**材料成型及控制工程专业培养方案**

（2021版）

**Material Processing and Control Engineering**

专业名称：材料成型及控制工程 专业代码：080203

**一、培养标准**

本专业培养能够适应现代机械工程领域材料成型及控制技术的发展，具备良好的思想品德、人文素质、创新精神、国际视野、团队合作与沟通能力，能有效运用专业相关知识和工程技术原则解决材料成型及控制复杂工程问题，能通过自主学习增加知识、提升工程实践能力，具有良好的职业道德，和服务国家材料及材料加工行业的可持续发展的意愿，能够从事材料成型及控制工程领域相关的设计制造、应用研究、设备维护和生产运行管理和经济决策的应用型高级专门人才。

培养目标分解如下：

**目标1**：拥有终身学习的意识，具有良好的职业道德、法律意识及社会责任感，践行服务社会及环境可持续发展理念。

**目标2：**具有一定国际视野、良好的创新意识，具备一定的协调、沟通与合作能力，能够在研发团队中发挥重要作用，促进材料加工行业的创新与发展。

**目标3：**具有较强的工程实践能力，能够运用数理、工程基础和专业知识，并使用现代工具，解决材料成型及控制工程复杂工程问题。

**目标4：**具备承担本专业领域相关的工程材料制备、改性与表征，以及复杂零部件的设计研发、工艺控制及相关管理工作的能力。

**二、毕业要求**

通过3-6年的系统学习，本专业的学生要求掌握材料成型领域的基础理论与知识，熟悉相关工程技术与规范，了解新兴技术；具备工程材料的选择与改性、成形质量控制、成形过程控制与检测、设备安装与调制和项目管理等工作的基本能力；具有现代科技观念、综合人文素质、较强的开拓创新能力；良好的工程素质、人文修养和沟通能力；具备终生学习、适应社会的能力。具体包括以下方面的能力和素养：

**毕业要求1：工程知识：**能够将数学、自然科学、工程基础、材料科学基础、材料成型及控制专业知识，用于解决机械工程零部件材料的选择与改性、成形质量控制等复杂工程问题。

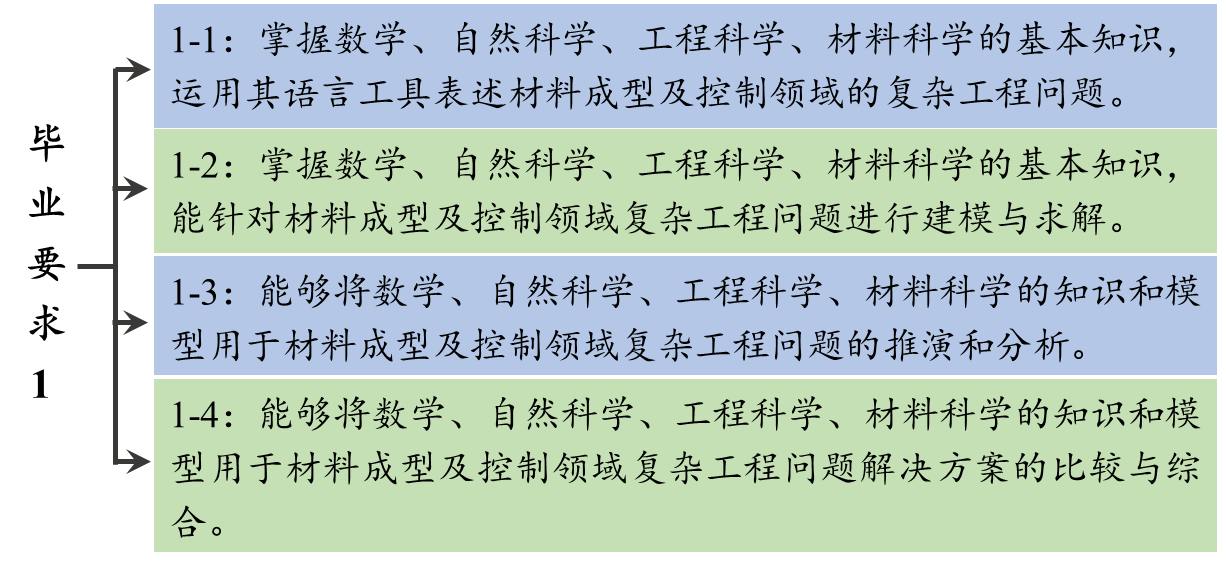


图1 毕业要求1指标点分解

**毕业要求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机械工程零部件材料的选择与改性、成形质量控制等复杂工程问题，判断解决复杂工程问题中有关机械工程零部件材料的选择与改性、成形质量控制的关键制约参数，并提出对应的解决方案和优化措施，从而获得有效的结论。

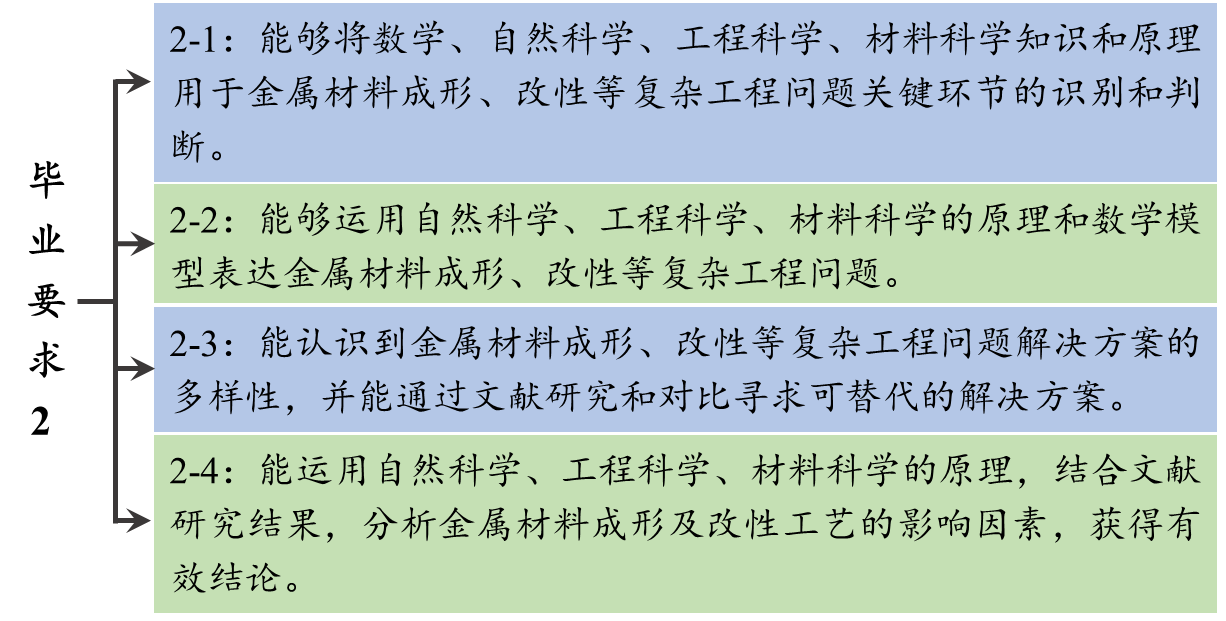


图2 毕业要求2指标点分解

**毕业要求3：设计/开发解决方案：**能够设计机械工程零部件材料的选择与改性、成形质量控制等复杂工程问题的解决方案，设计、优化满足特定需求的工艺或设备，并能够在设计环节中体现创新意识，综合考虑社会、健康、安全、法律、文化以及环境等因素。

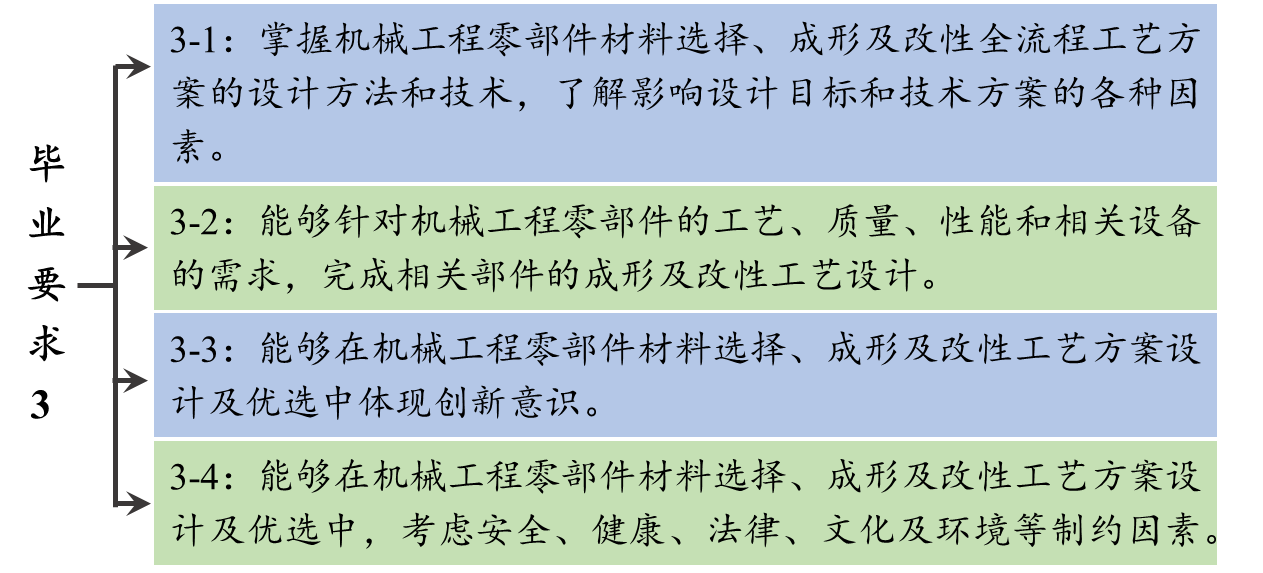


图3 毕业要求3指标点分解

**毕业要求4：研究：**能够基于材料成型及控制工程中的科学原理，并采用实验设计方法、分析测试方法对机械工程零部件材料的选择与改性、成形质量控制领域复杂工程问题进行实验设计、数据分析，并通过信息综合得到合理有效的结论。

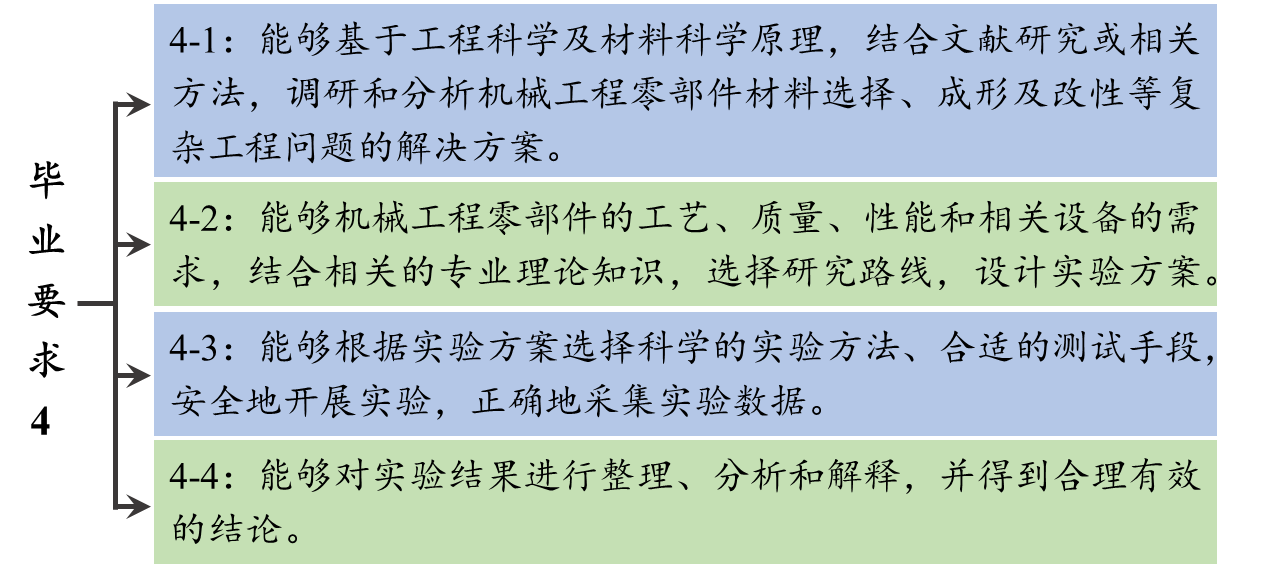


图4 毕业要求4指标点分解

**毕业要求5 ：使用现代工具：**能够针对机械工程零部件材料的选择与改性、成形质量控制复杂工程问题，选择、使用与开发恰当的技术、资源、现代工程工具和信息技术工具，进行预测与模拟，并能够理解其局限性。

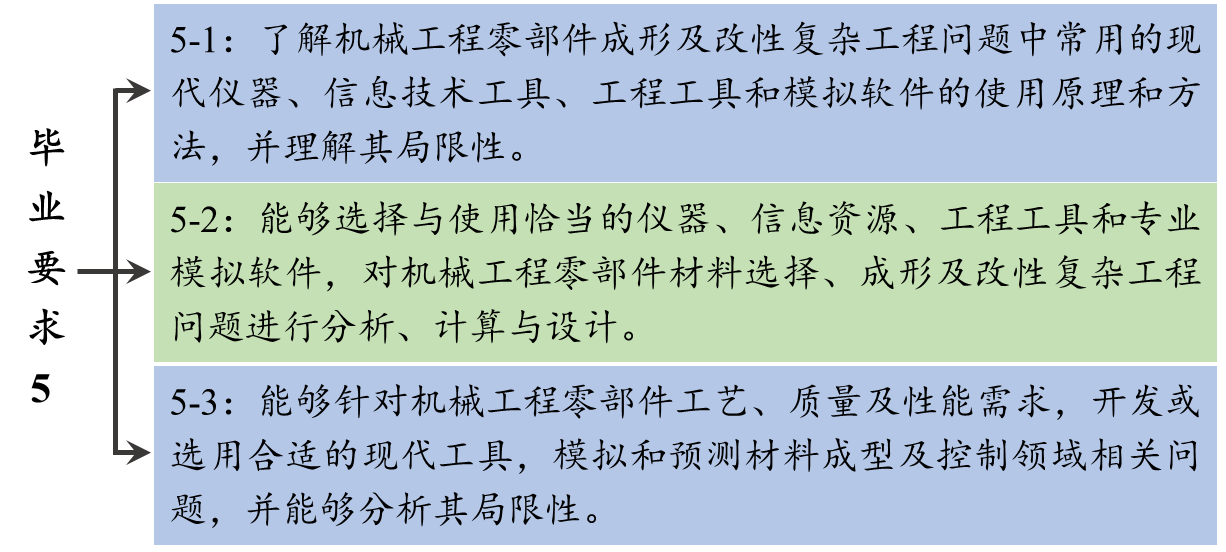


图5 毕业要求5指标点分解

**毕业要求6 ：工程与社会：**能够基于专业知识对工程实践的合理性进行分析，评价材料成型专业工程实践和复杂工程解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

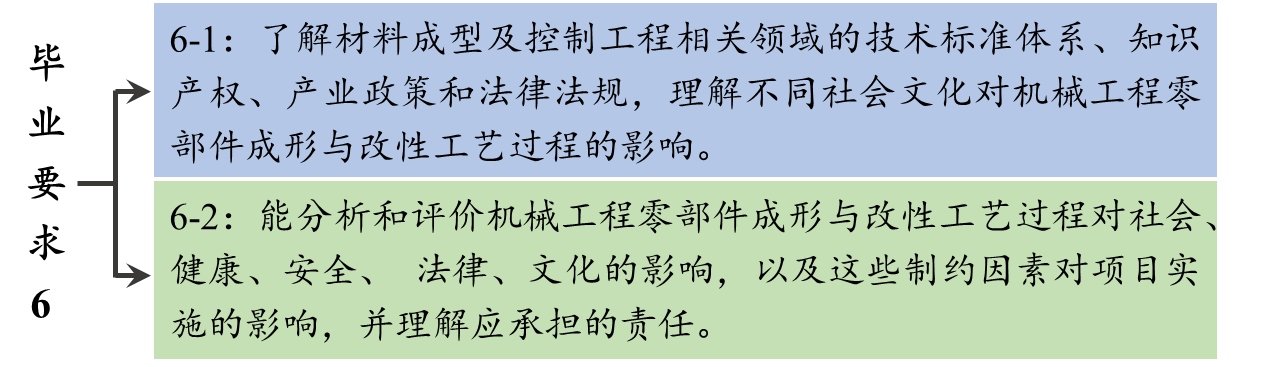


图6 毕业要求6指标点分解

**毕业要求7：环境与可持续发展：**能够理解和评价针对材料选择与改性、成形质量控制复杂工程问题的工程实践对环境、社会可持续发展的影响。

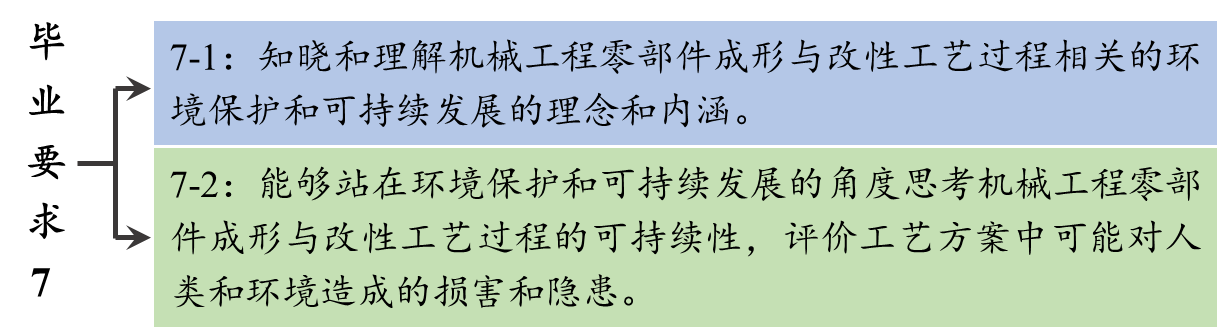


图7 毕业要求7指标点分解

**毕业要求8 ：职业规范：**具有人文社会科学素养、社会责任感，能够在材料选择与改性、成形质量控制工程实践中理解并遵守工程职业道德和规范，履行责任。

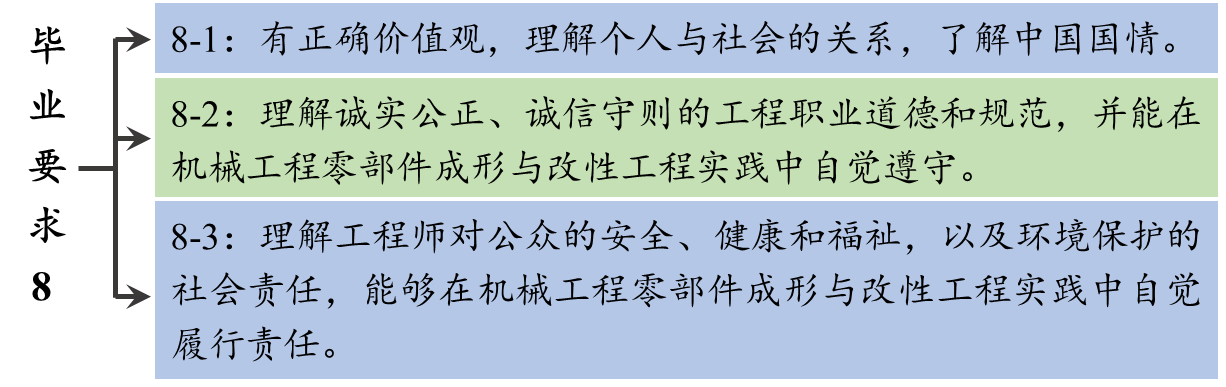


图8 毕业要求8指标点分解

**毕业要求9 ：个人与团队：**具有团队合作精神或意识，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。

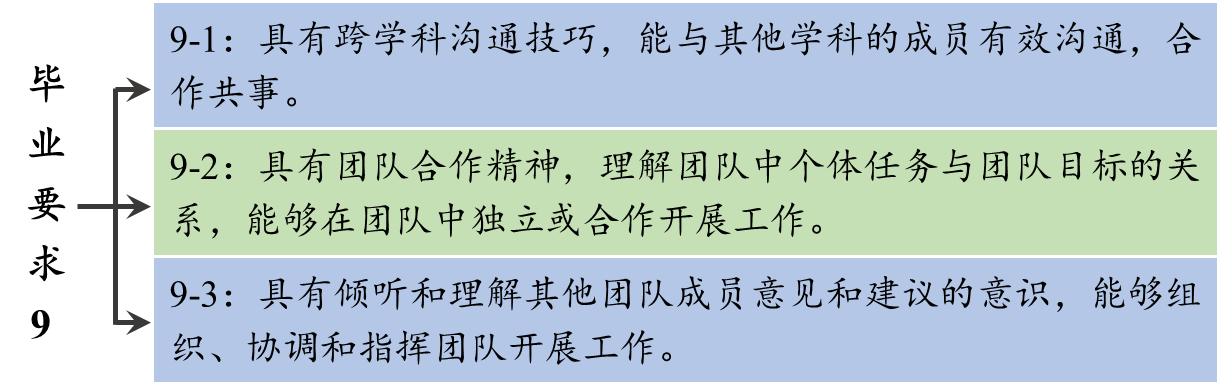


图9 毕业要求9指标点分解

**毕业要求10：沟通：**能够就机械工程零部件材料的选择与改性、成形质量控制等复杂工程问题与业界同行和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。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。

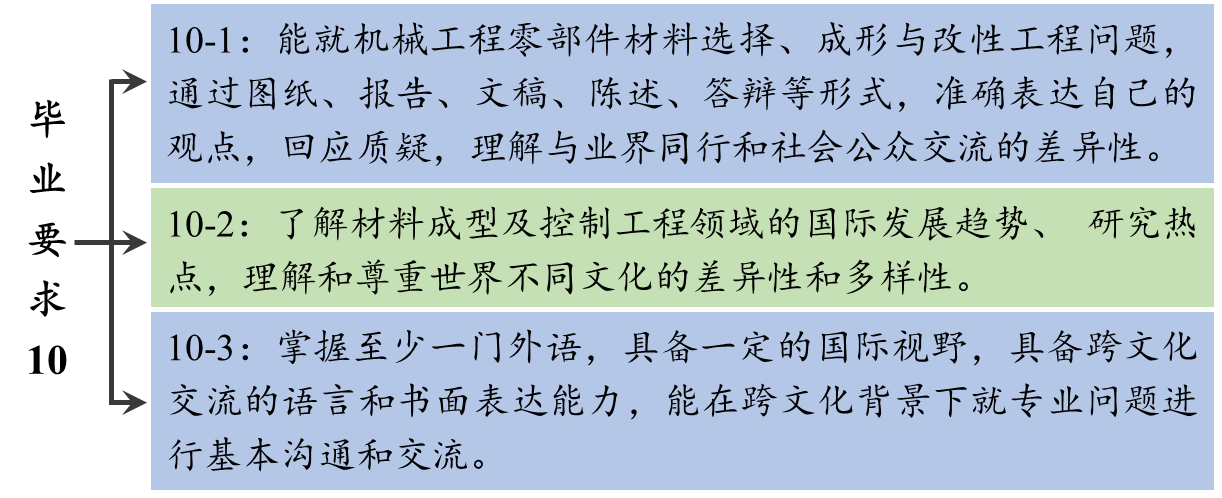


图10 毕业要求10指标点分解

**毕业要求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。

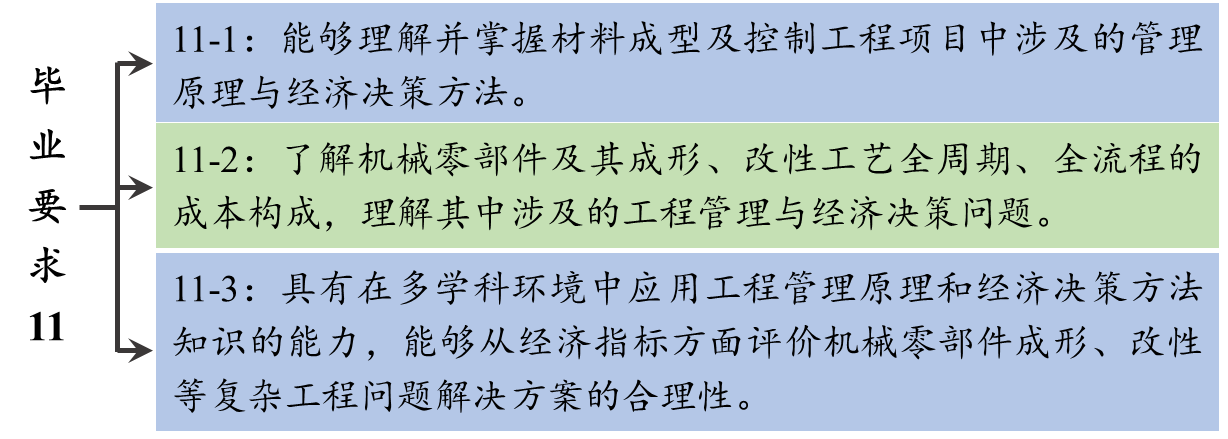


图11 毕业要求11指标点分解

**毕业要求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。

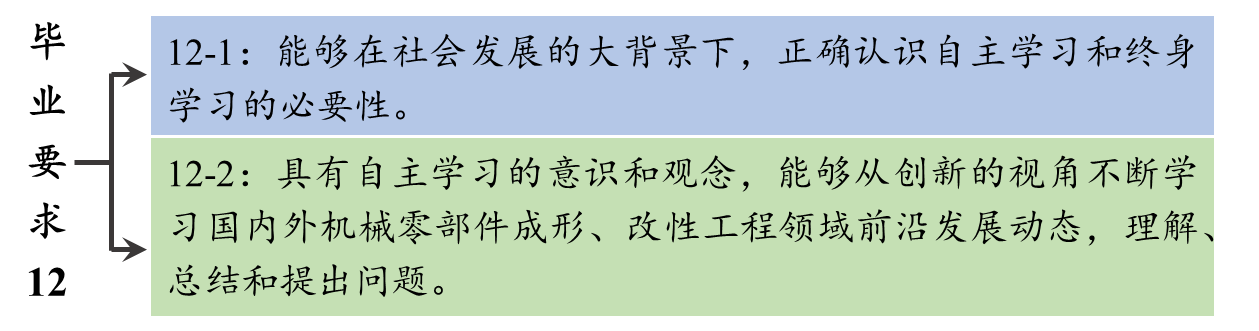


图12 毕业要求12指标点分解

**三、课程设置**

（一）主干学科：机械工程、材料科学与工程

（二）核心课程及主要实践性教学环节

1. 核心课程：

机械设计基础、金属工艺学、材料科学基础、材料成形检测及控制工程基础、材料物理与力学性能、材料分析方法、传输原理等。

2. 主要实践性教学环节：

思想政治理论课实践教学、机械制图测绘、机械原理和机械设计课程设计、材料成型及控制工程专业实验、工程训练、材料成型专业生产实习、材控毕业设计等。

**第二课堂创新实践学分**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **序号** | **课外活动名称** | **课外活动和社会实践的要求** | | **学分** |
| 1 | 社会实践活动或挂职锻炼 | 校、院级组织的寒暑假社会实践活动和挂职锻炼活动，按要求提交实践报告 | | 1 |
| 获得国家表彰 | | 2 |
| 获得省（部）级表彰 | | 1.5 |
| 获得校（地市）级表彰 | | 1 |
| 获得院级表彰 | | 0.5 |
| 2 | 英语及计算机考试 | 全国大学英语六级考试 | 考试成绩达到学校要求者 | 2 |
| 托福考试 | 达90分以上者 | 3 |
| 雅思考试 | 达6.5分以上者 | 3 |
| GRE考试 | 达306分以上者 | 3 |
| 全国计算机等级考试 | 获二级以上证书者 | 2 |
| 全国计算机软件资格、水平考试 | 获程序员证书者 | 2 |
| 获高级程序员证书者 | 3 |
| 获系统分析员证书者 | 4 |
| 3 | 创新创业与学科竞赛 | 校级 | 获一等奖者 | 3 |
| 获二等奖者 | 2 |
| 获三等奖者 | 1 |
| 省级 | 获一等奖者 | 4 |
| 获二等奖者 | 3 |
| 获三等奖者 | 2 |
| 全国 | 获一等奖者 | 6 |
| 获二等奖者 | 4 |
| 获三等奖者 | 3 |
| 4 | 项目 | 大学生创新创业训练计划项目 | 校级 | 1 |
| 省级 | 2 |
| 全国 | 3 |
| 5 | 论文 | 首位在全国性刊物发表论文 | 每篇论文 | 2~3 |

注：团委负责认定社会实践活动或挂职锻炼以及文体活动的学分；

创新创业学院负责认定创新创业与学科竞赛以及项目的学分。

（三）各环节学时学分比例

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **课程类别** | | **应修学分** | | **学分比例(%)** | **标准要求** |
| 数学与自然科学 | | 29 | | 16.1% | >=15% |
| 工程科学 | 工程基础 | 23 | 67 | 37.2% | >=30% |
| 专业基础 | 24 |
| 专业必修 | 10 |
| 专业选修 | 10 |
| 集中实践环节 | 劳动与思政教育实践 | 2 | | 1.1% | --- |
| 工程实践与毕业设计（论文） | 37 | | 20.6% | >=20% |
| 人文社会科学类通识教育 | 通识教育必修 | 31.5 | 45 | 25.0% | >=15% |
| 通识教育选修 | 13.5 |
| 合计 | | 180 | | 100% |  |

（四）第二课堂

第二课堂活动项目分为“社会责任”“创新能力”“实践能力”“身心修养” “特色发展”五个模块，进行分类记录和管理。

**四、毕业及学位要求**

学制：4年

修业年限：3~6年

毕业学分要求：不少于180学分；第二课堂8学分。

授予学位：符合国家学位规定和山东理工大学学位授予条件者，授予工学学士学位

**五、专业课程设置一览表（中英文对照）**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 课程类别 | | 课程  代码 | 课程名称 | 学分 | 学时 | | 开课学期 | 周学时 | 考核方式 | 备注 |
| 理论 | 实验实践 |
| 人文社会科学类通识教育课程 | 公共  必修 | 211611001 | 大学英语Ⅰ  College English I | 2 | 32 |  | 1 |  |  |  |
| 211611005 | 大学英语听说Ⅰ  College English Listening and SpeakingⅠ | 1 | 16 |  | 1 |  |  |  |
| 211811003 | 思想道德修养与法治  Ideological Morality & Rule of Law | 2.5 | 44 |  | 1 |  |  |  |
| 212111001 | 形势与政策Ⅰ  Physical Education Ⅰ | 1 | 16 | 20 | 1 |  |  |  |
| 213111001 | 军事理论  Military Theory | 1 | 36 |  | 1 |  |  |  |
| 210111001 | 新生研讨课（双语）  Freshman Seminar | 1 | 16 |  | 1 | 2 |  |  |
| 212111001 | 体育Ⅰ  Physical Education Ⅰ | 1 | 16 | 20 | 1 |  |  |  |
| 211611002 | 大学英语Ⅱ  College English II | 2 | 32 |  | 2 |  |  |  |
| 211611006 | 大学英语听说Ⅱ  College English Listening and SpeakingⅡ | 1 | 16 |  | 2 |  |  |  |
| 211811004 | 中国近现代史纲要  Outline of Chinese Modern | 2.5 | 40 |  | 2 |  |  |  |
| 212718001 | 信息检索与学术素养  Information Retrieval and Academic Literacy | 1.5 | 16 | 16 | 2 |  |  |  |
| 212111002 | 体育Ⅱ  Physical Education Ⅱ | 1 | 24 | 12 | 2 |  |  |  |
| 211611003 | 大学英语Ⅲ  College English III | 2 | 32 |  | 3 |  |  |  |
| 211811005 | 形势与政策Ⅰ  Situation & Policies Ⅰ | 1 | 16 |  | 3 |  |  |  |
| 211811001 | 马克思主义基本原理概论  Basic Principles of Marxism | 3 | 52 | 0 | 3 |  |  |  |
| 212111003 | 体育Ⅲ  Physical Education Ⅲ | 1 | 24 | 12 | 3 |  |  |  |
| 211611004 | 大学英语Ⅳ  College English Ⅳ | 2 | 32 |  | 4 |  |  |  |
| 211811002 | 毛泽东思想和中国特色社会主义理论体系概论  Mao Zedong Thought & Outline of Theory of Socialism with Chinese Characteristics | 4 | 64 |  | 4 |  |  |  |
| 212111004 | 体育Ⅳ  Physical Education Ⅳ | 1 | 24 | 12 | 4 |  |  |  |
| 211811006 | 形势与政策Ⅱ  Situation & Policies Ⅱ | 1 | 16 |  | 5 |  |  |  |
| 应修学分小计 | | 31.5 | | | | | |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 课程类别 | | | 课程  代码 | 课程名称 | | 学分 | 学时 | | | | | 开课学期 | 周学时 | | 考核方式 | 备注 |
| 理论 | | | 实验实践 | |
| 人文社会科学类通识教育课程 | 选修 | | 218112001 | 大学生心理健康教育\*  Psychologically Healthy Education for College Students | | 2 | 32 | | |  | | 1 |  | |  |  |
| 218312001 | 大学生职业生涯规划与就业指导\*  Career Planning and Vocational Counsel for College Students | | 1.5 | 28 | | | 4 | | 1 |  | |  |  |
| 217412001 | 创新方法基础\*  Fundamentals of Innovation Methods | | 0.5 | 10 | | |  | | 1 |  | |  |  |
| 212612001 | 中国传统文化\*  Chinese traditional culture | | 1 | 20 | | |  | | 1 |  | |  |  |
| 211812001 | 中国共产党历史  History of the Communist Party of China | | 1 | 16 | | |  | | 2 |  | |  | \*四选一 |
| 211812002 | 中华人民共和国史  History of PRC | | 1 | 16 | | |  | | 2 |  | |  |
| 211812003 | 改革开放史  History of Reform and Opening Up | | 1 | 16 | | |  | | 2 |  | |  |
| 211812004 | 社会主义发展史  History of Socialist Development | | 1 | 16 | | |  | | 2 |  | |  |
| 217412002 | 大学生创业基础\*  College students' entrepreneurial base | | 0.5 | 10 | | |  | | 3 |  | |  |  |
| 210818901 | 环境保护与可持续发展概论\*  Introduction to environmental protection and sustainable development | | 1.5 | 24 | | |  | | 5 |  | |  |  |
| 210118933 | 现代工业企业管理\*  Modern Industrial Enterprise Management | | 1.5 | 24 | | |  | | 5 |  | |  |  |
| 210118341 | 材料成型创新设计\*  Material Forming Innovative Design | | 2 | 32 | | |  | | 7 |  | |  |  |
| 213214001 | 材料成型专业创新实践  Practice of Innovation | | 2 |  | | |  | | 7 |  | | 认定 |  |
| 公选 | 美育类 | | 2 |  | | |  | |  |  | |  |  |
| 应修学分小计 | | | 13.5 | | | | | | | | | | 带\*限选 |
| 数学与  自然科  学课程 | | | 211118901 | 高等数学(A)Ⅰ  Advanced Mathematics(A)Ⅰ | | 5 | 80 | | |  | | 1 | 6 |  | |  |
| 211118910 | 线性代数（B）  Linear Algebra (B) | | 2.5 | 40 | | |  | | 1 | 5 |  | |  |
| 211118902 | 高等数学(A)Ⅱ  Advanced Mathematics(A)Ⅱ | | 5 | 80 | | |  | | 2 | 5 |  | |  |
| 211218901 | 大学物理(A)Ⅰ  College Physics | | 3 | 48 | | |  | | 2 | 4 |  | |  |
| 211215901 | 大学物理实验（A）Ⅰ  College Physics Experiment Ⅰ | | 0.75 |  | | | 24 | | 2 | 4 |  | |  |
| 210618199 | 普通化学(A)  Engineering Chemistry (A) | | 4 | 56 | | | 8 | | 2 |  |  | |  |
| 211118913 | 概率论与数理统计（D）  Probability & Statistics | | 3 | 48 | | |  | | 3 | 6 |  | |  |
| 211118917 | 计算方法  Computational Method | | 2 | 32 | | |  | | 3 | 4 |  | |  |
| 211218902 | 大学物理(A)Ⅱ  College Physics | | 3 | 48 | | |  | | 3 | 4 |  | |  |
| 211215902 | 大学物理实验（A）Ⅱ  College Physics Experiment(A)Ⅱ | | 0.75 |  | | | 24 | | 3 | 4 |  | |  |
| 应修学分小计 | | | 29 | | | | | | | | | |  |
| 课程类别 | | | 课程  代码 | | 课程名称 | 学分 | 学时 | | | | | 开课学期 | 周学时 | 考核方式 | | 备注 |
| 理论 | | | 实验实践 | |
| 工程科学 | | 工程基础课程 | 210518905 | | Python程序设计  Python program design | 3 | 32 | | | 32 | | 2 |  |  | |  |
| 210318123 | | 机械制图  Machine Drawing | 6 | 88 | | | 8 | | 3 |  |  | |  |
| 210418918 | | 电工与电子技术（B）  Electrical and Electronic Technology(B) | 3.5 | 50 | | | 6 | | 3 | 4 |  | |  |
| 210118931 | | 机械设计基础(A) （双语）  The Basic Design of Mechanic (A) | 4 | 64 | | |  | | 4 |  |  | |  |
| 210218905 | | 工程力学（B）  Engineering Mechanics (B) | 4 | 58 | | | 6 | | 4 | 4 |  | |  |
| 210118901 | | 互换性与技术测量(A)  Elementary Technology of Exchangeability Measurement (A) | 2.5 | 32 | | | 8 | | 5 |  |  | |  |
| 应修学分小计 | | | 23 | | | | | | | | | |  |
| 专业基础课程 | 210118305 | | 材料物理化学  Physical chemistry of Materials | 2.5 | 40 |  | | | 4 | |  |  | |  |
| 210118307 | | 传输原理  Principle of Transmission | 2 | 32 |  | | | 4 | |  |  | |  |
| 210118928 | | 金属工艺学(A)  Metal Technique (A) | 3 | 48 |  | | | 5 | |  |  | |  |
| 210118304 | | 材料科学基础  Basic Material Science | 4 | 64 |  | | | 5 | |  |  | |  |
| 210118306 | | 材料物理与力学性能(A)  Physical & Mechanical Properties of Materials (A) | 2 | 32 |  | | | 5 | |  |  | |  |
| 210118328 | | 金属热处理原理与工艺  Heat-Treatment Principle & Process of Metals | 2 | 32 |  | | | 5 | |  |  | |  |
| 210118303 | | 材料加工工程英语  Materials Processing Engineering English | 2 | 32 |  | | | 5 | | 4 |  | |  |
| 210118355 | | 工程材料（双语）  Engineering Materials | 2 | 32 |  | | | 6 | |  |  | |  |
| 210118301 | | 材料成形检测及控制工程基础  Materials Processing and Testing Technology | 2.5 | 40 |  | | | 6 | |  |  | |  |
| 210118302 | | 材料分析方法  Materials Analyses | 2 | 32 |  | | | 6 | |  |  | |  |
| 应修学分小计 | | | 24 | | | | | | | | | |  |
| 专业必修 | 210118319 | | 金属塑性成形工艺与模具设计  Metal Forming & Die Design | 3 | 48 | |  | | 6 | |  |  | | 塑  性  成  形 |
| 210118329 | | 金属塑性成形原理  Principle of metal plastic forming | 3 | 48 | |  | | 6 | |  |  | |
| 210118332 | | 塑性成形设备及自动化  Plasticity Forming Equipment and Automation | 2 | 32 | |  | | 6 | |  |  | |
| 210118333 | | 塑性成形数值模拟（双语）  Numerical Simulation on Materials Forming | 2 | 16 | | 16 | | 6 | |  |  | |
| 210118350 | | 增材制造与材料连接工艺  Process of Additive Manufacture & Welding | 3 | 48 | |  | | 6 | |  |  | | 增  材  制  造 |
| 210118352 | | 增材制造与材料连接原理  Principle of Additive Manufacture & Welding | 3 | 48 | |  | | 6 | |  |  | |
| 210118351 | | 增材制造与材料连接设备及自动化  Equipment and Automation of Additive Manufacture & Welding | 2 | 32 | |  | | 6 | |  |  | |
| 210118337 | | 增材制造与材料连接仿真技术（双语）  Computer simulation of Additive Manufacture & Welding | 2 | 16 | | 16 | | 6 | |  |  | |
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| 课程类别 | | 课程  代码 | 课程名称 | 学分 | 学时 | | | 开课学期 | | 周学时 | 考核方式 | 备注 |
| 理论 | | 实验实践 |
| 工程科学 | 专业必修（续） | 210118353 | 铸造工艺设计基础  Fundamental of casting process design | 3 | 48 |  | | 6 | |  |  | 智  能  铸  造 |
| 210118339 | 铸造成形原理  Principle of casting process | 3 | 48 |  | | 6 | |  |  |
| 210118336 | 智能铸造设备及自动化  Equipment and Automation of Intelligent casting technology | 2 | 32 |  | | 6 | |  |  |
| 210118337 | 铸造成形仿真技术（双语）  Computer simulation of casting process | 2 | 16 | 16 | | 6 | |  |  |
| 应修学分小计 | | 10 | | | | | | | |  |
| 专业选修 | 210118229 | 机器学习与人工智能  Machine Learning and Artificial Intelligence | 2 | 32 | |  | | 6 |  |  |  |
| 210118334 | 先进铸造技术  Advance Foundry Technology | 2 | 32 | |  | | 7 |  |  |  |
| 210118317 | 铸造合金及熔炼  Cast Alloy & Melting | 2 | 32 | |  | | 7 |  |  |  |
| 210118309 | 高性能金属材料  High-performance Metallic Materials | 2 | 32 | |  | | 7 |  |  |  |
| 210118314 | 模具制造工艺  Die & Mould Manufacturing Technology | 2 | 32 | |  | | 7 |  |  |  |
| 210118313 | 模具设计制造先进技术  Advanced Technology on Mold Design & Manufacturing | 2 | 16 | | 16 | | 7 |  |  |  |
| 210118325 | 焊接与增材制造先进技术  Advanced technology of Welding and Additive Manufacture | 2 | 32 | |  | | 7 |  |  |  |
| 210118331 | 塑料成形工艺与模具设计  Plastic Forming Technology & Mold Design | 2 | 32 | |  | | 7 |  |  |  |
| 210118357 | 材料连接技术基础  Fundamental of Welding and Joining | 2 | 32 | |  | | 7 |  |  |  |
| 210118310 | 焊接结构  Welding Structure | 2 | 32 | |  | | 7 |  |  |  |
| 210118315 | 纳米及非晶材料(英文)  Nano and amorphous materials | 2 | 32 | |  | | 7 |  |  |  |
| 210118311 | 计算机在材料科学与工程中的应用  Application of Computer in Materials Science and Engineering | 2 | 16 | | 16 | | 7 |  |  |  |
| 210118320 | 材料的腐蚀与防护  Corrosion and Protection of Materials | 2 | 32 | |  | | 7 |  |  |  |
| 210118344 | 定量金相学  Quantitative metallography | 1 | 16 | |  | | 7 |  |  |  |
| 210118342 | 表面工程基础（双语）  Fundamentals of surface engineering | 2 | 32 | |  | | 7 |  |  |  |
| 210118348 | 先进表面技术（英文）  Advanced surface technology | 2 | 32 | |  | | 7 |  |  |  |
| 210118346 | 计算机辅助设计与制造  Computer aided design and manufacturing | 2 |  | | 32 | | 7 |  |  |  |
| 应修学分小计 | | 10 | | | | | | | |  |

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| 课程类别 | | 课程  代码 | 课程名称 | | | 学分 | 学时 | | | 开课学期 | 周学时 | 考核方式 | 备注 |
| 理论 | | 实验实践 |
| 集中实践环节 | 劳动与思政教育实践 | 213114001 | 入学教育及军训  Entrance Education & Military Training | | | 1.5 |  | | +3 | 1 |  |  | 不计入总学分 |
| 213214004 | 劳动教育与实践  Labour Education | | | 2 |  | | +4 |  |  |  | 不计入总学分 |
| 211814001 | 思想政治理论课实践教学  The Practice of Ideological and Political Theory Course Teaching | | | 2 |  | | +2 | 4 |  |  |  |
| 应修学分小计 | | | | 5.5 | | | | | | | 3.5学分不计入总学分 |
| 工程实践与毕业设计（论文） | 210114306 | Python程序设计课程设计  Course project of Python program design | | | 2 |  | | +2 | 2 |  |  |  |
| 210315901 | 机械制图测绘(A)  Mechanical Drawing &Plotting (A) | | | 1 |  | | +1 | 3 |  |  |  |
| 210114312 | 材料成型专业认知实习  perceptual practice for Material Forming & Control | | | 1 |  | | +1 | 3 |  |  |  |
| 212814001 | 工程训练(A)  Engineering training | | | 4 |  | | +4 | 4 |  |  |  |
| 210114014 | 机械设计课程设计(B)  Course Exercise in Basic Mechanical Design (B) | | | 2 |  | | +2 | 4 |  |  |  |
| 210114303 | 材料成型及控制工程专业实验Ⅰ  Specialized experiment for Material Processing and Control Engineering I | | | 2 |  | | +2 | 5 |  |  |  |
| 210114304 | 材料成型及控制工程专业实验Ⅱ  Specialized experiment for Material Processing and Control Engineering II | | | 2 |  | | +2 | 6 |  |  |  |
| 210114307 | 金属塑性成形工艺与模具设计课程设计  Course Project of Metal Forming & Die Design | | | 2 |  | | +2 | 6 |  |  | 塑性  成形 |
| 210114308 | 塑性成形设备及自动化课程设计  Course Project of Plasticity Forming Equipment and Automation | | | 2 |  | | +2 | 6 |  |  |
| 210114313 | 增材制造与材料连接工艺课程设计(A)  Course Project of Additive Manufacture & Welding process | | | 2 |  | | +2 | 6 |  |  | 增材  制造 |
| 210114314 | 增材制造与材料连接设备课程设计(A)  Course Project of Additive Manufacture & Welding equipment | | | 2 |  | | +2 | 6 |  |  |
| 210114309 | 铸造工艺课程设计  Course project of casting process | | | 2 |  | | +2 | 6 |  |  | 智能  铸造 |
| 210114310 | 智能铸造设备课程设计  Course project of casting equipment | | | 2 |  | | +2 | 6 |  |  |
| 210114004 | 材料成型专业生产实习  Production Practice for Material Forming & Control | | | 3 |  | | +3 | 7 |  |  |  |
| 210114002 | 材料成型及控制工程专业毕业设计  Graduation Project for Materials Forming & Control | | | 16 |  | | +16 | 8 |  |  |  |
| 应修学分小计 | | | | 37 | | | | | | | |
| 总计 | | | | | | 180 | | | | | | | |
| **制 定** | | | | 王洪涛，宗然 | **审 核** | | | 李志永 | | | | | |
| **院 长** | | | | 葛文庆 | | | | | | | | | |

附表1：开设课程与毕业要求指标点的对应关系矩阵

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **类别** | | **课程名称** | 学分 | **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** | |
| **1-1** | **1-2** | **1-3** | **1-4** | **2-1** | **2-2** | **2-3** | **2-4** | **3-1** | **3-2** | **3-3** | **3-4** | **4-1** | **4-2** | **4-3** | **4-4** | **5-1** | **5-2** | **5-3** | **6-1** | **6-2** | **7-1** | **7-2** | **8-1** | **8-2** | **8-3** | **9-1** | **9-2** | **9-3** | **10-1** | **10-2** | **10-3** | **11-1** | **11-2** | **11-3** | **12-1** | **12-2** |
| 人文社科通识教育课程 | 公共必修 | 马克思主义基本原理 | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  | H |  |  | H |  |
| 毛泽东思想和中国特色社会主义理论体系概论 | 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  | H |  |
| 思想道德修养与法律基础 | 2.5 |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |
| 中国近现代史纲要 | 2.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  | H |  |
| 形势与政策 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  | H |  |  |  | M |  |  |  |  |  |  |
| 大学英语 | 10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |
| 体育 | 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | L | L |  |  |  |  |  |  |  |  |
| 军事理论 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  | L |  |  |  |  |  |  |  |  |
| 信息检索与学术素养 | 1.5 |  |  |  |  |  |  |  | H |  |  |  |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 新生研讨课（双语） | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |
| 通识教育选修 | 改革开放史 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 大学生心理健康教育\* | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |
| 环境保护与可持续发展概论\* | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |
| 大学生职业生涯规划与就业指导\* | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  | M |  |
| 中国传统文化\* | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |
| 创新方法基础\* | 0.5 |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |
| 大学生创业基础\* | 0.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  | H |  |  |  |  |
| 材料成型创新设计\* | 2 |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 现代工业企业管理 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  | H | H |  |  |  |

开设课程与毕业要求指标点的对应关系矩阵（续表）

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **类别** | | **课程名称** | 学分 | **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** | |
| **1-1** | **1-2** | **1-3** | **1-4** | **2-1** | **2-2** | **2-3** | **2-4** | **3-1** | **3-2** | **3-3** | **3-4** | **4-1** | **4-2** | **4-3** | **4-4** | **5-1** | **5-2** | **5-3** | **6-1** | **6-2** | **7-1** | **7-2** | **8-1** | **8-2** | **8-3** | **9-1** | **9-2** | **9-3** | **10-1** | **10-2** | **10-3** | **11-1** | **11-2** | **11-3** | **12-1** | **12-2** |
| 数学  与  自然  科学 | | 高等数学 | 10 | H |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 线性代数 | 2.5 | H |  |  |  |  | H |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 概率论与数理统计 | 3 | H |  |  |  |  | H |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 计算方法 | 2 |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 大学物理 | 6 |  | H |  |  | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 大学物理实验 | 1.5 |  |  |  |  |  |  |  | H |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |
| 普通化学 | 4 |  |  |  | H | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 工程科学 | 工程基础课 | 工程力学 | 4 |  | H |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Python程序设计 | 3 |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 机械制图 | 6 |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |
| 电工与电子技术 | 3.5 | H |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 机械设计基础 | 4 |  |  |  |  |  |  |  |  | H |  | H |  |  |  | L |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 互换性与技术测量 | 2.5 | H |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 专业基础课程 | 金属工艺学 | 3 |  |  | H |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料科学基础 | 4 |  |  | H |  |  |  |  | H |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料物理化学 | 2.5 | H |  |  |  |  |  |  | H |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 工程材料 | 2 |  |  |  |  |  |  |  | H |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料成形检测及控制工程基础 | 2.5 |  |  |  | H |  |  | H |  |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 传输原理 | 2 |  |  | H |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料物理与力学性能 | 2 |  |  | H |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料分析方法 | 2 |  |  |  |  |  |  |  | H |  |  |  |  |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 金属热处理原理与工艺 | 2 |  |  | H |  |  |  | H |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料加工工程英语 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |

开设课程与毕业要求指标点的对应关系矩阵（续表）

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **类别** | | **课程名称** | 学分 | **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** | |
| **1-1** | **1-2** | **1-3** | **1-4** | **2-1** | **2-2** | **2-3** | **2-4** | **3-1** | **3-2** | **3-3** | **3-4** | **4-1** | **4-2** | **4-3** | **4-4** | **5-1** | **5-2** | **5-3** | **6-1** | **6-2** | **7-1** | **7-2** | **8-1** | **8-2** | **8-3** | **9-1** | **9-2** | **9-3** | **10-1** | **10-2** | **10-3** | **11-1** | **11-2** | **11-3** | **12-1** | **12-2** |
| 专业必修 | 塑性成形 | 金属塑性成形工艺与模具设计 | 3 |  |  |  | H |  |  |  |  | H |  | L |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 金属塑性成形原理 | 3 |  |  | H |  | H |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 塑性成形设备及自动化 | 2 |  |  |  | H |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 塑性成形数值模拟 | 2 |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 增材制造 | 增材制造与材料连接工艺 | 3 |  |  |  | H |  |  |  |  | H |  | L |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 增材制造与材料连接原理 | 3 |  |  | H |  | H |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 增材制造与材料连接设备及自动化 | 2 |  |  |  | H |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 增材制造与材料连接仿真技术 | 2 |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 智能铸造 | 铸造工艺设计基础 | 3 |  |  |  | H |  |  |  |  | H |  | L |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 铸造成形原理 | 3 |  |  | H |  | H |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 智能铸造设备及自动化 | 2 |  |  |  | H |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 铸造成形仿真技术 | 2 |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 专  业  选  修 | | 先进铸造技术 | 2 |  |  |  | ▲ |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 铸造合金及熔炼 | 2 |  |  | ▲ |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 高性能金属材料 | 2 |  |  |  | ▲ |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 模具制造工艺 | 2 |  |  |  | ▲ |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 模具设计制造先进技术 | 2 |  |  |  | ▲ |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 焊接与增材制造先进技术 | 2 |  |  |  | ▲ |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 塑料成形工艺与模具设计 | 2 |  |  |  |  |  |  |  |  |  | ▲ |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料连接技术基础 | 2 |  |  |  |  |  |  |  |  |  | ▲ |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 焊接结构 | 2 |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

开设课程与毕业要求指标点的对应关系矩阵（续表）

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **类别** | **课程名称** | 学分 | **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** | |
| **1-1** | **1-2** | **1-3** | **1-4** | **2-1** | **2-2** | **2-3** | **2-4** | **3-1** | **3-2** | **3-3** | **3-4** | **4-1** | **4-2** | **4-3** | **4-4** | **5-1** | **5-2** | **5-3** | **6-1** | **6-2** | **7-1** | **7-2** | **8-1** | **8-2** | **8-3** | **9-1** | **9-2** | **9-3** | **10-1** | **10-2** | **10-3** | **11-1** | **11-2** | **11-3** | **12-1** | **12-2** |
| 专业选修 | 纳米及非晶材料 | 2 |  |  | ▲ |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 计算机在材料科学与工程中的应用 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 机器学习与人工智能 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料的腐蚀与防护 | 2 |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 定量金相学 | 1 |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 计算机辅助设计与制造 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 表面工程基础（双语） | 2 |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |
| 先进表面技术（双语） | 2 |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |  |  |  |  | ▲ |  |  |  |  |  |

开设课程与毕业要求指标点的对应关系矩阵（续表）

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **类别** | | **课程名称** | 学分 | **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** | |
| **1-1** | **1-2** | **1-3** | **1-4** | **2-1** | **2-2** | **2-3** | **2-4** | **3-1** | **3-2** | **3-3** | **3-4** | **4-1** | **4-2** | **4-3** | **4-4** | **5-1** | **5-2** | **5-3** | **6-1** | **6-2** | **7-1** | **7-2** | **8-1** | **8-2** | **8-3** | **9-1** | **9-2** | **9-3** | **10-1** | **10-2** | **10-3** | **11-1** | **11-2** | **11-3** | **12-1** | **12-2** |
| 集中实践环节 | | 入学教育及军训 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  |  |  |
| 劳动教育与实践 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |
| 思想政治理论课实践教学 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |
| 机械制图测绘 | 1 | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |
| 工程训练 | 4 |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  | H |  |  |  |  |  | H |  |  |  |
| 机械设计基础课程设计 | 2 |  |  |  |  |  |  |  |  |  | H | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Python程序设计课程设计 | 2 |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 材料成型专业生产实习 | 3 |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  |  |  | H |  |  |  |  | H |  |  |
| 材料成型专业认知实习 | 1 |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  |  |  |  |  | H |  |  |  |
| 材控专业毕业设计 | 16 |  |  |  |  |  |  |  | H |  |  |  |  | H |  |  | H |  |  | H | H | H |  |  |  |  |  |  |  |  | H |  |  |  | L | L |  |  |
| 材料成型及控制工程专业实验 | 4 |  |  |  |  |  |  |  |  |  |  |  |  |  | H | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  | H |
| 集中实践环节 | 塑性成形 | 金属塑性成形工艺与模具设计课程设计 | 2 |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 塑性成形设备及自动化课程设计 | 2 | H |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 增材制造 | 增材制造与材料连接工艺课程设计 | 2 |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 增材制造与材料连接设备课程设计 | 2 | H |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 智能铸造 | 铸造工艺课程设计 | 2 |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 智能铸造设备课程设计 | 2 | H |  |  |  |  |  |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

说明：强支撑（H）课程参与指标点达成度的计算，中支撑（M）课程和弱支撑（L）课程不参与指标点达成度的计算；一般的选修课程（▲）不参与指标点达成度的计算，但由符号\*标出的必选课程参与指标点达成度的计算；对于不参与达成度计算的课程，仍需要进行面向产出的课程目标达成情况评价，作为该课程教学质量持续改进的重要参考依据；选修课不覆盖全体学生，不参与毕业要求指标点达成度的计算。

附表2：毕业要求对培养目标的支撑关系矩阵

| **培养目标**  **毕业要求** | **培养目标1** | **培养目标2** | **培养目标3** | **培养目标4** |
| --- | --- | --- | --- | --- |
| 毕业要求 1  工程知识 |  |  | √ |  |
| 毕业要求 2  问题分析 |  |  | √ |  |
| 毕业要求 3  设计/开发解决方案 |  | √ | √ | √ |
| 毕业要求 4  研究 |  |  |  | √ |
| 毕业要求 5  使用现代工具 |  |  | √ | √ |
| 毕业要求 6  工程与社会 | √ |  |  |  |
| 毕业要求 7  环境和可持续发展 | √ |  |  |  |
| 毕业要求 8  职业规范 | √ |  |  |  |
| 毕业要求 9  个人和团队 |  | √ |  |  |
| 毕业要求10  沟通 |  | √ |  |  |
| 毕业要求11  项目管理 |  |  |  | √ |
| 毕业要求12  终身学习 | √ |  |  |  |