的规划、设计、评价和创新工作的高级专门人才。

The specialty of Industrial Engineering intends to cultivate the students to be the advanced engineering technology talented persons, working at planning and design of management system on producing, marketing, server field.

二、业务培养要求

Ⅱ Educational Requirement

学生主要学习工业工程方面的基本理论和基本知识，受到应用工业工程的理论与方法分析和解问题方面的基本训练，具有实际管理系统开发与设计的基本能力。

毕业生应获得以下几方面的知识和能力：

1.掌握工业工程学科的基本理论、基本知识；

2.掌握系统管理的分析方法和管理技术；

3.具有机械工程学科的基本技术，及较强的计算机能力和外语应用能力；

4.熟悉经济建设和企业管理的有关方法、政策和法规；

5.了解现代工业工程的理论前沿，应用前景和发展动态；

6.掌握文献检索、资料查询的基本方法，具有科学研究和实际工作的初步能力。

The students specializing in Industrial Engineering should try to learn the basic theories of industrial engineering, and be trained on the basic knowledge of industrial management, system design and development. The graduates should get the knowledge and talents as follows aspects:

1. Grasping the basic industrial engineering theories and knowledge.

2. Mastering methods and technology of system management and analysis.

3. Having the first-step ability of designing machine, establishing the application ability of computer and foreign languages.

4. Being familiar with the nation’s relevant industrial enterprises’ guidelines, policies and regulations.

5. Understanding the front edge and development for the modem industrial engineering.

6. Grasping the basic methods of document retrieval and data inquiry, also having the first-step ability of analyzing, solving the problems of industrial engineering.

三、主干学科

Ⅲ Major Disciplines

主干学科：工业工程、管理科学与工程、物流管理与工程

Major Disciplines: Industrial Engineering, Management Science and Engineering, Logistics Management and Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

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。

Core Courses: 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.

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

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

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	48	\	32.5	\	190
选修课 Elective Courses	9	2	13	10	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB 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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.									
		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										

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		艺术体育类 Art and Physical Education Courses										
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		
		4050063110	高等数学上 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学下 Advanced Mathematics AⅡ	5	80					2	高等数学上	
		4080039110	工程图学 A 上 Engineering Graphics AⅠ	3.5	56					1		
		4080040110	工程图学 A 下 Engineering Graphics AⅡ	2.5	40					2	工程图学 A 上	
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					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		
		小 计 Subtotal		30.5	504	36						
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分 NOTE: Minimum subtotal class credits: 2										
专业课程 Specialized Courses	必修课 Required Courses	4100009110	电工学 Electrical Engineering	3	48	8				3		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				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		
		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					4		
		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		

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		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		
		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		48	768	46	18					
	选修课 Elective Courses	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		
		4080107110	物流机械与设备 Logistics Machines and Facilities	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 Engineering	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.										

九、集中性实践教学环节建议进程表

Ⅸ 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	
4080230120	企业认识实习 Enterprise Practice	2	2	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	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 Simulation	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		40	32.5		7

十、其它要求

Ⅹ Other Demands

《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.

机械工程专业（国际班）本科培养方案
Undergraduate Program for Specialty in Mechanical Engineering of International 2+2 Program

一、业务培养目标

Ⅰ Educational Objectives

机械工程专业培养具备机械装备设计、制造、自动化和计算机的基础知识与应用能力，能在工业企业或科研设计单位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方面工作的高级工程技术人才。

Specialty in Mechanical Engineering Program aims at training the students who will demonstrate the knowledge and ability in machine design, manufacturing processes, automation, and computer technology application. Students are qualified in design, process, scientific and technological development, applied research, and operational management in industrial departments, enterprise organizations and R&D institutes.

二、业务培养要求

Ⅱ Educational Requirement

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. 具有较扎实的自然科学基础，较好的人文、艺术和社会科学基础；
2. 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；
3. 具有本专业必需的制图、计算、测试、文献检索和基本工艺操作等基本技能；
4. 具有较强的计算机能力和外语应用能力；
5. 具有本专业领域内某个专业方向所必需的专业知识，了解其科学前沿及发展趋势；
6. 具有较强的自学能力、研究能力、创新意识和较高的综合素质。

The students specializing in Mechanical Engineering will learn basic theory of machine design and manufacturing processes, and will be trained to become qualified modern mechanical engineers who are able to design product, manufacture parts, and control key elements or optimize manufacturing system by applying concepts of science, mathematics, engineering, and technology.

1.Students will demonstrate knowledge in natural science and social science, and demonstrate understanding of human factors and professional code of ethics.

2.Students will have a broad knowledge in discipline related fields including mechanics of materials, mechanical design theory, electricity and electronics, fluid power and hydromechanics, and design analysis.

3.Students will demonstrate application of science, mathematics, engineering, and technology to perform engineering drawing, design calculations, testing, literature retrieval and process operation for designing system, component, or process.

4.Students will demonstrate proficiency in the applications of computers, appropriate software, and computer aided tools, and instrumentation to solve technical problems. Additionally, students will demonstrate the proficiency in using foreign language.

5.Students will demonstrate necessary expertise in certain specialty and understand the scientific frontier and developing trend.

6. Students will demonstrate strong self-learning ability and research ability; and demonstrate creativity and critical thinking for design and problem solving activities.

三、主干学科

Ⅲ Major Disciplines

机械工程专业主干学科：力学、机械工程

Major Disciplines：Mechanics and Mechanical Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

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、电工学、模拟电子技术基础、数控技术、控制工程基础、机械制造技术基础、单片机应用系统设计、机械制造装备与设计、CAD/CAM 及数控加工技术综合实践

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

专业特色课程：机械制造技术基础、单片机应用系统设计、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, Micro-Controller Unit Application System , Numerical Control Technology , Practice of CAD/CAM and NC Machining , Machine Equipment Design

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	51.5	\	32	\	190
选修课 Elective Courses	9	2	10	10	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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		
		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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.									
		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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		*
		4050063110	高等数学 A 上 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学 A 下 Advanced Mathematics AⅡ	5	80					2	高等数学 A 上	
		4080039110	工程图学 A 上 Engineering Graphics AⅠ	3.5	56					1		*
		4080040110	工程图学 A 下 Engineering Graphics AⅡ	2.5	40					2	工程图学 A 上	*
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					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		
		小　计 Subtotal		30.5	504	36						
	选修课 Elective Courses	4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小　计 Subtotal		4	64	16						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal class credits: 2										
专业课程 Specialized Courses	必修课 Required Courses	4100008110	电工学 Electrical Engineering	3	48	8				3		
		4110050110	模拟电子技术基础 C Fundamentals of Analog Electronic Circuit C	3	48	8				4		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3		
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3		
		4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3		
		4050015110	材料力学 A Mechanics of Materials A	5	80	8				4		
		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		
			CFD & FEA Computational Fluid Dynamics and Finite Element Analysis	3	48		18			5-6		

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
			控制工程 Control Engineering	4	64	16				5-6		
			工程材料 A+B Engineering Mathematics A+B	3	54	16				5-6		
			机械设计 Mechanical Design	4	64	10	10			5-6		
			动力与车辆工程 Powertrain & Vehicle Engineering	4	64	8				5-6		
			可持续能源与环境 Sustainable Energy & the Environment	2.5	40	8				5-6		
			汽轮机及空压技术 Turbomachinery & Compressible Flows	2.5	40	18				5-6		
			综合机械工程 Synoptic Mechanical Engineering	2.5	40	10				7-8		
			小 计 Subtotal	51.5	830	118	28					
	选修课 Elective Courses		现代车辆工程 Advanced Vehicle Engineering	2	32	16				7-8		
			生物燃料与燃烧 Biofuels & Combustion	2	32	12				7-8		
			计算机图形学 Computational Geometr	2	32		12			7-8		
			过程建模技术 Process Modelling	2	32		12			7-8		
		修读说明：要求至少选修 2 门。 NOTE：Minimum subtotal 2:courses										
			现代力学 Advanced Mechanics	2	32	16				7-8		
			先进热系统 Advanced Thermal Systems	2	32	16				7-8		
			微机电系统 MEMS (Micro Electro Mechanical Systems)	2	32	16				7-8		
		修读说明：要求至少选修 2 门。 NOTE：Minimum subtotal 2:courses										
		小 计 Subtotal		14	224	76	24					
		修读说明：要求至少选修 10 学分。 NOTE：Minimum subtotal credits:10										
个性课程 Personalized Course	选修课 Elective Courses	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。 NOTE：Students can choose any courses from the other specialties. Minimum subtotal credits: 10.										

九、集中性实践教学环节建议进程表

Ⅸ 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	
	设计与专业训练 Design & Professional Skills (BEng)	4	3	5-6	
	工程报告 1 Individual Engineering Project (BEng)	5	4	5-6	
	工程报告 2 Individual Engineering Project (MEng)	12	10	7-8	
	机械设计与专业训练 Design & Professional Skills (MEng)	4	3	7-8	
	制造过程 R&D in Manufacturing Processes.	5	4	7-8	
小　　计　Subtotal		33.5	32		

十、其它要求

Ⅹ Other Demands

《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.

机械工程专业（学硕连读班）本科培养方案
Undergraduate Program for Specialty in Mechanical Engineering Specialty (Bachelor +Master Class)

一、业务培养目标

Ⅰ Educational Objectives

机械工程专业培养具备机械装备设计、制造、自动化和计算机的基础知识与应用能力，能在工业企业或科研设计单位从事机械工程领域内的科学研究、产品开发、设计制造和运行管理等方面工作的高级人才。

Specialty in Mechanical Engineering Program aims at training the students who will demonstrate the knowledge and ability in machine design, manufacturing processes, automation, and computer technology application. Students are qualified in science research, product development, design & manufacture and operation management in industrial enterprises and R&D institutions.

二、业务培养要求

Ⅱ Educational Requirement

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. 具有较扎实的自然科学基础，较好的人文、艺术和社会科学基础；

2. 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；

3. 具有本专业必需的制图、计算、测试、文献检索和基本工艺操作等基本技能；

4. 具有较强的计算机能力和外语应用能力；

5.具有本专业领域内某个专业方向所必需的专业知识，了解其科学前沿及发展趋势；

6.具有较强的自学能力、研究能力、创新意识和较高的综合素质。

The students specializing in Mechanical Engineering will learn basic theory of machine design and manufacturing processes, and will be trained to become qualified modern mechanical engineers who are able to design product, manufacture parts, and control key elements or optimize manufacturing system by applying concepts of science, mathematics, engineering, and technology.

1.Students will demonstrate knowledge in natural science and social science, and demonstrate understanding of human factors and professional code of ethics.

2.Students will have a broad knowledge in discipline related fields including mechanics of materials, mechanical design theory, electricity and electronics, fluid power and hydromechanics, and design analysis.

3.Students will demonstrate application of science, mathematics, engineering, and technology to perform engineering drawing, design calculations, testing, literature retrieval and process operation for designing system, component, or process.

4.Students will demonstrate proficiency in the applications of computers, appropriate software, and computer aided tools, and instrumentation to solve technical problems. Additionally, students will demonstrate the proficiency in using foreign language.

5.Students will demonstrate necessary expertise in certain specialty and understand the scientific frontier and developing trend.

6.Students will demonstrate strong self-learning ability and research ability; and demonstrate creativity and critical thinking for design and problem solving activities.

三、主干学科

Ⅲ Major Disciplines

主干学科：力学、机械工程

Major Disciplines：Mechanics and Mechanical Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

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、电工学、模拟电子技术基础、数控技术、控制工程基础、机械制造技术基础、单片机应用系统设计、机械制造装备与设计、CAD/CAM 及数控加工技术综合实践

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

专业特色课程：机械制造技术基础、单片机应用系统设计、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, Micro-Controller Unit Application System, Numerical Control Technology , Practice of CAD/CAM and NC Machining , Machine Equipment Design

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	51.5	\	32	\	190
选修课 Elective Courses	9	2	10	10	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ Theory Course Schedule

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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		
		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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C Language)	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN Language)	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB 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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.								
		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										

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		艺术体育类 Art and Physical Education Courses										
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		
		4050063110	高等数学 A 上 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学 A 下 Advanced Mathematics AⅡ	5	80					2	高等数学 A 上	
		4080039110	工程图学 A 上 Engineering Graphics AⅠ	3.5	56					1		
		4080040110	工程图学 A 下 Engineering Graphics AⅡ	2.5	40					2	工程图学 A 上	
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					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		
		小 计 Subtotal		30.5	504	36						
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal class credits: 2										
专业课程 Specialized Courses	必修课 Required Courses	4100008110	电工学 Electrical Engineering	3	48	8				3		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3		
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3		
		4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3		
		4110050110	模拟电子技术基础 C Fundamentals of Analog Electronic Circuit C	3	48	8				4		
		4050015110	材料力学 A Mechanics of Materials A	5	80	8				4	4050129110	
		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 Transmission	2.5	40	4				4		
		4080085110	控制工程基础 B Fundamentals of Control B Engineering B	2.5	40	4				5		

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
		4080060110	机械设计 Mechanical Designing	4	64	6				5	机械原理	
		4080028110	单片机应用系统设计 Micro-Controller Unit Application System Design	3.5	56	6				5		
		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	4	64	6				6		
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				7		
		4080068110	机械制造装备与设计 A Machine Equipment Design A	3	48					7		
		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		51.5	840	1068						
	选修课 Elective Courses	4080110110	现代设计技术 Modern Design Technology	2	32					6		
		4080083110	可编程控制器原理及应用 B Fundamentals & Application of Programmable Logic Controller B	2	32	4				6		
		4080027110	传感器原理及应用 B Fundamentals & Application of Sensors B	2	32	6				6		
		4080025110	成组技术 Group Technology	2	32					6		
		4080058110	机械 CAD/CAM Machinery CAD/CAM	2	32		6			6		
		4080089110	企业文化与 CI 策划 Enterprise Culture & CI Design	2	32					7		
		4080049110	光电精密仪器设计 Design of Photoelectric Precision Instrument	2	32					7		
		4080046110	工业工程项目管理 Industrial Engineering Project Management	2	32					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		
		4080048110	工艺过程自动化 Process Automation	2	32					7		
		4080080110	精密加工与特种加工 Technology of Special Machining and Precision Machining	2	32					7		
		4080057110	机电一体化系统设计 Mechatronics System Design	2	32					7		
		小 计 Subtotal		26.5	424	10	6					

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
		修读说明：要求至少选修 10 学分 NOTE：Minimum subtotal credits:10.										
个性课程 Personalized Course	选修课 Elective Courses	4080284130	振动与噪声基础 Fundamentals of Vibration and Noise	2	32			16		6		
		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		
		4080287130	机械制造中的信息技术 Information Technology in Mechanical Manufacturing	2	32	4				5		
		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.										

九、集中性实践教学环节建议进程表

Ⅸ 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	
4080164110	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		

十、其它要求

Ⅹ Other Demands

《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.

机械工程专业（卓越工程师班）本科培养方案
Undergraduate Program for Specialty in Mechanical Engineering (Excellent Engineer Class)

一、业务培养目标

Ⅰ Educational Objectives

培养能够适应国家经济、科技、社会发展对高素质工程技术人才的要求，满足机械工程领域，特别是汽车、建材建工和通用机械制造行业的生产实践需求，具有扎实的专业基础知识，较强的工程能力和创新意识，良好的团队合作精神， 能从事机械工程领域内的设计、制造、维护和运行管理等方面工作的应用型工程师。并为培养从事机械工程项目设计与开发的设计型工程师打下坚实基础。

The aim is to train application-oriented engineers who can adapt to the requirements of high-quality engineering and technical personnel due to the development of the national economy, science technology, and society, to satisfy the production practice demands in mechanical engineering, especially in the automobile, building construction and general mechanical manufacturing industry and have solid professional knowledge, strong engineering ability and innovative consciousness, and good teamwork spirit, and can engage in design, manufacturing, maintenance and operation management, etc. in the field of mechanical engineering, and also to lay a solid foundation to train designing engineers who are engaged in design and development of mechanical engineering project.

二、业务培养要求

Ⅱ Educational Requirement

1．掌握机械工程基础技术知识、操作技能和工程方法，了解机械工程领域的新产品、新技术、新工艺以及技术发展趋势。

1.1 具有从事机械工程工作所需的工程科学技术知识以及一定的人文和社会科学知识。

1.2 掌握扎实的机械工程基础知识和本专业的基本理论知识，了解本专业的发展现状和趋势。

1.3 熟悉机械工程领域的技术标准，了解汽车、建材建工机械、通用机械行业的相关政策、法律和法规。

2．具备运用适当的理论和实践方法解决机械工程实际问题的能力，在机械产品、机械制造系统的设计、运行和维护或解决实际工程问题方面得到系统化训练。

2.1 了解市场、用户的需求变化以及技术发展，具备初步的机械产品（特别是汽车零部件、建材建工机械产品）和机械制造设备（系统）开发的策划能力。

2.2 了解机械制造设备（系统）和建材建工机械设备（系统）的性能、特点和运行规律，具备基本的设备（系统）运行、管理、改进、维护方面的能力。

2.3 具有较强的机械产品（特别是汽车零部件、建材建工机械产品、机械制造设备）设计能力，具有较强的创新意识和进行机械产品创新设计的初步能力。

3．具有初步的项目和工程管理能力。

3.1 具有较强的质量、环境、职业健康安全和法律意识，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。

3.2 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。

3.3 能运用生产管理知识，具有制定机械产品生产计划和进行生产管理的初步能力。

3.3 具有一定的组织管理能力和进行项目任务分解、人力和资源调度的初步能力。

3.5 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。

3.6 具备应对危机与突发事件的初步能力。

4．有效的沟通与交流能力和较强的获取知识、终身学习的能力。

4.1 具有较强的表达和沟通能力。

4.2 具有较强的交流能力。

4.3 具有较强的获取知识、终身学习的能力。

5．具备良好道德和较强的责任感。

1. Students will master basic technical knowledge, skills and engineering methods of mechanical engineering; understanding new products, new technologies, new processes and the developing trend of the technology in the field of mechanical engineering.

1.1 Students will possess knowledge of engineering science required to engage in mechanical engineering and technology and certain knowledge of the humanities and social sciences.

1.2 Students will Master solid mechanical engineering technical knowledge and the basic theoretical knowledge; understanding the development status and trends of this profession.

1.3 Students will familiar with technical standards in the field of mechanical engineering; understand the relevant policies, laws and regulations in automobile, building construction machinery and general machinery industry.

2. Students will possess the ability to solve practical problems in mechanical engineering by employing appropriate theories and practice methods, and acquire systematic training in the area of mechanical products, machinery manufacturing system design, operation and maintenance, or solving practical engineering problems.

2.1 Students will understand the change of the market and customers' requirements and the development of technology, and possess the planning ability of developing the initial mechanical products (especially automobile parts, building construction machinery products) and machinery manufacturing equipments (systems).

2.2 Students will understand performances, characteristics and operation rules of mechanical manufacturing equipment (system) and building construction machinery equipment (system), and possess the basic skills of equipment (system) operation, management, improvement and maintenance.

2.3 Students will possess strong mechanical products (especially automobile parts, building construction machinery products, machinery manufacturing equipment) design ability and strong innovative consciousness and a preliminary ability of innovative design of mechanical products.

3. Students will possess preliminary abilities of project and engineering management.

3.1 Students will possess strong consciousness of quality, environment, occupational health and safety, and law; and can work according to the relevant standards and procedures within the specified scope of laws and regulations.

3.2 Students can employ knowledge of economic management and possess preliminary abilities of project budget and cost accounting of mechanical products.

3.3 Students can employ production management knowledge and possess preliminary abilities of drafting production planning of mechanical products and production management.

3.4 Students will possess certain organization management skills and preliminary abilities of project task decomposition, scheduling of personnel and resources.

3.5 Students will possess teamwork spirit to participate in team management and coordinate team work and ensure the work schedule.

3.6 Students will possess preliminary abilities to deal with crises and emergencies.

4. Students will possess effective communication skills and strong ability of knowledge acquiring and lifelong learning.

4.1 Students will possess strong expression and communication skills.

4.2 Students will possess strong communication skills.

4.3 Students will possess strong ability of knowledge acquiring and lifelong learning.

5. Students will possess good morals and strong sense of responsibility.

三、主干学科

Ⅲ Major Disciplines

主干学科：力学、机械工程

Major Disciplines：Mechanics and Mechanical Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

专业核心课程：工程图学、理论力学、材料力学、工程材料、金属工艺学、机械原理、机械设计、电工学、模拟电子技术基础、测试技术、控制工程基础、机械制造技术基础、单片机应用系统设计、机械制造装备与设计、数控技术、机电传动控制、机械 CAD/CAM

Core Courses：Theoretical Mechanics, Mechanics of Materials, Engineering Materials, Metal Technology, Principle of Mechanics, Mechanical Design, Electrical Engineering，Fundamentals of Analog Electronic Circuit, Testing Technology, Fundamental of Control Engineering, Fundamentals of Mechanical Manufacturing Technology, Micro-Controller Unit Application System Design, Mechanical Manufacturing Equipment Design Basis, Numerical Control Technology, Mechanical Transmission Control, Mechanical CAD/CAM.

专业特色课程：机械制造技术基础、机械制造装备与设计、单片机应用系统设计、数控技术、机电传动控制、机械 CAD/CAM

Characteristic Courses: Fundamentals of Mechanical Manufacturing Technology, Mechanical Manufacturing Equipment Design Basis, Micro-Controller Unit Application System Design, Numerical Control Technology, Mechanical Transmission Control, Mechanical CAD/CAM

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	52	\	36	\	190
选修课 Elective Courses	9	2	15.5	\	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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		
		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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C Language)	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB	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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.									
		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										

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		艺术体育类 Art and Physical Education Courses										
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 A 上 Advanced Mathematics AⅠ	5	80					1		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		
		4080039110	工程图学 A 上 Engineering Graphics AⅠ	3.5	56					1		
		4050064110	高等数学 A 下 Advanced Mathematics AⅡ	5	80					2	高等数学 A 上	
		4080040110	工程图学 A 下 Engineering Graphics AⅡ	2.5	40					2	工程图学 A 上	
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					2		
		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		30.5	504	36						
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal class credits: 2										
专业课程 Specialized Courses	必修课 Required Courses	4100008110	电工学 B Electrical Engineering B	3	48	8				3		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3		
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3		
		4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3		
		4110050110	模拟电子技术基础 C Fundamentals of Analog Electronic Circuit	3	48	8				4		
		4050015110	材料力学 A Mechanics of Materials A	5	80	8				4		
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4		
		4080023110	测试技术 B Measuring & Testing Technology B	2.5	40	4				4	控制工程基础 B	
		4080085110	控制工程基础 B Fundamentals of Control B	2.5	40	4				4		

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		4080060110	机械设计 Mechanical Designing	4	64	6				5	机械原理	
		4080064110	机械制造技术基础 A Fundamentals of Mechanical Manufacturing Technology	4	64	6				5		
		4080087110	流体力学与液压传动 Fluid Mechanics and Hydraulic	2.5	40	4				5		
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				5		
		4080028110	单片机应用系统设计 Micro-Controller Unit Application System Design	3.5	56	6				7		
		4080069110	机械制造装备与设计 B Machine Equipment and Design	2.5	40					7		
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4				5		
		4080058110	机械 CAD/CAM Machinery CAD/CAM	2	32		6			7		
		小 计 Subtotal		52	832	76	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 6)		
		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							
		4080252130	计算机辅助产品分析(有限元,优化设计) Computer-Aided Product Analysis (Finite Element, Optimization Design)	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 Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	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 15.5 学分。 NOTE：Minimum subtotal credits:15.5.										

九、集中性实践教学环节建议进程表

Ⅸ 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	
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	12	12	6（企业）	
4080218120	毕业设计 Graduation Design	17	11	8（企业）	
小 计 Subtotal		43.5	36		

十、其它要求

Ⅹ Other Demands

《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.

过程装备与控制工程专业（卓越工程师班）本科培养方案
Undergraduate Program for Specialty in Industrial Equipment and Control Engineering (Excellent Engineer Class)

一、业务培养目标

Ⅰ Educational Objectives

本专业注重创新设计与综合能力的培养，是以成套工业设备数字化为主体，培养具有机械、计算机、控制、力学、材料、化工等多学科交叉、宽厚扎实的理论基础与工程背景知识，并具有较强的计算机、控制及信息工程应用能力和科学研究与技术开发、设计制造、运行控制等综合能力，能从事过程工业相关技术领域的复合型卓越工程技术和管理人才，适应并参与国际竞争能力的高素质创新人才。

The major pays attention the train of the innovation design and the comprehensive ability,focuses on designing digital equipment sets for process industry and manufacturing companies. Students will demonstrate knowledge in mechanical design, computer application, process control, mechanics of materials, and chemistry engineering; be proficient in using contemporary techniques/skills, computer, control and information engineering application ability, research and technical development, design and manufacture, operation control, demonstrate awareness and knowledge of contemporary issues and global competition.

二、业务培养要求

Ⅱ Educational Requirement

过程装备与控制工程专业学生主要学习过程装备、机械设计、控制工程等方面的基本理论和基础知识，受到工程设计、测控技能和工程科学研究的基本训练，掌握对机电设备及成套设备的数字化设计制造和控制、优化设计、功能设计、创新改造和开发研究新型工业装备技术的基本能力。

经过本专业的学习，毕业生应获得以下几方面知识的能力：

1.掌握机械、计算机、控制、力学、材料、化工等学科的基本理论、基本知识；

2.掌握成套过程工业设备数字设计、数字制造与数字控制的综合知识；

3.具有扎实的机械设计基础、较强的计算机、控制及信息工程应用能力

4.具有对成套新装备、新技术进行开发研究与创新设计的能力；

5.具有工学专业必需的制图、计算、测试、设计、研究、工艺操作等基本技能；

6.掌握文献检索、资料查询的基本方法，具有一定的科学研究和实际工作的能力；

7.具有较强的计算机能力和外语应用能力；

8.具有创新意识和独立获取知识的能力。

9.具有较强的科学研究和实际工作的能力，能够综合应用现代过程工业的科学理论和技术手段解决工程实际技术问题。

The students specializing in Industrial Equipment and Control Engineering will learn basic theory of industrial equipment, machine design and control engineering, ect. Students will be trained to become qualified modern mechanical engineers who are specialized in digital design, digital manufacturing, and digital control to functionally and optimally operate industrial equipment.

Upon completion, students will be able to have:

1. A broad understanding of theoretical and technical foundation in machine design, computer hardware and software, control engineering, mechanics, materials, and chemistry engineering;

2. A broad understanding of synthetic knowledge of mechanic and equipment digitalization design, digitalization manufacturing and digitalization control;

3. The ability of performance analyzing, designing and optimizing of engineering equipments;

4. Skill of developing the new equipment set and innovation of designs by using new technology;

5. Skill of mechanical drawing, calculating, testing, researching, literature searching and technical

processing;

6. A broad understanding of theoretical and technical foundation in looking up datum, checking up literature;

7. Proficiency in computer application and foreign-language;

8. Self-learning ability and innovative consciousness.

9. With strong scientific research and practical work ability, being able to integrated application of modern process industry scientific theory and the technical method solving engineering technical problems.

三、主干学科

Ⅲ Major Disciplines

主干学科：机械工程、控制工程、材料科学与工程

Major Disciplines: Mechanical Engineering, Control Engineering, Material Science and Engineering

四、专业核心课程与专业特色课程

Ⅳ 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、电工电子技术基础、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、过程检测技术、工业装备成套技术、建材设备设计等。

Core Courses: Theoretical Mechanics, Materials Mechanics，Principle of Mechanics, Mechanical Design，Fundamentals of Mechanical Manufacturing Technology，Fundamentals of Electrical Engineering & Electronic Technology, Fluid Mechanics and Fluid Machinery, Process Principles and Equipment Engineering，Powder Mechanics and Equipment，Process Control Engineering, Process Measuring & Testing Technology, Industrial Equipment Packaging Technology, Design of Building Materials Equipment.

专业特色课程：过程控制技术、过程检测技术、建材设备设计、粉体力学与设备、工业装备成套技术、典型过程工业系统及设备

Characteristic Courses: Process Control Engineering, Process Measuring & Testing Technology, Design of Building Materials Equipment，Powder Mechanics and Equipment，Process Measuring & Testing Technology, Typical Process Industry System and Equipment.

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	52	\	39	\	190
选修课 Elective Courses	9	2	12.5	\	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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 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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C Language)	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN Language)	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB 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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.								
		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										

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		艺术体育类 Art and Physical Education Courses										
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 AⅠ	5	80					1		
		4080039110	工程图学 A1 Engineering Graphics AⅠ	3.5	56					1		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		
		4050064110	高等数学 A2 Advanced Mathematics AⅡ	5	80					2	高等数学 A1	
		4050024110	大学物理 C Physics C	4.5	72					2		
		4080040110	工程图学 A2 Engineering Graphics AⅡ	2.5	40					2	工程图学 A1	
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		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		30.5	504	36						
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal class credits: 2.										
专业课程 Specialized Courses	必修课 Required Courses	4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3		
		4100008110	电工学 Electrotechnology	3	48	8				3		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				3		
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				4		
		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				4		
		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		

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		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		
		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		52	832	66						
	选修课 Elective Courses	4080199120	CAD/CAM CAD/CAM	2.5	40		10			4 (2 选 1)		
		4080208120	机电工程软件 Engineering Software of Electric Machine	2.5	40		12					
		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 (2 选 1)		
		4080055110	机电传动控制 A Transmission and Control of Electric Machine A	2.5	40	4						
		4080098110	数控技术 Numerical Control Technique	2.5	40	4				7 (4 选 2)		
		4080127120	机电一体化系统设计 Mechatronics System Design	2.5	40							
		4080050110	光机电测控技术基础 Measurement Technology of Ray and Electro-mechanics	2.5	40							
		4080024030	成型机械与模具设计 Tool and Mould Design	2.5	40							
		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										

九、集中性实践教学进程表

Ⅸ Practice Training Table

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	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 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	

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	第二专业 Second Major
4100069110	过程计算机控制综合课程设计 Course Practice of Process Computer Control	1.5	1.5	5	
4080143110	过程装备单片机应用系统设计课程设计 Curricula Design of Computer Interface Technology	2	2	5	
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5	
4080282130	企业实践（企业） Enterprise Practice	20	12	6（企业）	
4080141110	工业装备成套技术综合课程设计 Curricula Design of Complete Sets of Process Equipment Technology	2.5	2.5	7	
4080219120	毕业设计（企业） Graduation Design	17	11	8（企业）	*
小　　计　Subtotal		57	39		

十、其它要求

Ⅹ Other Demands

《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.

测控技术与仪器专业（卓越工程师班）本科培养方案
Undergraduate Program for Specialty in Measuring & Control Technology and Instrumentation (Excellent Engineer Class)

一、业务培养目标

Ⅰ Educational Objectives

培养能够适应国家经济、科技、社会发展对高素质工程技术人才的要求，满足测控技术与仪器领域的生产实践需求，培养具有扎实的专业基础知识，较强的工程能力和创新意识，良好的团队合作精神，掌握测控系统与设备的现场技术，能在仪器科学与技术领域（特别是汽车、建材建工和通用制造行业）从事测控系统与设备的设计、制造、维护和运行管理等方面工作的应用型工程师，并为培养从事测控系统与设备项目设计与开发的设计型工程师打下坚实的基础。

The aim is to train application-oriented engineers who can adapt to the requirements of high-quality engineering and technical talents for the development of the national economy, science technology and society, can satisfy the production practice demands in control technology and instrument field and have solid professional knowledge, strong engineering capabilities，innovative consciousness, good teamwork spirit and on-site technical for control system and equipment for engaging in design, manufacturing, maintenance and operation management etc. in the fields of instrumentation science and technology (especially the automobile, building materials, construction engineering and general manufacturing industries). Meanwhile the education objectives also aim to lay a solid foundation to train designing engineers who are engaged in design and development of control system and equipment project.

二、业务培养要求

Ⅱ Educational Requirement

1．掌握一般性和专门的测控技术与仪器知识及具备初步相关技能，了解新兴技术。

1.1 具有从事测控技术与仪器领域工作所需的基础科学技术知识以及一定的人文和社会科学知识。

1.2 掌握扎实的测控技术与仪器基础知识和相关的方法、技能。

1.3 拥有测控技术与仪器方面的专业技术知识，了解本专业的发展现状和趋势。

2．具有选用适当的理论和实践方法解决测控技术与仪器工程实际问题的能力，并经历过测控系统设计、运行和维护或解决实际工程问题的系统化训练。

2.1 利用所学的理论知识与技术手段分析、解决实际工程问题，具备测控技术与仪器的工程应用能力。

2.2 了解市场、用户的需求变化以及技术发展，具备测控技术与仪器工程解决方案的设计、开发和实施能力。

2.3 具有对测控技术与仪器工程问题的基本认知、工程推理和判断能力，具备较强的创新意识和进行产品开发和设计、技术改造与创新的初步能力。

3．具有初步的项目和工程管理能力。

3.1 了解测控技术与仪器领域技术标准，能够使用合适的管理方法、管理计划和预算，组织任务、人力和资源，具备工程项目集成的意识和初步能力。

3.2 具有一定的质量、环境、职业健康安全和法律意识，具备应对危机与突发事件的初步能力。

3.3 具备团队协作精神，具有参与团队管理、协调团队工作，确保工作进度以及参与评估项目，提出改进建议的能力。

4．有效的沟通与交流能力。

4.1 具有一定的协调、管理、竞争与合作的基本能力，初步具备带领团队前行的指向能力。

4.2 能够熟练利用现代交流媒介进行工程表达，并进行工程文件的编纂，能够控制自我并了解和理解他人需求和意愿，具备较强的人际交往能力和环境适应能力。

4.3 能够使用技术语言，在跨文化环境下进行沟通与表达，具有能够参与国际竞争与合作的初步能力。

5．具备良好职业道德和责任感。

5.1 具有强烈的社会责任感、良好的工程职业道德和职业行为规范，遵守测控技术与仪器工程领域的职业行为准则。

5.2 具有较强的自我获取知识的能力和适应发展的学习能力

5.3 具有良好的质量、安全、服务和环保意识，具备测控系统及设备、生产过程及装置的安全可靠性、环保关联性等方面的基本知识。

1. Students will master basic and professional technical knowledge of control technology and instrument, process preliminary relevant skills and understand new technologies

1.1 Students will possess basic knowledge of science and technology required to engage in control technology and instrument field and certain knowledge of the humanities and social sciences.

1.2 Students will master solid basic theoretical knowledge, relevant methods and skills of control technology and instrument

1.3 Students will process professional technical knowledge of control technology and instrument and understanding the development status and trends of this profession.

2. Students will possess the ability to solve practical problems in control technology and instrument by employing appropriate theories and practice methods, and acquire systematic training in the area of control system design, operation and maintenance, or solving practical engineering problems.

2.1 Students will analyze and solve practical engineering problems with the theoretical knowledge and technical means, and process control technology and Instrument engineering application capabilities.

2.2 Students will understand the change of the market, customers' requirements and the development of technology, and possess the ability of designing, developing and implementing the control technology and instrument projects.

2.3 Students will possess basic knowledge, engineering reasoning and ability to judge for the control technology and instrument engineering problems, and process innovative consciousness and a preliminary ability of product development and design and technology transformation and innovation.

3. Students will possess preliminary abilities of project and engineering management.

3.1 Students will understand the technical standards of control technology and equipment, and can employ appropriate management methods, management plan and budget, project task, personnel and resources, and process the consciousness and preliminary abilities of integrated project.

3.2 Students will possess consciousness of quality, environment, occupational health and safety, law, and process preliminary abilities to deal with crises and emergencies.

3.3 Students will possess teamwork spirit and abilities of participating in team management, coordinating team work, ensuring the work schedule and projects assessing, and suggesting improvements.

4. Students will possess effective communication skills.

4.1 Students will possess basic abilities of coordination, management, competition and cooperation, and the preliminary abilities of leading the team forward.

4.2 Students will expertly use modern communication media to express the works, compile the project files, are able to control themselves and understand the needs and wishes of others, and will process strong interpersonal skills and ability to adapt to the environment.

4.3 Students will use technical language to communicate and express with others in cross-cultural environment, and will process preliminary abilities of participating in international competition and cooperation.

5. Students will possess good morals and strong sense of responsibility.

5.1 Students will possess strong sense of social responsibility, good work ethic and professional conduct,

and will comply with professional codes of conduct in the fields of control technology and instrument.

5.2 Students will possess strong abilities to acquire knowledge by themselves and learning abilities to adapt to the development.

5.3 Students will possess good consciousness of quality, safety, services and environmental protection, and will process basic knowledge of safety and reliability, environmental protection association of control system and instrument, and production processes and devices.

三、主干学科

Ⅲ Major Disciplines

主干学科：仪器科学与技术、控制科学与工程、光学工程、信息与通信工程

Major Disciplines: Instrumental Science and Technology, Mechanical Engineering, Optical Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

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、模拟电子技术基础、数字电子技术基础、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 A、控制工程基础 A、仪器制造技术、仪器光学基础、现代仪器设计、光纤传感器等。

Core Courses: Signal Analysis and Processing, Error Theory and Data Processing, Precision Mechanism Design, Basic Analog Electronic Technology, Basic Digital Electronic Technology, Instrument Circuit, Microcontroller Principle and Its Application of Measure and Control System, Principle and Application of Sensors A, Fundamentals of Control Engineering A, Instrument Manufacture Technology, Fundamentals of Optical Instrument, Modern Instrument Design, Optical Fiber Sensor and so on.

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 A、控制工程基础 A、仪器光学基础、现代仪器设计、光纤传感器。

Characteristic Courses: Microcontroller Principle and Its Application of Measure and Control System, Principle and Application of Sensors A, Fundamentals of Control Engineering A, Fundamentals of Optical Instrument, Modern Instrument Design, Optical Fiber Sensor.

五、学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bacheclor of Engineer

六、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	30.5	51	\	38.5	\	190
选修课 Elective Courses	9	2	14	\	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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 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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C)	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN)	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB)	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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.								
		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										

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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		艺术体育类 Art and Physical Education Courses										
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		
		4050063110	高等数学 A1 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学 A2 Advanced Mathematics AⅡ	5	80					2	高等数学 A1	
		4080039110	工程图学 A1 Engineering Graphics AⅠ	3.5	56					1		*
		4080040110	工程图学 A2 Engineering Graphics AⅡ	2.5	40					2	工程图学 A1	*
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					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		
		小 计 Subtotal		30.5	504	36						6
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal credits: 2.										
专业课程 Specialized Courses	必修课 Required Courses	4100008110	电工学 Electrical Engineering	3	48	8				3	大学物理 C	
		4050071110	工程力学 A Engineering Mechanics A	4	64	4				3	高等数学 A2 大学物理 C	
		4080078110	金属工艺学 B Metallurgical Technology B	2.5	40	4				3		
		4110049110	模拟电子技术基础 B Basic Analog Electronic Technology B	3.5	56					3	大学物理 C	*
		4110051110	模拟电子技术基础实验 Basic Analog Electronic Technology Experiments	0.5	16	16				3	大学物理 C	*
		4050052110	复变函数与积分变换 B Complex Function and Integral Transform B	3	48					4	高等数学 A2	*
		4080257130	误差理论与数据处理 Error Theory and Data Processing	2	32					4	概率论与数理统计 B	
		4080246130	测试信号分析与处理 Signal Analysis and Processing	2	32		4			4	高等数学 A2 线性代数	*
		4080265130	精密机械设计 Precision Mechanism Design	4	64	8				4	工程图学 A2 工程材料	*

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		4110066110	数字电子技术基础 A Basic Digital Electronic Technology A	4	64					4	电工学	*
		4110068110	数字电子技术基础实验 Basic Digital Electronic Technology Experiments	0.5	16	16				4	电工学	
		4080115110	仪器仪表电路 Instrument Circuit	2	32	4				4	模拟电子技术基础 B	*
		4080266130	控制工程基础 A Fundamentals of Control Engineering A	3	48	8				4	高等数学 A2 大学物理 C	*
		4080244130	测控系统微处理器原理及应用 Microcontroller Principle and Its Application of Measure and Control System	3.5	56	4				5	数字电子技术基础 A	*
		4080026110	传感器原理及应用 A Principle and Application of Sensors A	3.5	56	12				5	工程力学 A 仪器仪表电路	*
		4080111110	现代仪器设计 Modern Instrument Design	3.5	56	8				5	仪器仪表电路 数字电子技术基	*
		4080258130	仪器光学基础 Fundamentals of Optical Instrument	2.5	40	4				5	大学物理 C	*
		4080267130	仪器制造技术 Instrument Manufacture Technology	2	32					5	精密机械设计	
		4080268130	测控系统软件设计 Software Design of Measure and Control System	2	32		2			5	大学计算机基础 线性代数	*
		小 计 Subtotal		51	832	102	6					37
	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	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-teeh	1.5	24					7		
		4050510130	量子物理学 Quantum Physics	2	32					7		
		4080182110	典型测控系统及设备 Typical Measure and Control System and Equipments	2	32					6 (企业)	精密机械设计 控制工程基础 A	
		4080183110	企业自主选修课程 Independent Courses for Enterprise	2	32					6 (企业)	精密机械设计 控制工程基础 A	
		4080114110	仪器仪表 CAD 技术 The CAD Technique for Circuit	2	32		4			7	仪器仪表电路	
		4080020110	测控系统仿真 Simulation for Measure and Control System	2	32		4			7	大学计算机基础 线性代数	
		4080051110	光纤传感器 Optical Fiber Sensor	1.5	24	4				7	大学物理 C	
		4080101110	图像检测与处理技术 Imagine Detection and Processing Technique	2	32		4			7	测控系统仿真	

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
		4080253130	可编程控制器原理及应用 Fundamentals & Application of Programmable Logic Controller	2	32	4				7	传感器原理及应用 A	
		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 A	
		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	传感器原理及应用 A	
		4080256130	网络控制技术及应用 Networked Control Technology and Its Application	2	32	4				7	数字电子技术基础 A	
		4080049110	光电精密仪器设计 Design of Photoelectric Precision Instrument	2	32					7	传感器原理及应用 A	
		小 计 Subtotal		38.5	616	32	12					
		修读说明：要求至少选修 14 学分，其中数学、物理类课程至少选修 5 学分。 NOTE：Minimum subtotal credits: 14.Minimum mathematics, physics subtotal credits: 5.										

九、集中性实践教学环节建议进程表

Ⅸ 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 Practice of Mechanical Manufacturing Engineering B	4	4	3	
4080232120	仪器仪表电路设计与实训 Design and Training on Instrument Circuit	2	2	4	
4080243130	测控系统微处理器应用实训 Microcontroller Application Training 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	5	
4080231120	现代仪器设计与实训 Training on Modern Instrument Design	2	2	5	
4080245130	测控系统综合技能实训 Integrating Skills Training of Measure and Control System	2	2	7	
4080177110	专业实习 Profession Practice	2	2	6（企业）	
4080255130	企业实践 Enterprise Practice	10	10	6（企业）	
4080220120	毕业设计 Graduation Design	17	11	8（企业）	7*
小 计 Subtotal		54	38.5		7*

十、其它要求

Ⅹ Other Demands

《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.

包装工程专业（卓越工程师班）培养方案
Undergraduate Program for Specialty in Packaging Engineering（Excellent Engineer Class）

一、业务培养目标

Ⅰ Educational Objectives

包装工程专业培养能够适应国家经济、科技、社会发展对高素质工程技术人才的要求，具有扎实的专业基础知识，较强的工程能力和创新意识，良好的团队合作精神，具备包装系统设计与管理等方面的能力，能在商品生产与流通部门、包装企业、科研机构、外贸、商检等部门从事产品包装、质量检测、技术管理和科学研究的高级应用型工程技术人才。

The major of Packaging Engineering intends to cultivate application-oriented engineers who can adapt to the requirements of high-quality engineering and technical personnel due to the development of the national economy, science technology, and society. The students will have solid professional knowledge, strong engineering ability and innovative consciousness, and good teamwork spirit and become the advanced applied engineering technology talented persons in packaging system design and management. They will successfully work at manufacturing company and supply chain industry for the product packaging, quality inspection, and technology management, and perform the science research in these areas as well.

二、业务培养要求

Ⅱ Educational Requirement

1. 掌握一般性和专门的包装工程技术知识及具备初步相关技能，了解包装领域新兴技术发展趋势。

1.1 具有从事包装工程工作所需的基础科学技术知识以及一定的人文和社会科学知识

1.2 掌握扎实的包装工程基础知识和相关的方法、技能。

1.3 拥有包装工程方面的专业技术知识，了解本专业的发展现状和趋势

2. 具有选用适当的理论和实践方法解决包装工程实际问题的能力，并经历过生产运作系统的设计、运行和维护或解决实际工程问题的系统化训练

2.1 了解市场、用户的需求变化以及技术发展，具备初步的包装系统和包装设备开发的策划能力。

2.2 了解包装系统和设备的性能、特点和运行规律，具备基本的设备（系统）运行、管理、改进、维护方面的能力。

2.3 具有较强的包装系统和包装设备的设计能力，具有较强的创新意识和进行产品创新设计的初步能力。

3．掌握包装领域项目及工程管理的基本知识并具备参与能力

3.1 了解包装领域技术标准，具备工程项目集成的意识和初步能力，具有进行项目及工程管理系统方案的设计能力

3.2 具有一定的质量、环境、职业健康安全和法律意识，具备应对危机与突发事件的初步能力，具备参与管理、协调工作、团队，确保工作进度，确保项目及工程管理系统方案的实施与运行

4．有效的沟通、交流能力和较强的获取知识、不断学习的能力

4.1 具有较强的团队合作精神和协作能力

4.2 具有较强的人际交流及工程表达能力

4.3 外语交流能力及不断学习的能力

5．具备良好的职业道德和对职业、社会、环境的责任感

1. Students will master common and special technical knowledge of Packing Engineering, have the primary related skills and understanding developing trends of new technologies in the field of Packing

Engineering.

1.1 Students will possess basic knowledge of science and technology and certain knowledge of the humanities and social sciences.

1.2 Students will master solid basic knowledge and related methods and skills of Packing Engineering.

1.3 Students will have professional technical knowledge of Packing Engineering and understand the development status and trends of this profession.

2. Students will possess the ability to solve practical problems in Packing Engineering by employing appropriate theories and practice methods and acquire experiences of the design, running and maintenance of the manufacturing operation systems or systematic training in the area of solving practical engineering problems.

2.1 Students will understand the change of the market and customers' requirements and the development of technology, and possess the planning ability of developing the primary packing system and packing equipment.

2.2 Students will understand performances, characteristics and operation rules of packing equipment (system) and possess the basic skills of equipment (system) operation, management, improvement and maintenance.

2.3 Students will possess strong ability to design packing system and equipment and strong innovative consciousness and a preliminary ability of innovative design of products.

3. Students will possess preliminary abilities of project and engineering management in the area of Packing Engineering and the abilities to take part in it.

3.1 Students will understand the technical standards in the area of Packing Engineering, possess strong consciousness and preliminary abilities of integration of project and engineering and the abilities to design system blue prints of project and engineering management.

3.2 Students will possess strong consciousness of quality, environment, occupational health and safety, and law, preliminary abilities to deal with crises and emergencies, teamwork spirit to participate in team management and coordinate team work ,ensure the work schedule and performing and operation of project and engineering management.

4. Students will possess effective communication skills and strong ability of knowledge acquiring and endless learning.

4.1 Students will possess strong team-working spirit and collaboration abilities.

4.2 Students will possess strong communication and engineering expression abilities.

4.3 Students will possess ability of communication in foreign language and endless learning.

5. Students will possess good professional ethics and strong sense of responsible to professions, the society and environment.

三、主干学科

Ⅲ Major Disciplines

主干学科：包装工程、材料科学与工程、机械工程

Major Discipline: Packaging Engineering, Mechanical Engineering

四、专业核心课程与专业特色课程

Ⅳ Core Courses and Characteristic Courses

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.

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

五、计划学制与学位

Ⅴ Length of School and Degree

修业年限：四年

Duration： Four Years

授予学位：工学学士

Degree Granted: Bachelor of Engineer

六、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	30.5	52.5	\	36.5	\	190
选修课 Elective Courses	9	2	14.5	\	\	10	

七、课程修读指导建议

Ⅶ Recommendations on Course Studies

八、理论教学建议进程表

Ⅷ 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
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		
		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		
		程序设计语言课程组(三选一，3 学分) Courses of Computer Program Design (select one out of three, Credits: 3)										
		4120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C	3	48		12			2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program Design(FORTRAN	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program Design(VB 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 学分，建议每个类别中分别至少选修一门课程。 All students are required to obtain at least nine credits, and suggested to select at least one course in five categories respectively.								
		人文社科类 Arts and Social Science Courses										
		经济管理类 Economy and Management 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 总学时 Tot hrs.	实验 Exp.	上机 Operation	实践 Practice	课外 Extracur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		科学技术类 Science and Technology Courses										
		艺术体育类 Art and Physical Education Courses										
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		
		4080034110	工程材料 Engineering Material	2.5	40	4				2		*
		4050063110	高等数学 A 上 Advanced Mathematics AⅠ	5	80					1		
		4050064110	高等数学 A 下 Advanced Mathematics AⅡ	5	80					2	高等数学 A 上	
		4080039110	工程图学 A 上 Engineering Graphics AⅠ	3.5	56					1		*
		4080040110	工程图学 A 下 Engineering Graphics AⅡ	2.5	40					2	工程图学 A 上	*
		4050229110	线性代数 Linear Algebra	2.5	40					2		
		4050024110	大学物理 C Physics C	4.5	72					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		
		小 计 Subtotal		30.5	504	36						
	选修课 Elective Courses	4080118110	造型设计基础 Fundamentals of Contour Design	2	32					2		
		4080070110	基础工业工程 Fundamental Industrial Engineering	2	32	8				2		
		小 计 Subtotal		4	64	8						
		修读说明：要求至少选修 2 学分。 NOTE：Minimum subtotal class credits: 2										
专业课程 Specialized Courses	必修课 Required Courses	4100008110	电工学 Electrical Engineering A	3	48	8				3		
		4080054110	互换性与测量技术 B Interchangeability and Measurement B	2	32	4				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		*
		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		*
		4080062110	机械原理 Principle of Mechanics	3.5	56	4				4		

课程类别 Course Classifi-cation	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 总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur	建议修读学期 Suggested Term	先修课程 Prerequisite Course	第二专业 Second Major
		4080017110	包装造型与装潢设计 Packaging Modelling and Decorating	3.5	56		20			4		
		4080060110	机械设计 Mechanical Designing	4	64	6				5		
		4080016110	包装印刷技术 Introduction of Packaging Printing	2.5	40					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		
		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		
		4080019110	包装自动控制 A Packaging Automatic Control A	3	48	8				5		
		4080091110	气压传动设计 Design of Pneumatic Transmission	2	32	6				7		
		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		
		小 计 Subtotal		52.5	840	86	32					
	选修课 Elective Courses	4080006110	包装辅助设计软件应用 Aided Design Software Application of	3	48		24			3		
		4080100110	图文处理与印前设计 Image & Word Process and Prepress	3	48		16			4		
		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		
		4080260130	单片机应用系统设计 Micro-Controller Unit Application System Design	2.5	40	6				7		
		4080202120	工业机器人 Industrial robots	2	32					7		

课程类别 Course Classifi-cation	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	第二专业 Second Major
					总学时 Tot hrs.	实验 Exp.	上机 Ope-ration	实践 Prac-tice	课外 Extra-cur			
		4080251130	计算机仿真 Computer Simulation	3	48		16			7		
		小 计 Subtotal		26	416	14	56					
		修读说明：要求至少选修 14.5 学分。 NOTE：Minimum subtotal credits:14.5										

九、集中性实践教学环节建议进程表

Ⅸ 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	*
4080129110	包装造型与装潢设计课程设计 Course Design of Packaging Modelling and Decorating Design	2	2	4	*
4080147110	机械设计课程设计 Course Practice of Machinery Design	3	3	5	*
4080283130	企业实践 Enterprise Practice	10	10	6（企业）	*
4080189110	包装工程专业实验 Packaging Engineering Specialty Experiment	1	1	7	*
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		44	36.5		

十、其它要求

Ⅹ Other Demands

《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.