

遥感科学与技术专业培养方案

Undergraduate Program of the Major of Remote Sensing Science and Technology

I. 专业介绍 Introduction

遥感科学与技术专业是在测绘科学、计算机科学、电子科学、地球科学以及其他学科交叉渗透、相互融合的基础上发展起来的一门新兴学科。西南交通大学于 2004 年获教育部批准依托测绘学科开设遥感科学与技术本科专业，并于同年招收首届遥感专业本科生。西南交通大学遥感科学与技术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摄影测量与遥感科技人才。本专业为省级一流专业建设点，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。

Remote sensing science and technology is developed based on the integration of surveying science, computer science, electronic science, geoscience, and other related disciplines. In 2004, the Ministry of Education approved the Southwest Jiaotong University to set up undergraduate majors in remote sensing science and technology based on surveying and mapping disciplines. In the same year, the first RS undergraduate students were recruited. The remote sensing science and technology major of Southwest Jiaotong University aims to cultivate excellent photogrammetry and remote sensing talents with rail transit background, domestic first-class and international influence. The remote sensing science and technology major of Southwest Jiaotong University is a provincial first-class professional 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：081202

Program Code: 081202

专业名称： 遥感科学与技术

Program Name: Remote Sensing Science and Technology

II.培养目标 Objectives

遥感科学与技术专业旨在培养具有良好的职业道德，具备扎实的工程基础、遥感理论基础及空间信息处理与分析技能，能够适应国民经济和社会发展需要，特别是国家轨道交通领域发展需求以及我校“交通特色鲜明的综合性研究型一流大学”的总体定位需要，能够综合运用遥感科学及相关学科理论和专业知识，在轨道交通、自然资源、城市规划、军事国防等领域，从事测绘遥感信息生产、科学研究、技术管理和教育教学等方面工作的交通特色鲜明的复合型遥感人才。

毕业后经过 5 年左右的实际工作，能够达到注册测绘师的专业技术水平，成为单位骨干。具体培养目标如下：

(1) 职业素养：具有良好的职业道德，能够适应轨道交通等测绘遥感行业认真细致、不畏艰苦、团结协作的工作特点，具备快速适应不同工作环境的能力。

(2) 业务能力：具备工程师水平的工程 and 实践能力，能够综合运用理论知识、技术手段和工程方法解决轨道交通等行业在勘测、规划、设计、施工和运营阶段中的实际问题，具备独立承担复杂测绘遥感工程项目和任务的能力，成为所在领域的专业技术骨干或管理骨干。

(3) 管理与沟通能力：具有法律、社会、环境、经济、资源等多方面系统性视角，在团队协作中具有良好沟通交流能力，并具备领导和组织实施的能力。

(4) 国际视野和终身学习能力：具备国际视野、熟悉国际测绘遥感工程业务规则和跨文化交流能力，能够满足“一带一路”背景下对轨道交通等行业国际化人才的需求，在工作中通过继续教育或其他学习渠道不断提高自身水平。

(5) 创新能力：具有创新意识和系统思维能力，能够带领团队开发轨道交通领域的测绘地理信息平台，创新测绘遥感技术手段。

The students graduated from this undergraduate program are supposed to have good professional ethics, solid knowledge about photogrammetry and remote sensing theories and technologies. They should be able to conduct the Geographical information production, science research, technical management, and education on the related areas such as railway transportation, natural resources, urban planning.

The students should reach the level of the registered surveyor five years after they graduate and be technical experts on remote sensing. The specific objectives are as follows.

(1) Professional quality: Have good professional ethics, can quickly adapt to

different working environments, and cooperate with others.

(2) Professional ability: Have the practical ability of an engineer and technical expert. Can solve the remote sensing related problems in practice and finish the project and tasks.

(3) Management and communication: Have the visions of the related laws, society, environment, economy, natural resources and so on. Can well communicate with other workers. Has the ability to manage and conduct the projects.

(4) International visions and lifelong study: Have the international visions, be familiar with the international remote sensing engineering rules and can conduct cross cultural communications. Be able to satisfy the requirements of the international engineers to serve the Belt and Road Initiative advocacy. Keep abreast of new research and ideas such as by participating continuing education.

(5) Innovation capability: Have the sense of innovative and systematic thinking ability to solve the remote sensing problems in practice. Can lead a group to develop the geographic information platform for railway transportation. Be able to develop innovative photogrammetry and remote sensing approaches in necessity.

III.专业毕业要求 Graduation Requirements

(1) 工程知识: 能够将数学学院、自然科学、工程基础和专业应用于工程实践，并解决测绘、摄影测量与遥感领域的复杂工程问题。

(2) 问题分析: 能够应用数学学院、自然科学和测绘遥感学科的基本原理，并通过文献检索、资料检索、资料查询及现代信息技术获取的信息，对测绘遥感领域的复杂工程问题进行分析研究，以获得有效结论。

(3) 设计/开发解决方案: 能够应用测绘遥感学科的基本原理和方法，针对测绘遥感领域的复杂工程问题，设计开发解决方案和满足特定需求的系统，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

(4) 研究: 能够基于科学原理并采用科学方法对测绘遥感领域的复杂工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

(5) 使用现代工具: 针对测绘遥感领域的复杂工程问题，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，包括对复杂工程问题的预

测与模拟，并能够理解其局限性。

(6) 工程与社会：能够基于测绘遥感学科相关背景知识，对复杂工程问题进行合理分析，评价专业工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

(7) 环境和可持续发展：能够理解和评价针对测绘领域的复杂工程问题的专业工程实践对环境、社会可持续发展的影响。

(8) 职业规范：具有人文社会科学素养、社会责任感，能够在测绘遥感信息工程实践中理解并遵守工程职业道德和规范，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：能够就测绘领域的复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

(11) 项目管理：理解并掌握工程管理原理与经济决策方法，并能在土木、交通、测绘等多学科环境中应用上述原理和方法。

(12) 终身学习：了解测绘遥感学科领域的新理论、新方法和国内外发展动态，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。

(1) Engineering knowledge: Graduates should master the knowledge of mathematics, natural science, engineering fundamentals, and professional knowledge that needed in solving complex engineering problems encountered in the surveying, photogrammetry and remote sensing projects.

(2) Problem analysis: The graduates should have the ability of performing successful analysis of complex engineering problem in surveying and remote sensing based on mathematics, sciences, surveying and remote sensing principles and the information from literature search.

(3) Design/development of solutions: The graduates should have the ability to design and develop solutions and systems that meets certain requirements in surveying and remote sensing engineering based on surveying and remote sensing basic principles and methods. Consciousness of innovation should be reflected in the designing, and health, security, law, social, cultural and environmental factors should be considered.

(4) Research: The graduates should have the ability of performing research activity

in complex surveying and remote sensing engineering problems based on scientific principles and methods. This includes experiment designing, data analysis and explanation, and drawing valid conclusions based on information synthesis.

(5) Modern tool usage: Graduates should have the ability to develop, select, and apply appropriate techniques, resources, and modern engineering and IT tools in complex surveying and remote sensing engineering problem, including the prediction and simulation of the complex engineering problem. The understanding of the limitations is essential.

(6) The engineering and society: Graduates should master the basic theory and knowledge of surveying and remote sensing, should have the ability to perform reasonable analysis of complex surveying engineering activities, and to evaluate the societal, health, safe, legal and cultural impacts of projects, and understand the consequent responsibilities relevant to the surveying and remote sensing engineering practice.

(7) Environment and sustainability: Graduates should understand and evaluate the impact of the professional engineering solutions on the sustainable development of environment and society.

(8) Ethics: Graduates should have high humanistic quality and social responsibility and obey the engineering professional ethics during the surveying and remote sensing information engineering practice.

(9) Individual and teamwork: Graduates should act effectively as an individual, a member or leader in multidisciplinary teams.

(10) Communication: Graduates should communicate effectively on complex surveying and remote sensing engineering activities with the engineering community and with the public, such as, being able to write effective reports and design documentation, give clear presentations, and give and receive clear instructions.

(11) Project management: Graduates should master engineering management principles and economic decision-making method. They should be able to apply the above principles and methods in multidisciplinary environments including civil engineering, transportation, surveying etc.

(12) Life-long learning: Graduates should have the knowledge of the latest technology status and development of surveying, photogrammetry, and remote sensing. They should have the awareness of self-motivated and lifelong learning and should have the ability of continuous learning and adapting themselves in technological

changes.

IV.学制与学位 Duration and Degree

学制：4 年

Duration: 4 years

学位：工学学士学位

Degree: Bachelor of Engineering

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：误差理论与测量平差基础、大地测量学基础、地图制图学基础、地理信息系统原理、摄影测量学基础、遥感原理与应用、数字图像处理、计算机视觉与模式识别、数据库原理与应用、遥感影像地学解译、遥感物理基础、数字摄影测量、定量遥感。

Specialized Core Course: Error Theory and Foundation of Surveying Adjustment, Foundation of Geodesy, Foundation of Cartography, Principles of Geographic Information System, Foundations of Photogrammetry, Principles and Applications of Remote Sensing, Digital Image Processing, Computer Vision and Pattern Recognition, Spatial Database, Geoscience Interpretation of Remote Sensing Images, Physical Theory of Remote Sensing, Digital Photogrammetry, Quantitative Remote Sensing.

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）	2				6		8
	多元化课程 Diversified Courses							
	国际课程 International Courses							
	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							
	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	5						5
	专业基础课 Professional Foundational Courses	32.5	5.5					38
专业教育课程 Specialized Courses	专业核心课 Specialized Core Course	8	4					12
	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							153

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	3.3,6.2,6.3,8.3	
	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	8.1,12.1	
	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	8.1,11.1,11.2	
	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	7.2,8.1,8.2	
	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	7.2,8.1,8.2	
	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	3.2,8.1,8.2	
	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	3.2,8.1,8.2	
	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	3.2,8.1,8.2	
	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	3.2,8.1,8.2	
	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	3.2,8.1,8.2	
	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	3.2,8.1,8.2	
	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	3.2,8.1,8.2	

	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	3.2,8.1,8.2	
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	6.2,8.3	
	军事技能 Military Skills	必修 Compulsory	2	2	短 1 学期 Short Semester 1	武装部 Security Office	8.3,9.2	
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	10.3,12.2	
	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	10.3,12.2	
	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	10.3,12.2	
	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	10.3,12.2	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	8.3,9.2	
	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	8.3,9.2	
	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	8.3,9.2	
	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	8.3,9.2	
	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	8.3,9.2	
	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	8.3,9.2	

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	6.1,10.1, 10.2	
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	6.1,10.1, 10.2	
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	7.1,7.2,8.1, 8.2,8.3	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	7.1,7.2,8.1, 8.2,8.3	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	7.1,7.2,8.1, 8.2,8.3	
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	7.1,7.2,8.1, 8.2,8.3	
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	7.1,7.2,8.1, 8.2,8.3	

学科与专业基础课程 Discipline and Specialty foundational Courses 共 70 学分，其中必修 70 学分，限修 0 学分，选修 0 学分 A total credits of 70, including 70 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	1.1,2,3	
	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	1.1,1,4,2,3	
	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	1.1,2,3	
	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	1.1,1,4,2,3	
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	1.1,4,1	
	大学物理实验I Experiments of College Physics I	必修 Compulsory	1	1	第 2 学期 Semester 2		1.1,4,1	
	大学物理 B II College Physics B II	必修 Compulsory	3	0	第 3 学期 Semester 3		1.1,4,1	
	大学物理实验II Experiments of College Physics II	必修 Compulsory	1	1	第 3 学期 Semester 3		1.1,4,1	
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	3.1	
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	1.1,7,1	
	地球科学概论 Concept of Geosciences	必修 Compulsory	3	0	第 4 学期 Semester 4	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1,7,1,7,2	
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	1.2,5,2	

专业基础课 Professional Foundational Courses	数据结构 Data Structure	必修 Compulsory	3	0.5	第 2 学期 Semester 2	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.2,5.2	
	数据库原理与应用 Database Principles and Applications	必修 Compulsory	3	0	第 3 学期 Semester 3		2.2,5.1,5.2	
	测绘编程技术 Programming Techniques of Surveying and Mapping	必修 Compulsory	2	0	第 3 学期 Semester 3		3.1,5.3	
	数字图像处理 Digital Image Processing	必修 Compulsory	3	0.5	第 5 学期 Semester 5		2.2	
	计算机视觉与模式识别 Computer Vision and Pattern Recognition	必修 Compulsory	2	1	第 7 学期 Semester 7		1.4,2.3,3.4	
	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	1.4,2.1,4.2,5.2	
	大地测量学基础 Foundations of Geodesy	必修 Compulsory	3	0.5	第 3 学期 Semester 3		2.1,2.4	
	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		1.3,1.4,2.3,4.1	
	地图制图学基础 Foundations of Cartography	必修 Compulsory	2	0.5	第 3 学期 Semester 3		4.2,5.2,5.3	
	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	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.3,1.4,2.1,5.1	
	摄影测量学基础 Foundations of Photogrammetry	必修 Compulsory	3	0.5	第 4 学期 Semester 4		1.3,2.1,4.2,5.1	
	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		2.1,5.1,7.2	
地理信息系统原理 Principles of Geographic Information Systems	必修 Compulsory	3	0	第 4 学期 Semester 4	2.2,5.1,5.3			
专业教育课程 Specialized Courses								
共 16 学分，其中必修 12 学分，限修 4 学分，选修 0 学分 A total credits of 16, including 12 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	数字摄影测量 Digital Photogrammetry	必修 Compulsory	3	1	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1,2.3	
	遥感物理基础 Physical Theory of Remote Sensing	必修 Compulsory	2	0	第 5 学期 Semester 5		1.1,1.4,2.3	
	定量遥感 Quantitative Remote Sensing	必修 Compulsory	2	1	第 6 学期 Semester 6		1.4,2.1,2.3	
	微波遥感原理与应用 Principle and Application of Microwave Remote Sensing	必修 Compulsory	3	1	第 6 学期 Semester 6		1.1,1.4,2.3	

	遥感影像地学解译 Geoscience Interpretation of Remote Sensing Images	必修 Compulsory	2	1	第 7 学期 Semester 7		1.1,2.1,3.4, 5.2	
专业限修课 Specialized Restricted Courses	测绘工程专业和地理信息科学专业专业课 Specialized Courses of the major of Surveying Engineering and Geographic Information Science	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	3.2,3.4,5.1, 5.2,5.3	限修 4 学分 Limited 4 credits 说明: 测绘工程专业和地理信息科学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			
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	4.3,9.1	
	地理信息系统实验 Geographical Information System Experiments	必修 Compulsory	1	1	第 4 学期 Semester 4		9.1,10.1	
	数字测图实习 Practice of Digital Mapping	必修 Compulsory	2	2	短 1 学期 Short Semester 1		4.2,6.3,7.3, 9.2,11.3	
	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		3.1,9.1,10.1	
	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	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4.3,6.3,7.3, 9.2,9.3,11.3	
	遥感综合实习 Practical Remote Sensing Applications	必修 Compulsory	2	2	短 3 学期 Short Semester 3		4.3,6.3,7.3, 9.3,11.3	
	摄影测量综合实习 Practical Photogrammetry	必修 Compulsory	2	2	短 3 学期 Short Semester 3		4.3,6.3,7.3, 9.3,11.3	
	毕业设计(论文) Graduation Design (Dissertation)	必修 Compulsory	8	8	第 8 学期 Semester 8	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.4,3.2,3.3, 10.1,10.2, 12.2	

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	11.1,11.2, 11.3	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			
	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			
	大学生测绘技能或论文大赛 Surveying and Mapping Skills or Thesis Competition for College Students	限修 Distributional Electives			2-7 学期 Semester 2-7		11.1,11.2, 11.3	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		11.1,11.2, 11.3	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	3.2,12.1	
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	3.2,12.1	
	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	8.3,9.2	
学分总计 Total Credits			153					

西南交通大学培养方案变更申请表

申请单位		专业（方向）		涉及年级		涉及学生人数	
地球科学与环境工程学院		遥感科学与技术、测绘工程(茅以升班)		2023		161	
课程名称	课程编码	课程学分	选修性质	开课学期	变更内容	变更原因	
定量遥感		2	限修——测绘(茅班) 必修——遥感	6	定量遥感 B	2023 级该课程改为 2 学分。根据课程代码编码规则需要变更课程名称。	
遥感影像地学解译		2	限修——测绘(茅班) 必修——遥感	7	遥感影像地学解译 B		
本专业专家论证意见（可另附表）：							
专业负责人意见：同意 专业负责人签名：2023 年 10 月 11 日		教授委员会意见： 经 2023 年 10 月 11 日教授委员会讨论，与会委员表决情况如下： 同意 教授委员会主任签名：2023 年 10 月 13 日		学院/中心 意见： 院长/主任 签名： 学院/中心（盖章）： 2023 年 10 月 13 日			
开课学院/中心 意见：（如变更课程非本单位需要填写本栏） 开课单位教学负责人 签名： 年 月 日							