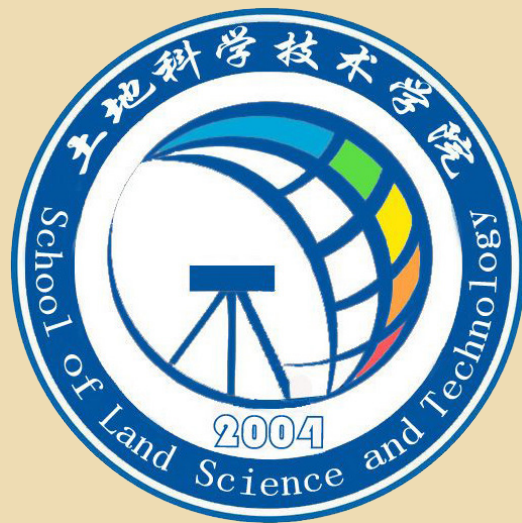


土地科学技术学院

School of Land Science and Technology



测绘工程专业培养方案

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以及职业道德，具备数理和计算机基础，掌握地质学和测绘专业基础知识、空间信息数据采集和综合处理的基本原理、方法和技能，胜任国家基础测绘、自然资源调查、地质环境灾害监测等领域相关的测绘地理信息工程技术与测绘管理工作，具有较强的组织管理能力、继续学习能力、创新能力、国际视野和地质测绘特色的高级工程技术人才，毕业五年左右达到测绘工程师水平，成为单位技术或管理骨干。本专业毕业生应达到以下目标：

(1) 具备良好的道德修养和人文社会科学素养，良好的工程职业道德和规范，较强的社会责任感和事业心，基于自身知识和能力，愿意服务于国家与社会，能够承担和履行社会责任；

(2) 能够在国家基础测绘、自然资源环境调查、地质环境灾害监测、城市和工业与工程建设等领域，从事测绘地理信息工程的设计与实施、技术开发、工程管理等工作，胜任测绘工程师的工作；

(3) 具备较强的团队意识、国际视野、沟通交流能力、合理决策能力和组织管理能力，能够承担团队中的领导角色；

(4) 具备创新能力和继续学习能力，能够独立或协同承担测绘地理信息科研工作；

(5) 具有良好的专业素养、丰富的工程管理经验 and 适应行业发展的能力，成为测绘地理信息企事业单位中的技术骨干或管理人才。

二、毕业要求

本专业学生主要学习测绘工程的基本理论和基本知识，掌握测绘及数据处理的手段与方法，接受测绘基本技能训练，具有应用所学基础理论和专业知识，分析解决自然资源调查与地质灾害监测复杂工程问题、开展科学研究、从事生产设计和组织管理的基本能力。毕业生应获得以下方面的知识、能力与素质：

(1) 工程知识：具备解决基础测绘和地质测绘的复杂工程问题的数学、自然科学、工程基础、测绘科学、地球科学等知识以及运用专业知识进行工程数据获取和处理的能力；能提出解决基础测绘、城市地质环境灾害监测、自然资源环境调查等测绘工程问题的可行方案，并进行比较与综合。

(2) 问题分析：能够应用数学、自然科学、工程科学、测绘科学、地球科学的基本原理和逻辑思维，结合文献检索与分析，准确识别与表达复杂测绘工程中的核心问题和关键环节，具备问题剖析、数学建模以及推理验证的能力，以获得有效结论。

(3) 设计 / 开发解决方案：能够根据复杂基础和地质测绘工程项目的目标、任务和要求，考虑社会、安全、健康、法律、文化以及环境等因素，设计、开发解决方案，编撰项目设计任务书及相关技术文档；了解当代科技发展前沿，能够应用新技术与方法对设计方案进行完善和创新。

(4) 研究：能够基于科学原理结合测绘基础理论和新技术以及计算机技术，对复杂基础和地质测绘工程问题进行研究，通过创新型实验设计，利用信息综合、数据处理分析与解释等科学方法，得到合理有效的结论。

(5) 使用现代工具：熟练掌握现代测绘仪器设备、测绘地理信息相关软件的操作和使用，能够针对复杂测绘工程，综合运用软硬件工具对地质调查与灾害监测等工程方案进行优化设计，应用于形变灾害的监测、预测和模拟，以及地理信息服务中的数据获取及分析，并理解其局限性。

(6) 工程与社会：熟悉国家和测绘行业方针、政策和法律法规，理解测绘成果的重要性，能够客观评价测绘工程技术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，对所实施的工程质量负责，并理解应承担的责任。

(7) 环境和可持续发展：能够理解和评价复杂基础和地质测绘工程问题的实践活动对环境保护、

社会可持续发展的影响。

(8) 职业规范：具有爱国主义情怀，良好的、人文社会科学素养和社会责任感，能够在测绘工程实践中理解并遵守工程职业道德和规范，理解工程师对公众的安全、健康和福祉，以及环境保护的社会责任理解测绘成果对国家安全、领土完整、公众安全与社会等的影响，并自觉履行其责任。

(9) 个人和团队：具有良好的组织沟通、协调管理、合理决策能力及团队合作精神，能够理解一个多角色团队中每个角色的含义以及对整个团队环境和目标的意义；能够在多学科背景下的团队中胜任个体、团队成员以及负责人等职责。

(10) 沟通：具备较强的口头和书面表达能力，具有一定的国际视野和跨语言文化沟通和交流的能力。能够就复杂测绘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、陈述发言和清晰表达或回应指令。

(11) 项目管理：理解并掌握基础测绘和地质测绘工程实施过程中的工程管理与经济决策方法，并能在地学和资源环境等多学科环境中应用。

(12) 终身学习：能够针对基础测绘和地质测绘不断变化的需求，具有终身学习的意识，掌握自主有效的学习能力；具备综合应用各种手段收集资料、拓展知识领域、不断学习、适应发展的能力。

三、主干学科

测绘科学与技术。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业后要求后，授予工学学士学位。

五、核心课程

主要核心课程：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、遥感原理与应用（双语）、摄影测量学、激光雷达技术与地学应用（双语）、不动产测量、InSAR 技术与地质灾害监测应用、测绘管理学与法律法规等。

主要实践课程：北戴河地质实习、数字地形测量学实习、大地测量实习、测量程序综合实践、地理信息工程实践、摄影测量实习、工程测量实习、遥感原理与地学应用实习、InSAR 地质灾害形变监测实习、LiDAR 地学应用实习、创新创业实践、毕业论文等。

Undergraduate Program in Surveying and Mapping Engineering

1. Academic Objectives

The major aims to cultivate talents who are well-rounded in moral, intellectual, physical and aesthetic development, have good natural science and human science literacy as well as professional ethics, have basic knowledge of mathematics, science and computer, master basic knowledge of geology and mapping, basic principles, methods and skills of spatial information data collection and comprehensive processing. They are competent in the management of mapping and geographic information engineering technology and mapping in the fields of national basic mapping, natural resources survey, geological and environmental disaster monitoring, etc. They have strong organizational management ability, continuous learning ability, innovation ability, international vision and geological mapping characteristics of scientific research and application-oriented technical personnel. About five years after graduation, they will reach the level of surveying and mapping engineer and become the backbone of the technical or management agency. After five years of practice, graduates of this major should achieve the following goals:

(1) Possess good ethics and humanities and social science literacy, good engineering professional ethics and standards, strong sense of social responsibility and professionalism, based on their own knowledge and ability, willing to serve the country and society, and able to assume and perform social responsibilities;

(2) Be able to engage in the design and implementation of surveying and mapping geographic information engineering, technology development, project management, etc. in the fields of national basic surveying and mapping, natural resources and environmental surveys, geological environmental disaster monitoring, urban and industrial and engineering construction, and be competent for the work of surveying and mapping engineers;

(3) Possess a strong team awareness, international vision, communication skills, reasonable decision-making skills and organizational management skills, and be able to assume the leadership role in the team;

(4) Have the ability to innovate and continue to learn, and be able to independently or collaboratively undertake scientific research on surveying and mapping geographic information;

(5) With good professional quality, rich engineering management experience and the ability to adapt to the development of the industry, become a technical backbone or managerial talent in surveying and mapping geographic information enterprises and institutions.

2. Graduation Requirements

Students in this major mainly learn the basic theory and basic knowledge of surveying and mapping engineering, master the means and methods of surveying and mapping and data processing, receive basic skills training in surveying and mapping, and have the basic ability to apply the basic theories and professional knowledge to analyze and solve complex engineering problems of natural resource investigation and geological disaster monitoring, conduct scientific research, and engage in production design and organization management.

Graduates should acquire the following knowledge, abilities and qualities:

(1) Engineering Knowledge: Graduates have the knowledge of mathematics, natural science, engineering fundamentals, surveying and mapping science, earth science, etc. to solve complex engineering problems of basic surveying and mapping and the ability to use professional knowledge to acquire and process engineering data; and they can propose feasible solutions to surveying and mapping engineering problems of basic surveying and mapping, urban geo-environmental disaster monitoring, natural resources and environment survey, etc., and compare and synthesize them.

(2) Problem Analysis: Graduates are able to apply the basic principles and logical thinking of mathematics, natural science, engineering science, surveying and mapping science, earth science, combined with literature search and analysis, to accurately identify and express the core problems and key aspects of complex surveying and mapping engineering, and have the ability to problem analysis, mathematical modeling and reasoning verification to obtain effective conclusions.

(3) Design/Develop Solutions: Graduates should be able to design and develop solutions, compile project design tasks and related technical documents according to the objectives, tasks and requirements of complex foundation and geological mapping projects, taking into account social, safety, health, legal, cultural and environmental factors; and they should be aware of the frontiers of contemporary technological development and be able to apply new technologies and methods to improve and innovate design solutions.

(4) Research: Graduates are able to conduct research on complex basic and geological mapping engineering problems based on scientific principles combined with basic mapping theories and new technologies as well as computer technology, and they can use scientific methods such as information synthesis, data processing analysis and interpretation to obtain reasonable and effective conclusions through innovative experimental designs.

(5) Use of Modern Tools: Graduates are proficient in the operation and use of modern surveying and mapping instruments and equipment, surveying and mapping geographic information-related software, and they are able to optimize the design of engineering programs such as geological survey and disaster monitoring for complex surveying and mapping projects, apply them to the monitoring, prediction and simulation of deformation disasters, as well as data acquisition and analysis in geographic information services, and understand their limitations.

(6) Engineering and Society: Graduates are familiar with national and mapping industry guidelines, policies and laws, and understand the importance of mapping results. They are able to objectively evaluate the social, health, safety, legal, and cultural impacts of mapping engineering practices and solutions to complex engineering problems, take responsibility for the quality of the work performed, and understand the responsibilities that should be assumed.

(7) Environment and Sustainable Development: Graduates will be able to understand and evaluate the impact of practical activities on complex fundamental and geological mapping engineering problems on environmental protection and sustainable development of society.

(8) Professional Norms: Graduates have patriotism, good, humanities and social sciences and a sense of social responsibility, and can understand and abide by engineering professional ethics and norms in the practice of surveying and mapping engineering, and understand the social responsibility of engineers for public safety, health and welfare, and environmental protection understand the impact of surveying and mapping results on national security, territorial integrity, public safety and society, etc., and consciously fulfill their responsibilities.

(9) Individual and Team: Graduates have good organizational communication, coordination and management, rational decision-making skills and teamwork, and are able to understand the meaning of each role in a multi-role team and its significance to the overall team environment and goals; they are able to perform competently as individuals, team members and leaders in a multidisciplinary context.

(10) Communication: Graduates have strong oral and written communication skills, with some international perspective and the ability to communicate and interact across languages and cultures. They are able to communicate and interact effectively with industry peers and the public on complex surveying and mapping engineering issues, including writing reports and design submissions, presenting statements, and articulating or responding to instructions clearly.

(11) Project Management: Graduates understand and master the engineering management and economic decision-making methods in the implementation of basic mapping and geological mapping projects, and can

apply them in a multidisciplinary environment such as geology and resource environment.

(12) Lifelong Learning: Graduates are able to address the changing needs of basic surveying and mapping and geological mapping, have the awareness of lifelong learning and master the ability to learn independently and effectively; and they have the ability to comprehensively apply various means to collect information, expand the field of knowledge, keep learning and adapt to development.

3. Main disciplines

Surveying and mapping science and technology.

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

Main core courses: Introduction to Surveying and Mapping, Error Theory and Surveying Adjustment Foundation, Geodesy Foundation, GNSS Principle and Application, Geographic Information System Principle, Remote Sensing Principle and Application (Bilingual), Photogrammetry, Lidar Technology and Geoscience Application (Bilingual), Real estate surveying, InSAR Technology and Geological Disaster Monitoring Application, Surveying and Mapping Management and Laws and Regulations, etc.

Main practical courses: Beidaihe Geological Practice, Digital Topography Practice, Geodesy Practice, Comprehensive Practice of Surveying Program, Geographic Information Engineering Practice, Photogrammetry Practice, Engineering Survey Practice, Remote Sensing Principles and Geoscience Application Practice, InSAR Geological Disaster Deformation Monitoring Practice, LiDAR Geoscience Application Practice, Innovation and Entrepreneurship Practice, Graduation Thesis, 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	4	2	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	712	44.5	10	14		13.5	5	2								
	专业核心课程 Specialized Fundamental Courses	632	39.5		4		1	11	11.5	10					2		
	专业拓展课程 Specialized Development	96	6														
实践教育 Practical Education	课程实践 Course Practice	32 周 +80 学时	30		1	10	1		1.5	3		2.5	5	6			
	课外实践 Extracurricular practice		6														
必修课总学分 Required course credits																152	
选修课总学分 Elective course credits																	24
最低毕业总学分 Total Credits																	176

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): 712 学时 (712 Hours), 44.5 学分 (44.5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
IS120036	测绘工程专业导论课 Introduction to Surveying and Mapping Engineering	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 A (1) College Physics A(1)	64	4	64			考试 Exam	2	
DR192102	大学物理 A (2) College Physics A(2)	64	4	64			考试 Exam	3	
DR011036	地球科学概论 Geosciences	64	4	32	32		考试 Exam	2	
DR021223	工程图学 B Engineering Drawing B	48	3	38	10		考试 Exam	1	
DR021029	工程力学 Engineering Mechanics	56	3.5	52	4		考试 Exam	3	
DR042126	电工电子技术 A Electrical and Electronic Technology	64	4	50	14		考试 Exam	3	
DR122073	计算机图形学 Computer Graphics	32	2	22	10		考试 Exam	5	
DR123074	数据结构 Data Structure	32	2	22	10		考试 Exam	4	
总计 Total		712	44.5	632	80				

4、专业核心课程 (Core Professional Courses): 632 学时 (632 hours), 39.5 学分 (39.5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
DR122003	测绘学概论 Introduction to Geomatics	16	1	16			考试 Exam	3	
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	
SR121102	数字地形测量学 Digital Topography	64	4	40	24		考试 Exam	2	
SR122103	GNSS 测量原理及其应用 GNSS Surveying Principles and Application	40	2.5	28	12		考试 Exam	4	
SR122104	大地测量学基础 Foundation of Geodesy	48	3	36	12		考试 Exam	4	
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	
SS123013	测绘管理学与法律法规 Management and Laws of Surveying and Mapping	24	1.5	24			考试 Exam	5	
SR123107	工程测量学 Engineering Surveying	48	3	28	20		考试 Exam	6	
SR123108	海洋测绘 Hydrographic Surveying and Charting	32	2	20	12		考试 Exam	5	
SR123109	摄影测量学 Photogrammetry	48	3	32	16		考试 Exam	6	
SR123110	激光雷达技术与地学应用 (双语) LiDAR: Principles and Geo-application (bilingual)	32	2	24	8		考试 Exam	6	
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	
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	
SR124112	不动产测绘 Real Estate Surveying	32	2	20	12		考试 Exam	7	

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
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	
总计 Total		632	39.5	440	192				

5、专业拓展课程 (Specialized Development Courses): 96 学时 (96 hours), 6 学分 (6 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	
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	
SS122115	自然资源调查与管理 Investigation and Management of Natural Resources	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	
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	
SS123118	卫星导航与定位技术 Satellite Navigation and Positioning Technology	32	2	24	8		考查 Term Paper	5	
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	
SR122046	土地经济学 (含房产经济学) Land Economics	48	3	48			考试 Exam	4	
SR123141	国土空间规划 Territorial Spatial Planning	48	3	32	16		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
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		456	28.5	382	74				

6、课程实践 (Practice Course): 32周+80学时 (32 weeks and 80 hours), 30学分 (30 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	
PR192046	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	
PR122122	大地测量学与GNSS应用实习 Geodesy and GNSS application practice	3周	3	考查 Term Paper	2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	
PR124026	工程测量实习 Engineering Surveying Practice	2周	2	考查 Term Paper	7	
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	

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
PR124030	毕业设计 (论文) Graduation Design (Thesis)	12 周	6	考查 Term Paper	8	
总计 Total		32 周 +80 学时	30			

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

包括主题教育活动、社会实践、社会活动、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.

八、毕业要求与培养目标矩阵（工程教育认证类专业）

毕业要求	培养目标				
	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：工程知识		√			
毕业要求 2：问题分析		√		√	
毕业要求 3：设计 / 开发解决方案	√	√		√	√
毕业要求 4：研究		√		√	√
毕业要求 5：使用现代工具		√			√
毕业要求 6：工程与社会	√				√
毕业要求 7：环境和可持续发展	√				√
毕业要求 8：职业规范	√		√		√
毕业要求 9：个人和团队			√		√
毕业要求 10：沟通	√	√	√		√
毕业要求 11：项目管理		√	√		√
毕业要求 12：终身学习	√	√	√	√	√