**地理信息科学专业培养方案**

**Curriculum for Undergraduate of Geographic Information Science Major**

**一、培养目标**

本专业培养符合国家经济建设和社会发展需要，德、智、体、美、劳全面发展，具备扎实的自然科学基础、良好的人文素养和一定的国际视野，掌握3S技术的基础知识、基本理论和基本技能，能在资源管理、环境保护、城乡建设、交通运输、灾害监测等领域从事空间数据采集分析、地理信息服务、系统开发设计等工作，知识结构合理、社会适应能力强、富有实践能力和创新创业精神的高素质应用型人才。期待毕业生五年左右达到以下目标：

1.具备扎实的数学、自然科学基础及其运用能力，具有良好的人文素养、社会责任感和职业道德。

2.具备3S领域专业知识和专业技能，胜任地理空间信息采集、分析、处理和地理信息系统开发、设计、建模、维护和技术管理等工作。

3.具备团队协作或独立解决地理信息系统复杂工程问题的能力，成为技术骨干或管理骨干。

4.具备终身学习和适应发展的能力，能够将地理信息技术应用于资源环境、城乡建设、交通运输、灾害监测等领域并不断拓展。

5.具备较强的专业交流能力和开阔的国际视野，胜任地理信息科学领域的国际交流与合作。

**I.Training objectives**

 This major trains undergraduate students to be the high quality practical talents with all around development of moral, intellectual, aesthetics, labor education and have reasonable knowledge structure, strong social adaptability, rich practical ability, strong innovation and entrepreneurship in line with national economic construction and social development needs. The graduated students must have a solid natural science foundation, good humanities and certain international vision, master the basic knowledge, theories and skills of 3S technology, and can engage in spatial data collection and analysis, geographic information service, system development and design in the fields of resource management, environmental protection, urban and rural construction, transportation, and disaster monitoring. The graduated students are expected to achieve the following objectives in about five years:

1. Having a solid foundation in mathematics, natural science and the ability to use them, and having good humanistic quality, social responsibility and professional ethics.

2. Having professional knowledge and skills in 3S field, and can be competent in geospatial information collection, analysis, processing and geographic information system development, design, modeling, maintenance and technical management.

3. Having the ability to work as a team or independently to solve complex engineering problems in GIS, and becoming a technical or management backbone.

4. Having the ability of lifelong learning and adaptation to development, and can apply geographic information technology to resources and environment, urban and rural construction, transportation, disaster monitoring and other fields and keep expanding.

5. Having a strong professional communication ability and broad international vision, and can be competent in international communication and cooperation in the field of geographic information science.

**二、毕业要求**

1.职业道德：具有良好的职业道德，能够在地理信息采集和应用中理解并遵守国家相关法律法规。

2.专业知识：具有扎实的数学、地理学和计算机科学知识和较宽阔的自然科学基础，掌握3S技术基础知识和基本理论。

3.专业技能：具有地理空间信息采集、分析、处理和地理信息系统开发、设计能力，具备识别、表达和分析复杂地理信息科学问题的能力，能够结合行业需求进行地理信息系统方案设计、优化与建模。

4.科学研究：具有科学探索精神，能够针对地理信息科学复杂问题开展实验设计、数据分析与解释，并得到合理有效结论。

5.现代工具：掌握2门最新开发和编程语言，具备机器学习与大数据挖掘基本编程能力，能够对地理信息科学复杂问题进行分析、预测和模拟，并理解其局限性。

6.人文素养：具备人文社会科学素养和可持续发展理念，理解地理信息工程实践中应承担的安全、环境和社会责任。

7.沟通协作：具备专业表达沟通、团队协作和组织管理能力，具有国际视野，能够进行跨文化交流与合作。

8.终身学习：具有接受新知识、新理论和新技术的能力，以及不断学习和适应发展的精神。

**II.Requirements**

1. Professional ethics: having a good professional ethics and the consciousness of abiding by relevant national laws and regulations in the collection and application of geographic information.

2. Professional knowledge: having a solid knowledge of mathematics, geography and computer science and a broad foundation of natural science; mastering basic knowledge and basic theory of 3S technology.

3. Professional skills: having the ability of geographic spatial information collection, analysis, processing and geographic information system development and design, the ability to identify, express and analyze complex geographic information scientific problems, and the ability to design, optimize and model geographic information system schemes according to industry requirements.

4. Scientific research: having the spirit of scientific exploration, and can carry out experimental design, data analysis and interpretation for complex problems of geographic information science, and having the ability to obtain the reasonable and effective conclusions.

5. Modern tools: mastering 2 newly developed and programming languages, having basic programming abilities of machine learning and big data mining, having the ability to analyze, predict and simulate complex problems in geographic information science with modern tools, and understanding their limitations.

6. Humanistic literacy: having humanistic and social science literacy and the concept of sustainable development, and understanding the safety, environment and social responsibility that should be undertaken in the practice of geographic information engineering.

7. Communication and collaboration: having international vision and the ability of professional communication, teamwork, organization and management, and can be competent in cross-cultural communication and cooperation.

8. Lifelong learning: having the ability to accept new knowledge, theories and technologies, as well as having the spirit of continuous learning and adaptation to development.

**附：培养目标实现矩阵**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 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 |  |  |  | √ | √ |

**三、专业主干课程**

地理信息系统原理、遥感原理与应用、人文与自然地理学、空间数据库原理、GIS开发语言，GIS应用与开发，卫星导航定位技术、地图学、工程测量、城市地理学、计量地理学等。

**III．Core courses**

Principles of Geographic Information System, Principles and Applications of Remote Sensing, Human and Physical Geography, Principles of Spatial Database, GIS Development Language, Application and Development of GIS, Satellite Navigation and Positioning Technology, Cartography, Engineering Surveying, Urban Geography, Quantitative Geography.

**四、基本学制：四年**

**IV. Recommended length of the program:** **4 years**

**五、授予学位：理学学士**

学生修满所规定的最低毕业学分，符合武汉科技大学授予学士学位规定，授予理学学士学位。

**V. Degree: Bachelor of Science**

Students will be conferred the bachelor degree of science if they achieve the stated minimum credits of graduation and meet the stipulation of bachelor's degree of Wuhan university of science and technology.

**六、毕业学分要求：176学分**

|  |  |  |  |
| --- | --- | --- | --- |
| 课程类型 | 学分要求 | 课程类型 | 学分要求 |
| 1、通识教育平台课程 | 46 | 3、专业课程模块 | 55 |
| 必修课程 | 42 | 必修课程 | 42 |
| 选修课程 | 4 | 选修课程 | 13 |
| 2、学科基础平台课程 | 45 |
| 必修课程 | 34 | 4、实践教学模块 | 23 |
| 选修课程 | 11 | 5、素质拓展模块 | 7 |

\*通识教育选修课4学分包括：人文社科类1学分、艺术体育类1学分、自然科学类1学分、经济管理类 1学分

**VI. Credits required for graduation：176 credits**

|  |  |  |  |
| --- | --- | --- | --- |
| Type of courses | Academic credits | Type of courses | Academic credits |
| 1.Courses of general education | 46 | 3. Specialized Courses | 55 |
| Required courses | 42 | Core specialized courses | 42 |
| Elective courses | 4 | Elective courses | 13 |
| 2. General disciplinary courses  | 45 |
| Required Courses | 34 | 4.Practicum and Internship Courses | 23 |
| Elective Courses | 11 | 5.Quality Envelopment Courses | 7 |

**七、学分比例**

**VII. Ratio of Credits**

1. **必修选修学分比例**

**The proportion of compulsory elective credits**

|  |  |  |
| --- | --- | --- |
| 类别 | 学分 | 占总学分比例 |
| 必修 | 148 | 84.09% |
| 选修 | 28 | 15.91% |

1. **实践教学环节学分比例**

**The Proportion of credits in practice teaching**

|  |  |  |  |
| --- | --- | --- | --- |
| 实践教学环节 | 实验教学学分 | 26 | 31.82% |
| 实践教学模块 | 23 |
| 素质拓展模块 | 7 |

1. **毕业要求实现矩阵**

**VIII. Graduation Realization Matrix**

| **课程名称** | **地理信息科学专业毕业要求** |
| --- | --- |
| （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） |
| 思想道德修养与法律基础 | √ |  |  |  |  | √ |  |  |
| 中国近现代史纲要 |  |  |  |  |  | √ | √ |  |
| 马克思主义基本原理 |  |  |  | √ |  | √ |  |  |
| 毛泽东思想与中国特色社会主义理论体系概论 | √ |  |  |  |  | √ |  |  |
| 大学计算机文化基础 |  | √ |  |  |  |  |  | √ |
| 大学英语 |  |  |  |  |  |  | √ | √ |
| 体育 |  |  |  |  |  |  | √ | √ |
| 大学生心理健康教育 | √ |  |  |  |  |  | √ |  |
| 职业生涯规划与就业创业指导 | √ |  |  |  |  |  |  | √ |
| 军事课 | √ |  |  |  |  |  | √ |  |
| 公益劳动 | √ |  |  |  |  |  | √ |  |
| 形势与政策 | √ |  |  |  |  | √ |  |  |
| 高等数学 |  | √ |  | √ |  |  |  |  |
| 线性代数 |  | √ |  | √ |  |  |  |  |
| 概率论与数理统计 |  | √ |  | √ |  |  |  |  |
| 大学物理 |  | √ |  | √ |  |  |  |  |
| 大学物理实验 |  | √ |  | √ |  |  |  |  |
| 计算机程序设计基础(C)  |  | √ | √ |  |  |  |  | √ |
| 工程制图 |  | √ | √ |  |  |  |  |  |
| 地理信息科学导论 | √ | √ |  |  |  |  | √ |  |
| 人文与自然地理学 |  | √ | √ | √ |  |  |  |  |
| 工程地质与水文地质 |  | √ | √ | √ |  |  |  |  |
| 技术经济与投资分析 |  | √ | √ |  |  | √ |  |  |
| 工程测量 | √ | √ | √ |  |  |  |  |  |
| CAD技术 |  | √ | √ |  |  |  |  |  |
| 城市地理学 |  | √ | √ | √ |  |  |  |  |
| 经济地理学 |  | √ | √ | √ |  |  |  |  |
| 地理信息系统原理 |  | √ | √ |  |  |  |  | √ |
| GIS开发语言 |  | √ | √ |  | √ |  |  | √ |
| 地图学 |  | √ | √ |  |  |  |  |  |
| 遥感原理与应用 |  | √ | √ |  |  |  |  |  |
| 计量地理学 |  | √ | √ | √ |  |  |  |  |
| 系统工程基础 |  | √ | √ | √ |  |  |  | √ |
| 土地规划 |  | √ | √ |  |  |  |  |  |
| 空间数据库原理 |  | √ | √ |  |  |  |  |  |
| GIS应用与开发 |  | √ | √ |  | √ |  |  |  |
| 卫星导航定位技术 |  | √ | √ |  |  |  |  |  |
| 地理信息科学前沿专题 |  | √ |  | √ |  |  |  | √ |
| 工程项目管理 |  | √ | √ |  |  | √ |  |  |
| 房屋建筑学 |  | √ | √ |  |  |  |  | √ |
| 土地评价与土地管理 |  | √ | √ |  |  |  |  | √ |
| 三维数字建模基础 |  | √ | √ |  |  |  |  |  |
| 机器学习与数据挖掘 |  |  | √ | √ | √ |  |  | √ |
| 矿山数字建模 |  | √ | √ |  |  |  |  | √ |
| 专业英语 |  | √ |  |  |  |  | √ | √ |
| 网络地理信息系统 |  | √ | √ |  |  |  |  |  |
| 智慧环境 |  | √ | √ |  |  |  |  | √ |
| 数字图像处理 |  | √ | √ |  |  |  |  |  |
| 测绘地理信息法律法规 | √ | √ |  |  |  | √ |  |  |
| 地理信息服务 |  | √ | √ |  |  |  |  | √ |
| 认识实习 | √ |  | √ |  |  |  | √ |  |
| 计算机制图课程设计 |  | √ | √ |  |  |  |  |  |
| 地理信息系统课程设计 |  | √ | √ |  |  |  |  |  |
| 遥感图像处理课程设计 |  | √ | √ |  |  |  |  |  |
| GIS应用与开发课程设计 |  | √ | √ | √ |  |  |  | √ |
| 测量实习 | √ |  | √ |  |  |  | √ |  |
| 生产实习 | √ |  | √ |  |  |  | √ |  |
| 毕业实习 | √ |  | √ |  |  |  | √ |  |
| 毕业设计(论文) |  | √ | √ | √ |  |  |  | √ |

**九、课程修读进程表**

Ⅸ. Course review Process Map

第三学期

第二学期

第七学期

第六学期

第五学期

第八学期

第一学期

第四学期

各类专业选修课

大学英语(一)

计算机制图课程设计

地理信息系统课程设计

测量实习

毕业实习

选修课程的课内实验

数据库技术应用

网络技术及应用

计算机程序设计基础(C)

概率论与数理统计

GIS应用与开发

课程设计(二)

GIS应用与开发

课程设计(一)

生产实习

认识实习

地理信息科学

前沿专题

系统工程基础

地图学

空间数据库原理

地理信息系统原理

遥感原理与应用

卫星导航

定位技术

人文与自然地理学

工程测量

技术经济与投资分析

地理信息科学导论

经济地理学

城市地理学

土地规划

工程地质与水文地质

遥感图像处理课程设计

GIS应用与开发

GIS开发语言

数据库技术应用

网络技术及应用

计算机程序设计基础(C)

军事理论、马克思主义基础原理等思想政治类课程

公共类、基础类选修课程

毕业设计(论文)

大学英语(四)

大学英语(三)

大学英语(二)

体 育(四)

体 育(三)

体 育(二)

体 育(一)

线性代数

高等数学 (二)

高等数学 (一)

暑期社会实践3

暑期社会实践2

暑期社会实践1

计量地理学

工程制图

**十、教学环节设置及学分分布表**

X. Offered Course and Distribution of Academic Credits

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 课程类型 | 课程性质 | 课程编码 | 课程名称 | 学分 | 合计 | 课内学时 | 实践学时 | 学期 | 先修课程/备注 |
| 讲课学时 | 实验学时 | 上机学时 |
| 平台 | 通识教育平台课程 | 必修 | 5105001 | 思想道德修养与法律基础Moral Cultivation and Basics of Law | 3 | 48 | 42 |  |  | 6 | 1 |  |
| 5103001 | 中国近现代史纲要An Outline of Modern and Contemporary History of China | 3 | 48 | 42 |  |  | 6 | 2 |  |
| 5102001 | 马克思主义基本原理Fundamentals of Marxism | 3 | 48 | 44 |  |  | 4 | 3 |  |
| 5101001 | 毛泽东思想与中国特色社会主义理论体系概论Theoretical system of socialism with Chinese characteristics | 5 | 80 | 64 |  |  | 16 | 4 |  |
| 1303601 | 大学计算机文化基础A Cultural Basis of College Computer Science A | 3 | 48 | 30 |  | 18 |  | 1 |  |
| 1401840 | 大学英语（一）College English (I) | 3 | 48 | 48 |  |  |  | 1 |  |
| 1401841 | 大学英语（二）College English (II) | 3 | 48 | 48 |  |  |  | 2 |  |
| 1401842 | 大学英语（三）College English (III) | 3 | 48 | 48 |  |  |  | 3 |  |
| 1401843 | 大学英语（四）College English (IV) | 3 | 48 | 48 |  |  |  | 4 |  |
| 1501882 | 体育(一) Physical Education(I) | 1 | 26 | 26 |  |  |  | 1 |  |
| 1501883 | 体育(二) Physical Education(II) | 1 | 34 | 34 |  |  |  | 2 |  |
| 1501884 | 体育(三) Physical Education(III) | 1 | 34 | 34 |  |  |  | 3 |  |
| 1501885 | 体育(四) Physical Education(IV) | 1 | 34 | 34 |  |  |  | 4 |  |
| 2501004 | 大学生心理健康教育Mental Health Education | 1 | 16 | 16 |  |  |  | 1 |  |
| 2501005 | 职业生涯规划与就业创业指导Career Plan and Employment Entrepreneurial Guidance | 1 | 16 | 16 |  |  |  | 2 |  |
| 2501006 | 军事课Military Course | 4 | 148 | 36 |  |  | 112 | 1,2 |  |
| 2501002 | 公益劳动Community Service | 1 | 16 |  |  |  | 16 | 4 |  |
| 5106001 | 形势与政策World Affairs and State Policy | 2 | 64 | 64 |  |  |  | 1-8 |  |
| 选修 |  | 人文社科类1学分Humanity and Social Science 1 Academic Credit |
|  | 经济管理类1学分Economic and Management 1 Academic Credit |
|  | 自然科学类1学分Natural Science 1 Academic Credit（“Introduction to Metallurgy” is required） |
|  | 艺术体育类1学分Artistic and Sports 1 Academic Credit |
| 学科基础平台课程 | 必修 | 0702601  | 高等数学A(一) Advanced Mathematics A(I) | 5  | 80  | 80  | 0  | 0  | 0  | 1  |  |
| 0702602  | 高等数学A(二)Advanced Mathematics A(II) | 6.5  | 104  | 104  | 0  | 0  | 0  | 2  |  |
| 0702026  | 线性代数Linear Algebra | 2  | 32  | 32  | 0  | 0  | 0  | 3  |  |
| 0702304 | 概率论与数理统计 BProbability and Mathematical Statistics B | 2.5 | 40  | 40  | 0  | 0  | 0  | 4  |  |
| 0703605 | 大学物理B(一) College Physics B(I) | 2.5 | 40 | 40 | 0 | 0 | 0 | 2 | 　 |
| 0703606 | 大学物理B(二) College Physics B(II) | 2 | 32 | 32 | 0 | 0 | 0 | 3 | 　 |
| 0703607 | 大学物理实验B Experiments of College Physics B | 1.5 | 24 | 0 | 24 | 0 | 0 | 3 | 　 |
| 0302609 | 工程制图BEngineering Graphics B | 3 | 48 | 48 | 0 | 0 | 0 | 1 |  |
| 1303604 | 计算机程序设计基础(C) Basics of Computer Programming(C) | 4 | 64 | 40 | 0 | 24 | 0 | 2 |  |
| 0109001 | 地理信息科学导论Introduction to Geographic Information Science | 1 | 16 | 16 | 0 | 0 | 0 | 2 |  |
| 0108084  | 人文与自然地理学＊＊Human and Physical Geography | 4 | 64 | 56 | 0 | 0 | 8 | 3 |  |
| 选修 | 1303605  | 数据库技术及应用Database Technology and Applications | 3  | 48  | 24  | 0  | 24  | 0  | 3  |  |
| 1303029 | 离散数学Discrete Mathematics | 4 | 64 | 64 | 0 | 0 | 0 | 3 |  |
| 1303606  | 网络技术及应用Network technology and applications | 3  | 48  | 24  | 0  | 24  | 0  | 4  |  |
| 0401004  | 电子技术 Electronic Technology | 3  | 48  | 34  | 14  | 0  | 0  | 4  |  |
| 0702019 | 数学建模Mathematical Modeling | 2 | 32 | 28 | 0 | 4 | 0 | 4 |  |
| 1601004 | 信息检索与利用Information Retrieval | 1  | 16  | 16  | 0  | 0  | 0  | 2  |  |
| 模块 | 专业课程模块 | 专业核心课程 | 必修 | 0108050  | 工程地质与水文地质Engineering Geology and Hydrographic Geology  | 2.5  | 40  | 36 | 0  | 0  | 4 | 4  |  |
| 0108025  | 技术经济与投资分析 Techno-economics and Investment Analysis | 2  | 32  | 32  | 0  | 0  | 0  | 4  |  |
| 0101015  | 工程测量Engineering Surveying | 3  | 48  | 40 | 0  | 0  | 8 | 4  |  |
| 0108001  | CAD技术CAD | 2  | 32  | 16  | 0  | 16  | 0  | 4  |  |
| 0108005  | 城市地理学Urban Geography | 2.5  | 40  | 40  | 0  | 0  | 0  | 5  |  |
| 0108031  | 经济地理学Economic Geography | 2.5  | 40 | 40 | 0  | 0  | 0  | 5  |  |
| 0109002 | 地理信息系统原理Principles of Geographic Information System | 2.5 | 40 | 24 | 0 | 16 | 0 | 5 |  |
| 0109003 | GIS开发语言GIS Development Language | 4 | 64 | 32 | 0 | 32 | 0 | 5 |  |
| 0108076  | 地图学Cartography | 2  | 32  | 24 | 0  | 8  | 0  | 5  |  |
| 0109004 | 遥感原理与应用Principles and Applications of Remote Sensing | 3 | 48 | 40 | 0 | 8 | 0 | 5 |  |
| 0108059 | 计量地理学Quantitative Geography | 3  | 48  | 40  | 0  | 8  | 0  | 6 |  |
| 0101077  | 系统工程基础System Engineering Foundation | 3  | 48  | 48  | 0  | 0  | 0  | 6  |  |
| 0108072  | 土地规划Land Use Planning | 2 | 32 | 32 | 0  | 0  | 0 | 6  |  |
| 0109005 | 空间数据库原理Principles of Spatial Database | 2.5 | 40 | 32 | 0 | 8 | 0 | 6 |  |
| 0109006 | GIS应用与开发Application and Development of GIS | 2.5 | 40 | 20 |  | 20 | 0 | 6 |  |
| 0109007 | 卫星导航定位技术Satellite Navigation and Positioning Technology | 1 | 16 | 16 | 0 | 0 | 0 | 7 |  |
| 0109008 | 地理信息科学前沿专题Frontier Themes of Geographic Information Science | 2 | 32 | 32 | 0 | 0 | 0 | 7 |  |
| 专业任选课程 | 选修 | 0109017 | 工程项目管理Project Management | 2.5  | 40  | 40  | 0  | 0  | 0  | 5  |  |
| 0108019  | 房屋建筑学Building Architecture  | 3  | 48  | 48  | 0  | 0  | 0  | 5  |  |
| 0108038 | 土地评价与土地管理Land Evaluation and Land Management | 2 | 32 | 0 | 0 | 0 | 0 | 6 |  |
| 0109009 | 三维数字建模基础Basis of 3D Digital Modeling | 2.5 | 40 | 24 | 0  | 16 | 0  | 6 |  |
| 0109010 | 机器学习与数据挖掘Machine Learning and Data Mining | 2.5 | 40 | 20 | 0 | 20 | 0 | 6 |  |
| 0109019 | 智慧环境Wisdom Environment | 2  | 32  | 32 | 0  | 0 | 0  | 6  |  |
| 0109018 | 矿山数字建模Mine Digital Modeling | 2.5 | 40 | 20 | 0 | 20 | 0 | 7 |  |
| 0109012 | 专业英语Specialized English | 1.5 | 24 | 24 | 0 | 0 | 0 | 7 |  |
| 0109011 | 网络地理信息系统Network Geographic Information System | 2.5 | 40 | 32 | 0 | 8 | 0 | 7 |  |
| 0109014 | 数字图像处理Digital Image Processing | 2 | 32 | 16 | 0 | 16 | 0 | 7 |  |
| 0109015 | 测绘地理信息法律法规Laws and Regulations for Surveying and Mapping Geographic Information | 2 | 32 | 32 | 0 | 0 | 0 | 7 |  |
| 0109016 | 地理信息服务Geographic Information Service | 2.5 | 40 | 40 | 0 | 0 | 0 | 7 |  |
| 实践教学模块 | 必修 | 0109090 | 认识实习 Cognition Practice | 2 | 2周 | 0 | 0 | 0 | 2周 | 5 |  |
| 0109089 | 计算机制图课程设计Course Design in Computer Cartography | 1 | 2周 | 0 | 0 | 0 | 2周 | 5 | 1周集中1周分散 |
| 0109091 | 地理信息系统课程设计Course Design in Geographic Information System | 1 | 2周 | 0 | 0 | 0 | 2周 | 5 | 1周集中1周分散 |
| 0109092 | 遥感图像处理课程设计Course Design in Remote Sensing Image Processing | 1 | 2周 | 0 | 0 | 0 | 2周 | 6 | 1周集中1周分散 |
| 0109093 | GIS应用与开发课程设计(一)Course Design in Application and Development of GIS(Ⅰ) | 2 | 4周 | 0 | 0 | 0 | 4周 | 6 | 2周集中2周分散 |
| 0109094 | GIS应用与开发课程设计(二) Course Design in Application and Development of GIS(Ⅱ) | 2 | 4周 | 0 | 0 | 0 | 4周 | 7 | 2周集中2周分散 |
| 0109095 | 测量实习 Surveying Practice | 2 | 2周 | 0 | 0 | 0 | 2周 | 5 | 分散进行 |
| 0109096 | 生产实习Production Practice | 2 | 2周 | 0 | 0 | 0 | 2周 | 7 |  |
| 0109097 | 毕业实习Pre-graduation Internship | 2 | 2周 | 0 | 0 | 0 | 2周 | 8 |  |
| 0109098 | 毕业设计(论文) Undergraduate Project(Thesis) | 8 | 14周 | 0 | 0 | 0 | 14周 | 8 |  |
| 素质拓展模块 | 必修 | 创新创业教育 | 创新创业课程1学分（创新创业课程群）Innovation Course 1 Academic Credits |
| 创新创业实践2学分Innovation Practices 1 Academic Credits |
| 第二课程 | 第二课堂3学分Second Classroom 3 Academic Credits |
| 心理健康教育实践 | 心理健康教育实践1学分Practices of Mental Health Education 1 Academic Credits |

**十一、教学进程安排表**

|  |  |
| --- | --- |
| 学期 | 周 次 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 1 | ♀ | ♀ | ⊙/★ | ★ | ★ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | ● |  | 　 | 　 | 　 | 　 | 　 | 　 | 　 | 　 |
| 2 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | ● |  | 　 | 　 | 　 | 　 | 　 | 　 | 　 | 　 |
| 3 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | ● |  |  | 　 | 　 | 　 | 　 | 　 | 　 | 　 |
| 4 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | ●　 |  | 　 | 　 | 　 | 　 | 　 | 　 | 　 | 　 |
| 5 | ╬ | ╬ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | × | × | ● |  |  | 　 | 　 | 　 | 　 | 　 | 　 | 　 |
| 6 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | × | × | × | ●　 |  | 　 | 　 | 　 | 　 | 　 | 　 | 　 | 　 |
| 7 | ∕ | ∕ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | × | × | ● |  |  |  |  |  |  |  |  |  |
| 8 | ＃ | ＃ | ※ | ※ | ※ | ※ | ※ | ※ | ※ | ※ | ※ | ※ | ※ | ※ | ※ | ※ | √ | √ | ┼ |  |  |  |  |  |  |  |  |  |
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符号说明：

1、♀ 入学前机动 2、⊙ 入学教育 3、★ 军训 4、□理论教学 5、√ 机动时间 6、●考试 7、×课程设计 8、Ε专业实验或实习 9、—假期

10、▲ 学年论文 11、Ｇ技能训练 12、※ 毕业设计（论文） 13、┼毕业鉴定 14、＃毕业实习 15、Ｓ写生 16、∕ 生产实习(金工实习)

17、Τ教材教法 18、☆ 教育实习 19、○技能教育实习 20、◎ 专题讲座 21、◆ 公益劳动 22、△ 社会调查 23、╬ 认识实习