

材料类全英创新班（本硕、本博连读）

Materials Science & Engineering (English Teaching Innovation Class)

专业代码：0804

学 制：4 年

Program Code: 0804

Duration: 4years

培养目标：

培养能坚持社会主义道路，德智体全面发展，掌握坚实宽广的自然科学及材料类基础理论知识和深入系统的材料类专业知识，具有国际竞争力、战略性创新思维、独立科研能力和组织领导才能，能够在新材料领域从事材料设计与研发、制造与应用、管理与决策等工作的拔尖人才。

Educational Objectives:

English Teaching Creative Class of Materials Science and Engineering is committed to cultivate top-notch innovative talents who can adhere to the socialist road and all-roundly develop in physique, morality and intelligence. To cultivate the leading personnel with a solid and broad theoretical basis of natural science and materials, with solid material knowledge and practical skills, with international vision, strategic innovation thinking, independent scientific research ability and organizational leadership, who will be able to conduct material design and research, manufacturing and application, management and decision-making in the field of new materials science.

毕业要求：

№1. 工程知识：掌握扎实的基础知识、专业基本原理、方法和手段，能够将数学、自然科学、工程基础和专业用于解决复杂工程问题，并接触和掌握材料行业基本营运知识，为解决企业材料工程实际复杂问题打下知识基础。

№1.1 掌握数学及其相关领域的基础理论知识，为学习专业基础课程和解决材料工程复杂问题奠定扎实的理论基础。

№1.2 掌握物理及其相关领域的基础理论知识，为学习专业基础课程和解决材料工程复杂问题奠定扎实的理论基础。

№1.3 掌握化学及其相关领域的基础理论知识，为学习专业基础课程和解决材料工程复杂问题奠定扎实的理论基础。

№1.4 掌握工程基础及其相关领域的基础理论知识，为学习本专业行业基本营运知识和解决材料工程复杂问题奠定扎实的理论基础。

№1.5 掌握本专业基础课程及其相关领域的基础理论知识，为材料设计、制造和解决材料工程复杂问题奠定扎实的理论基础。

№1.6 掌握本专业行业基本营运知识，为提升专业管理与营销能力和解决材料工程复杂问题奠定扎实的理论基础。

№2. 问题分析：能够应用数学、自然科学和工程科学的基本原理、方法和手段以及材料行业基

本营运知识，识别、表达、并通过文献研究分析材料工程中的复杂问题，以获得有效结论。

№2.1 能够应用数学基础知识深入学习专业基础课程和进行材料工程复杂问题分析、识别、表达的能力。

№2.2 能够应用物理基础知识深入学习专业基础课程和进行材料工程复杂问题分析、识别、表达的能力。

№2.3 能够应用化学基础知识深入学习专业基础课程和进行材料工程复杂问题分析、识别、表达的能力。

№2.4 能够应用工程基础知识学习本专业行业基本营运知识和进行材料工程复杂问题分析、识别、表达的能力。

№2.5 能够应用专业基础知识材料设计、制造和进行材料工程复杂问题分析、识别、表达的能力。

№2.6 能够应用材料行业基本营运知识提升专业管理与营销能力和进行材料工程复杂问题分析、识别、表达的能力。

№2.7 能够通过多种途径获取知识并分析材料工程复杂问题的能力并获得有效结论。

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

№3.1 掌握设计针对材料工程复杂工程解决方案所必须的基础知识和专业基本原理。

№3.2 掌握设计针对材料工程复杂工程解决方案所必须的专业基础知识和专业核心知识。

№3.3 掌握设计针对材料工程复杂工程解决方案所必须的工程基本技能知识和工程实践技能。

№3.4 掌握设计针对材料工程复杂工程解决方案所必须的专业工程基本技能并具备组织能力。

№3.5 掌握设计针对材料工程复杂工程解决方案所必须的专业基本实践技能和领导技能。

№3.6 掌握设计针对材料工程复杂工程解决方案所必须的综合研究技能并具备创新能力。

№3.7 了解专业相关的社会、健康、安全、法律、文化以及环境等相关知识。

№3.8 了解专业现状、发展前沿及趋势并具备国际化竞争能力。

№4. 研究：能够基于科学原理并采用科学方法对材料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。

№4.1 掌握基于科学原理并采用科学方法对材料工程复杂问题进行研究的基本方法和基本理论（数据整理和分析）。

№4.2 掌握基于科学原理并采用科学方法对材料工程复杂问题进行物理性能研究及材料结构表征、分析测试技能。

№4.3 掌握基于科学原理并采用科学方法对材料工程复杂问题进行化学性质研究及相关分析测试表征基本方法和技能。

№4.4 培养基于科学原理并采用科学方法对材料工程复杂问题进行研究并对实验结果进行整理、归纳和分析的能力。

№4.5 培养基于科学原理并采用科学方法对材料工程复杂问题的研究结果进行有效分析并获得相关结论的能力。

№4.6 具备基于科学原理并采用科学方法对材料工程复杂问题进行研究所必需的实验设计和研究能力，对实验内容有全面的认识和了解。

№5. 使用现代工具：能够针对材料工程复杂问题，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，包括对材料工程复杂问题的预测与模拟，并能够理解其局限性。

№5.1 掌握工程基本设计和测试技能。

№5.2 掌握材料工程专业基础相关仪器设备实践技能。

№5.3 掌握材料工程计算机仿真模拟设计与实践技能。

№5.4 掌握材料工程相关应用软件使用技能。

№5.5 掌握材料工程相关文献专利等信息资源的搜索技能与存储和归档。

№6. 工程与社会：能够基于材料工程相关背景知识进行合理分析，评价材料工程专业实践和材料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。

№6.1 掌握将工程相关背景知识用于材料工程技术问题分析及解决方案制定的基本知识。

№6.2 掌握用于材料工程技术问题分析及解决方案的物理、化学和结构分析测试技能。

№6.3 培养对材料工程问题进行实验设计过程全面了解的能力。

№6.4 培养材料工程师所必需的工程实验设计能力。

№6.5 培养对材料工程技术问题和实验结果进行整理、归纳和分析的能力。

№6.6 培养评价材料工程专业实践和材料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的基本能力。

№6.7 树立专业工程问题解决方案对社会、健康、安全、法律以及文化相应责任感。

№7. 环境和可持续发展：能够理解和评价针对材料工程复杂问题的专业工程实践对环境、社会可持续发展的影响。

№7.1 正确评价材料工程专业实践中的环境问题和可持续发展的基本技能。

№7.2 正确分析、认识和评价在材料工程实践中环境的影响。

№7.3 正确分析、认识和评价在材料工程实践中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。

№8.1 培养扎实的人文素质修养和社会责任感。

№8.2 培养并在实践中践行职业道德和规范。

№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。

№9.1 培养一定的团队协作能力。

№9.2 培养一定的团队领导技能。

№9.3 培养一定的管理及协调技能。

№10. 沟通：能够就材料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。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

№10.1 培养专业信息交流与沟通的技能（报告撰写，设计文档，陈述发言，中英文表达及回应指令）。

№10.2 具有基本的外语沟通与交流能力，拓广专业领域知识并发展相关的国际化视野。

№10.3 具有多学科、跨文化背景下的沟通交流技能及实践。

№10.4 培养一定的人际交往和沟通能力以及团队合作精神。

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

№11.1 掌握材料设计与制造的基本原理和方法。

№11.2 掌握材料工程管理原理的基本原理和方法。

№11.3 掌握材料工程中经济决策的基本原理和方法。

№11.4 材料工程管理与经济决策方法在本专业教育和实践中的应用。

№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。

№12.1 掌握提高自身素养的学习技能。

№12.2 掌握提高专业素质的学习技能。

№12.3 掌握主动式学习实践和自我评价的能力。

Student Outcomes:

1. Engineering Knowledge: A solid grasp of basic knowledge, basic principles, methods and means, an ability to apply knowledge of mathematics, science, engineering fundamentals and engineering specialization to solving complex engineering problems, together with well understanding of basic knowledge of materials industry operation, as a foundation for the solution to practical and complex engineering problems in the materials industry.
 - 1.1 A good grasp of basic theoretical knowledge in mathematics and other relevant fields as a solid theoretical foundation for the study of specialty-related basic courses and the solution to complex materials engineering problems.
 - 1.2 A good grasp of basic theoretical knowledge in physics, electronic, electric and other relevant fields as a solid theoretical foundation for the study of specialty-related basic courses and the solution to complex materials engineering problems.
 - 1.3 A good grasp of basic theoretical knowledge in chemistry and other relevant fields as a solid theoretical foundation for the study of specialty-related basic courses and the solution to complex materials engineering problems.
 - 1.4 A good grasp of engineering fundamentals and basic theoretical knowledge in other relevant fields as a solid theoretical foundation for the study of basic knowledge of materials industry operation and the solution to complex materials engineering problems.
 - 1.5 A good grasp of specialty-related basic courses and basic theoretical knowledge in other relevant fields as a solid theoretical foundation for materials design, manufacture and the solution to complex materials engineering problems.
 - 1.6 A good grasp of basic knowledge of materials industry operation as a solid theoretical foundation for promoting abilities of professional management and marketing, and the solution to complex materials engineering problems.
2. Problem Analysis: An ability to identify, formulate and analyze complex materials engineering problems, reaching to substantiated conclusions using basic principles, methods and means of mathematics, science, engineering and materials industry operation.
 - 2.1 An ability to further study in specialty-related basic courses, identify, formulate and analyze complex

materials engineering problems using basic knowledge of mathematics.

- 2.2 An ability to further study in specialty-related basic courses, identify, formulate and analyze complex materials engineering problems using basic knowledge of physics.
- 2.3 An ability to further study in specialty-related basic courses, identify, formulate and analyze complex materials engineering problems using basic knowledge of chemistry.
- 2.4 An ability to further study in basic knowledge of materials industry operation, identify, formulate and analyze complex materials engineering problems using basic engineering knowledge.
- 2.5 An ability to conduct materials design and manufacture, identify, formulate and analyze complex materials engineering problems using specialty-related basic knowledge.
- 2.6 An ability to promote professional management and marketing competences, identify, formulate and analyze complex materials engineering problems using basic knowledge of materials industry operation.
- 2.7 An ability to achieve knowledge through various channels for analysis of complex materials engineering problems and reaching to substantiated conclusions.
3. Design / Development Solutions: An ability to design solutions for complex materials engineering problems and innovatively design systems, components or process that meet specific needs with societal, public health, safety, legal, cultural and environmental considerations.
 - 3.1 A good grasp of basic knowledge and specialty-related fundamentals necessary for designing solutions to complex materials engineering problems
 - 3.2 A good grasp of basic and core knowledge of specialty necessary for designing solutions to complex materials engineering problems
 - 3.3 A good grasp of basic engineering technical knowledge and engineering practical skills necessary for designing solutions to complex materials engineering problems
 - 3.4 A good grasp of basic engineering skills of specialty and organizing ability necessary for designing solutions to complex materials engineering problems
 - 3.5 A good grasp of basic practical skills of specialty and leadership skills necessary for designing solutions to complex materials engineering problems
 - 3.6 A good grasp of comprehensive research skills and innovation ability necessary for designing solutions to complex materials engineering problems
 - 3.7 Comprehension of knowledge in the fields of societal, public health, safety, legal, cultural and environmental issues relevant to the specialty
 - 3.8 Understanding of the state of arts, developing trend and the frontier of the specialty, equipped with international competitiveness
4. Research: An ability to conduct investigations of complex materials engineering problems based on

scientific theories and adoption of scientific methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

- 4.1 A good grasp of the basic theories and methods for conducting investigations of complex materials engineering problems based on scientific theories and adoption of scientific methods (data sorting and analysis)
 - 4.2 A good grasp of the skills of physical properties study, materials structure characterization, analysis and testing for conducting investigations of complex materials engineering problems based on scientific theories and adoption of scientific methods
 - 4.3 A good grasp of the skills of chemical properties study, relevant analysis and testing methods for conducting investigations of complex materials engineering problems based on scientific theories and adoption of scientific methods
 - 4.4 An ability to conduct investigations of complex materials engineering problems based on scientific theories and adoption of scientific methods including experimental data sorting, conclusion and analysis.
 - 4.5 An ability to conduct investigations of complex materials engineering problems based on scientific theories and adoption of scientific methods, and carry out valid analysis to yield relevant conclusions
 - 4.6 An ability of experiment design and research necessary for conducting investigations of complex materials engineering problems based on scientific theories and adoption of scientific methods, with comprehensive understanding of experimental contents
5. Applying Modern Tools: An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities, with an understanding of the limitations
 - 5.1 A good grasp of basic engineering skills of design and testing
 - 5.2 A good grasp of practical skills of instrument relevant to materials engineering
 - 5.3 A good grasp of design and practical skills of computer simulation and modeling in materials engineering
 - 5.4 A good grasp of software application skills relevant to materials engineering
 - 5.5 An ability to search, storage and file information resources including literatures and patents relevant to materials engineering
6. Engineering and Society: An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice for the solutions to the complex materials engineering problems
 - 6.1 A good grasp of basic knowledge of applying contextual knowledge to the analysis and solution for materials engineering problems

- 6.2 A good grasp of physical, chemical and structure characterization skills applied to the analysis and solution for technical problems in materials engineering
- 6.3 An ability to comprehensively understand experiment design processing for materials engineering problems
- 6.4 An ability to design engineering experiments necessary for materials engineer
- 6.5 An ability to sort, conclude and analyze experimental data and engineering technical problems
- 6.6 An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues relevant to professional engineering practice.
- 6.7 Responsibilities in societal, health, safety, legal and cultural issues arising from solutions to professional engineering problems

7. Environment and Sustainable Development: An ability to understand and evaluate the impact of professional engineering practice for the solutions to the complex materials engineering problems in environmental and societal contexts and demonstrate knowledge of and need for sustainable development
 - 7.1 An ability to evaluate the environmental issues in the materials engineering practice and the basic skills for sustainable development
 - 7.2 An ability to analyze, understand and evaluate the impact of professional engineering practice in environmental contexts
 - 7.3 An ability to analyze, understand and evaluate the impact of professional engineering practice in societal contexts

8. Professional Standards: An understanding of humanity science and social responsibility, being able to understand and abide by professional ethics and standards responsibly in engineering practice
 - 8.1 Understanding of humanity science and social responsibility
 - 8.2 An ability to understand and abide by professional ethics and standards responsibly in engineering practice

9. Individual and Teams: An ability to function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings
 - 9.1 An ability of teamwork
 - 9.2 Skills of leadership
 - 9.3 Skills of management and coordination

10. Communication: An ability to communicate effectively on complex engineering problems with the engineering community and with society at large, such as being able to comprehend and write effective

reports and design documentation, make effective presentations, give and receive clear instructions, and communicate in cross-cultural contexts with international perspective

10.1 Skills of professional communication, including report writing, documentation design, presentation, giving and receiving bilingual instructions

10.2 An ability to communicate in foreign language with broad professional knowledge and international perspective

10.3 An ability to communicate in cross-cultural contexts

10.4 An ability of interpersonal interaction and communication with teamwork spirit

11. Project Management: Demonstrate knowledge and understanding of engineering management principles and methods of economic decision-making, to function in multidisciplinary environments

11.1 A good grasp of principles and methods of materials design and manufacture

11.2 A good grasp of principles and methods of engineering management

11.3 A good grasp of principles and methods of economic decision-making in engineering

11.4 An ability to apply engineering management principles and methods of economic decision-making in the specialty-related education and practice

12. Lifelong Learning: Recognition of the need for, and an ability to engage in independent and life-long learning with the ability to learn continuously and adapt to new developments

12.1 Study skills to improve personal qualities

12.2 Study skills to improve professional qualities

12.3 An ability of proactive study and practice along with self-evaluation

专业简介:

材料类创新班于 2009 年成立并开始招生, 2016 年改为材料类全英创新班, 由先进材料国际化示范学院负责。先进材料国际化示范学院是 2014 年, 由中国教育部和国家外国专家局一起创立的国际教育试点单位之一。先进材料国际化示范学院是依托于具有学术实力的材料科学与工程学院(材料学院)成立的。材料学院的研究领域包括光电材料和设备, 特种玻璃纤维材料和激光、电材料、功能性聚合物、橡胶和塑料、陶瓷、混凝土、生物医学材料等等, 拥有 1 个发光材料和设备的国家重点实验室和国家工程研究中心, 2 个教育部重点实验室, 以及 4 个广东省重点实验室。

Program Profile:

English Teaching Creative Class of Materials Science and Engineering is designed for training students to have profound knowledge in scientific theories, excellent skills in professional practices, innovative awareness and competence, independent research capacity, international competitive strength, enterprising spirit, and global vision. In order to achieve this goal, the school has introduced curriculum system from

famous international universities and designed all major courses taught in English. .

English Teaching Creative Class of Materials Science and Engineering belongs to International School of Materials Science and Engineering. International School of Materials Science and Engineering is part of the Network of International Centers for Education in China (NICE), which was co-launched by the State Administration of Foreign Experts Affairs of China (SAFEA) and the Ministry of Education (MOE) in 2013. Our International School of Materials Science and Engineering built on the academic strength of the School of Materials Science and Engineering (SMSE) in SCUT. SMSE conducts research in the fields of optoelectronic materials and devices, special glass fiber materials and laser, electric materials, functional polymers, rubber and plastics, ceramics and concrete, bio-medical materials, and so on. It boasts a State Key Laboratory of Luminescent Materials and Devices, a National Engineering Research Center, two Key Laboratories of Ministry of Education, and four Key Laboratories of Guangdong Province.

专业特色:

借鉴国际著名大学的教学体系，引进国际优秀教师和先进的教材，并围绕中国特色设置科学的教学和人才培养体系。在本科阶段实行“厚基础、高素质、强创新”培养，以材料微结构与性能关系的核心理论为主要专业基础，培养学生掌握传统及高新技术产业领域材料、器件及产品设计制备理论、工艺技术及检测手段，为攻读更高学历奠定坚实的基础。

Program Features:

Drawing on the teaching system of internationally renowned universities, introducing international excellent teachers and advanced teaching materials, and setting up scientific teaching and talent training system around Chinese characteristics. Implementing cultivation of "thick Foundation, high-quality, strong innovation" at the undergraduate stage. Taking the core theory of the relations between material microstructure and performance as the main professional foundation, cultivating students to grasp the theory, technology and detection method of traditional and high-tech industry materials as well as devices and product design, in order to lay a solid foundation for a higher education.

授予学位: 工学学士学位

Degree Conferred: Bachelor of Engineering

主干课程:

无机分析化学、有机化学、物理化学、固体物理、结构化学、热力学与统计物理、材料科学基础、材料物理性能、材料近代测试方法。

Core Courses:

Inorganic Analytical Chemistry, Organic Chemistry, Physical Chemistry, Solid Physics, Structural Chemistry, Thermodynamics and Statistical Physics, Materials Mechanics, Fundamentals of Materials Science, Physical Properties of Materials, Modern Methods for Materials Characterization and Analysis.

特色课程：

研究型课程： 独立研究、材料计算与模拟

讨论型课程（含新生研讨课、专题研讨课）： 迷人的材料、聚焦纳米材料、当今的材料、材料选择与设计

创新实践课程： 材料科学与工程综合实验、材料近代测试方法实验

创业教育课程： 工程中的金融与法律

Featured Courses:

Research Training: Independent research, material calculation and simulation

Seminars ((including freshman seminar, topic seminar) : Stuff Matters, Focusing Nano-material, Today's Materials, Materials Selection and Design

Innovative Practice: Comprehensive Experiments in Materials Science and Engineering, Modern Methods for Materials Characterization and Analysis

Entrepreneurship Education: Introduction of Law and Finance for Engineering

一、教学计划总体安排表 (General Teaching Schedule)

学 年	学 期	教 学 进 度 安 排 (周)																		理 论 教 学	考 试	入 学 教 育	军 训	课 程 设 计	大 作 业	工 程 训 练	电 子 实 验	综 合 实 践	社 会 实 习	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	D	D	D	14	1	1	3															19									
	2	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	Q	B	B	16	2															2	20										
二	3	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	Q	B	B	16	2															2	20										
	4	A	A	A	A	A	A	A	A	A	A	A	A	G	G	A	A	Q	B	B	15	2				2										1	20											
三	5	A	A	A	A	A	A	A	A	A	I	I	I	E	E	Q	B	B	K	K	10	2			2			3		2						1	20											
	6	A	A	A	A	A	A	A	A	A	A	A	I	I	I	Q	A	A	B	B	14	2						3									1	20										
四	7	研究生阶段学习, 并完成本科毕业设计 (论文)																		16	2																			2	20							
	8																																									3		15	2			20
		合 计 (周)																		101	13	1	3	2		2		6		2	3														15	2	9	159

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	66.0	1020	
	通识 General Education	10.0	160	
学科基础课 Disciplinary Basic Courses	必修 Compulsory	48.0	840	
	选修 Elective	8.0	128	
专业领域课 Specialty-related Courses	必修 Compulsory	2.0	32	
	选修 Elective	9.0	144	
合计 Total		143.0	2324	
集中实践教学环节 (周) Practice Training (Weeks)	必修 Compulsory	35.0	35 周 33 weeks	
毕业学分要求 Credits Required for Graduation	143.0+35.0=178.0			

备注: 1.创新班学生毕业前英语六级必须达到 426 分及以上。2.创新班的学生若放弃推免或退出但留在创新班, 其毕业所修学分不能低于普通班材料科学与工程专业学生的毕业学分。3.硕士、博士阶段课程修读要求及毕业资格按照学生修读的研究生专业培养方案执行, 第四年在导师的指导下修读相关课程。4.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
23 24	1892	432	1988	336	178	151	27	35	132.5	10.5	10.0

三、专业教学计划表 (Teaching Schedule)

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 Credits	开课学期 Semester	毕业要求 Student Outcomes
				总学时 Class Hours	上机 Computer-aided Class Hours	实验 Lab Hours	实践 Practice Hours			
公共基础课 General Basic Courses	143093	思想道德修养与法律基础 Cultivation of Thought and Morals & Fundamental of Law	必修课 C	(40) (36)				2.5	3	№8.1, 9.2, 12.1
	143091	中国近现代史纲要 Skeleton of Chinese Modern History		(32) 24				2.0	5	№ 7.1, 7.3, 10.3,
	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	4	№8.1, 9.1, 12.3
	143090	马克思主义基本原理 Fundamentals of Marxism Principle		(40) 36				2.5	6	№ 6.1, 9.2, 9.3,
	143094	形势与政策 Analysis of the Situation & Policy		(128)				2.0		№ 6.6, 6.7, 10.3
	144341	学术英语 (一) Academic English (一)		64				4.0	1	№10.2, 10.3, 10.4, 12.1
	144342	学术英语 (二) Academic English (二)		64				4.0	2	№10.2, 10.3, 10.4, 12.1
	145295	信息技术导论 Introduction of Information Technology		32				2.0	1	№ 1.3, 5.2, 5.3, 5.4, 5.5
	146107	软件技术基础 Technology Software programming		48				3.0	2	№ 2.2, 4.4, 5.2
	152001	体育 (一) Physical Education (1)		32			32	1.0	1	№ 9.1, 12.1
	152002	体育 (二) Physical Education (2)		32			32	1.0	2	№ 9.1, 12.1
	152003	体育 (三) Physical Education (3)		32			32	1.0	3	№ 9.1, 12.1
	152004	体育 (四) Physical Education (4)		32			32	1.0	4	№ 9.1, 12.1
	106001	军事理论 Military Principle		(16)				1.0	2	№9.3, 10.4

140191	微积分 II (一) Calculus (1)	80				5.0	1	№ 1.1, 2.1, 4.1
140192	微积分 II (二) Calculus (2)	80				5.0	2	№ 1.1, 2.1, 4.1
140197	线性代数与解析几何 Linear Algebra & Analytic Geometry	48				3.0	1	№ 1.1, 2.1, 4.1
140019	概率论与数理统计 Probability & Mathematical Statistics	48				3.0	2	№ 1.1, 2.1, 4.1
140015	复变函数 I Functions of Complex Variables I	32				2.0	3	№1.1,2.1
140045	数学物理方程 Mathematical Physics Equation	48				3.0	3	№1.1,1.2,2.1, 2.2
141005	大学物理III (一) General Physics (1)	64				4.0	2	№1.3, 2.2, 4.2
141006	大学物理III (二) General Physics (2)	64				4.0	3	№1.3, 2.2, 4.2
141007	大学物理实验 (一) Physics Experiment (1)	32	32			1.0	2	№ 4.2, 5.4, 6.2
141008	大学物理实验 (二) Physics Experiment (2)	32	32			1.0	3	№ 4.2, 5.4, 6.2
130009	工程制图 Engineering Drawing	48				3.0	1	№1.4, 2.5, 6.4
	人文科学领域 Humanities	96				6.0		№7.3,8.1,8.2,9.3,10.1, 11.1, 11.2, 11.3, 12.2, 12.3
	社会科学领域 Social Science	64				4.0		№7.3,8.1,8.2,9.3,10.1, 11.1,11.2,11.3,12.2, 12.3
	科学技术发展史 Development History of Science and Technology	32				2.0	5	№8.1
	工程中的金融与法律 Finance and Law in Engineering	32				2.0	3	№6.6,6.7, ,8.1,8.2, ,11.3,11.4
合 计 Total		1020	64	128		66.0		
		160				10.0		

三、专业教学计划表 (续) (Teaching Schedule)

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	147116	无机分析化学 Inorganic and Analytical Chemistry	必 C	64				4.0	1	№1.2, 2.3, 3.1
	147117	无机分析化学实验 I Inorganic and Analytical Chemistry Laboratory I	必 C	32		32		1.0	1	№4.3, 5.3
	147021	有机化学 II Organic Chemistry	必 C	64				4.0	2	№1.2, 2.3, 3.1
	147007	有机化学实验 I Organic Chemistry Experiments	必 C	32		32		1.0	2	№4.3, 5.3
	141065	热力学与统计物理 Thermodynamics statistical physics	必 C	48				3.0	5	№1.2,2.2,4.2
	133287	工程力学 I Engineering Mechanics	必 C	48				3.0	3	№1.4, 3.3, 5.1
	147056	物理化学 (一) Physical Chemistry	必 C	48				3.0	3	№1.2, 2.3, 3.1

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				
	147057	物理化学（二） Physical Chemistry	必 C	48				3.0	4	№1.2, 2.3, 3.1	
	147055	物理化学实验 II Physical Chemistry Experiment	必 C	32		32		1.0	4	№4.3, 5.3	
	136325	当今的材料（一） Materials in Today's World (1)	必 C	32				2.0	3	№1.4,1.5, , 2.2, 2.5 ,6.1,7.1,7.2, 7.3	
	136326	当今的材料（二） Materials in Today's World (2)	必 C	32				2.0	4	№1.4,1.5, , 2.2, 2.5 ,6.1,7.1,7.2, 7.3	
	136296	实验室安全规范 Laboratory Safety Specification	必 C	8				0.5	3	№6.3,6.4,6. 5,7.2,7.3,,8. 2	
	136253	材料科学基础 Fundamentals of Materials Science	必 C	64				4.0	4	№1.4, 2.5, 4.6	
	130083	机械设计基础 Basis of Mechanical Design	必 C	48				3.0	5	№1.4, 2.5, 4.6	
	130311	机械基础综合实验 II Poly-experiment of Mechanical Fundamentals	必 C	16		16		0.5	5	№5.2, 5.4	
	136085	材料物理性能 Physical Properties of Materials	必 C	48				3.0	5	№1.2,2.2	
	136327	固体物理&结构化学 Solid Physics& Structural Chemistry	必 C	48				3.0	6	№1.2,1.3,,2 .2,2.3	
	136254	材料近代测试方法 Modern Methods for Materials Characterization and Analysis	必 C	48				3.0	6	№4.1,4.4	
	136328	材料近代测试方法实验 Modern Test Methods for Materials	必 C	32		32		1.0	6	№5.1,10.1	
	136329	高分子物理与化学 Polymer Physics and Chemistry	必 C	48				3.0	4	№1.5, 2.4, 3.2	
	136330	电动力学 Quantum Electrodynamics	选 E	48				3.0	4	№1.2,2.2	
	136331	量子力学 Quantum Mechanics	选 E	48				3.0	4	№1.2,2.2	
	136206	材料成型加工基础	选 E	48				3.0	6	№6.1,6.2,6. 3,6.4	
	136332	材料选择与设计 Materials Selection and Design	选 E	32				2.0	6	№3.1,3.2,3. 3, ,4.1 ,5.1,5.2,5.3	
	136333	材料计算与模拟 Materials Calculation and Simulation	选 E	32				2.0	6	№5.1, 5.4, 12.2	
	合计 Total			必 C	840		144		48.0		
				选 E	选修课修读最低要求 8.0 学分 minimum elective course credits required:8.0						
Specialty - related Courses	136324	迷人的材料 Marvellous Materials	必 C	16				1.0	2	№1.6, 2.6, 3.2	
	136131	聚焦纳米材料 Zooming in on Nanomaterials	必 C	16				1.0	1	№1.6, 2.4, 6.6, 7.3	
	136334	光电材料 Optical Materials	选 E	32				2.0	6	№1.6, 2.4, 6.6, 7.3	
	130025	复合材料 CompositeMaterials	选 E	32				2.0	6	№1.6, 2.4, 6.6, 7.3	

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			
	136335	能源材料 Energy Materials	选 E	32				2.0	6	№1.6, 2.4, 6.6, 7.3
	136336	半导体材料 Semiconductor Materials	选 E	32				2.0	6	№1.6, 2.4, 6.6, 7.3
	136337	陶瓷材料 Ceramic Materials	选 E	32				2.0	6	№1.6, 2.4, 6.6, 7.3
	136303	高分子材料 Polymer Materials	选 E	32				2.0	6	№1.6, 2.4, 6.6, 7.3
	136338	胶体与表面化学 Surface and Colloids	选 E	32				2.0	6	№1.6, 2.4, 6.6, 7.3
	136084	粉体工程 Powder Technology	选 E	32				2.0	5	№2.5, 5.5, 7.3
	136223	薄膜材料与技术 Thin Film Materials Science and Technology	选 E	32				2.0	6	№8,9,11,12
	120003	创新研究训练 Innovation Research Training	选 E	32				2.0		№2,3,4,6,9, 10,12
	120004	创新研究实践 I Innovation Research Practice I	选 E	32				2.0		№2,3,4,6,9, 10,12
	120005	创新研究实践 II Innovation Research Practice II	选 E	32				2.0		№2,3,4,6,9, 10,12
	120006	创业实践 Entrepreneurial Practice	选 E	32				2.0		№2,3,4,6,9, 10,12
	合计 Total		必 C	32				2.0		
			选 E	选修课修读最低要求 9.0 学分 minimum elective course credits required:9.0						

备注：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	№ 8.1, 9.1, 10.4
143197	马克思主义理论与实践 Marxism Theory and Practice	必 C	2 周		2.0	假期	№ 6.6, 6.7, 9.1, 10.4
130356	工程训练 I Engineering Training	必 C	2 周		2.0	4	№ 5.5, 6.1, 6.4, 12.2
136138	认识实习 Basic Specialized Training	必 C	2 周		2.0	5	№ 3.7, 6.6, 7.2, 8.1, 8.2, 9.2
136163	毕业实习 Technical Training	必 C	3 周		3.0	8	№2.4, 5.4, 6.7, 7.1, 9.2, 12.1
130195	机械设计基础课程设计 Course Project of the Basis of Mechanical Design	必 C	2 周		2.0	5	№ 2.5, 4.6, 6.4

136339	材料科学与工程综合实验 Comprehensive Experiments in Materials Science and Engineering	必 C	3 周		3.0	5	№ 2.6, 3.6, 4.5, 6.5, 9.1, 9.2, 10.4
136330	独立研究 Independent Study	必 C	3 周		3.0	6	№ 2.6, 3.6, 4.5, 6.5, 9.1, 9.2, 10.4, 12.1, 12.3
136162	毕业设计（论文） Research (Thesis)	必 C	15 周		15.0	8	№ 3.6, 3.7, 4.4, 4.5, 4.6, 6.7, 7.2, 9.3, 10.1, 12.1, 12.3
合 计 Total		必 C	35 周		35.0		

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。

五.“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.