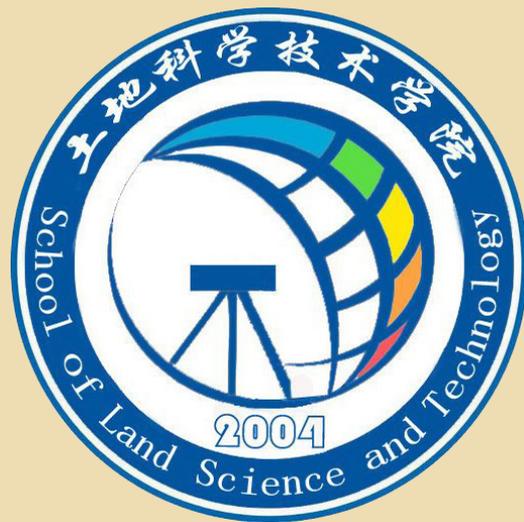


土地科学技术学院

School of Land Science and Technology



遥感科学与技术专业培养方案

一、专业培养目标

本专业旨在培养德智体美劳全面发展，具有良好的自然科学与人文科学素养，具备数理和计算机基础，掌握遥感科学与技术专业基础知识、多源遥感信息数据采集和综合处理的基本原理、方法和技能，胜任自然资源调查、生态环境保护、地质环境灾害监测等领域相关的遥感工程技术与管理工作的，具有较强的组织管理能力、继续学习能力、创新能力、国际视野和地质遥感特色的高级应用型工程技术人才，毕业五年左右达到遥感工程师水平，成为单位技术及管理骨干。

二、毕业要求

本专业学生主要学习遥感科学与技术的基本理论和基本知识，掌握遥感及数据处理的手段与方法，具有较好的科学和工程素养，具有应用所学基础理论和专业知识，分析解决复杂工程问题、开展科学研究、从事生产设计和组织管理的基本能力。

三、主干学科

测绘科学与技术、计算机科学与技术、地理学。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予工学学士学位。

五、核心课程

测绘学概论、误差理论与测量平差基础、大地测量学基础、GNSS 原理及其应用、地理信息系统原理、航空与航天数据获取、遥感原理与应用、摄影测量学、数字图像处理、遥感图像解译、激光雷达技术与地学应用、人工智能与地学大数据、遥感技术与地学应用等。

Undergraduate Program in Remote Sensing Science and Technology

1. Academic Objectives

This major cultivates the all-round development students of morality, intelligence, physical education, beauty and labor. The students possess good natural science and humanities literacy, mathematics and computer foundation, mastering the basic knowledge of remote sensing science and technology and the basic principles of multi-source remote sensing information data collection and comprehensive processing, methods and skills. The students can be competent in remote sensing engineering technology and management related to natural resource investigation, ecological environment protection, geological environmental disaster monitoring and other fields. The applied engineering and technical talents, with strong organizational and management capabilities, continued learning capabilities, innovative capabilities, international vision and features of geological remote sensing, have reached the level of remote sensing engineers about five years after graduation and become the backbone of the unit's technology and management.

2. Graduation Requirements

This major requires students to learn the basic theories and basic knowledge of remote sensing science and technology, master the methods of remote sensing and data processing. Students should have some basic abilities, including good scientific and engineering literacy, the basic theories and professional knowledge they have learned, analyzing and solving complex engineering problems, carrying out scientific research, engaging in production design and organization management.

3. Main disciplines

Surveying and Mapping, Computer Science and Technology, Geography.

4. Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Engineering when they have completed the required minimum credits and have met all other requirements.

5. Core Courses

Introduction to Geomatics, Error Theory and Foundation of Surveying Adjustment, Foundation of Geodesy, Principles and Applications of Global Navigation Satellite System, The Principles of Geographic Information System, Aviation and Aerospace Data Acquisition, Remote Sensing Principles and Applications, Photogrammetry, Digital Image Processing, Remote Sensing Image Interpretation, Lidar Technology and Geoscience Applications, Artificial Intelligence and Geoscience Big Data, Remote Sensing Technology and Geoscience Applications, etc.

六、最低毕业总学分要求及学分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	698	38	11	15	1	4	4		2	1			
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	856	53.5	7	17		13.5	14		2				
	专业核心课程 Specialized Fundamental Courses	408	25.5				1.5	6		9	9			
	专业拓展课程 Specialized Development	128	8											
实践教育 Practical Education	课程实践 Course Practice	33 周 +80 课时	31		1	10	1			5.5		2.5	5	6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits												148		
选修课总学分 Elective course credits													26	
最低毕业总学分 Total Credits														174

七、课程设置 (Curriculum)

1、通识教育必修课程 (Required Courses of General Education): 698 学时 (698 Hours), 38 学分 (38 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR181009	思想道德与法治 Ideological Morality and Rule of Law	48	3	40	8		考试 Exam	1	
GR181008	中国近现代史纲要 Essentials of Modern Chinese History	48	3	40	8		考试 Exam	2	
GR182014	马克思主义基本原理 Fundamental Principles of Marxism	48	3	40	8		考试 Exam	3	
GR183004	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thoughts and Theoretical System of the Chinese Characteristic Socialism	64	4	48	16		考试 Exam	4	
GR181012	习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thoughts on Socialism with Chinese Characteristics in the New Era	32	2	28	4		考试 Exam	5	
GR180005	形势与政策 Situation and Policies	32	2	32			考查 Term Paper	1-8	
GR301004	大学生职业生涯规划与就业指导 (1) Career Planning and Employment Guidance for University Students (1)	20	1	16	4		考试 Exam	2	
GR303005	大学生职业生涯规划与就业指导 (2) Career Planning and Employment Guidance for University Students (2)	18	1	12	6		考试 Exam	6	
GR301005	大学生心理素质教育 (1) Mental Health (1)	16	1	16			考查 Term Paper	1	
GR303005	大学生心理素质教育 (2) Mental Health (2)	16	1	16			考查 Term Paper	5	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR302008	军事理论 Military Theory	36	1	36			考试 Exam	2 夏	
GR081071	大学英语 (1) College English(1)	64	4	64			考试 Exam	1	
GR081072	大学英语 (2) College English(2)	32	2	32			考试 Exam	2	
GR081067	大学英语素质拓展课 Competence-oriented Education for College English	32	2	32			考试 Exam	2	
GR141005	体育 (1) (系列课程) Physical Education (1)	32	1		32		考试 Exam	1	
GR141006	体育 (2) (系列课程) Physical Education(2)	32	1		32		考试 Exam	2	
GR142007	体育 (3) (系列课程) Physical Education(3)	32	1		32		考试 Exam	3	
GR142008	体育 (4) (系列课程) Physical Education(4)	32	1		32		考试 Exam	4	
GR041003	程序设计基础 A Fundamentals of Programming A	64	4	24	24	16	考试 Exam	2	
总计 Total		698	38	476	206	16			

2、通识教育选修 (Selective Courses of General Education): 192 学时 (192Hours), 12 学分 (12 Credits)

序号 No.	课程类别 Courses Classification	课程名称 Courses Name	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
1	人文社科类 (含在线课程) Humanities and Social Sciences Courses (Inc. Online courses)	见附件 1	7	考查 Term Paper	2-8	4 个类别中选修 7 个学分, 其中,《大学生安全教育》(1 学分) 必选。
2	自然科学类 (含在线课程) Natural Science Courses (Inc. Online Courses)	见附件 2		考查 Term Paper	2-8	
3	自然文化类 Natural Culture Courses	见附件 3		考查 Term Paper	2-8	
4	体育与健康类 Sports and Health Courses	见附件 4		考查 Term Paper	5-8	
5	创新创业教育类 (含在线课程) Innovation and Entrepreneurship Courses (Inc. Online Courses)	见附件 5	3	考查 Term Paper	2-8	选修 3 个学分, 其中《新生研讨课》(1 学分) 必选。
6	审美与艺术类 Aesthetics and Art Courses	见附件 6	2	考查 Term Paper	2-4	
总计 Total			12			

3、学科基础课程 (Disciplinary Fundamental Courses): 856 学时 (856 Hours), 53.5 学分 (53.5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
IS121127	遥感科学与技术专业导论课 Introduction to Remote Sensing Science and Technology	16	1	16			考查 Term Paper	1	
DR191001	高等数学 A (1) Advanced Mathematics A(1)	96	6	96			考试 Exam	1	
DR191002	高等数学 A (2) Advanced Mathematics A(2)	96	6	96			考试 Exam	2	
DR192005	线性代数 Linear Algebra	32	2	32			考试 Exam	3	
DR192006	概率论与数理统计 Probabilistic and Mathematics Statistic	48	3	48			考试 Exam	4	
DR191101	大学物理 (1) College Physics (1)	48	3	48			考试 Exam	2	
DR192102	大学物理 (2) College Physics (2)	48	3	48			考试 Exam	3	
DR011036	地球科学概论 Geosciences	64	4	32	32		考试 Exam	2	
SR121102	数字地形测量学 Digital Topographic Surveying	64	4	40	24		考试 Exam	2	
DR021029	工程力学 B Engineering Mechanics	56	3.5	52	4		考试 Exam	3	
DR042126	电子电工技术 A Electrical and Electronic Technology A	64	4	50	14		考试 Exam	3	
DR122003	测绘学概论 Introduction to Geomatics	16	1	16			考试 Exam	3	
SR122104	大地测量学基础 Foundation of Geodesy	48	3	36	12		考试 Exam	4	
SR122101	误差理论与测量平差基础 Error Theory and Foundation of Surveying Adjustment	56	3.5	44	12		考试 Exam	4	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR122103	GNSS 测量原理及其应用	40	2.5	28	12		考试 Exam	4	
DR123074	GNSS Surveying Principles and Application 数据结构 Data Structure	32	2	22	10		考试 Exam	4	
DR122073	计算机图形学 Computer Graphics	32	2	22	10		考试 Exam	5	
总计 Total		856	53.5	726	130				

4、专业核心课程 (Core Professional Courses): 408 学时 (408 hours), 25.5 学分 (25.5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR123105	地图制图学基础 Foundation of Cartography	32	2	26	6		考试 Exam	5	
SR123106	地理信息系统原理 A Geographic Information System A	48	3	30	18		考试 Exam	5	
SR122128	遥感物理基础 Remote Sensing Physics Foundation	32	2	24	8		考试 Exam	4	
SR122129	航空与航天数据获取 Aviation and Aerospace Data Acquisition	24	1.5	16	8		考试 Exam	3	
SR123017	遥感原理与应用 (双语) Principles and Applications of Remote Sensing(bilingual)	32	2	24	8		考试 Exam	4	
SR123113	测绘程序设计与实践 Comprehensive Programming Practice of Surveying and Mapping	48	3	24	24		考试 Exam	5	
SR123109	摄影测量学 Photogrammetry	48	3	32	16		考试 Exam	6	
SR122130	数字图像处理 Digital Image Processing	32	2	24	8		考试 Exam	4	
SR123131	遥感图像解译 Remote Sensing Image Interpretation	16	1	8	8		考试 Exam	5	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR123110	激光雷达技术与地学应用 (双语) LiDAR: Principles and Geo-application	32	2	24	8		考试 Exam	6	
SR123111	InSAR 技术与地质灾害监测应用 InSAR: Principles and Application in Geological Hazard	32	2	24	8		考试 Exam	6	
SR123114	人工智能与地学大数据 Artificial Intelligence and Geoscience Big Data	32	2	24	8		考试 Exam	6	
总计 Total		408	25.5	280	128		考试 Exam		

5、专业拓展课程 (Specialized Development Courses): 128 学时 (128 hours), 8 学分 (8 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
DR192018	复变函数与积分变换 Complex Variable Function and Integral Transformations	48	3	48			考试 Exam	4	
SS123117	遥感技术与地学应用 Remote Sensing Technology and Geoscience Application	32	2	24	8		考查 Term Paper	6	
SS122115	自然资源调查与管理 Natural Resources Investigation and Management	32	2	32			考查 Term Paper	3	
SS123116	地质灾害监测与预警预报 Geological Disaster Monitoring and Early Warning Forecast	32	2	24	8		考查 Term Paper	6	
SS122119	测绘专业英语 Specialty English for Surveying and Mapping	24	1.5	24			考查 Term Paper	4	
SR122042	土地管理学 Land Management	48	3	42	6		考试 Exam	3	
SR122045	土地资源学 Land Resources Science	48	3	36	12		考试 Exam	3	
SR123141	国土空间规划 Territorial Spatial Planning	48	3	32	16		考试 Exam	5	
SR123132	自然资源登记 Natural Resource Registration	32	2	26	6		考试 Exam	6	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR123108	海洋测绘 Hydrographic Surveying and Charting	32	2	20	12		考试 Exam	5	
SS124120	科研论文写作与实践 Research Paper Writing and Practice	32	2	24	8		考查 Term Paper	7	
总计 Total		408	25.5	332	76				

6、课程实践 (Practice Course): 33 周 +48 学时 (33 weeks and 48 hours), 31 学分 (31 Credits)

课程代码 Course Code	课程名称 Course Name	周数 (学时) Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR311003	军事技能训练 Military Theory and Practice	2 周	2	考查 Term Paper	1 夏	
PR181010	思想政治社会实践 Political Social Practice	32 学时	2	考查 Term Paper	1 夏	
PR011044	北戴河地质实习 Geological Practice in Beidaihe	2 周	2	考查 Term Paper	1 夏	
PR191045	实验物理 (1) Physics Experiments (1)	24 学时	1	考试 Exam	2	
PR191045	实验物理 (2) Physics Experiments (2)	24 学时	1	考试 Exam	3	
PR121121	数字地形测量实习 Topographic Surveying Practice	4 周	4	考查 Term Paper	1 夏	
PR123123	摄影测量课程设计与实习 Course design and practice of Photogrammetry	2.5 周	2.5	考查 Term Paper	3 夏	
PR123124	地理信息工程课程设计与实践 Course design and practice of Geographic Information Engineering	1.5 周	1.5	考查 Term Paper	5	
PR123133	数字图像处理与遥感图像解译实习 Digital Image Processing and Remote Sensing Image Interpretation Practice	2 周	2	考查 Term Paper	5	
PR124134	人工智能与大数据实习 Artificial Intelligence and Geoscience Big Data Practice	2 周	2	考查 Term Paper	7	

6、课程实践 (Practice Course): 33 周 +48 学时 (33 weeks and 48 hours), 31 学分 (31 Credits)

课程代码 Course Code	课程名称 Course Name	周数 (学时) Week (hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR123135	遥感原理与地学应用实习 Remote Sensing Practice	2 周	2	考查 Term Paper	5	
PR124125	地质环境与灾害监测综合实习 Comprehensive Practice of Geological Environment and Disaster Monitoring	3 周	3	考查 Term Paper	7	
PR124126	毕业设计 (论文) Graduation Design (Thesis)	12 周	6	考查 Term Paper	8	
总计 Total		33 周 +80 学时	31			

7、课外实践 (Extracurricular practice): 6 学分 (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等, 其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.