

机械工程（卓越双语班）

Mechanical Engineering (Excellent Engineer Class)

专业代码：080201

学制：4年

Speciality Code:080201

Schooling Years: 4 Years

培养目标：

培养培养热爱祖国、坚持社会主义道路、适应国家发展需要、德智体全面发展、具有坚实的机械学科理论基础（包括：机械制造及自动化、机械电子、机械设计）、优化的知识结构、卓越的工程实践能力和创新思维，以及国际化交流能力的机械工程领域研究型工程师和未来企业领军人才。

Educational Objectives:

To cultivate students become patriotic, to follow the socialist road, to adapt to national development requirements, to develop in an all-round way morally, intellectually and physically, to become research-oriented engineers and future leading talents in mechanical engineering field who possess solid theoretical basis of mechanical discipline (including Mechanical Manufacturing & Automation, Mechatronics, Mechanical Design), optimal knowledge structure, superb abilities of engineering practice, innovative mind and international communication capability.

毕业要求：

№1.工程知识：掌握从事机械工程师工作所需的数学和其他相关的自然科学知识、机械工程基础理论知识、专业基本原理、方法和手段以及一定的经济管理知识，为解决机械工程复杂问题打下知识基础。

№2.问题分析：能够应用数学、自然科学、本专业基本原理、方法和手段以及经济管理知识，识别、表达、并通过文献研究分析机械工程复杂问题，以获得有效结论。

№3.设计/开发解决方案：能够设计针对机械工程复杂问题的解决方案，设计满足特定需求的机械系统、单元（部件）或工艺流程，并能够在设计环节中体现创新意识和技术经济意识，考虑社会、健康、安全、法律、文化以及环境等因素。

№4.研究：能够基于科学原理并采用科学方法对机械工程复杂问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

№5.使用现代工具：能够针对机械工程复杂问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对机械工程复杂问题的预测与模拟，并能够理解其局限性。

№6.工程与社会：能够基于机械工程相关背景知识进行合理分析，评价机械工程实践和机械工程复杂问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

№7.环境和可持续发展：能够理解和评价针对机械工程复杂问题的工程实践对环境、社会可持续发展的影响。

№8.职业规范：具有人文社会科学素养、社会责任感，能够在工程实践中理解并遵守工程职业道德和规范，履行责任。

№9.个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

№10.沟通：能够就机械工程复杂问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具有比较开阔的国际视野，能够在跨文化背景下进行比较流利的沟通和交流。

№11.项目管理：理解并掌握机械工程管理原理与经济决策方法，并能在多学科环境中应用。

№12.终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

Student Outcomes:

№1. Engineering knowledge: Students must have mastered mechanical-related natural science knowledge such as mathematics, basic theoretical knowledge of mechanical engineering, professional basic discipline, methodology and some level of economic management, and the state-of-art and trend of mechanical engineering, which lays the knowledge ground to solve practical and intricate mechanical engineering problems of enterprises.

№2. Problem analysis: Students need to recognize, express and analyze intricate problems of mechanical engineering via mathematics, natural science, expertise fundamentals, methodology, economic management and relevant literature to obtain valid conclusions.

№3. Solution designing/developments: Students need to design solutions aiming at intricate problems of mechanical engineering, mechanical system which can meet particular requirements, and procedures of units (components) or process. Furthermore, they need to embody innovation consciousness and technical economy sense during the process of design and consider some factors including society, health, safety, law, culture and environment.

№4. Research: Students need to have the capabilities to study intricate problems of mechanical engineering based on scientific principles and the employment of scientific methodology which includes experiment design, data analysis and explanation, obtainment of reasonable and valid conclusions.

№5. Employment of modern appliances: Students need to be able to develop, select and utilize appropriate technology, resources, modern engineering tools and information technology tools, which includes prediction and simulation of intricate mechanical engineering problems, and they need to understand the limitation.

№6. Engineering and safety: Students need to reasonably analyze and assess the effects of mechanical engineering practice and solution to the intricate problems of mechanical engineering on society, health, safety, law and culture, and they need to know the responsibilities they need to take.

№7. Environment and sustainable development: Students need to understand and assess the effects of engineering practice aiming at intricate problems of mechanical engineering on environment and social sustainable development.

№8. Vocational norms: Students need to possess scientific qualities of humanistic society and social responsibilities, and they need to understand and observe engineering professional morals and norms and take corresponding responsibilities.

№9. Individuals and teams: Students need to play a role in individual, team member and conductor under multidisciplinary background.

№10. Communication: Students need to communicate effectively with peers and public mass aiming at intricate problems of mechanical engineering which includes report writing and manuscript designing, speech statement, clear and articulate response or expression of instructions. Furthermore, they need to have some international perspectives and to be able to communicate under multicultural background.

№11. Project management: Students need to understand and master the methods of managerial principals of mechanical engineering and economy decision and to be able to apply them under multidisciplinary environment.

№12. Lifelong study: Students need to have the consciousness of independent study and lifelong study and have the capabilities of continuous study and adaptation of development.

专业介绍:

机械工程（卓越双语班）于 2015 年设置。机械工程专业历史悠久，学科 1934 年始创于原国立中山大学，1952 年经院系调整形成华南工学院机械工程专业。1981 年成为国家首批博士学位授权点。2003 年获批机械工程一级学科博士学位授予权学科和一级学科博士后科研流动站。2006 年成为广东省重点学科，2007 年被教育部列为国家重点学科培育学科。经过数十年的发展，华南理工大学机械工程专业已成为立足华南、面向全国的研发和创新人才的培养基地。本专业围绕精密制造装备、精密和超精密加工技术、精密成形及模具技术、面向装备的控制技术等开展教学与研究工作，部分领域在国内处于优势地位，为国家培养了一大批先进制造创新人才。多年来，我校机械工程专业本科生就业率一直保持在 100%，人才培养质量受到用人单位的高度认可，在国内外，尤其在华南地区形成了重要的影响。

本专业师资力量雄厚。本专业建立了 4 个稳定的校内实习基地及联系建立了 20 多个校外实习基地，其中具有稳定合作关系的实习基地有湖北十堰东风汽车发动机厂及二汽公司若干子工厂、广州本田发动机厂、广州明珞汽车装备有限公司等，稳定的校外实习基地为本专业学生提供了良好的校外实践场所和条件。拥有丰富的专业相关中、外文纸质和电子图书以及网络学术资源数据，为专业教学和科研工作提供了良好条件。

Specialty Introduction:

Mechanical Engineering of SCUT (South China University of Technology) is a time-honored major which was established in former Stated-owned Sun Yat-Sen University in 1934, and it became Mechanical Engineering expertise of South China Polytechnic College by the modification of national colleges in 1952. This major became one of the first national doctorate authorization centers. In 2003, mechanical

engineering was approved to be the Level 1 discipline of mechanical engineering doctorate granting discipline and Level 1 discipline post-doctoral mobile research station. It became the key discipline of Guangdong Province in 2006 and was enrolled as state key development discipline by National Education Minister in 2007. After decades of development, mechanical engineering of SCUT has become the innovation foundation of scientific and innovative talents based on Southern China and nationwide. This major closely performs teaching and research centering on precise manufacturing equipment, precise and super-precise manufacturing technology, precise forming and mold technology, and some of the areas take the lead in China which cultivated a horde of innovative talents in advanced manufacturing field. Over the years, the employment rate of students majoring in mechanical engineering in our campus is always 100% which is highly recognized by enterprises, and it poses a great impact at home and abroad especially in southern China.

The teaching force of this major is strong and solid, there are 26 professional teachers in Mechanical Manufacturing Department which includes 15 professors, 7 deputy professors and 4 lecturers. The teachers mentioned above undertake main course construction tasks of mechanical manufacturing specialty and other faculties taking part in talent cultivation of mechanical manufacturing are as follows: 17 teachers in Mechanics Department, 8 teachers in Industrial Training Center; 8 experiment personnel of mechanical engineering. Workforce in other experimental sub-centers participating in the experimental courses are as follows: 6 teachers in Machinery Foundation Experiment Sub-center, 33 teachers in Industrial Training Center. Our faculty has founded 4 stable in-campus practice bases and established more than 20 out-campus practice bases for students majoring in mechanical engineering, among these practice bases, enterprises such as Shiyuan Dongfeng Automobile Engine Factory of Hubei Province, some subsidiary factories affiliated to Secondary Automotive Corporation, Guangzhou Honda Engine Plant, Guangzhou Mingluo Automotive Equipment Limited Company have formed solid and stable cooperation relationships with us, therefore, these stable out-campus practice bases provide excellent and suitable extracurricular practice sites and conditions. Furthermore, there are bountiful resource data of papers, electronic books and network academia at home and abroad which paves an advantageous path for expertise teaching and research.

专业特色：

厚基础、重实践，培养具有卓越的工程实践能力与创新思维的机械工程领域研究型工程师。培养模式为3+1（本科）+3（硕士）。本科毕业生约一半可推免就读本校同专业工程型研究生。本科阶段前三年在校学习机械工程领域基础课程并有企业见习，第四年在企业工程实践教育，使学生受到现代工程师的基本训练和企业文化熏陶，具有在机械工程领域从事研发或管理、营销的基本能力及发展为研究型工程师、企业领军人的潜力。

Specialty Features:

Through solidifying the basis and emphasizing practice, students are cultivated to become research-oriented engineers in mechanical engineering field who are equipped with superb engineering practice capabilities and innovative mind. The training mode is 3+1 (bachelor degree) +3 (master degree). About a majority of undergraduates can be recommended directly to be engineering-oriented graduates majoring in the same specialty of the campus. In the first three years during undergraduate period, students need to learn fundamental courses in the mechanical engineering field and to undergo enterprise internship. They will receive enterprise practical education in the 4th year which makes them edified by basic training of modern engineers and corporation culture. They need to have the basic abilities of development, management and marketing in the mechanical engineering area and have the potential of being research-oriented engineers and enterprise leading talents.

授予学位：工学学士学位

Degree Conferred: Bachelor of Engineering

主干课程：

画法几何及机械制图、电工与电子技术、材料力学、流体力学、工程热力学、传热学、机械工程材料、机械原理、机械设计、成型技术基础、机械制造技术基础、测试技术、机械控制工程基础。

Main Courses:

Descriptive Geometry & Machine Drafting Electrical Engineering and Electrontechnics, Mechanics of Materials, Fluid Mechanics, Engineering Thermodynamics, Heat Transmission, Materials of Mechanical Engineering, Theory of Machines and Mechanism, Mechanical Design, Basis of Material Shaping Technology, Fundamentals of machine Manufacture Engineering Science, Testing Technology, Basis of Cybernetics

特色课程：

全英语教学课程：机械设计、机械制造技术基础

双语教学课程：机械工程材料、工程热力学、传热学、成型技术基础、机械原理、测试技术

研究型课程：汽车试验技术，汽车电子控制技术，汽车振动与噪声控制，汽车碰撞与安全技术

讨论型课程：机械工程导论、微机电系统、塑性加工及模具计算机技术、汽车产品制造质量管理

创新实践课程：创新思维与实践、基于项目的设计实践（企业专家指导）、汽车产品制造质量管理（企业教师授课）、白车身制造工艺（企业教师授课）、白车身制造自动化设备（企业教师授课）

专题研讨课（企业专家授课）：新能源汽车技术

创业教育课程：企业信息化及生产管理、机电产品市场营销学

Featured Courses

Courses Taught in English: Mechanical Design, Fundamentals of Machine Manufacture Technology

Bilingual Courses: Materials of Mechanical Engineering, Engineering Thermodynamics, Heat Transmission, Basis of Material Shaping Technology, Theory of Machines and Mechanism, Testing Technology

Research-based Course: Automobile Testing Technology, Automobile Electronic Control Technology, Automobile Vibration & Noise Control, Automobile Collision & Security Technology

Discussional Courses: Machinery Manufacturing Introduction, Micro-Electro-Mechanical Systems, Plastic Forming and CAX Technology of Mold, Quality Management of Automotive Product Manufacturing.

Innovation Practice Courses: Innovation Thought and Practice, Design Practice Based on Projects (Directed by Enterprise Experts), Quality Management of Automotive Product Manufacturing (Taught by Enterprise Experts), Manufacturing Process of Car Body (Taught by Enterprise Experts), Manufacturing Automation Equipment of Car Body (Taught by Enterprise Experts)

Special Subject Discussional Course (Teaching by Enterprise Experts): New Energy Automobile

Entrepreneurship Education Course: Enterprise Informatization & Production Management, Mechanical and Electrical Products Marketing

一、教学计划总体安排表 (Teaching Plan Schedule)

学 年 期	教 学 进 度 安 排 (周)																				理 论 教 学	考 试	入 学 教 育	军 训	课 程 设 计	工 程 大 作 业	电 子 实 习	综 合 实 验	社 会 实 践	生 产 实 习	毕 业 实 习	其 它 实 习	中 外 合 作 项 目	毕 业 设 计	就 业 安 排	机 动	假 期	小 计																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20																																						
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R																																								
一	1	C	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	D	D	D	13	2	1	3														19																				
	2	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	Q	B	B	18	2														2	20																					
二	3	G	G	G	G	A	A	A	A	A	A	A	A	A	A	A	M	M	B	B	13	2				4											1	20																				
	4	G	G	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	I	B	B	12	2			2	2		1									1	20																			
三	5	A	A	A	A	A	A	A	A	A	A	A	H	H	I	I	B	B	E	E	11.5	2			2		2	2.5										20																				
	6	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	I	I	B	B	E	E	15	2			2			1											20																	
四	7	A	A	A	A	A	A	A	A	A	A	A	A	A	M	M	M	M	M	M	14																	6	20																			
	8	L	O	O	O	O	O	O	O	O	O	O	O	O	O	O	Q	Q	Q	Q																	1	15	4	20																		
合 计 (周)																				96.5	12	1	3	6		6	2	4.5	40																											15	6	159

备注:1. 部分企业实习在寒暑假穿插进行; 2. 第四学年进行企业实习、本科毕业设计、部分硕士课程等。

二、各类课程学分登记表 (Registration Form of Curriculum Credits)

1. 学分统计表 (Credits Registration Form)

课程类别 Course Category	课程要求 Requirement	学分 Credits	学时 Academic Hours	备注 Remarks
公共基础课 General Basic Courses	必修 Compulsory	69.5	1084	
	通识 General Education	10.0	160	
学科基础课 Disciplinary Basic Courses	必修 Compulsory	48.5	792	
	选修 Elective	0.0	0	
专业领域课 Specialty-related Courses	必修 Compulsory	5.0	80	
	选修 Elective	8.5	136	
合 计 Total		141.5	2252	
集中实践教学环节(周) Practice Training (Weeks)	必修 Compulsory	47.5	47.5 周	
毕业学分要求 Credits Required for Graduation	141.5+47.5=189.0			

备注：硕士阶段课程修读要求及毕业资格按照学生修读的硕士专业培养方案执行，并在校内导师和企业导师指导下修读课程和企业实习；学生本科阶段在取得专业教学计划规定学分的同时，还必须第二课堂取得 2 个人文素质教育学分和 4 个创新能力培养学分。

2. 类别统计表 (Category Registration Form)

学时 Academic Hours					学分 Credits						
总学时数 Total	其中 Include		其中 Include		总学分数 Total	其中 Include		其中 Include			其中 Include
	必修学时 Compulsory	选修学时 Elective	理论教学学时 Theory Course	实验教学学时 Lab		必修学分 Compulsory	选修学分 Elective	集中实践教学环节学分 Practice-concentrated Training	理论教学学分 Theory Course Credits	实验教学学分 Lab	创新创业教育学分 Innovation and Entrepreneurship Education
2252	1956	296	2002	250	189	170.5	18.5	47.5	133.5	8	12

三、专业教学计划表 (Teaching Schedule)

类别 Course	课程	课程名称 Course Title	是	学时数 Total Curriculum Hours	学分	开课	毕业
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Category	代码 Course No.		否必修 C/E	总学时 Class Hours	上机 Computer-aided Class Hours	实验 Lab Hours	实践 Practice Hours	数 Credits	学期 Semester	要求 Student Outcome
公共基础课 General Basic Course	143093	思想道德修养与法律基础 Cultivation of Thought and Morals & Fundamental of Law		(40) (36)				2.5	1	№8
	143091	中国近现代史纲要 Skeleton of Chinese Modern History		(32) 24				2.0	2	№8
	143106	毛泽东思想和中国特色社会主义理论体系概论 Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics		(80) 48				5.0	3	№8
	143090	马克思主义基本原理 Fundamentals of Marxism Principle		(40) 36				2.5	4	№8
	143094	形势与政策 Analysis of the Situation & Policy		(128)				2.0	1-8	№8
	152001	体育（一） Physical Education (1)		32			32	1.0	1	№12
	152002	体育（二） Physical Education (2)		32			32	1.0	2	№12
	152003	体育（三） Physical Education (3)		32			32	1.0	3	№12
	152004	体育（四） Physical Education (4)		32			32	1.0	4	№12
	106001	军事理论 Military Principle		(16)				1.0	2	№9
	144001	大学英语（一） College English(1)		64				4.0	1	№10
	144002	大学英语（二） College English(2)		64				4.0	2	№10
	145268	C++程序设计基础 Foundation of the C++ Programming Design	必修课 C	48				3.0	1	№5
	145271	面向对象程序设计 Object-Oriented Programming		32				2.0	2	№5
	140191	微积分II（一） Calculus(1)		80				5.0	1	№1,2
	140192	微积分II（二） Calculus(2)		80				5.0	2	№1,2
	140197	线性代数与解析几何 Linear Algebra & Analytic Geometry		48				3.0	1	№1,2
	140019	概率论与数理统计 Probability & Mathematical Statistics		48				3.0	2	№1,2
	145022	计算方法 Computing method		32				2.0	3	№1,2
	141005	大学物理III（一） General Physics (1)		64				4.0	2	№1,2
	141006	大学物理III（二） General Physics (2)		64				4.0	3	№1,2
	141007	大学物理实验（一） Physics Experiment(1)		32		32		1.0	2	№1,2
	141008	大学物理实验（二） Physics Experiment(2)		32		32		1.0	3	№1,2
	147045	大学化学 General Chemistry		32				2.0	1	№1,2
	147036	大学化学实验 General Chemistry Experiment		16		16		0.5	2	№1,2
	130137	画法几何及机械制图（一） Descriptive Geometry & Machine Drawing (1)		48				3.0	1	№1,2,5

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcome
				总学 时 Class Hours	上机 Computer-aided Class Hours	实验 Lab Hours	实践 Practice Hours			
	130138	画法几何及机械制图（二） Descriptive Geometry & Machine Drawing(2)		64				4.0	2	№1,2,5
		人文科学领域 Humanities Field	通 识 课 E	96				6.0		№8
		社会科学领域 Social Science Field		64				4.0		№8
		合 计 Total	必 C	1244		80	128	79.5		

备注：学生不能修读社会科学领域课管理类课程。

三、专业教学计划表（续）

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes
				总学 时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice			
学科基础课 Disciplinary Basic Courses	133100	理论力学 I Theoretical Mechanics	必 C	64				4.0	3	№1,2
	133288	材料力学 II Mechanics of Materials	必 C	72		6		4.5	4	№1,2
	135105	电工与电子技术 III Electrical Engineering and Electronic technique	必 C	80				5.0	4	№1,2
	135081	电工与电子技术实验 Experiment of Electrical Engineering and Electronic technique	必 C	32		32		1.0	5	№1,2
	130078	机械工程材料 Materials of Mechanical Engineering	必 C	40				2.5	4	№1,2
	130381	工程热力学 Engineering Thermodynamics	必 C	32				2.0	4	№1,2
	130380	流体力学 Fluid Mechanics	必 C	32				2.0	4	№1,2
	130412	传热学 Heat Transmission	必 C	32				2.0	5	№1,2
	130393	机机械工程导论 Introduction to Mechanical Engineering	必 C	16				1.0	1	№6,7
	130391	微机电系统 Micro-Electro-Mechanical Systems	必 C	16				1.0	1	№2,4
	130352	塑性加工及模具计算机技术 Plastic Forming and CAX Technology of Mold	必 C	16				1.0	2	№2,4
	130265	机械原理 III Theory of Machines and Mechanism	必 C	56				3.5	4	№1,2,3
	130263	机械设计 III Mechanical Design	必 C	56				3.5	5	№1,2,3
	130070	互换性与技术测量 Interchangeability & Measurement Technology	必 C	24				1.5	4	№1,2

	130052	测试技术 Testing Technology	必 C	40				2.5	6	№1,2,3	
	130115	微机原理及应用 Principle Application of Microcomputer	必 C	32				2.0	5	№1,2,3	
	130081	机械控制工程基础 Basis of Cybernetics	必 C	40		4		2.5	5	№1,2,3	
	130020	成型技术基础 Basis of Material Shaping Technology	必 C	56				3.5	5	№1,2,3	
	130190	机械制造技术基础 Fundamentals of machine Manufacture technology	必 C	56				3.5	6	№1,2,3	
	合 计 Total			必 C	792		38		48.5		
专业领域课 Specialty-related Courses	企业模块课程 1										
	130426	汽车产品制造质量管理 Quality Management of Automotive Product Manufacturing	必 C	48				3.0	7	№2,4,7,8	
	130427	汽车试验技术 Automobile Testing Technology	选 E	16				1.0	7	№2,4	
	130428	新能源汽车技术 New Energy Automotive Technology	选 E	16				1.0	7	№4,6,7	
	167005	汽车电子控制技术 Automobile Electronic Control Technology	选 E	16				1.0	7	№2,4	
	130429	汽车振动与噪声控制 Automobile Vibration & Noise Control	选 E	16				1.0	7	№2,4	
	130430	汽车动力总成技术 Automotive Powertrain Technology	选 E	16				1.0	7	№1,3	
	130431	汽车碰撞与安全技术 Automobile Collision & Security Technology	选 E	16				1.0	7	№2,3,4	
	企业模块课程 1										
	130432	白车身制造工艺 Manufacturing Process of Car Body	必 C	16				1.0	7	№3,6	
	130433	白车身制造自动化设备 Manufacturing Automation Equipment of Car Body	必 C	32				2.0	7	№3,6	
	130434	发动机制造装备与工艺 Engine Manufacturing Equipment & Technology	选 E	16				1.0	7	№1,2,3	
	130435	焊接工艺及焊接设备制造 Welding Process & Welding Equipment Manufacturing	选 E	16				1.0	7	№1,2,3	
	130436	激光加工原理与应用 Principle and Application of Laser Processing	选 E	32				2.0	7	№1,2,3	
	公共选修课										
	130082	机械设备数控技术 Computer numerical control machine tools (CNC)	必 C	32				2.0	6	№1,2,3	
	130193	科技情报检索 Scientific and Technical Information Retrieval	选 E	16				1.0	6	№2,5	
130054	创新思维与实践 Innovation Thought and Practice	选 E	24				1.5	6	№4,12		
130227	液压及气压传动技术 Hydraulic and Pneumatic Transmission Technology	选 E	40		4		2.5	6	№1,2,3		

	130039	机电产品市场营销学 Mechanical and Electrical Products Marketing	选 E	32				2.0	6	№6,8
	130425	企业信息化及生产管理 Enterprise Informatization & Production Management	选 E	32				2.0	5	№1,2,11
	131120	专业英语 Professional English	选 E	24				1.5	5	№10
	120003	创新研究训练 Innovation Research Training	选 E	32				2.0		№2,9,12
	120004	创新研究实践 I Innovation Research Practice 1	选 E	32				2.0		№2,9,12
	120005	创新研究实践 II Innovation Research Practice 2	选 E	32				2.0		№2,9,12
	120006	创业实践 Entrepreneurial Practice	选 E	32				2.0		№9,11,12
	合计 Total		必 C	80				5.0		
			选 E	选修课修读最低要求 8.5 学分（其中企业课程至少 4 学分） minimum elective course credits required:10.5						

备注：企业必修课程“汽车产品制造质量管理”优先安排（校内不安排管理类课程）。学生根据自己开展科研训练项目、学科竞赛、发表论文、获得专利和自主创业等情况申请折算为一定的专业选修课学分（创新研究训练、创新研究实践 I、创新研究实践 II、创业实践等创新创业课程）。每个学生累计申请为专业选修课总学分不超过 4 个学分。经学校批准认定为选修课学分的项目、竞赛等不再获得对应第二课堂的创新学分。

四、集中实践教学环节(Practice-concentrated Training)

课程代码 Course No	课程名称 Course Title	是否必修 C/E	学时数 Total Curriculum Hours		学分数 Credits	开课学期 Semester	毕业要求 Student Outcomes
			实践 Practice weeks	授课 Lecture Hours			
106002	军训 Military Training	必 C	3 周		3.0	1	№9
143197	马克思主义理论与实践 Marxism Theory and Practice	必 C	2 周		2.0	假期	№8
130357	工程训练 II Engineering Training	必 C	6 周		6.0	3 和 4	№1,9
141073	电子工艺实习 Practice of Electronic	必 C	2 周		2.0	5	№1,9
130080	机械工程材料综合实验 Comprehensive Experiment of Mechanical Engineering Materials	必 C	1 周		1.0	5	№1,9
130160	机械原理课程设计 Course Project of the Mechanisms and Machine Theory	必 C	2 周		2.0	4	№1,3
130175	机械设计课程设计 Course Project of Mechanical Design	必 C	2 周		2.0	5	№1,3
130312	机械基础综合实验 III Comprehensive Experiment of Mechanical Foundation III	必 C	1.5 周		1.5	4、5	№1,2
130178	学科基础实验课(制造) Basic Experiments for the Subject of Mechanical Manufacture	必 C	1 周		1.0	5、6	№1,2
130179	学科基础实验课(电控) Basic Experiments for the Subject of Electric Control	必 C	1 周		1.0	5、6	№1,2

130403	企业认知实习 Enterprise Cognition Practice	必 C	2 周		2.0	3、4	№6,8
130437	基于项目的设计实践 Design Practice Based on Projects	必 C	6 周		6.0	7	№3,9,0,11
130255	毕业实习 Graduation Practice	必 C	3 周		3.0	8	№3,6,9,11
130036	毕业设计（论文）（企业进行） Graduation Thesis	必 C	15 周		15.0	8	№3,4,5,7
合 计 Total		必 C	47.5 周		47.5		
		选 E	选修课修读最低要求 0 学分 minimum elective course credits required: 0				

五、第二课堂

第二课堂由人文素质教育和创新能力培养两部分组成。

1.人文素质教育基本要求

学生在取得专业教学计划规定学分的同时，还应结合自己的兴趣适当参加课外人文素质教育活动，参加活动的学分累计不少于 2 个学分。

2.创新能力培养基本要求

学生在取得本专业教学计划规定学分的同时，还必须参加国家创新创业训练计划或广东省创新创业训练计划或 SRP（学生研究计划）或百步梯攀登计划或一定时间的各类课外创新能力培养活动（如学科竞赛、学术讲座等），参加活动的学分累计不少于 4 个学分。

5.“Second Classroom” Activities

“Second Classroom” Activities are comprised of two parts, Humanities Quality Education and Innovative Ability Cultivation.

1)Basic Requirements of Humanities Quality Education

Besides gaining course credits listed in one’s subject teaching curriculum, a student is required to participate in extracurricular activities of Humanities Quality Education based on one’s interest, acquiring no less than two credits.

2)Basic Requirements of Innovative Ability Cultivation

Besides gaining course credits listed in one’s subject teaching curriculum, a student is required to participate in any one of the following activities: National Undergraduate Training Programs for Innovation and Entrepreneurship, Guangdong Undergraduate Training Programs for Innovation and Entrepreneurship, Student Research Program (SRP), One-hundred-steps Innovative Program, or any other extracurricular activities of Innovative Ability Cultivation that last a certain period of time (e.g. subject contests, academic lectures), acquiring no less than four credits.