# 材料化学 2021 版本科培养方案
# Undergraduate Education Plan for Specialty in Materials Chemistry (2021)

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| 专业名称<br>Major | 材料化学<br>Materials Chemistry | 主干学科<br>Major Disciplines | 材料科学，化学<br>Materials science, Chemistry |
| 计划学制<br>Duration | 四 年<br>4 Years | 授予学位<br>Degree Granted | 工学学士<br>Bachelor of Engineering |
| 所属大类<br>Disciplinary | 材料类<br>Materials | 大类培养年限<br>Duration | 1 年<br>1 year |

**最低毕业学分规定**
**Graduation Credit Criteria**

| **课程分类 Course Classification 课程性质 Course Nature** | 公共基础课程 Public Basic Courses | 通识教育课程 Public Courses | 大类课程 Basic Courses in General Discipline | 专业教育课程 Specialized Courses | 个性课程 Personalized Course | 集中性实践教学环节 Specialized Practice Schedule | 课外学分 Study Credit after Class | 总学分 Total Credits |
|---|---|---|---|---|---|---|---|---|
| 必修课 Required Courses | 31 | \ | 25 | 53 | \ | 18 | 10 | 180.0 |
| 选修课 Elective Courses | \ | 9 | \ | 18 | 6 | \ | 10 | |

## 一、 培养目标与毕业要求
## Ⅰ Educational Objectives &Requirement
### （一） 培养目标

培养具有良好的社会责任感、人文社科素养和职业道德，具有扎实的化学、数理和其它自然科学知识，系统掌握现代材料领域的材料科学、材料化学、工程应用的多学科多领域知识，具有团队精神、创新能力和国际视野，能够在新材料、新能源、信息、通讯、环保等领域，从事材料与工艺设计、材料合成与制备、材料服役行为分析与控制、材料改性、新材料新器件研发与生产、应用系统集成及经营管理等工作的高层次科学研究与工程技术人才，成为德智体美劳全面发展的社会主义事业合格建设者和可靠接班人。

本专业期待毕业生五年后能达成下列目标：

（1）身心健康，具备良好的敬业精神、社会责任感和职业道德，关注社会问题，具有质量意识、环境意识和安全意识。（基本素质）

（2）具备解决材料化学及相关领域复杂工程问题的能力，能够胜任材料与工艺设计、材料合成与制备、材料服役行为分析与控制、材料改性、新材料新器件研发与生产、应用系统集成及经营管理等工作。（专业技能）

（3）在新材料、新能源、信息、通讯、环保等领域具有社会竞争力。（服务领域）

（4）具有良好的表达能力、交流沟通能力以及良好的团队意识和合作精神，在团队中具有协调和领导能力。（社会能力）

（5）具有创新精神、创新能力和国际视野，坚持终身学习与自我完善，跟踪材料化学、相关交叉学科及行业领域发展动态，并有能力服务社会。（自我发展）

**I　Education Objectives**

The training plan aims at fostering students for high-level scientific researchers and engineers with good social responsibility, humanistic and social science qualities and professional ethics. It enables students to have solid foundation in basic theories of chemistry, mathematics and natural science and systematically grasp multidisciplinary and multi-field knowledge of materials science, materials chemistry and engineering application in the fields of modern materials. With team and initiative spirit and international view, students can do the work of design of materials and processing, synthesis and manufacturing of materials, analysis and control of materials service, modification of materials, research and development of new materials and devices, and system integration and operation management, which makes graduates become high-level researchers and engineers in material industries, as well as qualified builder and reliable successor of the socialist cause with all-round development in areas such as morals,intelligence, physical fitness, work and aesthetics.

Students of this program are expected to achieve the following objectives 5 years after graduation：

（1）Have a good physical and mental health, and a good professional dedication, social responsibility, humanistic and social science qualities and professional ethics and concerning on social problems with quality, environmental and security awareness.(basic quantities)

（2）Enable to do the work of analyzing, solving complicated engineering tasks in materials chemistry and related and be competent to jobs in areas of materials design, synthesis and preparation,analysis and control of materials service, materials modification, research and development of new materials and devices, application of system integration and management.（profession skills）

（3）Have social competitiveness in the fields of materials synthesis and preparation, processing and forming, structure and property analysis, materials design and calculation, materials environmental behavior effect and industrialization application. (service areas)

（4）Have good presentation and communication skills as well as good team work spirit with coordination and leadership skills in the team. (social abilities)

（5）Have innovative spirits, creative consciousness, international views; and keep lifelong learning and self-improvement; follow development trends in materials chemistry and related areas for serving the society. (self-development)

**（二） 毕业要求**

(1) **工程知识:** 能够应用数学、自然科学、工程基础和材料专业知识，解决新材料新器件研发和服役过程中的复杂工程问题。

(2) **问题分析:** 能够应用数学、自然科学和材料工程科学的基本原理，结合文献研究，识别、表达并分析材料化学及相关领域的基本科学问题和新材料新器件研发和服役过程中的复杂工程问题，以获得有效结论。

(3) **解决方案:** 能够针对新材料新器件设计和产品开发中的复杂工程问题，制定解决方案，开发满足需求的材料、技术和工艺，在设计中体现创新意识，同时考虑社会、健康、安全、法律、文化以及环境等因素。

(4) **研究:** 能够基于材料化学、材料科学原理并采用现代测试技术和研究方法，对新材料研制和器件开发中的复杂工程问题进行研究，包括问题的提出与判断、研究方案的设计与实施、实验数据和相关信息的分析与关联，通过研究得到合理有效的结论。

(5) **工具使用:** 能够开发、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，对新材料和器件的设计、制备、结构与性能以及应用中的复杂工程问题进行预测与模拟，并理解所得结论的适用性和局限性。

(6) **工程与社会:** 能够基于材料化学、材料工程相关背景知识进行合理分析，评价新材料研制和器件开发中的新技术、新工艺和复杂工程问题的解决方案对社会、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:** 了解与本专业相关的规范、政策、法津和法规，能够理解和评价针对新材料新器件研发和服役过程中的复杂工程问题的工程实践或解决方案对环境、社会和可持续发展的影响。

(8) **职业规范:** 具有人文社会科学素养和社会责任感和良好的心理素质，能够在新材料新器件的工程实践中理解并遵守职业道德和规范，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:** 具备国际化视野，针对材料化学及相关领域的基本科学问题和复杂工程问题，能够在跨文化背景下与业界同行及社会公众进行有效沟通和交流，包括设计方案和撰写报告、陈述发言、清晰表达与问题讨论。

(11) **项目管理:** 理解并掌握材料化学及相关领域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，并具备不断学习和适应发展的能力。

**II Graduation Requirement**

(1) **Engineering knowledge:** The ability to apply the basic and professional knowledge of mathematics, natural science,technology foundation and materials related to solve the complicated issues encountered in the research and service processes of new materials and devices.

(2) **Problem analysis:** The ability to apply basic principles of mathematics, natural science and engineering science, and combine with literature investigation to identify, express and analyze basic scientific problems and complex engineering problems in material chemistry and related fields, and obtain effective conclusions.

(3) **Design/development solution:** The ability to develop solutions for complex engineering problems in the field of new materials; developing materials, technologies and processes to meet the needs and being innovative in materials design, as well as taking into account the social, health, safety, legal, cultural and environmental factors.

(4) **Research:** The ability to conduct investigations on complicated issues encountered in the research processes of new materials and devices based on the basic principles in materials chemistry and materials science and modern characterization methods, including raising and judging questions, designing and implementing research proposals, analyzing and correlating experimental data and obtaining effective conclusions.

(5) **Usage of modern tools:** The ability to develop, select and employ proper technology, resources, modern technology and communication tools to predict and simulate the complicated engineering issues in the search process of new materials and devices and understand the applicability and limitations of the obtained conclusions.

(6) **Engineering and society:** The ability to analyze and evaluate the impact of solution proposals of new technology and complicated issues during the research processes of new materials and

devices on society, healthy,security, law and culture and understand the assumed responsibility based on relevant knowledge on materials chemistry and material engineering.

(7) **Environment and sustainable development:** Understanding of related regulations, policies, laws related to this major, being able to understand and evaluate the impact of engineering practices on environment, society and sustainable development.

(8) **Professional standards:** Having good humanistic, social science and mental qualities, being able to abide by the professional ethics and norms in the material engineering practice and assume the responsibilities.

(9) **Individual and team:** The ability to assume the roles of individual, team member and responsible in amulti-disciplinary teams.

(10) **Communication:** The ability to effectively communicate to peers and mass audience for complicated issues in materials chemistry and related in a diverse cultural environment, including designing plans and writing reports, presentations and problem discussions.

(11) **Project management:** The ability to understand and grasp the principles of engineering management and methods of economic decision, employ them for project management.

(12) **Life-long learning:** Having the awareness of self-study and lifelong learning, and the ability for continuous study and adapting to development.

表 1 培养目标的矩阵关系毕业要求支撑

| 毕业要求 | 培养目标 1 | 培养目标 2 | 培养目标 3 | 培养目标 4 | 培养目标 5 |
|---|---|---|---|---|---|
| 毕业要求 1 | | √ | √ | | |
| 毕业要求 2 | | √ | √ | | |
| 毕业要求 3 | | √ | √ | | |
| 毕业要求 4 | | √ | √ | | |
| 毕业要求 5 | | √ | √ | | √ |
| 毕业要求 6 | √ | √ | √ | √ | |
| 毕业要求 7 | √ | | | √ | |
| 毕业要求 8 | √ | | | √ | |
| 毕业要求 9 | | | | √ | √ |
| 毕业要求 10 | | | | √ | √ |
| 毕业要求 11 | | √ | √ | √ | |
| 毕业要求 12 | √ | | | √ | √ |

毕业要求的达成需以课程（教学环节）的教学活动为支撑。本专业为 合理设置课程体系、落实对毕业要求的支撑课程，对各项毕业要求进行了解。每项毕业要求（一级指标）被分解为若干层层递进的指标点（二级指标），前一指标点的达成是下一指标点达成的基

础，而下一指标点的达成是前一指标点的升华，所有指标点一起，支撑了该毕业要求的达成。根据上述分解方法， 本专业各项毕业要求的指标点分解如下表所示。

表 2 毕业要求指标点的分解

| 毕业要求 | 指标点 |
| --- | --- |
| 毕业要求 1.工程知识:能够应用数学、自然科学、工程基础和材料专业知识，解决新材料新器件研发和服役过程中的复杂工程问题。 | 1.1 能将数学、自然科学、工程基础和材料专业知识用于工程问题的表述。 |
| | 1.2 能够运用数学、自然科学、工程基础和专业知识针对材料中的实际问题建立数学模型并求解。 |
| | 1.3 能够将相关知识和数学模型方法用于推演、分析材料工程实践中的问题。 |
| | 1.4 能够将相关知识和数学模型方法用于材料工程问题解决方案的比较和综合。 |
| 毕业要求 2.问题分析:能够应用数学、自然科学和材料工程科学的基本原理，结合文献研究，识别、表达并分析材料化学及相关领域的基本科学问题和新材料新器件研发和服役过程中的复杂工程问题，以获得有效结论。 | 2.1 能够运用数学、自然科学和工程科学的基本原理，识别和判断材料类工程实践中的基本科学问题与技术问题。 |
| | 2.2 能够基于材料化学、材料科学的基本原理和方法，结合数学模型方法，表达材料类工程实践中的基本科学问题与技术问题。 |
| | 2.3 能认识到解决问题方案的多样性，会通过文献研究确定解决方案。 |
| | 2.4 能运用材料化学、材料科学的基本原理，结合文献研究，分析影响因素，得出有效结论。 |
| 毕业要求 3.解决方案:能够针对新材料新器件设计和产品开发中的复杂工程问题，制定解决方案，开发满足需求的材料、技术和工艺，在设计中体现创新意识，同时考虑社会、健康、安全、法律、文化以及环境等因素。 | 3.1 掌握新材料设计和产品开发全周期、全流程的方法和技术，了解影响设计目标和技术方案的各种因素。 |
| | 3.2 能够针对特定需求，对器件和单元进行设计。 |
| | 3.3 能够对产品的制备与加工工艺进行设 |

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| | 计，在设计中体现创新意识。 |
| | 3.4 对产品的制备与加工工艺的设计中考虑安全、健康、法律、文化及环境等制约因素。 |
| 毕业要求 4.研究:能够基于材料化学、材料科学原理并采用现代测试技术和研究方法，对新材料研制和器件开发中的复杂工程问题进行研究，包括问题的提出与判断、研究方案的设计与实施、实验数据和相关信息的分析与关联，通过研究得到合理有效的结论。 | 4.1 能够基于材料化学、材料科学与工程的基础理论，通过文献研究，调研和分析复杂工程问题的解决方案。 |
| | 4.2 能够根据实际应用对新材料的结构和性能要求，选择技术路线，设计实验方案。 |
| | 4.3 能够根据实验方案，构建实验系统，实施实验方案，采集实验数据。 |
| | 4.4 能够运用专业知识和技术，对实验数据进行分析和解释，通过信息综合得出合理有效的实验结论，撰写论文或技术报告。 |
| 毕业要求 5.工具使用:能够开发、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，对新材料和器件的设计、制备、结构与性能以及应用中的复杂工程问题进行预测与模拟，并理解所得结论的适用性和局限性。 | 5.1 了解专业常用的现代仪器、信息技术工具、工程工具和模拟软件的使用原理和方法，并理解其局限性。 |
| | 5.2 能够选择与使用现代工具和技术，对专业复杂工程问题进行分析、计算与设计。 |
| | 5.3 能够针对新材料设计、制备、加工与应用，具备开发或选用满足需求的现代工具、对材料的结构与性能进行模拟与预测的能力，并能分析其局限性。 |
| 毕业要求 6.工程与社会:能够基于材料化学、材料工程相关背景知识进行合理分析，评价新材料研制和器件开发中的新技术、新工艺和复杂工程问题的解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。 | 6.1 了解与材料类工程实践相关的技术标准、知识产权、产业政策和法律法规，理解不同社会文化对工程实践的影响。 |
| | 6.2 能够分析和评价专业工程实践对社会、健康、安全、法律以及文化影响，并理解工程师应承担的责任。 |
| 毕业要求 7.环境和可持续发展:了解与本专 | 7.1 理解材料类工程实践对环境、社会的影 |

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| 业相关的规范、政策、法津和法规，能够理解和评价针对新材料新器件研发和服役过程中的复杂工程问题的工程实践或解决方案对环境、社会和可持续发展的影响。 | 响，了解相关的规范、政策、法津和法规，知晓环境保护和社会可持续发展的内涵，具有环境保护和可持续发展的意识。 |
| | 7.2 能评价材料类工程实践对人类和环境造成的损害和隐患，具备提出改善方案的能力。 |
| 毕业要求 8.职业规范:具有人文社会科学素养和社会责任感和良好的心理素质，能够在新材料新器件的工程实践中理解并遵守职业道德和规范，履行责任。 | 8.1 具有社会主义价值观，理解个人和社会的关系，了解中国国情。 |
| | 8.2 理解诚实公正、诚信守则的工程职业道德和规范，并能在材料类工程实践中自觉遵守。 |
| | 8.3 理解工程师对公众的安全、健康和福祉，以及环境保护的社会责任，能够在材料类工程实践中自觉履行责任。 |
| 毕业要求 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 具有团队意识和协作能力，能够与团队成员有效沟通，理解团队的重要性，与其他成员共享信息，合作共事。 |
| | 9.2 能够在多学科背景下的团队中，独立或合作开展工作。 |
| | 9.3 能够组织、协调和指挥团队开展工作。 |
| 毕业要求 10.沟通:具备国际化视野，针对材料化学及相关领域的基本科学问题和复杂工程问题，能够在跨文化背景下与业界同行及社会公众进行有效沟通和交流，包括设计方案和撰写报告、陈述发言、清晰表达与问题讨论。 | 10.1 能够就专业中的基本科学问题和复杂工程问题，通过口头、书面等方式与团队成员、业界同行及社会公众进行有效的沟通和交流。 |
| | 10.2 了解材料化学学科/行业的国际、研究热点，理解并尊重世界不同文化的差异性和多样性。 |
| | 10.3 具备跨文化交流的语言和书面表达能力，能就专业问题，在跨文化背景下进行基本沟通和交流。 |

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| 毕业要求 11.项目管理:理解并掌握材料化学及相关领域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 掌握工程项目中涉及的管理与经济决策方法。 |
| | 11.2 了解材料、器件、工艺的研发、生产、服役及消亡的全周期、全流程的成本构成，理解其中涉及的工程管理与经济决策问题。 |
| | 11.3 能在多学科环境下，在新材料、新器件、新工艺的设计开发解决方案中，运用工程管理与经济决策方法。 |
| 毕业要求 12.终身学习:具有自主学习和终身学习的意识，并具备不断学习和适应发展的能力。 | 12.1 具有自主学习的思维，掌握自主学习的方法，能认识不断探索和自主学习的必要性，具备创新意识和终身学习的意识。 |
| | 12.2 具有批判性思维，知晓拓展知识和能力的途径，身心健康，能针对个人或职业发展的需求，进行自主学习，适应社会发展。 |

**二、专业核心课程与专业特色课程**

**Ⅱ Core Course and Characteristic Courses**

**（一） 专业核心课程**

材料科学基础B,材料化学原理,计算化学B,材料合成与加工,材料研究与测试方法B,材料化学合成及表征实验D,材料物理

Fundamentals of Materials Science,Principle of Materials Chemistry,Calculation Chemistry,Materials Synthesizing and Processing,Methods of Materials Research and Testing,Experiments on Materials Chemistry and Characterization,Materials Physics

**（二） 专业特色课程**

功能材料器件设计训练A,材料化学原理,计算化学B,电化学原理与应用,半导体光电化学,材料表面与界面B,材料腐蚀与防护,高分子化学与物理B,材料合成与加工,材料化学合成及表征实验D

Training on Devices Design for Functional Materials,Principle of Materials Chemistry,Calculation Chemistry,Electrochemical Fundamentals and Applications,Semiconductor Photoelectrochemistry,Materials Surface and Interface,Materials Corrosion and Protection,Polymer Chemistry and Physics,Materials Synthesizing and Processing,Experiments on Materials Chemistry and Characterization

**附：毕业要求实现矩阵**

| 专业核心课程 | 专业特色课程 | 课程名称 | 材料化学专业毕业要求 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | 1 | | | | 2 | | | | 3 | | | | 4 | | | | 5 | | | 6 | | 7 | | 8 | | | 9 | | | 10 | | | 11 | | | 12 | |
| | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 |
| | | 安全工程 | | | | | | | | | | | | | | | | | | | | √ | √ | | | | | | | | | | | | | | | | | | |
| | | 概率论与数理统计C | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| √ | √ | 计算化学B | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | | | | | | | | | |
| √ | | 材料物理 | | | | | √ | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| √ | √ | 材料化学原理 | | √ | √ | √ | | √ | | √ | | | | | √ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | √ | 材料腐蚀与防护 | | | | | | | | | | | | | | | | | | | | | | √ | √ | | | | | | | | | | | | | | | | |
| | | 有机化学C | | | | | | | | | | | | | | | | | | | | | | √ | | | | | | | | | √ | | | | | | | | |
| | | 有机化学实验D | | | | | √ | √ | | √ | | | | | | | | | | | | | | √ | √ | | | | | | | | | | | | | | | | |
| | √ | 高分子化学与物理B | | | | | | | √ | √ | | | | | | | | | | | | | | | | | | | √ | | | | | | | | | | | | |
| | | 材料科学基础实验A | | | | | | | | | | | | | √ | | √ | √ | | | | | | | | | | | | | | | | | | | | | | | |
| √ | | 材料科学基础B | √ | | √ | √ | √ | √ | | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 电工电子实习B | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | |

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| | | 计算化学实验 | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | | | | | |
| | | 光纤传感材料与技术 | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | | | | | √ | | | |
| | √ | 半导体光电化学 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ |
| | | 机械制造工程实训D | | | | √ | | | | | | √ | | | | | | | | | √ | | | | | | √ | √ | √ | | | | | | | √ |
| | | 新能源材料与技术A | | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | |
| | | 燃料电池材料及器件 | | | | | | | | | | | | | | | | | | | | | √ | √ | | | | | | | √ | √ | | | | |
| | | 功能材料A | | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | |
| | | 认识实习 | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | √ | | | | | | | | √ | √ | |
| √ | √ | 材料合成与加工 | | | | | | √ | √ | | | | | | | | | | | | | √ | | | | | | | | | | | | | | |
| | √ | 电化学原理与应用 | | | | | | | | √ | | √ | | | | | | | | | √ | | | | | | | | | | | | | | | |
| | √ | 材料表面与界面B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | | | | |
| | | 专业实习 | | | | | | | | | | | | | | | | | | | √ | √ | | | √ | √ | √ | | √ | √ | | | | | | |
| | | 材料与环境B | | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | √ | | | | | | | | | |
| | | 光电 | | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | |

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| | | 信号检测技术 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 毕业论文 | | | | | | | | | √ | √ | √ | √ | √ | √ | √ | | | | | | | | | | | | | √ | √ | | | | | |
| | | 电工与电子技术基础 C | | | | | | | | | | | | | | | | | | | √ | √ | | | | | | | | | | | | | | |
| | | 线性代数 | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 分析化学实验 C | | | | √ | | | | √ | | | | | | √ | | | | | | | | | | | | | | | | | | | | |
| | | 工程力学 A | | | √ | | | √ | | | | | | | | | | | | | | | | | √ | | | | | | | | | | | √ |
| | | 分析化学 C | | √ | | | | | | √ | | | | | √ | | | | | | | | | | | | | | | | | | | | | |
| | √ | 功能材料器件设计训练 A | | | | | | | | | √ | √ | √ | √ | | | | | | | | | | | | | | | | | | | | | | |
| | | 物理化学实验 B | | | | √ | | | | √ | | | | √ | | | | √ | | | | | | | | | | | | | | | | | | |
| | | 材料研究与测试方法实验 B | | | | | | | | | | | | | | √ | √ | √ | √ | √ | | | | | | | | | | | | | | | | |
| √ | | 材料研究与测试方法 B | | | | | | | | | | | | | | √ | | | √ | √ | √ | | | | | | | | | | | | | | | |
| | | 机械设计基础课程设计 | | | | | | | | √ | | | | √ | | | | | | | | √ | | | | | | | | | | | | | | |
| | | 机械设计基础 | | | | | | | | √ | | | | √ | | | | | | | | √ | | | | | | | | | | | | | | |

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| | | 物理实验B | | | | | | | √ | | | | | | | | | | | | | | | | | | | | | √ | | | | | | |
| | | 物理化学D | √ | √ | √ | √ | √ | √ | √ | | | | | √ | √ | √ | √ | | | | | | | | | | | | | | | | | | | |
| | | 项目管理B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | | |
| | | 纳米材料与纳米技术A | | | | | | | | | | | | | | | | | | | | | √ | | | | | | | | | | | | √ | √ |
| | | 半导体材料与器件 | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | | |
| √ | √ | 材料化学合成及表征实验D | | | | | | | | | | | | √ | √ | √ | √ | | | | | | | | | √ | √ | √ | | | | | | | | |
| | | 传递原理基础 | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | | |
| | | 特种玻璃A | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | | √ | √ | | | |
| | | 薄膜材料与技术 | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | | |
| | | 太阳能电池材料与器件 | | | | | | | | | | | | | | | | | | | | √ | √ | | | | | | √ | √ | | | | | | |
| | | 金属材料前沿 | | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | | | | | √ | √ |
| | | 复合材料进展 | | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | | | | | √ | √ |
| | | 高分子材料研究进 | | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | | | | | √ | √ |

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| | | 新能源汽车结构与原理D | | | | √ | | √ | | | | | | | | | | | | | | | | √ | | | | | | | | | | | | |
| | | 人工智能导论 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 智能制造概论 | | | | | | | | | | | | | | | | | | | | | | | | | √ | | | | | | | | √ | √ |
| | | 微电子封装材料与互连技术 | | | | | | | | | | | | | | | | | | | | | | √ | | | | | | | | | | | √ | √ |
| | | 无机非金属材料工学 B | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | | | | | | | | |
| | | 思想道德与法治 | | | | | | √ | √ | | | | | | | | | | | | √ | | | | | | √ | | | | | | | | | √ |
| | | 中国近现代史纲要 | | | | | √ | | | | | | √ | √ | | | | | | | √ | | | √ | | | √ | | | | | | | | √ | |
| | | 大学英语 1 | | | | | | | | | | | | | | | | | | √ | | | | | | | | √ | | √ | | | √ | | | |
| | | 大学英语 2 | | | | | | | | | | | | | | | | | | √ | | | | | | | | √ | | √ | | | √ | | | |
| | | 军事理论 | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | |
| | | 军事技能训练 | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | | | | | | |
| | | 体育 1 | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | | 体育 2 | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | | Python 程序设计基础 A | | | | | | √ | | | | √ | | | | | | | √ | √ | | | | | | | | | | | | | | | | |
| | | 计算机基 | | | | | | √ | | | | √ | | | | | | | √ | √ | | | | | | | | | | | | | | | | |

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| | | 础与Python程序设计综合实验A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | C程序设计基础B | | | | | √ | | | | √ | | | | | | | | √ | √ | | | | | | | | | | | | | | | | | |
| | | 计算机基础与C程序设计综合实验B | | | | | √ | | | | √ | | | | | | | | √ | √ | | | | | | | | | | | | | | | | | |
| | | 新生研讨课 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ |
| | | 工程图学C | √ | | | | | | | √ | | | | | | | | √ | | | | | | | | | | | | | | | | | | | |
| | | 高等数学A上 | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 无机化学B | √ | | √ | | √ | | | | | | | | | √ | | | | | | | | | | | | | | | | | | | | | |
| | | 无机化学实验B | √ | | √ | | √ | | √ | | | | √ | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 高等数学A下 | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 材料概论 | | | | | | | | | | | | | | | | | | | | | √ | | | | | | | √ | √ | √ | | | | | |
| | | 大学物理B | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | √ |
| | | 毛泽东思想和中国特色社会主义理论 | | | | | | | | | | | | | | | | | | | | | | | √ | √ | | | | | | | | √ | | √ | √ |

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| | | 体系概论 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 马克思主义基本原理 | | | | √ | | | | | | | | | | | | | | | | | | | | | | | | | √ | | | | √ |
| | | 大学英语 3 | | | | | | | | | | | | | | | | | | √ | | | | | | | √ | | √ | | | √ | | | | |
| | | 大学英语 4 | | | | | | | | | | | | | | | | | | √ | | | | | | | √ | | √ | | | √ | | | | |
| | | 体育 3 | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | | 体育 4 | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | √ | √ | √ | √ | | | √ | √ |

## 三、 教学建议进程表

## Ⅲ Course Schedule

(一)公共基础必修课程
1 Public Basic Compulsory Courses

| 开课单位 Course College | 课程编号 Course Number | 课程名称 Course Title | 学分 Crs | 学时分配 Including | | | | | | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 总学时 Tot hrs. | 理论 Theory | 实验 Exp. | 上机 Ope-ratio. | 实践 Prac-tice. | 课外 Extra-cur. | | |
| 马克思主义学院 | 4220001210 | 思想道德与法治 | 2.5 | 42 | 42 | 0 | 0 | 0 | 0 | 1 | |
| | | Morality and the rule of law | | | | | | | | | |
| 马克思主义学院 | 4220002180 | 中国近现代史纲要 | 2.5 | 42 | 42 | 0 | 0 | 0 | 0 | 2 | |
| | | Outline of Contemporary and Modern Chinese History | | | | | | | | | |
| 外语学院 | 4030001210 | 大学英语 1 | 2 | 48 | 32 | 0 | 0 | 0 | 16 | 1 | |
| | | College English Ⅰ | | | | | | | | | |
| 外语学院 | 4030002210 | 大学英语 2 | 2 | 48 | 32 | 0 | 0 | 0 | 16 | 2 | |
| | | College English Ⅱ | | | | | | | | | |
| 学工部 | 1050002210 | 军事理论 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 2 | |
| | | Military Theory | | | | | | | | | |
| 学工部 | 1050001210 | 军事技能训练 | 2 | 136 | 0 | 0 | 0 | 136 | 0 | 1 | |
| | | Military Skills Training | | | | | | | | | |
| 体育学院 | 4210001170 | 体育 1 | 1 | 32 | 32 | 0 | 0 | 0 | 0 | 1 | |
| | | Physical Education Ⅰ | | | | | | | | | |
| 体育学院 | 4210002170 | 体育 2 | 1 | 32 | 32 | 0 | 0 | 0 | 0 | 2 | |
| | | Physical Education Ⅱ | | | | | | | | | |
| 计算机智能学院 | 4120003210 | Python 程序设计基础 A | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 2 | |
| | | Foundation of Python Programming A | | | | | | | | | |
| 计算机智能学院 | 4120007210 | 计算机基础与 Python 程序设计综合实验 A | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 2 | Python 程序设计基础 A, |
| | | Comprehensive Experiments of Foundation of Computer and PYTHON Language Programming A | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 计算机智能学院 | 4120002210 | C 程序设计基础 B | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 2 | |
| | | Foundations of C Language Programming A | | | | | | | | | |
| 计算机智能学院 | 4120006210 | 计算机基础与 C 程序设计综合实验 B | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 2 | C 程序设计基础 B, |
| | | Comprehensive Experiments of Foundation of Computer and C Language Programming B | | | | | | | | | |
| 马克思主义学院 | 4220003180 | 毛泽东思想和中国特色社会主义理论体系概论 | 4.5 | 66 | 66 | 0 | 0 | 0 | 0 | 3 | |
| | | Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics | | | | | | | | | |
| 马克思主义学院 | 4220005180 | 马克思主义基本原理 | 2.5 | 42 | 42 | 0 | 0 | 0 | 0 | 4 | |
| | | Marxism Philosophy | | | | | | | | | |
| 外语学院 | 4030003210 | 大学英语 3 | 2 | 48 | 32 | 0 | 0 | 0 | 16 | 3 | |
| | | College English Ⅲ | | | | | | | | | |
| 外语学院 | 4030004210 | 大学英语 4 | 2 | 48 | 32 | 0 | 0 | 0 | 16 | 4 | |
| | | College English Ⅳ | | | | | | | | | |
| 体育学院 | 4210003170 | 体育 3 | 1 | 32 | 32 | 0 | 0 | 0 | 0 | 3 | |
| | | Physical Education Ⅲ | | | | | | | | | |
| 体育学院 | 4210004170 | 体育 4 | 1 | 32 | 32 | 0 | 0 | 0 | 0 | 4 | |
| | | Physical Education Ⅳ | | | | | | | | | |
| 小 计 Subtotal | | | 34.0 | 808 | 544 | 64 | 0 | 136 | 64 | | |

修读说明：“Python 程序设计基础 A+计算机基础与 Python 程序设计综合实验 A”或者“C 程序设计基础 B+计算机基础与 C 程序设计综合实验 B”二选一。
NOTE: “Python Programming Basics A + Comprehensive Experiment of Computer Foundation and Python Programming A” OR“Fundamentions of Computer Program Design(C) B+Foundations of Computer and C Language Programming Experiments B”.

(二)通识教育选修课程
2 General Education Elective Courses

| | | |
|---|---|---|
| 核心选修 Core elective courses | 文明与传统 Civilization and Tradition Courses | 通识课程应修满至少 9 学分。自主选修课程中，至少在经济与管理、创新与创业两个领域中各选修 1.5 学分；至少在艺术与审美领域中选修 1 门课程；至少在法学与社会科学、历史与文化、哲学与心理学、语言与文学、数学与自然科学五个领域中任意选修 1 门课程。<br>Minimum subtotal credits: 9. Self-selected courses: at least 1.5 credits in Economics and Management, at least 1.5 credits in Innovation and Entrepreneurship, at least 1 course in Art and Aesthetics, at least 1 course in Law and Social Science OR History and Culture OR Philosophy and Psychology OR Language and Literature OR Mathematics and Natural Sciences. |
| | 社会与发展类 Society and Development Courses | |
| | 艺术与人文类 Art and Humanities Courses | |
| | 自然与方法类 Nature and methods Courses | |
| 自主选修 选修 Core elective courses | 数学与自然科学,哲学与心理学,法学与社会科学,经济与管理,历史与文化,语言与文学,艺术与审美,创新与创业<br>Mathematics and Natural Sciences,Philosophy and Psychology,Science and Social Sciences,Economics and Management,History and Culture,Language and Literature,Art and Aesthetics,Innovation and Entrepreneurship | |

(三)大类必修课程
3 Basic Discipline Required Courses

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 材料学院 | 4070002210 | 新生研讨课 | 1 | 16 | 16 | 0 | 0 | 0 | 0 | 1 | |
| | | Fresh Seminar (Materials Science and Engineering) | | | | | | | | | |
| 机电学院 | 4080374170 | 工程图学 C | 3 | 56 | 48 | 0 | 0 | 0 | 8 | 1 | |
| | | Engineering Graphics | | | | | | | | | |
| 理学院 | 4050001210 | 高等数学 A 上 | 4.5 | 72 | 72 | 0 | 0 | 0 | 0 | 1 | |
| | | Advanced Mathematics A Ⅰ | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 化生学院 | 4200357170 | 无机化学 B | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 1 | |
| | | Inorganic Chemistry | | | | | | | | | |
| 化生学院 | 4200358170 | 无机化学实验 B | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 1 | 无机化学 B, |
| | | Inorganic Chemistry Experiment | | | | | | | | | |
| 理学院 | 4050002210 | 高等数学 A 下 | 5.5 | 88 | 88 | 0 | 0 | 0 | 0 | 2 | 高等数学 A 上, |
| | | Advanced Mathematics A Ⅱ | | | | | | | | | |
| 材料学院 | 4070016110 | 材料概论 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 2 | |
| | | Introduction to Materials | | | | | | | | | |
| 理学院 | 4050463130 | 大学物理 B | 5 | 80 | 80 | 0 | 0 | 0 | 0 | 2 | |
| | | College Physics | | | | | | | | | |
| 小 计 Subtotal | | | 25.0 | 424 | 384 | 32 | 0 | 0 | 8 | | |
| (四)专业必修课程<br>4 Specialized Required Courses | | | | | | | | | | | |
| 理学院 | 4050224110 | 物理实验 B | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 3 | 大学物理 B, |
| | | Physics Experiment | | | | | | | | | |
| 材料学院 | 4070581170 | 材料化学合成及表征实验 D | 5 | 160 | 0 | 160 | 0 | 0 | 0 | 7 | |
| | | Experiments on Materials Chemistry and Characterization | | | | | | | | | |
| 理学院 | 4050598170 | 概率论与数理统计 C | 2.5 | 40 | 40 | 0 | 0 | 0 | 0 | 3 | 高等数学 A 下, |
| | | Probability and Mathematical Statistics | | | | | | | | | |
| 化生学院 | 4200274120 | 有机化学 C | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 4 | |
| | | Organic Chemistry | | | | | | | | | |
| 化生学院 | 4200302120 | 有机化学实验 D | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 4 | 有机化学 C, |
| | | Organic Chemistry Experiment | | | | | | | | | |
| 化生学院 | 4200366170 | 物理化学 D | 3.5 | 56 | 56 | 0 | 0 | 0 | 0 | 3 | |
| | | Physical Chemistry | | | | | | | | | |
| 化生学院 | 4200367170 | 物理化学实验 B | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 3 | 物理化学 D, |
| | | Physical Chemistry Experiment | | | | | | | | | |
| 理学院 | 4050071110 | 工程力学 A | 4 | 64 | 60 | 4 | 0 | 0 | 0 | 3 | |
| | | Engineering Mechanics | | | | | | | | | |
| 化生学院 | 4200303120 | 分析化学 C | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 3 | |
| | | Analytical Chemistry | | | | | | | | | |
| 化生学院 | 4200376170 | 分析化学实验 C | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 3 | 分析化学 C, |
| | | Analytic Chemistry Lab. | | | | | | | | | |
| 自动化学院 | 4100005210 | 电工与电子技术基础 C | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 4 | |
| | | Fundamentals of Electrical Technology & Electrical Engineering C | | | | | | | | | |
| 机电学院 | 4080457170 | 机械设计基础 B | 2.5 | 40 | 40 | 0 | 0 | 0 | 0 | 5 | |
| | | Fundamentals of Mechanical Design | | | | | | | | | |
| 材料学院 | 4070554170 | 材料科学基础 B | 4 | 64 | 64 | 0 | 0 | 0 | 0 | 4 | |
| | | Fundamentals of Materials Science | | | | | | | | | |
| 材料学院 | 4070280120 | 材料科学基础实验 A | 1.0 | 32 | 0 | 32 | 0 | 0 | 0 | 4 | 材料科学基础 B, |
| | | Fundamentals of Materials Science:Lab Course | | | | | | | | | |
| 材料学院 | 4070577170 | 材料化学原理 | 5 | 80 | 80 | 0 | 0 | 0 | 0 | 5 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Principle of Materials Chemistry | | | | | | | | | |
| 材料学院 | 4070578170 | 计算化学 B | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 5 | |
| | | Calculation Chemistry | | | | | | | | | |
| 材料学院 | 4070579170 | 计算化学实验 | 1 | 32 | 0 | 0 | 32 | 0 | 0 | 5 | 计算化学 B, |
| | | Calculation Chemistry Experiment | | | | | | | | | |
| 材料学院 | 4070580170 | 材料物理 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 5 | |
| | | Materials Physics | | | | | | | | | |
| 材料学院 | 4070138110 | 电化学原理与应用 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 5 | |
| | | Electrochemical Fundamentals and Applications | | | | | | | | | |
| 材料学院 | 4070036110 | 材料研究与测试方法 B | 2.5 | 40 | 40 | 0 | 0 | 0 | 0 | 6 | |
| | | Methods of Materials Research and Testing | | | | | | | | | |
| 材料学院 | 4070555170 | 材料研究与测试方法实验 B | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 6 | 材料研究与测试方法 B, |
| | | Experiments on Materials Research and Testing Method | | | | | | | | | |
| 理学院 | 4050229110 | 线性代数 | 2.5 | 40 | 40 | 0 | 0 | 0 | 0 | 3 | 高等数学 A 下, |
| | | Linear Algebra | | | | | | | | | |
| 小 计 Subtotal | | | 53.0 | 1040 | 652 | 356 | 32 | 0 | 0 | | |
| (五)专业选修课程<br>5 Specialized Elective Courses | | | | | | | | | | | |
| 材料学院 | 4070002110 | 安全工程 * | 1 | 16 | 16 | 0 | 0 | 0 | 0 | 5 | |
| | | Safety Engineering | | | | | | | | | |
| 材料学院 | 4070071110 | 新能源材料与技术 A | 2.0 | 32 | 32 | 0 | 0 | 0 | 0 | 7 | |
| | | Materials and Technology of New Energy | | | | | | | | | |
| 材料学院 | 4070558170 | 材料与环境 B * | 1 | 16 | 16 | 0 | 0 | 0 | 0 | 5 | |
| | | Materials & Environment | | | | | | | | | |
| 材料学院 | 4070582170 | 材料表面与界面 B * | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 5 | |
| | | Materials Surface and Interface | | | | | | | | | |
| 材料学院 | 4070014110 | 材料腐蚀与防护 * | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | |
| | | Materials Corrosion and Protection | | | | | | | | | |
| 材料学院 | 4070583170 | 高分子化学与物理 B * | 3 | 48 | 40 | 8 | 0 | 0 | 0 | 6 | |
| | | Polymer Chemistry and Physics | | | | | | | | | |
| 材料学院 | 4070021110 | 材料合成与加工 * | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | |
| | | Materials Synthesizing and Processing | | | | | | | | | |
| 材料学院 | 4070073110 | 功能材料 A | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 4 | |
| | | Functional Materials | | | | | | | | | |
| 材料学院 | 4070091210 | 半导体光电化学 | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 6 | |
| | | Semiconductor Photoelectrochemistry | | | | | | | | | |
| 材料学院 | 4070313130 | 光电信号检测技术 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | |
| | | Detection Technology of Photo-Electric Signals | | | | | | | | | |
| 材料学院 | 4070046110 | 半导体材料与器件 | 2.0 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | |
| | | Semiconductor Materials and Devices | | | | | | | | | |
| 材料学院 | 4070531150 | 光纤传感材料与技术 | 1 | 16 | 16 | 0 | 0 | 0 | 0 | 7 | |
| | | Materials and Applications of Optical Fiber Sensor | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 材料学院 | 4070116110 | 纳米材料与纳米技术 A | 2.0 | 32 | 32 | 0 | 0 | 0 | 0 | 7 | |
| | | Nanomaterials and Nanotechnology | | | | | | | | | |
| 材料学院 | 4070008220 | 燃料电池材料及器件 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 7 | |
| | | Fundamentals and Applications of Fuel Cell Materials | | | | | | | | | |
| 材料学院 | 4070151110 | 项目管理 B * | 1 | 16 | 16 | 0 | 0 | 0 | 0 | 5 | |
| | | Project Management | | | | | | | | | |
| 小 计 Subtotal | | | 26.0 | 416 | 408 | 8 | 0 | 0 | 0 | | |
| 修读说明：要求至少选修 18 学分。<br>NOTE：Minimum subtotal credits: 18. | | | | | | | | | | | |
| (六)个性课程<br>6 Personalized Elective Courses | | | | | | | | | | | |
| 材料学院 | 4070083210 | 传递原理基础 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 5 | |
| | | Fundamentals of Transfer Theory | | | | | | | | | |
| 材料学院 | 4070135110 | 特种玻璃 A | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 6 | |
| | | Special Glass | | | | | | | | | |
| 材料学院 | 4070009110 | 薄膜材料与技术 | 1.0 | 16 | 16 | 0 | 0 | 0 | 0 | 6 | |
| | | Thin-film Materials and Technology | | | | | | | | | |
| 材料学院 | 4070332130 | 太阳能电池材料与器件 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | |
| | | Solar Cell Materials and Devices | | | | | | | | | |
| 材料学院 | 4070348130 | 金属材料前沿 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 7 | |
| | | Metal Material Frontier | | | | | | | | | |
| 材料学院 | 4070080210 | 复合材料进展 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 7 | |
| | | Frontier of Composite Materials | | | | | | | | | |
| 材料学院 | 4070061110 | 高分子材料研究进展 | 2.0 | 32 | 32 | 0 | 0 | 0 | 0 | 7 | |
| | | Development of Polymer Materials | | | | | | | | | |
| 汽车学院 | 4090103210 | 新能源汽车结构与原理 D | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 7 | |
| | | Structures and Theory of New Energy Vehicle | | | | | | | | | |
| 计算机智能学院 | 4120440190 | 人工智能导论 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 7 | |
| | | Introduction of Artificial | | | | | | | | | |
| 材料学院 | 4070040210 | 智能制造概论 | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 7 | |
| | | Introduction to Intelligent Manufacturing | | | | | | | | | |
| 材料学院 | 4070085210 | 微电子封装材料与互连技术 | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 7 | |
| | | Micro electronic packaging materials and interconnection technology | | | | | | | | | |
| 材料学院 | 4070145110 | 无机非金属材料工学 B | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | |
| | | Inorganic Non-metallic Material Engineering | | | | | | | | | |
| 小 计 Subtotal | | | 21.0 | 336 | 336 | 0 | 0 | 0 | 0 | | |
| 修读说明：要求至少选修 6 学分，学生从以上个性课程（至少选修 2 门）和学校发布的其它个性课程目录中选课。<br>NOTE: Minimum subtotal credits: 6. And students are required to obtain at least 2 courses from the Personalized Elective Courses listed above. | | | | | | | | | | | |
| (七)专业教育集中性实践教育环节<br>7 Specialized Practice Schedule | | | | | | | | | | | |
| 材料学院 | 4070106210 | 毕业论文 | 8.5 | 272 | 0 | 0 | 0 | 272 | 0 | 8 | |
| | | Graduation Thesis | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 机电学院 | 4080152110 | 机械制造工程实训 D | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 4 | |
| | | Training on Mechanical Manufacturing Engineering D | | | | | | | | | |
| 自动化学院 | 4100069110 | 电工电子实习 B | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 4 | |
| | | Practice of Electrical Engineering & Electronics | | | | | | | | | |
| 材料学院 | 4070230110 | 专业实习 | 3 | 48 | 0 | 0 | 0 | 48 | 0 | 6 | |
| | | Practical Training in Major | | | | | | | | | |
| 材料学院 | 4070218110 | 认识实习 | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 5 | |
| | | Cognition Practice | | | | | | | | | |
| 材料学院 | 4070017220 | 功能材料器件设计训练 A | 1.5 | 48 | 0 | 0 | 0 | 48 | 0 | 6 | |
| | | Training on Devices Design for Functional Materials | | | | | | | | | |
| 机电学院 | 4080146110 | 机械设计基础课程设计 | 2 | 32 | 0 | 0 | 0 | 32 | 0 | 5 | |
| | | Course Design on Fundamentals of Mechanical Design | | | | | | | | | |
| 小 计 Subtotal | | | 18.0 | 448 | 0 | 0 | 0 | 448 | 0 | | |

## 四、 修读指导
## IV Recommendations on Course Studies

课外培养方案详见《武汉理工大学第二课堂课外学分实施办法》。《形势与政策》和《心理健康教育》课程为课外必修课程，分别计 2 个课外学分。

Please refer to the cultivation plan of the second class-Implementation Measures for Extracurricular Credits of the Second Class of Wuhan University of Technology. Situation & Policy (2 credits) and Mental Health Education (2 credits) are the required extracurricular courses.

**学院教学负责人：赵春霞**

**专业培养方案负责人：顾少轩**