

高分子材料与工程

Polymer Materials & Engineering

专业代码：080407

学 制： 4 年

Program Code: 080407

Duration: 4 years

培养目标:

致力于培养能坚持社会主义道路，德智体全面发展的专业型复合人才。本专业毕业生应具有大材料学科和高分子材料学科扎实的基础知识及应用能力，具有分析问题、解决问题的实践能力；具有不断提升自身知识结构、技能和素质的终身学习能力；具有良好的职业道德和“三实一新”（基础扎实、工作踏实、作风朴实、勇于创新）的优秀品质。学生毕业后五年左右应具备：能够灵活运用相关理论并用于从事岗位工作中的产品提升，工艺改进；具备从应用目标出发对高分子材料进行成本、工艺、环保、性能和效益综合评估及材料选用的初步能力；具有对高分子材料的制备、改性及加工过程中相关的伦理、技术经济分析和管理的初步能力；具有全球化视野和熟练掌握所从事行业的发展特点和趋势的能力；培养了正确的职业道德修养和价值观，成为行业的有用人才。

Educational Objectives:

Polymer materials and engineering is committed to cultivate inter-disciplinary talents who can adhere to the socialist road and all-roundly develop in physique, morality and intelligence. The graduates have the solid basic knowledge and application ability of materials science and polymer material science, with the practical ability to analyze and solve the problem, with the lifelong learning ability to constantly improve their knowledge structure, skills and qualities, having good occupation morals and "three innovation and one new" (solid foundation, work steadily, unpretending style, innovative) excellent quality. The students graduated for five years are expected to flexibly use the relevant theories to improve the product quality and process technology; possess the ability to evaluate the cost, technology, environmental protection, comprehensive effectiveness of polymer materials and preliminary selection of materials from the application goal; possess the preliminary ability to analyze and manage the related ethics, technical economic of preparation, modification and processing process; possess the global perspective and the ability to grasp the development characteristics and trends in the industry; cultivate the occupation morals and correct values, become a useful talent in the industry. Through five years of practice, taking the innovation spirit and practical ability training system as the core, improve the quality education and innovation education, cultivate their own become a high-quality "Three Create" (innovation, creativity and entrepreneurship) international senior specialized talent.

毕业要求:

№1.工程知识：能够将数学、自然科学、工程基础和专业知识用于解决复杂工程问题。

№1.1 掌握数学及其相关领域的基础理论知识，并为解决复杂工程问题奠定扎实的理论基础。

№1.2 掌握基础化学及其相关领域的基础理论知识，并为解决复杂工程问题奠定扎实的理论基础。

№1.3 掌握物理及电子电工及其相关领域的基础理论知识，并为解决复杂工程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，并为解决复杂工程问题奠定扎实的理论基础。

№1.5 掌握专业基础课程及其相关领域的基础理论知识，并为解决复杂工程问题奠定扎实的理论基础。

№1.6 掌握专业工程基础课程及其相关领域的理论知识，并为解决复杂工程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，识别、表达、并通过文献研究分析复杂工程问题，以获得有效结论。

№2.1 能够应用数学基础知识进行工程复杂问题分析、识别、表达的能力。

№2.2 能够应用自然科学基础知识进行工程复杂问题分析、识别、表达的能力。

№2.3 能够应用化学基础知识进行工程复杂问题分析、识别、表达的能力。

№2.4 能够应用专业基础知识进行工程复杂问题分析、识别、表达的能力。

№2.5 能够应用工程基础知识进行工程复杂问题分析、识别、表达的能力。

№2.6 能够通过多种途径获取知识并分析复杂工程问题的能力并获得有效结论。

№3.设计/开发解决方案：能够设计针对复杂工程问题的解决方案，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 掌握设计针对复杂工程问题解决方案的从事专业工程工作所必须的专业基础知识。

№3.2 掌握设计针对复杂工程问题解决方案的从事专业工程工作所必须的专业核心知识。

№3.3 掌握设计针对复杂工程问题解决方案的从事专业工程工作所必须的工程基本技能知识和工程实践技能。

№3.4 掌握设计针对复杂工程问题解决方案的从事专业工程工作所必须的专业工程基本技能。

№3.5 掌握设计针对复杂工程问题解决方案的从事专业工程工作所必须的专业基本实践技能。

№3.6 掌握设计针对复杂工程问题解决方案的从事专业工程工作所必需的综合研究技能。

№3.7 了解专业现状，发展前沿及趋势。

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

№4.1 掌握基于科学原理并采用科学方法对复杂工程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复杂工程问题进行研究物理及材料结构表征、分析测试技能。

№4.3 掌握基于科学原理并采用科学方法对复杂工程问题进行研究化学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复杂工程问题进行研究对实验结果具有整理、归纳和分析的能力。

№4.5 对基于科学原理并采用科学方法对复杂工程问题进行研究的结果进行有效分析并获得相关结论。

№4.6 具备基于科学原理并采用科学方法对复杂工程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 and 了解。

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

№5.1 掌握基本设计和测试技能。

№5.2 工程设计实践技能。

№5.3 专业基础化学实践技能。

№5.4 用于解决复杂工程技术问题的基本技能。

№5.5 用于解决复杂工程技术问题的综合技能。

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

№6.1 掌握将工程相关背景知识用于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 培养对工程问题进行实验设计过程的全面了解。

№6.4 具备工程师所必需的工程实验设计能力。

№6.5 培养对工程技术问题和实验结果具有整理、归纳和分析的能力。

№6.6 培养评价专业工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响的基本能力。

№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复杂工程问题的工程实践对环境、社会可持续发展的影响。

№7.1 正确评价工程实践中的环境和社会可持续发展的基本技能。

№7.2 正确的分析、认识和评价在复杂工程实践中的环境影响。

№7.3 正确的分析、认识和评价在复杂工程实践中的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：能够就复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

№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，表达及回应指令）。

№10.2 具有专业领域知识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，团队合作精神。

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

№11.1 掌握工程管理原理的基本原理和方法。

№11.2 掌握工程中经济决策的基本原理和方法。

№11.3 工程管理与经济决策方法在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 学习实践和自我评价。

Student Outcomes:

№1.Engineering Knowledge: An ability to apply knowledge of mathematics, science, engineering fundamentals and engineering specialization to the solution of complex engineering problems.

1.1 Master the basic theoretical knowledge of mathematics and its related fields, and lay a solid theoretical foundation for solving complex engineering problems.

1.2 Master the basic theoretical knowledge of chemistry and its related fields, and lay a solid theoretical foundation for solving complex engineering problems.

1.3 Master the basic theoretical knowledge of physical and electronic related fields, and lay a solid theoretical foundation for solving complex engineering problems.

1.4 Master the basic theoretical knowledge of engineering and its related fields, and lay a solid theoretical foundation for solving complex engineering problems.

1.5 Master the basic theoretical knowledge of professional foundation courses and its related fields, and lay a solid theoretical foundation for solving complex engineering problems.

1.6 Master the basic theoretical knowledge of professional engineering foundation courses and its related fields, and lay a solid theoretical foundation for solving complex engineering problems.

№2.Problem Analysis: An ability to identify, formulate and analyze complex engineering problems, reaching to substantiated conclusions using basic principles of mathematics, science, and engineering.

2.1 The ability to apply basic mathematical knowledge to analyze, identify and express engineering complex problems.

2.2 The ability to apply basic natural science knowledge to analyze, identify and express engineering complex problems.

2.3 The ability to apply basic chemistry knowledge to analyze, identify and express engineering complex problems.

2.4 The ability to apply basic professional knowledge to analyze, identify and express engineering complex problems.

2.5 The ability to apply basic engineering knowledge to analyze, identify and express engineering complex problems.

2.6 The ability to acquire knowledge and analyze complex engineering problems through a variety of ways and to obtain effective conclusions.

№3.Design / Development Solutions: An ability to design solutions for complex 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 Master the basic knowledge related to the major necessary to design professional engineering work for complex engineering problem solutions.
- 3.2 Master the core knowledge related to the major necessary to design professional engineering work for complex engineering problem solutions.
- 3.3 Master the basic skills and engineering skills necessary to work in a professional engineering work for complex engineering problem solutions.
- 3.4 Master the basic skills necessary for professional engineering work in the design of complex engineering problem solutions.
- 3.5 Master the basic skills necessary for professional practicing work in the design of complex engineering problem solutions.
- 3.6 Master the necessary comprehensive research skills for the design of complex engineering problem solutions for professional engineering work.
- 3.7 Understand the professional status, front development and trends.

№4.Research: An ability to conduct investigations of complex engineering problems based on scientific theories and adopting scientific methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

- 4.1 Master the basic method and basic theory (data collation and analysis) of scientific research on complex engineering problems based on scientific principles and scientific methods.
- 4.2 Master the scientific principles and scientific methods of complex engineering issues to study the physical and material structure of the characterization, analysis and testing skills.
- 4.3 Master the scientific principles and scientific methods of complex engineering issues to study the chemical analysis of test and characterization of basic methods and skills.
- 4.4 Cultivate the ability to induct and analyze results of experiments based on scientific principles and scientific methods, in order to study on complex engineering issues.
- 4.5 Cultivate the ability to study and analyze complex engineering problems based on the results of scientific principles and the use scientific methods, to obtain the relevant conclusions.
- 4.6 Cultivate the ability to study and design experiments based on scientific principles and scientific methods, to have a comprehensive knowledge and understanding for experimental content.

№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 Master the skills of basic design and testing.
- 5.2 Master the skills of engineering design and its practice.
- 5.3 Master the skills of basic chemistry and its practice.

5.4 Master the basic skills to solve complex engineering and technical problems.

5.5 Master the comprehensive skills to solve complex engineering and technical problems.

№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.

6.1 Master the engineering background knowledge to apply in analyzing engineering technical problems and developing a solution.

6.2 Master the physical, chemical and structural analysis and testing skills for analyzing and solving engineering problems.

6.3 Develop a comprehensive understanding of the engineering design process.

6.4 Master necessary engineering design capabilities for an engineer.

6.5 Cultivate the ability to organize, summarize and analyze engineering problems and experimental results.

6.6 Develop basic competencies that evaluating the impact of professional engineering practice and complex engineering problem solutions on society, health, safety, law and culture.

6.7 Establish a corresponding sense of responsibility for society, health, safety, law and culture when making professional engineering problem solutions.

№7.Environment and Sustainable Development: An ability to understand and evaluate the impact of professional engineering solutions in environmental and societal contexts and demonstrate knowledge of and need for sustainable development.

7.1 An ability to correctly evaluate environmental problems and social sustainable development in engineering practice.

7.2 An ability to correctly analyze, understand and evaluate the environmental impacts of complex engineering practice.

7.3 An ability to correctly analyze, understand and evaluate the impact on social sustainable development in complex engineering practice.

№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 Cultivate a solid humanistic accomplishment and social responsibility.

8.2 Cultivate and fulfill professional ethics and norms in 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 Cultivate a certain team collaboration skills.

9.2 Cultivate a certain team leadership skills.

9.3 Cultivate a certain management and coordination skills.

№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 An ability to exchange professional information and communicate (writing reports, designing submissions, delivering presentations, articulating and responding to directives).

10.2 Master an international perspective of the development related to the field of professional knowledge.

10.3 Master the skills of communicating and practicing in a multidisciplinary and cross-cultural background.

10.4 Cultivate a certain degree of interpersonal skills, communication skills and team 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 Master the basic principles and methods of engineering management.

11.2 Master the basic principles and methods of economic decision-making in engineering.

11.3 Master the application of engineering management and economic decision-making methods in professional education and practice.

№12. Lifelong Learning: A 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 Master the learning skills to improve their own literacy.

12.2 Master the learning skills to improve the professional quality.

12.3 Master the skills of practicing and self-evaluation.

专业简介:

高分子材料与工程专业具有悠久的办学历史和国内一流的水平。本专业的前身是华南工学院 1952 年成立的全国首家橡胶专业，1958 年成立的全国首批高分子化工专业和化学纤维专业，1997 年合并为“高分子材料与工程”专业。目前它不仅覆盖了三大高分子材料：塑料、纤维、橡胶以及传统的粘合剂、涂料、非织造布等科学与技术的教学与科研，同时还发展了新兴学科和交叉学科方向，如高分子光电材料与器件、高分子功能材料、生物医用材料和环境友好材料等内容。本专业以高分子合成、结构与性能、成型加工为核心课程，坚持优化和完善实践教学，工程实践结合率高，注重学生三创能力的培养。本专业师资力量雄厚，结构合理，有专任教师 70 多人，95% 的教师具有博士学位。与本专业实验教学相关的学校基础实验室总面积达 17044 平方米，本专业所在的实验教学分中心有 1308 平方米，生均使用面积约为 2.725 平方米。与校外企业单位联合建立了 27 家实习实践基地，包括了塑料，橡胶，纤维，涂料，粘合剂，光电，功能材料等高分子传统领域和新材料领域。

Program Profile:

Polymer materials and engineering has a long history and ranks in the domestic first-class level. The predecessor of this major consists of the country's first major of rubbers set up by South China Institute of Technology in 1952, and the first batch of polymer chemical engineering and chemical fibers set up in 1958, which were merged into Polymer Materials and Engineering in 1997. At present, it not only covers the teaching and research of major polymer materials: plastic, fiber, rubber, traditional adhesives, coatings and nonwovens technology, but also the development of new disciplines and interdisciplinary direction, such as polymer optoelectronic materials and devices, polymer functional materials, biomedical materials and environmentally friendly materials and so on. This major takes polymer synthesis, structure and performance, molding processing as the core curriculum, adheres to optimize and improve the practice of teaching with a high rate of engineering practice, and focuses on cultivating students' ability of 'Three Creative Ability'. The professional teachers strength is strong, reasonable structure. There are 74 full-time teachers, including two academician of the Chinese Academy of Sciences, three Changjiang Scholar professors, three 973 chief scientists, six teachers obtained the National Natural Science Fund for Distinguished Youth Fund, two teachers selected as Youth Thousand Talents program, 11 teachers obtained the Ministry of Education (New cross century) personnel, One National Excellent Teacher, One Guangdong Excellent Teacher, Five Pearl River Scholar professors. 47% of the total teachers have the senior professional post, 38% of the teachers have senior vice title, 95% of the teachers have doctoral degree. The total area of the related experimental teaching laboratory is 17044 m². The experimental teaching center is 1308 m², the average area per student is 2.725 m². And we have 27 internship practice base outside SCUT, including plastics, rubber, fiber, coatings, adhesives, photoelectric functional materials etc. in traditional polymer and new materials. Adhering to the advantages of the personnel training of traditional polymer materials, we promote the high-tech materials merge with each other, and broaden field of the major, in order to expand the employment areas of graduates and to lay a solid foundation on their pursuing in higher education. Through the study, students will acquire the knowledge of polymer materials' composition and the regulate of structure and performance, master the basic theory and skills of polymer materials and its processing, as well as materials research methods and modern testing technology, with the ability to apply materials science basic theory and skills into new materials research and technology development. After graduation, students can engage in scientific research, teaching, technical development, further study or related management in the fields of polymer and related materials.

专业特色:

本专业具有悠久的办学历史和国内一流的水平，是教育部高等学校特色专业、广东省名牌专业，通过中国工程教育认证。在橡胶加工与改性、高分子溶液与凝胶、建筑工程高分子、海洋工程高分子、发光高分子材料与器件等方向处于国内领先地位。

Program Features:

This major with a long history and ranking in the domestic first-class level, is the Characteristic Major of Institution of Higher Learning of the Ministry of Education, Famous Major in Guangdong Province, and is qualified with the Chinese Engineering Education Certification. We are in the domestic leading position in the aspects of rubber processing & modification, polymer solution & gel, construction engineering polymers, marine engineering polymers, optoelectronic polymer materials & devices, and so on.

授予学位：工学学士学位

Degree Conferred: Bachelor of Engineering

主干课程：

无机化学、有机化学、物理化学、高分子化学、高分子物理、高分子材料成型加工基础。

Core Courses:

Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Polymer Chemistry, Polymer Physics, Polymer Materials Processing

特色课程：

双语教学课程：高分子物理、高分子化学

全英语教学课程：高分子化学进展、高分子物理进展

本研共享课程：高分子化学进展、高分子物理进展、高分子光化学与光物理、高等有机合成实验

本研贯通课程：高分子近代测试、聚物流变学

综合性实验课程：高分子化学综合实验、高分子物理实验综合课程、高分子加工及设计性实验

新生研讨课：高分子与现代生活

创业教育课程：先进材料产业模式与创新发展的

专业技能培训课程：科技论文写作、高等有机合成实验

Featured Courses:

Bilingual Courses: Polymer Physics, Polymer Chemistry,

Courses Taught in English: Progress in Polymer Chemistry, Progress in Polymer Physics

Baccalaureate-Master's Shared Courses: Progress in Polymer Chemistry, Progress in Polymer Physics, Polymer Photochemistry and Photophysics, Advanced Organic Synthesis Experiment

Baccalaureate-Master's Integrated Courses:

Research Courses: Polymer Modern Testing Technology, Polymer Rheology

Comprehensive Experimental Courses: Comprehensive Experiment of Polymer Chemistry, Comprehensive Experiment of Polymer Physics, Polymer Processing and Design Experiment

Freshmen Seminars: Polymers and Modern Life

Entrepreneurship Courses: Advanced Material Industry Model and Innovation Development

Professional Skills Training Courses: Scientific Paper Writing, Advanced Organic Synthesis Experiment

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 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 | 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 | K | K | B | B | 16 | 2 | | | | | | | | | | | | | 2 | 20 | | | | |
| | 4 | A | A | A | A | A | A | A | A | A | A | A | G | G | A | A | Q | Q | B | B | 14 | 2 | | | | | 2 | | | | | | | | | 20 | | | | |
| 三 | 5 | A | A | A | A | A | A | A | A | A | A | A | A | A | A | Q | E | E | B | B | 15 | 2 | | | 2 | | | | | | | | | | 1 | 20 | | | | |
| | 6 | A | A | A | A | A | A | A | A | A | A | A | A | A | A | N | I | I | B | B | 15 | 2 | | | | | | | | | | | | | 1 | 20 | | | | |
| 四 | 7 | A | A | A | A | A | A | A | B | B | I | I | I | Q | O | O | O | O | O | 8 | 2 | | | | | | | | | | | | | 5 | 1 | 20 | | | | |
| | 8 | L | L | L | L | L | O | O | O | O | O | O | O | O | O | Q | Q | P | P | P | | | | | | | | | | | | | | | | 10 | 3 | 2 | 20 | |
| 合 计 (周) | | | | | | | | | | | | | | | | | | 98 | 13 | 1 | 3 | 2 | | 2 | | 6 | | 2 | 5 | | 1 | 15 | 3 | 8 | | | 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 | 60.0 | 924 | |
| | 通识 General Education | 10.0 | 160 | |
| 学科基础课 Disciplinary Basic Courses | 必修 Compulsory | 45.0 | 784 | |
| | 选修 Elective | 7.0 | 112 | |
| 专业领域课 Specialty-related Courses | 必修 Compulsory | 4.0 | 64 | |
| | 选修 Elective | 12.0 | 192 | |
| 合 计 Total | | 138.0 | 2236 | |
| 集中实践教学环节 (周) Practice Training (Weeks) | 必修 Compulsory | 39.0 | 39 周 | |
| 毕业学分要求 Credits Required for Graduation | 138.0+39.0=177.0 | | | |

备注：学生在取得专业教学计划规定学分的同时，还必须取得第二课堂 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 | 其中 Include | 其中 Include | 总 | 其中 Include | 其中 Include | 其中 Include |
| | | | | | | |

| | | | | | | | | | | | |
|--------------|--------------------|------------------|-------------------------|---------------|--------------|--------------------|------------------|--|---------------------------------|---------------|---|
| 学时数 Total | 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 | 学分数 Total | 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 |
| 2236 | 1772 | 464 | 1902 | 334 | 177 | 148 | 29 | 39.0 | 127.5 | 10.5 | 13.0 |

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 | 2 | No 8.1, 9.2, 12.1 |
| | 143091 | 中国近现代史纲要 Skeleton of Chinese Modern History | | (32) 24 | | | | 2.0 | 1 | No 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 | No 8.1, 9.1, 12.3 |
| | 143090 | 马克思主义基本原理 Fundamentals of Marxism Principle | | (40) 36 | | | | 2.5 | 3 | No 6.1, 9.2, 9.3, |
| | 143094 | 形势与政策 Analysis of the Situation & Policy | | (128) | | | | 2.0 | 1-8 | No 6.6, 6.7, 10.3 |
| | 144001 | 大学英语(一) College English(1) | | 64 | | | | 4.0 | 1 | No 10.2, 10.3, 10.4, 12.1 |
| | 144002 | 大学英语(二) College English(2) | | 64 | | | | 4.0 | 2 | No 10.2, 10.3, 10.4, 12.1 |
| | 145223 | 大学计算机基础 Foundations of Computer | | 32 | | | | 2.0 | 1 | No 1.3, 5.2, 5.3, 5.4, 5.5 |
| | 145269 | VB 语言程序设计 VB Language Programming | | 48 | | | | 3.0 | 2 | No 2.2, 4.4, 5.2 |
| | 152001 | 体育(一) Physical Education (1) | | 32 | | | 32 | 1.0 | 1 | No 9.1, 12.1 |
| | 152002 | 体育(二) Physical Education (2) | | 32 | | | 32 | 1.0 | 2 | No 9.1, 12.1 |
| | 152003 | 体育(三) Physical Education (3) | | 32 | | | 32 | 1.0 | 3 | No 9.1, 12.1 |
| | 152004 | 体育(四) Physical Education (4) | | 32 | | | 32 | 1.0 | 4 | No 9.1, 12.1 |
| | 106001 | 军事理论 Military Principle | | (16) | | | | 1.0 | 2 | No 9.3, 10.4 |
| | 140189 | 微积分 I (一) Calculus I (1) | | 80 | | | | 5.0 | 1 | No 1.1, 2.1, 4.1 |
| | 140190 | 微积分 I (二) Calculus I (2) | | 64 | | | | 4.0 | 2 | No 1.1, 2.1, 4.1 |
| | 140197 | 线性代数与解析几何 Linear Algebra & Analytic Geometry | | 48 | | | | 3.0 | 1 | No 1.1, 2.1, 4.1 |
| | 140019 | 概率论与数理统计 Probability & Mathematical Statistics | | 48 | | | | 3.0 | 2 | No 1.1, 2.1, 4.1 |

| | | | | | | | | | |
|----------------------------|---|-------|------|--|----|-----|------|---|--|
| 141001 | 大学物理 I (一) General Physics I (1) | | 48 | | | | 3.0 | 2 | № 1.3, 2.2, 4.2 |
| 141002 | 大学物理 I (二) General Physics I (2) | | 48 | | | | 3.0 | 3 | № 1.3, 2.2, 4.2 |
| 141007 | 大学物理实验 (一) College Physical Experiment (1) | | 32 | | 32 | | 1.0 | 2 | № 4.2, 5.4, 6.2 |
| 141008 | 大学物理实验 (二) College Physical Experiment (2) | | 32 | | 32 | | 1.0 | 3 | № 4.2, 5.4, 6.2 |
| 130139 | 工程制图 (一) Engineering Drawing (1) | | 48 | | | | 3.0 | 1 | № 1.4, 2.5, 6.4 |
| 130140 | 工程制图 (二) Engineering Drawing (2) | | 32 | | | | 2.0 | 2 | № 1.4, 2.5, 6.4 |
| | 人文科学领域 Humanities | 通识课 E | 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 |
| 合 计 Total | | | 1084 | | 64 | 128 | 70.0 | | |

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-aided Class Hours | 实 验 Lab Hours | 实 践 Practice | | | |
| 学科基础课 Disciplinary Basic Courses | 136018 | 材料科学与工程导论 Introduction to Materials Science and Engineering | 必 C | 16 | | | | 1.0 | 1 | № 1.5, 8.1, 10.2, 10.3 |
| | 147005 | 无机化学III Inorganic Chemistry III | 必 C | 48 | | | | 3.0 | 1 | № 1.2, 2.3, 3.1 |
| | 147003 | 无机化学实验 I Experiment of Inorganic Chemistry I | 必 C | 16 | | 16 | | 0.5 | 1 | № 4.3, 5.3 |
| | 136360 | 有机化学 (一) Organic Chemistry (1) | 必 C | 64 | | | | 4.0 | 3 | № 1.2, 2.3, 3.1 |
| | 136361 | 有机化学 (二) Organic Chemistry (2) | 必 C | 48 | | | | 3.0 | 4 | № 1.2, 2.3, 3.1 |
| | 147007 | 有机化学实验 I Organic Chemistry Experiment I | 必 C | 32 | | 32 | | 1.0 | 3 | № 4.3, 5.3 |
| | 136362 | 物理化学 (一) Physical Chemistry (1) | 必 C | 64 | | | | 4.0 | 3 | № 1.2, 2.3, 3.1 |
| | 136363 | 物理化学 (二) Physical Chemistry (2) | 必 C | 48 | | | | 3.0 | 4 | № 1.2, 2.3, 3.1 |
| | 147012 | 物理化学实验 I Physical Chemistry Experiment I | 必 C | 16 | | 16 | | 0.5 | 4 | № 4.3, 5.3 |
| | 133091 | 工程力学 I Engineering Mechanics I | 必 C | 48 | | | | 3.0 | 4 | № 1.4, 3.3, 5.1 |

| | | | | | | | | | |
|--------|--|--------|----|--|----|--|-----|---|--------------------------------------|
| 135026 | 电工与电子技术 I Electrical Engineering and Electrotechnics I | 必 C | 72 | | 24 | | 4.0 | 4 | № 1.3, 3.4, 3.5, 5.1, 5.2, 6.1 |
| 130083 | 机械设计基础 Fundamentals 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 II | 必 C | 16 | | 16 | | 0.5 | 5 | № 5.2, 5.4 |
| 136115 | 流体力学与传热 II Fluid Mechanics and Heat Transfer II | 必 C | 48 | | | | 3.0 | 5 | № 1.6, 3.3, 3.5 |
| 137021 | 传质与分离工程 II Mass Transfer and Separation Process II | 必 C | 40 | | | | 2.5 | 6 | № 1.6, 3.3, 3.5 |
| 137063 | 化工原理实验 (一) Experiment of Chemical Engineering Principles (1) | 必 C | 16 | | 16 | | 0.5 | 5 | № 6.2, 6.3 |
| 137064 | 化工原理实验 (二) Experiment of Chemical Engineering Principles (2) | 必 C | 16 | | 16 | | 0.5 | 6 | № 6.2, 6.3 |
| 136155 | 高分子化学 Polymer Chemistry | 必 C | 64 | | | | 4.0 | 5 | № 1.5, 2.4, 3.2 |
| 136156 | 高分子物理 Polymer Physics | 必 C | 64 | | | | 4.0 | 5 | № 1.5, 2.4, 3.2 |
| 136369 | 高分子与现代生活 Polymers and Modern Life | 选 E | 16 | | | | 1.0 | 1 | № 1.6, 2.4, 6.6, 9.1 |
| | 高分子科学与工程进展 Progress of Polymer Science and Engineering | 选 E | 32 | | | | 2.0 | 6 | № 1.6, 2.4, 6.6, 10.2, 10.3 |
| 136366 | 结晶化学 Crystal Chemistry | 选 E | 32 | | | | 2.0 | 4 | № 1.2, 2.2 3.1 |
| 136370 | 专业英语阅读与写作 Scientific English Reading and Writing | 选 E | 32 | | | | 2.0 | 6 | № 10.2, 10.3, 12.2 |
| 136053 | 化工仪表及自动化 Chemical Instrument and Automation | 选 E | 32 | | | | 2.0 | 7 | № 3.1, 5.1, 5.4 |
| 130240 | 计算机技术在材料加工中的应用 Application of Computer Technology in Material Processing | 选 E | 32 | | 6 | | 2.0 | 6 | № 5.1, 5.4, 12.2 |
| 136041 | 绿色化学导论 Introduction to Green Chemistry | 选 E | 32 | | | | 2.0 | 6 | № 1.2, 7.1, 7.3 |

| | | | | | | | | | | |
|------------------------------------|----------------------------|--|-------------|---|--|-----|--|------|---|--------------------------------|
| | 170195 | 生物化学与分子生物学 Biochemistry and Molecular Biology | 选 E | 32 | | | | 2.0 | 2 | № 1.2, 2.2 3.1, 6.6, 6.7 |
| | 合 计 Total | | 必 C | 784 | | 142 | | 45.0 | | |
| | | | 选 E | 选修课修读最低要求 7.0 学分 minimum elective course credits required: 7.0 | | | | | | |
| 专业领域课 Specialty-related Courses | 136049 | 高分子材料成型加工基础 Polymer Materials Processing | 必 C | 64 | | | | 4.0 | 6 | № 1.6, 2.6, 3.2 |
| | 136193 | 高分子近代测试 Polymer Modern Testing Technology | 限 选 E | 48 | | | | 3.0 | 6 | № 3.4, 4.2, 5.1 |
| | 136371 | 聚合物反应工程基础 Fundamentals of Polymer Reaction Engineering | 限 选 E | 32 | | | | 2.0 | 7 | № 1.5, 2.4, 3.2 |
| | 136030 | 高分子材料成型加工设备 The equipment of Polymer Material Processing | 选 E | 32 | | | | 2.0 | 6 | № 3.4, 5.5, 6.3 |
| | 136031 | 高分子成型模具设计 The Design of Polymer Material Processing Mold | 选 E | 32 | | | | 2.0 | 6 | № 2.5, 5.5, 6.1 |
| | 136023 | 聚合物复合材料 Polymer Composites | 选 E | 32 | | | | 2.0 | 6 | № 1.6, 2.4, 6.6, 7.3 |
| | 136372 | 橡塑制品设计与制造 Design and Manufacture of Rubber Products | 选 E | 32 | | | | 2.0 | 6 | № 2.5, 5.5, 7.3 |
| | 136373 | 高性能聚合物 High-Performance Polymer | 选 E | 32 | | | | 2.0 | 6 | № 1.6, 2.4, 6.6, 7.3 |
| | | 涂料与胶粘剂 Coatings and Adhesives | 选 E | 32 | | | | 2.0 | 6 | № 2.5, 5.5, 7.3 |
| | 136374 | 功能高分子 Functional Polymeric Materials | 选 E | 32 | | | | 2.0 | 6 | № 1.6, 2.4, 6.6, 7.3 |
| | | 聚物流变学 Polymer Rheology | 选 E | 32 | | | | 2.0 | 6 | № 1.5, 2.4, 4.2, 4.5 |
| | | 高分子光化学与光物理 Polymer Photochemistry and Photophysics | 选 E | 32 | | | | 2.0 | 5 | № 1.5, 2.4, 3.2, 7.3 |
| | 136375 | 高分子化学进展 Progress in Polymer Chemistry | 选 E | 32 | | | | 2.0 | 6 | № 2.4, 6.6, 10.2, 12.2 |
| | 136376 | 高分子物理进展 Progress in Polymer Physics | 选 E | 32 | | | | 2.0 | 7 | № 2.4, 6.6, 10.2, 12.2 |
| | 130106 | 金属塑性成形原理 Principle of Metal Plastic Shaping | 选 E | 32 | | | | 2.0 | 7 | № 1.4, 2.5, 3.6 |

| | | | | | | | | | |
|----------------------------|---|--------|---|--|--|--|-----|---|--|
| 136298 | 先进材料产业模式与创新发 展 Advanced Material Industry Model and Innovation Development | 选 E | 32 | | | | 2.0 | 4 | № 8.2, 9.1, 9.2, 9.3, 11.3, 12.3 |
| 120003 | 创新研究训练 Innovation Research Training | 选 E | 32 | | | | 2.0 | | № 8.2, 9.1, 10.1, 10.4, 12.1 |
| 120004 | 创新研究实践 I Innovation Research Practice I | 选 E | 32 | | | | 2.0 | | № 8.2, 9.1, 10.1, 10.4, 12.1 |
| 120005 | 创新研究实践 II Innovation Research Practice II | 选 E | 32 | | | | 2.0 | | № 8.2, 9.1, 10.1, 10.4, 12.1 |
| 120006 | 创业实践 Entrepreneurial Practice | 选 E | 32 | | | | 2.0 | | № 8.2, 9.1, 10.1, 10.4, 12.1 |
| 合 计 Total | | 必 C | 64 | | | | 4.0 | | |
| | | 选 E | 选修课修读最低要求 12.0 学分 minimum elective course credits required: 12.0 | | | | | | |

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 I | 必 C | 2 周 | | 2.0 | 4 | № 5.5, 6.1, 6.4, 12.2 |
| 136138 | 认识实习 Perceptual Practice | 必 C | 2 周 | | 2.0 | 3 | № 3.7, 6.6, 7.2, 8.1, 8.2, 9.2 |
| 136163 | 毕业实习 Graduation Practice | 必 C | 4 周 | | 4.0 | 8 | № 2.4, 5.4, 6.7, 7.1, 9.2, 12.1 |
| 136026 | 高分子化学综合实验 Comprehensive Experiment of Polymer Chemistry | 必 C | 3 周 | | 3.0 | 6 | № 2.6, 3.6, 4.5, 6.5, 9.1, 9.2, 10.4 |
| 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 |
| 136021 | 高分子物理综合实验 Comprehensive Experiment of Polymer Physics | 必 C | 3 周 | | 3.0 | 7 | № 2.6, 3.6, 4.5, 6.5, 9.1, 9.2, 10.4 |

| | | | | | | | |
|----------------------------|---|--------|------|--|------|-----|---|
| 136377 | 高分子加工及设计性实验 Polymer Processing and Design Experiment | 必 C | 3 周 | | 3.0 | 7 | № 2.6, 3.6, 4.5, 6.5, 9.1, 9.2, 10.4 |
| 136368 | 高等有机合成实验 Advanced Organic Synthesis Experiment | 选 E | 4 周 | | 4.0 | 7 | № 2.6, 3.6, 4.5, 6.5, 9.1, 9.2, 10.4 |
| 136162 | 毕业论文 Graduation Project | 必 C | 15 周 | | 15.0 | 7/8 | № 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 | 39 周 | | 39.0 | | |

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.