

地理信息科学专业培养方案

Undergraduate Program of the Major of Geographic Information Science

I. 专业介绍 Introduction

2002 年教育部批准西南交通大学依托测绘学科开设地理信息系统本科专业，并于同年招收首届地理信息系统本科生，2012 年教育部更名为地理信息科学。西南交通大学地理信息科学专业定位为培养轨道交通特色鲜明、国内一流、具有国际影响力的卓越地理信息人才，前 2 年测绘大类培养，后 2 年分专业方向学习。本专业为国家级重点专业（培育）专业，拥有国地联合工程实验室、国家级仿真实验教学中心、国家级工程实践教育中心、教育部创新团队等“产学研用”人才培养平台。

In 2002, the Ministry of Education approved the Southwest Jiaotong University to set up undergraduate majors in geographic information systems based on surveying and mapping disciplines. In the same year, the first GIS undergraduate students were recruited. In 2012, the Ministry of Education changed the major's name to geographic information science. The geographic information science major of Southwest Jiaotong University aims to cultivate excellent geographical information talents with rail transit background, domestic first-class and international influence. In the first two years, undergraduate program for the major contains general education courses and basic courses of the discipline of surveying and mapping, and in the next two years, students can select different specialties in which there are elective courses. The geographic information science major of Southwest Jiaotong University is a national key professional (nurturing) major, with some “production-study-research” talent training platforms, e.g. the national joint engineering laboratory, the national-level simulation experiment teaching center, the national engineering practice education center, the Ministry of Education innovation team, and so on.

专业代码：070703

Program Code: 070703

专业名称：地理信息科学

Program Name: Geographic Information Science

II.培养目标 Objectives

本专业面向“数字中国”、“交通强国”、“西部大开发”、“一带一路”、“美丽中国”等重大国家战略和生态文明建设需求，适应地理信息科学技术与产业的发展需要，培养具备地理信息科学、测绘、摄影测量与遥感等方面基本知识、基本理论和基本技能，能在科研机构、高等院校以及国民经济各行业胜任应用开发、教学工作和科学研究，能在测绘、交通、国土、资源、环境、人口、旅游、国防、基础设施和规划管理等部门成为 GIS 应用技术开发、生产管理和行政管理等方面的卓越地理科学类人才。

For the needs of major national strategies and ecological civilization construction such as “digital China”“railway transportation”, “western development”, “One Belt and One Road” and “beautiful China”, and the developments of geographic information science and technology and industry, the geographic information science major of Southwest Jiaotong University aims to cultivate excellent students with the basic knowledge, basic theories and basic skills in the specialties of surveying, photogrammetry and remote sensing, who can conduct application, teaching and scientific research work in research institutions, universities and national economic industries. Students should become outstanding geoscience talents in GIS application technology development, production management and administrative management in the branches of surveying, transportation, land management, resources management, environment, population, tourism, national defense, infrastructure and planning management.

III.专业毕业要求 Graduation Requirements

(1) 政治素质要求：具有坚定正确的政治方向，热爱祖国，热爱人民，拥护中国共产党领导，自觉践行社会主义核心价值观。遵纪守法，团结协作，具有良好的思想品德修养和职业道德。

(2) 人文素质要求：具有良好的人文社科知识，树立科学的世界观、人生观和价值观，具备良好的人文社会科学素养和强烈的社会责任感，人格健全、身心健康、尊重生命。正确处理人、社会、自然三者关系。

(3) 理学素质要求：具有扎实的数学、物理学、化学、计算机等自然科学领域的基础知识和基本实验技能，形成科学规范的自然科学世界观和方法论，掌握正确的学习方法，树立终身学习的理念。

(4) 专业素质与能力要求：具有宽厚的专业基础知识，掌握地理信息获取、

处理、分析、表达、应用与服务的基本原理与方法，具备较强的专业基本技能，了解本专业应用行业的现状及发展趋势，能够运用所学专业理论、实验技能及信息技术等，对城镇化、全球化、环境变化、生态安全、防灾减灾与可持续发展等复杂人地系统问题进行系统分析和研究，提出相应的对策建议或解决方案。

(5) 审辨思维要求：具有审辨思维能力，可综合运用所掌握的专业理论知识和技能，能够从多视角发现、辨析、质疑、评价本专业及相关领域的现象和问题，提出独立性的见解或应对措施。

(6) 创新创业要求：具有创新创业意识，能够将创新思维、创新能力和创业精神在创新实验和创新科技开发与研究中付诸实践。

(7) 交流协作要求：具有较强的沟通表达能力，能够开展学术交流和社会交际，可以通过书面或口头表达形式，与同行、企业、社会公众和管理部门就本专业领域现象和问题进行有效沟通。具有较强的团队意识和合作精神，并作为成员或领导者在团队活动中发挥积极作用。

(8) 全球视野要求：掌握一门外国语，了解全球化、城镇化、生态环境安全等重大问题，能够理解和尊重世界不同文化的多样性和差异性，具备在跨不同文化背景下参与地理科学领域相关交流与合作的能力。

(9) 能力提升要求：具有自我管理和自主学习能力，能够通过不断学习，适应社会需要，实现个人可持续发展。

(1) Political requirements: to have a firm and correct political direction; to love the motherland; to love the people; to support the leadership of the Communist Party of China; to consciously practice the core values of socialism; to obey the law; to unite and cooperate with other people; to have a good ideological, moral cultivation and professional ethics.

(2) Humanities requirements: to master the knowledge of humanities and social sciences; to establish a scientific world outlook, outlook on life and values; to have a good humanities and social science quality, high social responsibility, sound personality, physical and mental health, respect for life; to correctly handle the relationship among people, society and nature.

(3) Scientific requirements: to have solid basic knowledge and basic experimental skills in the fields of mathematics, physics, chemistry, computer science, etc.; to form a scientific and standardized natural world view and methodology; to master the learning methods; to establish the concept of lifelong learning.

(4) Professional requirements: to have a broad professional basic knowledge; to master the basic principles and methods of geographic information acquisition, processing, analysis, representation, application and service; to have good professional basic skills; to understand the status and development trends of the discipline and the branch; to apply the professional theory, experimental skills and information technology to systematically analyze and study the complex human-land system

problems such as urbanization, globalization, environmental change, ecological security, disaster prevention and mitigation and sustainable development, and to propose corresponding suggestions or solutions.

(5) Thinking requirements: to have the ability of discerning thinking; to apply the professional knowledge and skills in practice; to discover, discriminate, question and evaluate the phenomena and problems from multiple perspectives in the related fields, and to propose independent opinions or responses.

(6) Innovation and entrepreneurship requirements: to have innovative and entrepreneurial awareness; to put innovative thinking, innovation ability and entrepreneurial spirit into practice in innovative experiments and innovative technology development and research.

(7) Communication and cooperation requirements: to have good communication and expression skills; to have the ability to carry out academic discussion and social communication; to effectively communicate with peers, enterprises, the public and management departments on the phenomena and problems in this field through written or oral presentation; to have a strong sense of teamwork and cooperation, and to actively participate the team activities as a member or leader.

(8) Global vision requirements: to master a foreign language; to understand major issues of globalization, urbanization, ecological environment security, and so on; to understand and respect the diversity of different cultures in the world; to have the ability to participate in the cross-culture exchange and cooperation of geographical sciences.

(9) Ability improvement requirements: to have self-management and self-learning ability; to achieve ability improvement through continuous learning; to adapt to social needs.

IV.学制与学位 Duration and Degree

学制：4 年

Duration: 4 years

学位：理学学士学位

Degree: Bachelor of Science

V.主干学科与专业核心课程 Main Subject and Specialized Core Course

主干学科：测绘科学与技术

Main Subject: Surveying and Mapping

专业核心课程：地图制图学基础、误差理论与测量平差基础、地理信息系统原理、摄影测量学基础、遥感原理与应用、GIS 应用开发、GIS 数量分析方法与应用、人文地理学、专题制图与空间信息可视化、三维 GIS 技术基础、WebGIS 技术与开发。

Specialized Core Course : Foundations of Cartography, Error Theory and Foundations of Surveying Adjustment, Principles of Geographic Information Systems, Foundations of Photogrammetry, Principles and Applications of Remote Sensing, GIS Application Development, Quantitative Analysis Method and Application of GIS, Human Geography, Thematic Mapping and Visualization of Spatial Information, 3D GIS Technology Foundation, WebGIS Technology and Development.

VI. 毕业学分基本要求 Basic Requirements of Credits for Graduation

课程体系 Curriculum System		学分要求 Credits Requirements						
		必修 Compulsory		限修 Distributional Electives		选修 Free Electives		小计 Subtotal
		理论 Theory	实践 Practice	理论 Theory	实践 Practice	理论 Theory	实践 Practice	
公共基础 课程 Public Basic Courses	思政类 Ideological Politics Courses	15	2					17
	军事类 Military Courses	2	2					4
	外语类 Foreign Language Courses	6		2				8
	体育类 Physical Education Courses		4					4
通识与多元 化课程 General Education and Diversified Courses	“交通天下”通识教育课程（含跨学科课程） Core General Education Courses（Interdisciplinary Courses）							
	多元化课程 Diversified Courses							
	国际课程 International Courses					6		6
	大学生心理健康教育课程 University Student Psychological Health Courses							
	学生成长与发展规划课程 Student Growth and Development Planning Courses							
	新生研讨课 Freshman Seminar	2						2
	劳动教育课程 Labor Education Courses	2						2

	公共艺术课程 Public Art Courses	2						2
学科与专业基础课程 Discipline and Specialty Foundational Courses	数学类 Mathematics Courses	16						16
	物理类 Physics Courses	6	2					8
	计算机基础类 Basic Computer Courses	2	1					3
	自然科学基础类 Natural Science Courses	2						2
	专业基础课 Professional Foundational Courses	22.5	2.5					25
专业教育课程 Specialized Courses	专业核心课 Specialized Core Course	18.5	7.5					26
	专业限选课 Specialized Restricted Courses			3	1			4
实践教学环节 Practice Courses	集中性实践教学环节：基本技能训练、工程实践、综合课程设计、社会与文化素质和实践、毕业实习与毕业设计 Centralized Practical Teaching Process: Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design		20					20

	创新创业实践：创新创业训练计划项目、个性化实验、学科竞赛、创新讲座等 Innovation and Entrepreneurship Practice: Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc				2			2
必修环节 A Compulsory Part	“第二课堂”项目：思想政治与道德素养类项目、学术科技与创新创业类项目、艺术体验与审美修养类项目、文化沟通与交往能力类项目、心理素质与身体素质类项目、社会工作与领导能力类项目、社会实践与志愿服务类项目 "The Second Lesson" Project: Ideological and Political Education and Moral Literacy Projects, Academic and Technological Innovation and Entrepreneurship Projects, Art Experience and Aesthetic Education Projects, Cultural Communication and Interpersonal Skills Projects, Psychological and Physical Health Projects, Social Work and Leadership Development Projects, Social Practice and Volunteering Projects	0						0
	大学生综合素质提升、学生体质达标测评 Comprehensive Quality Improvement Courses for College Students, Assessment of Students' Physical Fitness	0						0
总 计 Total								151
备注：专业限选课至少包含 1 门测绘工程专业或遥感科学与技术专业专业课程。 Note: Specialized Restricted Courses includes at least one course of Specialized Courses of the major of Surveying Engineering or Remote Sensing Science and Technology								

VII.课程设置细化表 Course Programs Table

公共基础课程 Public Basic Courses								
共 33 学分，其中必修 31 学分，限修 2 学分，选修 0 学分 A total credits of 33, including 31 for compulsory courses, 2 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class Practice Credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
思政类 Ideological Politics Courses	思想道德与法治 Ideological and Moral Education and the Rule of Law	必修 Compulsory	3	0.4	第 1 学期 Semester 1	马克思主义学院 School of Marxism	1	
	中国近现代史纲要 Conspectus of Chinese Modern History	必修 Compulsory	3	0.4	第 2 学期 Semester 2	马克思主义学院 School of Marxism	1	
	马克思主义基本原理 The Basic Principles of Marxism	必修 Compulsory	3	0.4	第 3 学期 Semester 3	马克思主义学院 School of Marxism	1,2	
	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Theoretical System of Socialism with Chinese Characteristics	必修 Compulsory	3	0.4	第 4 学期 Semester 4	马克思主义学院 School of Marxism	1,2	
	习近平新时代中国特色社会主义思想概论 Outline of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	必修 Compulsory	3	0.4	第 6 学期 Semester 6	马克思主义学院 School of Marxism	1,2	
	形势与政策 I Situation and Policy I	必修 Compulsory	0	0	第 1 学期 Semester 1	马克思主义学院 School of Marxism	1	
	形势与政策 II Situation and Policy II	必修 Compulsory	0	0	第 2 学期 Semester 2	马克思主义学院 School of Marxism	1	
	形势与政策 III Situation and Policy III	必修 Compulsory	0	0	第 3 学期 Semester 3	马克思主义学院 School of Marxism	1	
	形势与政策 IV Situation and Policy IV	必修 Compulsory	0	0	第 4 学期 Semester 4	马克思主义学院 School of Marxism	1	
	形势与政策 V Situation and Policy V	必修 Compulsory	0	0	第 5 学期 Semester 5	马克思主义学院 School of Marxism	1	
	形势与政策 VI Situation and Policy VI	必修 Compulsory	0	0	第 6 学期 Semester 6	马克思主义学院 School of Marxism	1	
	形势与政策 VII Situation and Policy VII	必修 Compulsory	0	0	第 7 学期 Semester 7	马克思主义学院 School of Marxism	1	

	形势与政策VIII Situation and Policy VIII	必修 Compulsory	2	0	第 8 学期 Semester 8	马克思主义学院 School of Marxism	1	
军事类 Military Courses	军事理论 Military Theories	必修 Compulsory	2	0	第 1 学期 Semester 1	武装部 Security Office	9	
	军事技能 Military Skills	必修 Compulsory	2	2	第 1 学期 Semester 1	武装部 Security Office	9	
外语类 Foreign Language Courses	英语 I College English I	必修 Compulsory	2	0	第 1 学期 Semester 1	外国语学院 School of Foreign languages	7,8	
	英语II College English II	必修 Compulsory	2	0	第 2 学期 Semester 2	外国语学院 School of Foreign languages	7,8	
	通用学术英语 English for General Academic Purposes	必修 Compulsory	2	0	第 3 学期 Semester 3	外国语学院 School of Foreign languages	7,8	
	职场英语 Workplace English	限修 Distributional Elective	2	0	第 4 学期 Semester 4	外国语学院 School of Foreign languages	7,8	限修 1 门, 2 学分 Limited to 1 course, 2 credits
	交际与文化视听说 Viewing, Listening & Speaking in English -- Communication & Culture							
	语言、文化与翻译 Language, Culture and Translation							
	英语公共演讲 Public Speaking in English							
体育类 Physical Education Courses	体育 I Physical Education I	必修 Compulsory	1	1	第 1 学期 Semester 1	体育学院 School of Physical Education	2	
	体育II Physical Education II	必修 Compulsory	1	1	第 2 学期 Semester 2	体育学院 School of Physical Education	2	
	体育III Physical Education III	必修 Compulsory	0.5	0.5	第 3 学期 Semester 3	体育学院 School of Physical Education	2	
	体育IV Physical Education IV	必修 Compulsory	0.5	0.5	第 4 学期 Semester 4	体育学院 School of Physical Education	2	
	体育健康课程 I Diversified Physical Education Courses I	必修 Compulsory	0.5	0.5	第 5 学期 Semester 5	体育学院 School of Physical Education	2	
	体育健康课程II Diversified Physical Education Courses II	必修 Compulsory	0.5	0.5	第 6 学期 Semester 6	体育学院 School of Physical Education	2	

通识与多元化课程 General Education and Diversified Courses 共 12 学分，其中必修 6 学分，限修 0 学分，选修 6 学分 A total credits of 12, including 6 for compulsory courses, 0 for distributional electives and 6 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
“交通天下”通识教育课程（含跨学科课程） Core General Education Courses (Interdisciplinary Courses)	“交通天下”通识课程 General Studies on Transportation	选修 Free Elective	4	0	2-7 学期 Semester 2-7	全校 The whole school	4	
新生研讨课 Freshman Seminar	测绘学漫谈 Surveying and Mapping	必修 Compulsory	2	0	第 1 学期 Semester 1	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	7,9	
多元化课程 Diversified Courses	全校跨学科课程 Interdisciplinary Course of University	选修 Free Elective	2	0	4-7 学期 Semester 4-7	全校 The whole school	8	按照《西南交通大学多元化课程修读指导手册》执行。 Follow the 《Instruction on manual of diversified courses of southwest Jiaotong University》
	学科竞赛课程 Subject Competition Courses of University	选修 Free Elective			4-7 学期 Semester 4-7	全校 The whole school	4,5,6,7,9	学科竞赛课程限测绘类/数学类/信息类 Subject Competition Courses of Geomatics/Mathematics/Information courses
	全校个性化选修课程 Personalized Elective Courses of University	选修 Free Elective			4-7 学期 Semester 4-7	全校 The whole school	8	
劳动教育课程 Labor Education Courses	劳动教育课程 Labor Education Courses	必修 Compulsory	2	0	4-7 学期 Semester 4-7	全校 The whole school	2,9	
公共艺术课程 Public Art Courses	公共艺术课程 Public Art Courses	必修 Compulsory	2	0	4-7 学期 Semester 4-7	全校 The whole school	2,9	

学科与专业基础课程 Discipline and Specialty foundational Courses 共 54 学分，其中必修 54 学分，限修 0 学分，选修 0 学分 A total credits of 54, including 54 for compulsory courses, 0 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
数学类 Mathematics Courses	高等数学I Advanced Mathematics I	必修 Compulsory	5	0	第 1 学期 Semester 1	数学学院 School of Mathematics	3	
	线性代数 B Linear Algebra B	必修 Compulsory	3	0	第 1 学期 Semester 1	数学学院 School of Mathematics	3	
	高等数学II Advanced Mathematics II	必修 Compulsory	5	0	第 2 学期 Semester 2	数学学院 School of Mathematics	3	
	概率论与数理统计 Probability and Mathematical Statistics	必修 Compulsory	3	0	第 2 学期 Semester 2	数学学院 School of Mathematics	3	
物理类 Physics Courses	大学物理 B I College Physics B I	必修 Compulsory	3	0	第 2 学期 Semester 2	物理科学与技术学院 School of Physical and Technology	3	
	大学物理实验I Experiments of College Physics I	必修 Compulsory	1	1	第 2 学期 Semester 2		3	
	大学物理 B II College Physics B II	必修 Compulsory	3	0	第 3 学期 Semester 3		3	
	大学物理实验II Experiments of College Physics II	必修 Compulsory	1	1	第 3 学期 Semester 3		3	
计算机基础类 Basic Computer Courses	计算机程序设计基础 Foundations of Computer Programming	必修 Compulsory	3	1	第 1 学期 Semester 1	计算机与人工智能学院 School of Computing and Artificial Intelligence	3	
自然科学基础类 Natural Science Courses	普通地质学 General Geology	必修 Compulsory	2	0	第 4 学期 Semester 4	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3	
专业基础课 Professional Foundational Courses	工程制图 Engineering Drawing	必修 Compulsory	2	1	第 1 学期 Semester 1	土木工程学院 School of Civil Engineering	4	

	数字地形测量学 Digital Topography	必修 Compulsory	3	0	第 2 学期 Semester 2	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4	
	数据库原理与应用 Database Principles and Applications	必修 Compulsory	3	0	第 3 学期 Semester 3		3	
	测绘编程技术 Programming Techniques of Surveying and Mapping	必修 Compulsory	2	0	第 3 学期 Semester 3		3,4	
	大地测量学基础 Foundations of Geodesy	必修 Compulsory	3	0.5	第 3 学期 Semester 3		4	
	数据结构 Data Structure	必修 Compulsory	3	0.5	第 2 学期 Semester 2		3	
	卫星导航定位原理 Principles of Global Navigation Satellite System	必修 Compulsory	3	0	第 4 学期 Semester 4		4	
	地球科学概论 A Concept of Geosciences A	必修 Compulsory	3	0	第 4 学期 Semester 4		3	
	数字图像处理 Digital Image Processing	必修 Compulsory	3	0.5	第 5 学期 Semester 5		4	
专业教育课程 Specialized Courses 共 30 学分，其中必修 26 学分，限修 4 学分，选修 0 学分 A total credits of 30, including 26 for compulsory courses, 4 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
专业核心课 Specialized Core Course	地图制图学基础 Foundations of Cartography	必修 Compulsory	2	0.5	第 3 学期 Semester 3	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4	
	误差理论与测量平差基础 Error Theory and Foundations of Surveying Adjustment	必修 Compulsory	3	0.5	第 3 学期 Semester 3		4	
	摄影测量学基础 Foundations of Photogrammetry	必修 Compulsory	3	0.5	第 4 学期 Semester 4		4	
	遥感原理与应用 Principles and Applications of Remote Sensing	必修 Compulsory	3	0.5	第 4 学期 Semester 4		4	
	地理信息系统原理 Principles of Geographic Information Systems	必修 Compulsory	3	0	第 4 学期 Semester 4		4	
	GIS 应用开发 GIS Application Development	必修 Compulsory	2	1	第 5 学期 Semester 5		4,6	
	GIS 数量分析方法与应用 Quantitative Analysis Method and Application of GIS	必修 Compulsory	2	1	第 6 学期 Semester 6		4,5	
	WebGIS 技术与开发 WebGIS Technology and Development	必修 Compulsory	2	1	第 6 学期 Semester 6		4,6	

	专题制图与空间信息可视化 Thematic Mapping and Visualization of Spatial Information	必修 Compulsory	2	1	第 5 学期 Semester 5		4,6	
	三维 GIS 技术基础 3D GIS Basics	必修 Compulsory	2	1	第 6 学期 Semester 6		4,6	
	人文地理学 Human Geography	必修 Compulsory	2	0.5	第 7 学期 Semester 7		2,4	
专业限修课 Specialized Restricted Courses	测绘工程专业和遥感科学与技术专业专业课 Specialized Courses of the major of Surveying Engineering & Remote Sensing Science and Technology	限修 Distributional Electives	2	0	2-7 学期 Semester 2-7	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4	限修 4 学分 Limited 4 credits 说明：测绘工程专业和遥感科学与技术专业专业课指这两个专业培养方案中的专业核心课
	环境化学 Environmental Chemistry	限修 Distributional Electives	2	1	第 7 学期 Semester 7		3	
实践教学环节 Practice Courses 共 22 学分，其中必修 20 学分，限修 2 学分，选修 0 学分 A total credits of 22, including 20 for compulsory courses, 2 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
集中性实践教学环节：基本技能训练、工程实践、综合课程设计、社会与文化素质和实践、毕业实习与毕业设计 Centralized Practical Teaching Process: Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design	普通测量实验 General Surveying Experiments	必修 Compulsory	1	1	第 2 学期 Semester 2	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4,7	
	地理信息系统实验 Geographical Information System Experiments	必修 Compulsory	1	1	第 4 学期 Semester 4		4,6	
	数字测图实习 Practice of Digital Mapping	必修 Compulsory	2	2	短 1 学期 Short Semester 1		4,7	
	测绘应用程序课程设计 Course Exercise of Surveying Application Programs	必修 Compulsory	1	1	短 2 学期 Short Semester 2		6,9	
	控制测量与平差实习 Control Survey and Adjustment Practice	必修 Compulsory	3	3	短 2 学期 Short Semester 2		4,7	

	GIS 应用系统课程设计 Curriculum Design on GIS Application System	必修 Compulsory	2	2	短 3 学期 Short Semester 3	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4,6,9	
	摄影测量与遥感应用实习 Practice of Photogrammetry and Remote Sensing Applications	必修 Compulsory	2	2	短 3 学期 Short Semester 3		4	
	毕业设计(论文) Graduation Design (Dissertation)	必修 Compulsory	8	8	第 8 学期 Semester 8		4,5,6,9	
创新创业实践：创新创业训练计划项目、个性化实验、学科竞赛、创新讲座等 Innovation and Entrepreneurship Practice: Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc	创新创业训练计划项目 Innovation and Entrepreneurship Training Program	限修 Distributional Electives	2	2	2-7 学期 Semester 2-7	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	5,6,7,9	主持或参与结题至少 1 项 Leading or participation at least one project conclusion
	个性化实验 Individual Experiment	限修 Distributional Electives			2-7 学期 Semester 2-7		4,5,6,7,9	
	重点实验室向本科生开放工程实践项目 Engineering Practice Projects of Key laboratories Opening to Undergraduates	限修 Distributional Electives			2-7 学期 Semester 2-7		4,5,6,7,9	
	大学生 GIS 应用技能大赛 GIS Application Skills Competition for College Students	限修 Distributional Electives			2-7 学期 Semester 2-7	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4,5,6,7,9	获省级或国家级竞赛三等奖及以上 Winning the third prize at the provincial or national level
	创新讲座 Innovative lectures	限修 Distributional Electives			2-7 学期 Semester 2-7	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	5	听全校至少 10 个科技讲座，本院不少于 5 个，提交科技报告 1 份 Listening to at least 10 lectures of science and technology and at least 5 in this school, submitting a report of science and technology

必修环节 A compulsory part 共 0 学分，其中必修 0 学分，限修 0 学分，选修 0 学分 A total credits of 0, including 0 for compulsory courses, 0 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求指标点 Indicators which Support Graduation Requirements	备注 Notes
“第二课堂”项目：思想政治与道德素养类项目、学术科技与创新创业类项目、艺术体验与审美修养类项目、文化沟通与交往能力类项目、心理素质与身体素质类项目、社会工作与领导能力类项目、社会实践与志愿服务类项目 "The Second Lesson" Project: Ideological and Political Education and Moral Literacy Projects, Academic and Technological Innovation and Entrepreneurship Projects, Art Experience and Aesthetic Education Projects, Cultural Communication and Interpersonal Skills Projects, Psychological and Physical Health Projects, Social Work and Leadership Development Projects, Social Practice and Volunteering Projects	“第二课堂”项目 "The Second Lesson" Project	必修 Compulsory	0	0	1-8 学期 Semester 1-8	校团委 Communist Youth League Committee	9	
大学生综合素质提升、学生体质达标测评 Comprehensive Quality Improvement Courses for College Students Assessment of Students' Physical Fitness	大学生综合素质提升 Comprehensive Quality Improvement Courses for College Students	必修 Compulsory	0	0	1-8 学期 Semester 1-8	校团委 Communist Youth League Committee	9	
	学生体质达标测评 Assessment of Students' Physical Fitness	必修 Compulsory	0	0	秋季学期 Fall semester	体育学院 School of Physical Education	2	
学分总计 Total Credits			151					