

遥感科学与技术专业培养方案

Undergraduate Program 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、空间科学、电子科学、地球科学、计算机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，它利用非接触传感器来提取目标对象的几何与物理特征信息。遥感科学与技术已经广泛应用于经济建设、社会发展、国家安全和人民生活等各方面，毕业生社会需求量大，就业前景广阔。

Remote sensing science and technology is developed based on the integration of surveying science, space science, electronic science, geoscience, computer science and other related disciplines. Space-borne or airborne sensors are used to acquire geometrical and physical information about an object or phenomenon without physical contact. Remote sensing science and technology has been widely used in economic construction, social development, national security, and daily life. Therefore, the society has a large demand for the graduates.

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主要培养掌握遥感与摄影测量基本理论、方法和技术，具有空间信息获取、处理、分析和应用专业知识的复合型高级技术应用人才。毕业生能从事摄影测量与遥感、测绘方面的生产、设计、规划和管理及有关教学、科研工作，适应的岗位有遥感、测绘类以及交通、国土、资源、环境、航空航天、国防、基础设施和规划管理、地震、石油、电力、物探和能源等领域，就业层次广，就业质量高，可在相关院校从事专业教学、科研工作，同时为摄影测量与遥感应用研究提供高素质的研究生生源。

The primary objective of this program of remote sensing science and technology is to educate high-quality professionals with basic knowledge and skills in remote sensing, as well as with excellent ability to acquire, process and analyze spatial information, and the ability of perform application of remote sensing in various field. This program can provide students with the basic knowledge and skills in photogrammetry and remote sensing required to work in the surveying and mapping, transportation, land planning and management, natural resources, environment, aviation and space industry, defense, infrastructure planning and management, earthquake, or energy field, with particular emphasis on the aspects of manufacturing, design, R&D, managing and application related to remote sensing. Meanwhile, this program can provide high quality potential students for graduate program of remote sensing.

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、工程基础和专业知识应用于工程实践，并解决测绘、摄影测量与遥感领域的复杂工程问题。

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. 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。

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. 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。

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. 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。

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. 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。

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. 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。

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. 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。

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. 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。

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. 个人和团队: 能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

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

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。

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. 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。

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. 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。

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
Degree: Bachelor of Engineering

V.主干学科与主干课程 Main Subject and Main Course

主干学科：测绘科学与技术
Main Subject: Surveying and Mapping

主干课程：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、数据库原理与应用、遥感影像地球科学与环境工程学院解译、遥感物理基础，摄影测量与遥感专题、定量遥感。

Main Course: Surveying Adjustment, Foundation of geodesy, Foundation of Cartography, Principles of Geographic Information System, Foundation of photogrammetry, Principles and Applications of Remote Sensing, Digital image processing, Spatial database, Geoscience interpretation of Remote Sensing Images, Remote sensing physics, Selected topics on photogrammetry and remote sensing, 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	思想政治类 Ideological Politics Courses	14	2					16
	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
通识教育课程 General Education Courses	核心通识课 Core General Education Courses			4				4

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VII.课程设置细化表 Course Programs Table

(I)课程设置 Course Programs

公共基础课程 Public Basic Courses 共 32 学分，其中必修 30 学分，限修 2 学分，选修 0 学分 A total credits of 32, including 30 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
思想政治类 Ideological Politics Courses	思想道德修养与法律基础 The Ideological and Moral Cultivation and Legal Basis	必修 Compulsory	3	0.4	第 1 学期 1St Semester	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 4 学期 4Rd Semester	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 3Rd Semester	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 I Introduction to Mao Zedong Thought and Theoretical System of Socialism with Chinese Characteristics I	必修 Compulsory	3	0.4	第 5 学期 5Th Semester	马克思主义学院 School of Marxism	7.2 8.1 8.2	
	毛泽东思想和中国特色社会主义理论体系概论 II Introduction to Mao Zedong Thought and theoretical System of Socialism with Chinese Characteristics II	必修 Compulsory	2	0.4	第 6 学期 6Th Semester	马克思主义学院 School of Marxism		
	形势与政策 I Situation and Policy I	必修 Compulsory	0	0	第 1 学期 1St Semester	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 2Nd Semester	马克思主义学院 School of Marxism		
	形势与政策 III Situation and Policy III	必修 Compulsory	0	0	第 3 学期 3Rd Semester	马克思主义学院 School of Marxism		
	形势与政策 IV Situation and Policy IV	必修 Compulsory	0	0	第 4 学期 4Th Semester	马克思主义学院 School of Marxism		
	形势与政策 V Situation and Policy V	必修 Compulsory	0	0	第 5 学期 5Th Semester	马克思主义学院 School of Marxism		
	形势与政策 VI Situation and Policy VI	必修 Compulsory	0	0	第 6 学期 6Th Semester	马克思主义学院 School of Marxism		

思想政治类 Ideological Politics Courses	形势与政策Ⅶ Situation and Policy Ⅶ	必修 Compulsory	0	0	第 7 学期 7Th Semester	马克思主义学 院 School of Marxism		
	形势与政策Ⅷ Situation and Policy Ⅷ	必修 Compulsory	2	0	第 8 学期 8Th Semester	马克思主义学 院 School of Marxism		
军事类 Military Courses	军事理论 Military Theories	必修 Compulsory	2	0	第 1 学期 1St Semester	武装部 Security Office	6.3 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 1St Semester	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 2Nd Semester	外国语学院 School of Foreign languages		
	通用学术英语 English for General Academic Purposes	必修 Compulsory	2	0	第 3 学期 3Rd Semester	外国语学院 School of Foreign languages		
	职场英语 Workplace English	限修 Distribution al Elective	2	0	第 4 学期 4Th Semester	外国语学院 School of Foreign languages		限选 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 1St Semester	体育部 Dept. of Physical Education	8.3 9.2	
	体育 II Physical Education II	必修 Compulsory	1	1	第 2 学期 2Nd Semester	体育部 Dept. of Physical Education		
	体育III Physical EducationIII	必修 Compulsory	0.5	0.5	第 3 学期 3Rd Semester	体育部 Dept. of Physical Education		
	体育IV Physical EducationIV	必修 Compulsory	0.5	0.5	第 4 学期 4Th Semester	体育部 Dept. of Physical Education		
	体育健康课程 I Diversified Physical Education Courses I	必修 Compulsory	0.5	0.5	第 5 学期 5Th Semester	体育部 Dept. of Physical Education		
	体育健康课程 II Diversified Physical Education Courses II	必修 Compulsory	0.5	0.5	第 6 学期 6Th Semester	体育部 Dept. of Physical Education		
通识教育课程 General Education Courses 共 6 学分，其中必修 2 学分，限修 4 学分，选修 0 学分 A total credits of 6, including 2 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 Requireme nts	备注 Notes

核心通识课 Core General Education	“交通天下”通识课程 General Studies on Transportation	限修 Distributional Elective	4		第 2-8 学期 2-8 Semester	全校 The whole school		限修 4 学分 Limited 4 credits
新生研讨课 Freshman Seminar	写作与交流 Writing and communication	必修 Compulsory	2		第 2 学期 2Nd Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	6.2 10.1 10.2	
学科与专业基础课程 Discipline and Specialty foundational Courses 共 73 学分，其中必修 73 学分，限修 0 学分，选修 0 学分 A total credits of 73, including 73 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
数学学院与自然科学基础课 Foundational Courses on Mathematics and Natural Science	高等数学 I Advanced Mathematics I	必修 Compulsory	5	0	第 1 学期 1St Semester	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 1St Semester	数学学院 School of Mathematics	1.1 1.4 2.3	
	计算机程序设计基础 Computer Programming Basics	必修 Compulsory	3	1	第 1 学期 1St Semester	信息科学与技术学院 School of Information Science and Technology	3.1	
	高等数学 II Advanced Mathematics II	必修 Compulsory	5	0	第 2 学期 2Nd Semester	数学学院 School of Mathematics	1.1 2.3	
	概率论与数理统计 A Probability Theory and Mathematical Statistics A	必修 Compulsory	4	0	第 2 学期 2Nd Semester	数学学院 School of Mathematics	1.1 1.4 2.3	
	大学物理 BI College Physics BI	必修 Compulsory	3	0	第 2 学期 2Nd Semester	物理科学与技术学院 School of Physical Science and Technology	1.1 4.1	
	大学物理实验 I College Physics Experiments I	必修 Compulsory	1	1	第 2 学期 2Nd Semester	物理科学与技术学院 School of Physical Science and Technology	1.1 4.1	
	大学物理 B II College Physics B II	必修 Compulsory	3	0	第 3 学期 3Rd Semester	物理科学与技术学院 School of Physical Science and Technology	1.1 4.1	
	大学物理实验 II College Physics Experiments II	必修 Compulsory	1	1	第 3 学期 3Rd Semester	物理科学与技术学院 School of Physical Science and Technology	1.1 4.1	
	数据库原理与应用 Database Theory & Application	必修 Compulsory	3	0	第 3 学期 3Rd Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.2 5.1 5.2	

数学学院与自然科学基础课 Foundational Courses on Mathematics and Natural Science	数据结构 Data Structure	必修 Compulsory	3	0.5	第 2 学期 2Nd Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.2 5.2	
	普通地质学 General Geology	必修 Compulsory	2	0	第 4 学期 4Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1 7.1	
专业基础课 Professional Foundational Courses	计算机视觉与模式识别 Computer Vision and Pattern Recognition	必修 Compulsory	2	1	第 7 学期 7Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.4 2.3 3.4	
	工程制图 Engineering Drawing	必修 Compulsory	2	0	第 1 学期 1St Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.2 5.2	
	数字地形测量学 Digital Topographic Surveying	必修 Compulsory	3	0	第 2 学期 2Nd Semester	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	
	测绘编程技术 Programming Technology for Surveying and Mapping	必修 Compulsory	2	0	第 3 学期 3Rd Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.1 5.3	
	大地测量学基础 Foundation of Geodesy	必修 Compulsory	3	0.5	第 3 学期 3Rd Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.1 2.4	
	误差理论与测量平差基础 Surveying Adjustment Basics	必修 Compulsory	3	0.5	第 3 学期 3Rd Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.3 1.4 2.3 4.1	
	地图制图学基础 Foundation of Cartography	必修 Compulsory	2	0.5	第 3 学期 3Rd Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4.2 5.2 5.3	
	卫星导航定位原理 Principle of Satellite Navigation and Positioning	必修 Compulsory	3	0	第 4 学期 4Th Semester	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 Foundation of Photogrammetry	必修 Compulsory	3	0.5	第 4 学期 4Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.3 2.1 4.2 5.1	

专业基础课 Professional Foundational Courses	遥感原理与应用 Principle and Application of Remote Sensing	必修 Compulsory	3	0.5	第 4 学期 4Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.1 2.1 5.1 7.2	
	地理信息系统原理 Principles of Geographic Information System	必修 Compulsory	3	0.5	第 4 学期 4Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.2 5.1 5.3	
	地球科学概论 Introduction to Earth Sciences	必修 Compulsory	3	0	第 4 学期 4Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1 7.1 7.2	
	数字图像处理 Digital Image Processing	必修 Compulsory	3	1	第 5 学期 5Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.2	
	遥感物理基础 Remote Sensing Physics	必修 Compulsory	2	0	第 5 学期 5Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1 1.4 2.3	
专业课程 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
专业核心课程 Specialized Core Course	摄影测量与遥感专题 Selected Topics on Photogrammetry and Remote Sensing	必修 Compulsory	3	1	第 5 学期 5Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1 2.3	
	遥感影像地学解译 Geoscience Interpretation of Remote Sensing Images	必修 Compulsory	3	1	第 7 学期 7Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1 2.1 3.4 5.2	
	定量遥感 Quantitative Remote Sensing	必修 Compulsory	3	1	第 6 学期 6Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	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 6Th Semester	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1 1.4 2.3	
专业限修课程 Specialized Restricted Courses	GIS 应用开发 GIS Application Development	限修 Distributional Electives	2	1	第 5 学期 5Th Semester	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


专业限修课程 Specialized Restricted Courses	GIS 数量分析方法与应用 Quantitative Analysis Method and Application of GIS	限修 Distribution al Electives	3	1	第 6 学期 6Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	专题制图与空间信息可视化 Thematic Mapping and Visualization of Spatial Information	限修 Distribution al Electives	2	1	第 5 学期 5Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
专业限修课程 Specialized Restricted Courses	三维 GIS 技术基础 3D GIS Basics	限修 Distribution al Electives	2	1	第 6 学期 6Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	环境化学 Environmental Chemistry	限修 Distribution al Electives	2	1	第 7 学期 7Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	WebGIS 技术与开发 WebGIS Technology and Development	限修 Distribution al Electives	2	1	第 6 学期 6Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	物理大地测量学 Physical Geodesy	限修 Distribution al Electives	2	1	第 5 学期 5Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	高等测量平差 Advanced Surveying Adjustment	限修 Distribution al Electives	2	1	第 6 学期 6Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	组合导航与位置服务 Integrated Navigation and Location Service	限修 Distribution al Electives	2	1	第 7 学期 7Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	变形监测与分析 Deformation Monitoring and Analysis	限修 Distribution al Electives	2	1	第 6 学期 6Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	不动产测量 Real Estate Surveying and Mapping	限修 Distribution al Electives	2	1	第 5 学期 5Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	卫星大地测量学 Satellite Geodesy	限修 Distribution al Electives	2	1	第 6 学期 6Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering
	工程测量学 Engineering Surveying	限修 Distribution al Electives	2	1	第 6 学期 6Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering

专业限修课程 Specialized Restricted Courses	高速铁路工程测量 Engineering Surveying of High Speed Railway	限修 Distribution al Electives	2	1	第 7 学期 7Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering		
<p style="text-align: center;">实习实践教学 Practice Course 共 24 学分，其中必修 24 学分，限修 0 学分，选修 0 学分 A total credits of 24, including 24 for compulsory courses, 0 for distributional electives and 0 for free electives</p>								
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 Requireme nts	备注 Notes
基本技能训练、 实习实训、综合 课程设计、社会 与文化素质实 践、毕业实习与 毕业设计 Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design	普通测量实验 Practical General Surveying	必修 Compulsory	1	1	第 2 学期 2Nd Semester	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 Practical GIS	必修 Compulsory	1	1	第 4 学期 4Th Semester	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering	9.1 10.1	
	数字测图实习 Practical Digital Mapping	必修 Compulsory	2	2	短 1 学期 Short Semester 1	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering	4.2 6.3 7.3 9.2 11.3	
	测绘应用程序课程设计 Surveying and Mapping Computer Programs Design	必修 Compulsory	1	1	短 2 学期 Short Semester 2	地球科学与环 境工程学院 Faculty of Geosciences and Environmental Engineering	3.1 9.1 10.1	
	控制测量与平差实习 Practical Control Measurement and Adjustment	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	
	遥感应用实习 Practical Remote Sensing Applications	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	4.3 6.3 7.3 9.3 11.3	
	摄影测量实习 Practical Photogrammetry	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	4.3 6.3 7.3 9.3 11.3	
	毕业设计(论文) Graduation Design (Thesis)	必修 Compulsory	12	12	第 8 学期 8Th Semester	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	
<p style="text-align: center;">多元化课程 Diversified course 共 4 学分，其中必修 0 学分，限修 4 学分，选修 0 学分 A total credits of 4, including 0 for compulsory courses, 4 for distributional electives and 0 for free electives</p>								

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
美育专业类课程 Aesthetic Education Specialty Courses	全校美育专业类课程 Aesthetic Education Courses of University	限修 4 学分 Distributional Elective 4 credits	2		第4-7学期 4-7 Semester	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 manual of diversified courses of southwest Jiaotong University》
学科竞赛类课程 Subject Competition Courses	全校学科竞赛课程 Subject Competition Courses of University		2		第4-7学期 4-7 Semester			
个性化选修课程 Personalized Elective Courses	全校个性化选修课程 Personalized Elective Courses of University		2		第4-7学期 4-7 Semester			
创新创业实践 Innovation and Entrepreneurship Practice 共 2 学分，其中必修 0 学分，限修 2 学分，选修 0 学分 A total credits of 2, including 0 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
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 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 2 学分 Distributional Electives 2 credits	2	2	第2-7学期 2-7 Semester		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		2	2	第2-7学期 2-7 Semester			
	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		2	2	第2-7学期 2-7 Semester			
	大学生测绘技能或论文大赛 Surveying and Mapping Skills or Thesis Competition for College Students		2	2	第2-7学期 2-7 Semester			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		2	2	第2-7学期 2-7 Semester			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
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（第二、第三课堂） Comprehensive Quality Improvement Courses for College Students (The Second and Third Classroom)	必修 Compulsory	0	0	第 1-8 学期 1-8 Semester	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	体育部 Dept. of Physical Education	8.3 9.2	
学分总计 Total Credits			157					

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		测绘工程/遥感科学与技术/地理信息科学/测绘工程（卓越班）		2019 级培养方案		2019 级
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
新生研讨课《写作与交流》	FGEE017814	2.0	必修	第 1 学年， 第 2 学期	课程名称变更为：新生研讨课《测绘学漫谈》	因为新生研讨课实行小班制教学，目前地学院优质教学资源不足，因此将新生研讨课变更为《测绘学漫谈》。原定《写作与交流》内容将以高年级系列讲座的形式对本科生开放，不作为培养计划内课程进行设置。
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：张明 年 月 日		教授委员会意见： 经 年 月 日教授委员会讨论，与会委员表决情况如下： 教授委员会主任签名：朱 年 月 日			学院/中心 意见： 同意 院长/主任 签名： 学院/中心（盖章）： 	
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						
教务处意见： <div style="text-align: center;">年 月 日</div>						

注：此表一式三份，一份存学院，一份存教学研究科，一份存排课考试中心。