测绘工程专业培养方案

专业名称与代码：测绘工程（ 081201）

专业培养目标：

本专业培养具备国家基础测绘、工程测量、海洋测量、不动产测量、摄影测量与遥感、地理信息工程等测绘理论知识和能力，能在国家基础测绘、城市和工程建设、交通、资源勘探与开发、国土资源调查与管理、环境保护与灾害防治等领域从事测绘工程设计、实施、管理等方面工作的具有基础厚、素质高、能力强的测绘技术人才。

专业毕业要求：

1. 具有良好的人文社会科学知识和素养，包括思想道德素质、科学素质、人文素质、心理和身体素质，坚持社会主义核心价值观。

2. 具有较强的语言表达和沟通能力，具有较强的团队协作意识。

3. 思维活跃，具有开拓创新的意识。

4. 具有扎实的数学、物理等自然科学和工程科学知识，以及基本的经济和管理知识，并了解当代科技发展的主要方面和应用前景。

5. 具有扎实的测绘工程专业理论与技术知识。包括：测绘地理信息数据获取、处理、表达与利用的理论、方法与技术。

6. 掌握各项测绘工程在规划设计、施工建设、竣工验收及运营管理阶段所进行的各种测量工作的理论方法与技术。

7. 掌握测绘工程项目技术设计、施测、数据处理等方面的专业知识。

8. 熟悉测绘法律、法规、行业技术标准与规范。

9. 掌握计算机、互联网和信息技术在测绘工程中应用的技术与方法。

10. 具有综合应用现代科技手段获取与处理信息的能力，有较好的专业文献阅读能力、工程科技报告和论文的写作能力。

11. 具有较强的英语综合运用能力，能熟练阅读本专业的英文技术文献，并具有一定的英语口语交流能力。

12. 具有较强的项目组织、管理与执行能力。

13. 了解本学科基本的研究方法，具有运用所学知识发现、分析和解决测绘地理信息工程科技问题的能力，具备一定的独立思考和创新能力和较强的自学能力，能与时俱进地学习，适应未来发展的要求。

毕业要求的实现过程和途径：

序号	毕　业　要　求	实现途径（教学过程）
1	具有较好的人文社会科学素养、较强的社会责任感和良好的工程职业道德	**①课程教学：**毛泽东思想和中国特色社会主义理论体系概论、马克思主义基本原理、思想道德修养与法律基础、军事理论、中国近现代史纲要、体育Ⅰ-Ⅳ、大学生就业指导、社会科学类、自然科学类、人文艺术类、经

序号	毕 业 要 求	实现途径（教学过程）
		济管理类等。 **②课外学习：**开展“大学生青年文化艺术节”、“高雅艺术进校园”等主题教育活动，开展测绘技能大赛、运动会、定向越野等活动；开展新生入学教育和毕业生系列教育主题活动；开展大学生“暑假社会实践”活动；加强学务指导老师、辅导员队伍建设，加强学生干部队伍建设，提高对学生的教育引导。
2	具有从事工程工作所需的相关数学、自然科学以及基本的经济和管理知识	**①课程教学：**高等数学 A、线性代数 A、概率论与数理统计 A、数据结构与数据库、大学物理 C、地球科学概论、工程制图、土力学、计算机图形学、管理经济学、科技论文写作、文献信息检索等课程。 **②课外学习：**参与挑战杯、机器人足球、信调大赛、软件设计大赛、英语比赛、数学竞赛、建模比赛等活动。
3	掌握扎实的工程基础知识和本专业的基本理论知识，具有系统的工程实践学习经历；了解本专业的前沿发展现状和趋势	**①课程教学：**测绘学概论、误差理论与测量平差基础、地图制图学基础、数字地形测量学、大地测量学基础、摄影测量学、GNSS 原理及其应用、遥感原理与应用、地理信息系统原理、工程测量学、测绘软件设计与开发、变形观测与数据处理、工程地质学基础、土木工程概论、岩土工程、路桥勘测设计。 **②课外学习：** 3S 论坛、邀请校内外专家来校做学术讲座，组织学生参加各类竞赛（如英语竞赛，数学建模等）、产学研、测绘技能大赛、科技活动等，鼓励学生参加计算机等级考试和软件工程师考试。
4	具备综合运用测绘专业理论与方法进行分析理论、技术方法和手段，发现问题、分析问题并解决工程问题的能力；具备设计和实施工程实验的能力，并能够对实验结果进行分析	**①课程教学：**物理实验 B、专业英语、计算机高级语言课程设计、面向对象程序设计课程设计、创新创业学习、测绘软件设计与开发、数字地形测量教学实习、摄影测量教学实习、大地测量和工程测量教学实习、GNSS 教学实习等；生产实习，毕业实习和毕业设计。 **②课外学习：**组织学生参考各种学科竞赛如“挑战杯”，创新实验计划、测绘技能比赛，组织学生参加大学生科研项目、产学研等。
5	具有追求创新的态度和意识，掌握基本的创新方法；具有综合运用理	**①课程教学：**创新创业学习、多门基础课程程序设计、测绘软件设计与开发、测绘工程监理与招投标、综合实习、课间实习、毕业

序号	毕 业 要 求	实现途径（教学过程）
	论和技术手段进行项目设计、创新和技术改造的能力，设计中能够综合考虑经济、环境、社会、法律、安全、健康、伦理等制约因素和可持续发展的要求	设计（论文）；科技论文报告活动、测绘新技术讲座和 3S 论坛等。 **②课外学习：**组织学生到学校的实习基地实习和参加企事业单位的生产实习，组织学生参加学科竞赛，邀请校内外专家来校做工程技术讲座、举办学术报告和学科前沿讲座等。
6	掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法	**①课程教学：**开设科技写作、文献信息检索等、计算机网络技术、面向对象程序设计、数据结构等课程。 **②课外学习：**鼓励学生参加计算机等级考试和软件工程师考试。
7	了解与本专业相关的职业和行业的生产、设计、研究与开发、环境保护和可持续发展等方面的方针、政策和法律法规，能正确认识工程对于客观世界和社会的影响，发扬“艰苦朴素、求真务实”的校训精神	**①课程教学：**思想道德修养和法律基础、测绘管理与法律法规、不动产测量与管理、测绘工程监理与招投标等课程。 **②课外学习：**社会调查、参观企事业单位、参观三峡和隔河岩大坝等，校外专家讲座。
8	具有一定的组织管理能力、较强的表达能力和人际交往能力以及在多学科团队中发挥作用的能力	**①课程教学：**组织学生参加各种测量实习、课程设计、毕业设计（论文）、社会实践、社会调查、大学生科技活动；号召学生参加学生社团、担任学生干部。 **②课外学习：**“大学生青年艺术节”、“高雅艺术进校园”等主题教育活动，开展测绘仪器技能大赛、运动会、演讲比赛、风采展示、社区文化节等校园文化活动。
9	具有适应发展的能力、终身教育的意识和继续学习的能力	**①课程教学：**开展各类课程、实习、课程设计、毕业设计、科技活动、科技比赛等。 **②课外学习：**参观三峡和隔河岩大坝等单位，通过心理健康主题教育、安全教育等校园文化活动、学风建设、考风教育等活动提高学生的适应发展等能力，通过创新人才计划、李四光计划和海外游学培养方式为学生提供

序号	毕 业 要 求	实现途径（教学过程）
		继续学习的机会。
10	具有初步的外语应用能力，能阅读本专业的外文资料，具有一定的国际视野和跨文化交流、竞争与合作能力	**①课程教学：**开设大学英语Ⅰ-Ⅳ，第二外语选修、专业英语阅读、通识选修课、专业选修课、自主学习等。 **②课外学习：**大学生英语竞赛、数学建模、设计大赛和演讲比赛、中西文化月、英语等级考试、计算机等级考试，推荐学生加入创新人才计划、李四光计划、将军计划，选派学生和教师到国外参加国际会议，邀请国外专家来校讲座。

主干学科： 测绘科学与技术。

核心课程：测绘学概论、误差理论与测量平差基础、地图制图学基础、数字地形测量学、大地测量学基础、摄影测量学、GNSS 原理及其应用、遥感原理与应用、地理信息系统原理、工程测量学、测绘软件设计与开发、变形观测与数据处理、工程地质学基础。

主要专业实验：水准仪、全站仪、GNSS 接收机、数字摄影测量工作站、三维激光扫描仪等测绘仪器的操作；数字测图、GNSS、摄影测量、遥感、地图制图、地理信息系统测绘软件设计与开发。

主要实践性教学环节：

1. 计算机高级语言课程设计 1.5 周
2. 面向对象程序设计课程设计 1.5 周
3. 数字地形测量教学实习 5 周
4. 摄影测量教学实习 2 周
5. 大地测量教学实习 3 周
6. GNSS 教学实习 2 周
7. 工程测量教学实习 1 周
8. 毕业实习 10 周
9. 毕业设计 6 周

修业年限：四年。

授予学位：工学学士。

相近专业：遥感科学与技术。

Surveying and Mapping Engineering Program

Specialty and Code: Surveying and Mapping Engineering (081201)

Education Objective：

The program objective is to instruct students' basic theory, basic knowledge and skills in national basic surveying and mapping, engineering surveying, marine surveying, real estate surveying, photogrammetry and remote sensing, geographic information engineering, etc. and to develop students to be surveying and mapping professionals with solid foundation of knowledge, high quality and strong capability working in the fields of national basic surveying and mapping, urban and engineering construction, communications, exploitation and development of resources, land and resources investigation and management, environmental protection and disaster prevention and control, etc.

Graduation Requirements：

1. Have good humanistic and social science knowledge and accomplishment, including ideological and ethical standards, scientific qualities, humanistic qualities, psychological and physical qualities; adhering to the socialist core values;
2. Have strong expressive and communication ability and strong teamwork spirit;
3. Think actively and have pioneering and innovative spirit；
4. Master the solid knowledge in natural science and engineering science such as mathematics, physics and basic economic and management knowledge; have a good understanding of the major areas and application prospect in the contemporary scientific and technological development;
5. Master the solid theoretic and technical knowledge of surveying and mapping engineering, including theories, methods and technologies for data collection, processing, expression and application of surveying and mapping geographic information;
6. Master the theories, methods, and techniques in various surveying and mapping projects during the planning design, construction, completion approval and operations;
7. Master the technical knowledge in technical design, working, and data processing in the surveying and mapping engineering projects;
8. Be acquainted with the laws, regulations, and industrial technical standards and codes of surveying and mapping engineering;
9. Master the technologies and application methods of the computer, Internet and information technology in surveying and mapping engineering projects；
10. Have comprehensive capability in applying modern technologies to obtaining and processing information; have good abilities in reading professional literature and writing engineering technology reports and papers;
11. Have a strong comprehensive ability in English: read English technical literature fluently and have a satisfactory English speaking ability;
12. Have strong capability in project organization, management and execution;
13. Understand the basic research methods; apply the learnt knowledge to discovering,

analyzing and solving the engineering problems about surveying and mapping geographic information; have independent thinking, innovative ability and strong self-learning ability; learn knowledge by keeping pace with the times so as to adapt to the requirements of the future development.

Graduation requirements and ways to achieve：

No.	Graduation requirements	Ways to achieve（teaching process）
1	Good humanistic and social science qualities; strong sense of social responsibility; good professional ethics;	① **Classroom Teaching:** Maoism and Socialism with Chinese Characteristics Introduction, Basic Principle of Marxism, Ideological and Moral Cultivation and Fundamentals of Law, Military Theory, China Modern and Contemporary History Outline, PE I-IV, University Students Career Guidance, Social Sciences, Natural Sciences, Humanity and Art, Economic Management, etc. ② **Out-of-class Learning :** University Students Youth Culture and Art Festival, Campus High Art Themed Activity, Surveying and Mapping Skills Contest, Games, Orienteering, Orientations for new students, Graduates Series Education Themed Activities, Summer Holiday Social Practices; strengthen team building of students affairs advisers, instructors, and students leaders; improve the education guidance for the students.
2	Equipped with necessary knowledge of related mathematics, natural science and basic economic and management for engineering work;	①**Classroom Teaching:** Advanced Mathematics A, Linear Algebra A, Probability and Statistics A, Data Structure and Database, College Physics C, Introduction to Geosciences, Engineering Drawing, Soil Mechanics, Computer Graphics, Managerial Economics, Technical Paper Writing, Literature Information Retrieval, etc. ②**Out-of-class Learning :** Challenge Cup,

No.	Graduation requirements	Ways to achieve（teaching process）
		Robot Football, Information Surveying Contest, Software Design Contest, English Contest, Mathematics Contest, Modeling Contest, etc.
3	Solid basic engineering knowledge and theoretic knowledge of the program; systematic engineering practices experience; keep informed of the development status and trends of the cutting-edge technology in the field;	**Classroom Teaching :** Introduction to Geomatics, Error Theory and Foundation of Surveying Adjustment, Foundation of Cartography, Digital Topography, Foundation of Geodesy, Photogrammetry, GNSS Principle and Application, Remote Sensing Principle and Application, GIS Principle, Engineering Surveying, Surveying and Mapping Software Design and Development, Deformation Observation and Data Processing, Engineering Geology, Introduction to Civil Engineering, Geotechnical Engineering, Road and Bridge Survey Design. ②**Out-of-class Learning :** 3S forum, academic lectures by experts from the university and beyond the university, various contests (English Contest, Mathematics Modeling, etc.), industry-university-research cooperation, Surveying and Mapping Skills Contest, scientific and technological activities, etc.; encourage students to participate in computer rank examinations and software engineer examination.
4	Comprehensively employ the theories, technical methods and approaches of the program to discover problems, analyze problems, and solve engineering problems; capable of designing and	① **Classroom Teaching:** Physical Experiment B, Professional English, Advanced Computer Programming Language Course Design, OOP Course Design, Innovation and Entrepreneurship Study, Surveying and Mapping Software Design and Development, Digital Topographic Survey Teaching Practice, Photogrammetry Teaching Practice, Geodesy and Engineering Surveying Teaching Practice,

No.	Graduation requirements	Ways to achieve（teaching process）
	executing engineering experiments, and analyzing the experimental results;	GNSS Teaching Practice, etc. Production Practice, Graduation Practice, and Graduation Project; ②**Out-of-class Learning：** organize students to participate in various discipline competitions, like Challenge Cup, innovation experiment program, surveying and mapping skills contest, university students scientific research projects, industry-university-research cooperation, etc.
5	Have an attitude and sense of innovation; master basic innovation methods; capable of employing theories and technical methods to design, innovate and modify technologies; comprehensively consider such restraints as economy, environment, society, law, safety, health, ethics, so on, and the requirements of sustainable development during engineering design;	① **Classroom Teaching:** Innovation and Entrepreneurship Study, several basic course program design, Surveying and Mapping Software Design and Development, Surveying and Mapping Engineering Supervision and Bidding, Comprehensive Practice, Class Break Practice, Graduation Project (paper); Scientific Paper Report Activity, New Surveying and Mapping Technology lecture, 3S forum, etc.; ②**Out-of-class Learning：** organize students to participate in the campus base practices and production internships in companies; discipline competitions; invite experts from inside and outside of the universities to deliver engineering technology lectures; organize academic report and lectures on cutting-edge technologies, etc.
6	Master basic methods in bibliographic retrieval, data query and obtaining information by modern information technology;	① **Classroom Teaching:** Scientific Writing, Literature Information Retrieval, Computer Network Technology, OOP Design, Data Structure, etc. ②**Out-of-class Learning：** encourage students to participate in computer ranking examinations

No.	Graduation requirements	Ways to achieve（teaching process）
		and software engineer examinations;
7	Understand the policies, laws and regulations in the production, design, research, development in the professions and industries related to the program, as well as in the environmental protection and sustainable development, etc.; capable of correctly recognizing the influence of engineering on the objective world and society; carry forward the school motto “hardworking, plain-living, realistic and pragmatic”;	① **Classroom Teaching:** Ideological and Moral Cultivation, and Fundamentals of Law, Surveying and Mapping Management and Laws and Regulations, Real Estate Surveying and Management, Surveying and Mapping Engineering Supervision and Bidding, etc. ②**Out-of-class Learning :** Social investigation, visit enterprises and public institutions, visit the Three Gorges and Geheyan Dam, etc., lectures by experts invited from outside of the university.
8	Organization and management ability, strong expressive ability and interpersonal skills; play a critical role in interdisciplinary teams;	① **Classroom Teaching:** organize the students to take part in various surveying and mapping practices, course design, graduation design (paper), social practice, social investigation, university students scientific and technological activities; encourage the students to join in associations and become students leaders; ②**Out-of-class Learning :** University Students Youth Culture and Art Festival, Campus High Art Themed Activity, Surveying and Mapping Instruments Skills Contest, Games, Speech Contest, Presentation Contest, Community Cultural Festival, and other campus cultural activities.

No.	Graduation requirements	Ways to achieve（teaching process）
9	Adaptive ability, sense of life-long education, and ability of continuing learning;	① **Classroom Teaching:** organize various courses, practices, course design, graduation design, technological activities, technological contests, etc.; ②**Out-of-class Learning :** visit the Three Gorges and Geheyan Dam, etc.; enhance the students' adaptive ability through psychological health education, safety education, and other campus themed cultural activities, as well as construction of study style, and education of examination rules; provide the students with continuing learning opportunities through innovative talents plan, Li Siguang Program, and overseas study tour.
10	Equipped with preliminary English application ability; capable of reading English literature of the program; have international vision and intercultural communication, competition and cooperation ability.	① **Classroom Teaching :** College English I-IV, Optional Second Foreign Language, Professional English Reading, Optional Common Knowledge, Elective courses, autonomous learning, etc.; ②**Out-of-class Learning :** College Student English Contest, mathematics modeling, design contest, speech contest, Chinese-Western Culture Month, English grade examination, computer ranking examination; recommend students to participate in the innovative talents plan, Li Siguang Program, and General Plan; select students and teachers to attend overseas international meetings; invite foreign experts to deliver lectures.

Major Disciplines： Surveying and mapping science and technology

Main Courses：

Introduction to Geomatics, Error Theory and Foundation of Surveying Adjustment, Foundation of Cartography, Digital Topography, Foundation of Geodesy, Photogrammetry, GNSS Principle and Application, Remote Sensing Principle and Application, Geographic Information System Principle, Engineering Surveying, Surveying and Mapping Software Design and Development, Deformation Observation and Data Processing, Engineering Geology Introduction.

Lab Experiments:

Operation of surveying and mapping instruments, including level gage, total station, GNSS receiver, digital photogrammetric station, 3D laser scanner, etc.; modern survey data processing skills for digital mapping, GNSS, photogrammetry, remote sensing, map making, and geographic information system; surveying and mapping software design and development.

Practical Work:

1. Advanced computer programming language course design	1.5 week	1st semester
2. Object-oriented programming course design	1.5 week	2nd semester
3. Digital topographic survey teaching practice	6 weeks	4th semester
4. Photogrammetry teaching practice	2 weeks	5th semester
5. Geodetic surveying teaching practice	3 weeks	6th semester
6. GNSS teaching practice	2 weeks	6th semester
7. Engineering surveying teaching practice	1 week	7th semester
8. Graduation practice	10 weeks	8th semester
9. Graduation project	6 weeks	8th semester

Duration： four years

Degree Granted： Bachelor of Engineering

Related Specialties: Remote Sensing Science and Technology

测绘工程专业课程教学计划表

Course Descriptions of Surveying Engineering

课程类别 Classi-fication		课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
						讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
通识教育课 Liberal Education Courses	必修 Compulsory	11706200	马克思主义基本原理 Principles of Marxism	3	48	48				3						
		11706500	毛泽东思想与中国特色社会主义理论体系概论 Introduction to Mao Tse-tung Thought and the Theoretical System of Socialism with Chinese Characteristics	4	64	64						4				
		11711800	中国近现代史纲要 The Essentials of Modern Chinese History	2	32	32					2					
		120002*0	思想道德修养与法律基础 Morality Education & Fundamentals of Law	3	48	48			1.5	1.5						
		113076*0	体育 Physical Education	4	144	144			1	1	1	1				
		109116*0	大学英语（ABC） College English（ABC）	12	192	192			3	3	3	3				
		21919400	计算机高级语言程序设计（C++） Computer High-level Language（C++）	3.5	56	36	20		3.5							
		21121100	测绘学概论 Introduction to Geomatics	1	16	16			1							
		14300100	军事理论 Military Theory	2	32	32			2							
	选修 Elective	总计 12 学分，含创新创业选修课学分，跨学科选修课不低于 6 学分		12	192											
		小计 Sum		**46.5**	**824**	**612**	**20**		**12**	**8.5**	**6**	**8**				
Disciplinary Fundamental Courses	学科基础课	212127*1	高等数学 A Advanced Mathematics A	11.5	184	184			5	6.5						
		21212801	线性代数 A Linear Algebra A	3.5	56	56				3.5						
		21213501	概率论与数理统计 A Probability and Statics A	3.5	56	56					3.5					
		212130*3	大学物理 C College Physics C	6	96	96				3.5	2.5					
		21213202	物理实验 B Physics Experiments B	2	32		32			2						

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
					讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
	20102100	地球科学概论 Introduction to Geosciences	2	32	32			2							
	21906800	面向对象程序设计 B Object-Oriented Programming B	3	48	28	20			3						
	21126300	数据结构与数据库 Data Structure and Database	4	64	48	16				4					
	20714200	工程制图 Engineering Drawing	2.5	40	40				2.5						
	211264*0	数字地形测量学 Digital Topography	6	96	64	32	高等数学			4	2				
	21123501	误差理论与测量平差基础 A Error Theory and Foundation of Surveying Adjustment A	3.5	56	48	8	概率论与数理统计 测量学				3.5				
	小计 Sum		**47.5**	**760**	**652**	**108**		**7**	**21**	**14**	**5.5**				
专业主干课 Main Specialty Courses	21128800	摄影测量学 Photogrammetry	3.5	56	48	8	误差理论与测量平差基础					3.5			
	21128300	大地测量基础 Foundation of Geodesy	3.5	56	46	10	误差理论与测量平差基础						3.5		
	21123601	GNSS 原理及其应用 A GNSS Principles and Applications A	3.5	56	40	16						3.5			
	21127600	测绘软件设计与开发 Software Design and Development of Geomatics	3.0	48	24	24						3.0			
	21114800	地理信息系统原理 Principles of Geographic Information System	3	48	28	20							3		
	21126500	地理信息系统软件与应用 GIS Software and Applications	3	48	24	24						3			
	21121301	地图制图学基础 A Foundation of Cartology A	3.5	56	36	20				3.5					
	21127701	工程测量学 A Engineering Surveying A	3.5	56	48	8							3.5		
	21117700	遥感原理与应用 Principles and Applications of Remote sensing	2.5	40	40							2.5			
	20508400	工程地质学基础 B Principles of Engineering Geology B	2.5	40	40						2.5				
	20502300	变形观测与数据处理 Deformation Observation and Data Processing	2	32	32								2		
	小计 Sum		**33.5**	**536**	**406**	**130**				**3.5**	**2.5**	**15.5**	**12**		

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
					讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
专业选修课 Specialty Elective Courses		具体见专业选修课列表	17	272											
合计 Sub-total			**144.5**	**2392**	**1670**	**258**		**19**	**29.5**	**23.5**	**16**	**15.5**	**12**		
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	41919500	计算机高级语言课程设计（C++） Course Design for Computer High-Level Language C++	1.5	1.5 周				1.5							
	41920200	面向对象程序设计课程设计 Course Design of Object-Oriented Programming	1.5	1.5 周					1.5						
	41126600	数字地形测量教学实习 Digital topographic survey teaching practice	6	6 周							6				
	41126700	摄影测量教学实习 Teaching Practice of Photogrammetry	2	2 周								2			
	41126800	大地测量教学实习 Geodetic surveying teaching practice	3	3 周									3		
	41126900	GNSS 教学实习 GNSS Surveying teaching practice	2	2 周									2		
	41127000	工程测量教学实习 Engineering Geodetic surveying teaching practice	1	1 周										1	
	41122300	毕业设计（论文） Graduation Design (Thesis)	16	16 周											16
	小计 Sum		**35**	**35 周**				**3.5**	**1.5**		**6**	**2**	**5**	**1**	**16**
创新创业学习学分 Freedom study	ZZ35S	社会调查 Social Investigation	2												
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, Innovation and Research Presentation)	3												
	小计 Sum		**5**												
总计 Total			**184.5**	**2392+ 35 周**	**1670**	**258**		**22.5**	**31**	**23.5**	**22**	**17.5**	**17**	**1**	**16**
	20520302	土力学 B Soil Mechanics B	3	48	40	8					3				

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
					讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
	21921303	计算机图形学 C Computer Graphics C	2	32	32						2				
	21110600	遥感图像处理 Remote Sensing Image Processing	2.5	40	28	12								2.5	
	21110800	遥感图像解译 Remote Sensing and Image Interpretation	2	32	24	8								2	
	21108100	数字地面模型 Digital Terrain Model--DTM	2	32	24	8								2	
	21105400	激光雷达技术 Lidar Technology	2	32	24	8								2	
	21127100	测绘工程监理与招投标 Surveying Project Supervision and Bidding	2	32	32							2			
	21124500	测绘管理与法律法规 Surveying Management and Laws	1.5	24	24								1.5		
	21127200	不动产测量与管理 Real Estate Surveying and Management	2.5	40	22	18						2.5			
	21127300	工程与工业摄影测量 Engineering and Industrial Photogrammetry	1.5	24	24								1.5		
	20516200	土木工程概论 Introduction to Civil Engineering	2	32	32							2			
	20513400	路桥勘测设计 Reconnaissance and Design of Road and Bridge	2	32	32								2		
	20530200	岩土工程监测 Geotechnique Engineering Monitoring	2	32	32							2			
	21128700	数字地球与智慧城市 Digital earth and Smart city	2	32	20	12							2		
	21127400	3s 集成与应用 Integration and Application of GIS, RS and GPS	2	32	32									2	
	21126000	专业英语阅读 Specialized English Reading	1.5	24	24								1.5		
	21127500	科技论文写作 Scientific Writing	1.5	24	24									1.5	
	21121200	文献信息检索 Information Retrieval	1.5	24	24			1.5							

注： 1. 通识教育选修课学分和创新创业自主学习学分未列入具体学期。通识教育选修课建议涵盖经济管理等知识。

2. 专业选修课学分不得低于 17 学分，建议选修课内容涵盖:土力学 B、计算机图形学，土木工程概论、岩土工程监测、测绘管理与法律法规、不动产测量与管理、测绘工程监理与招投标、文献信息检索、科技论文写作等知识。

测绘工程专业课程分类统计

	通识教育课程 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	创新创业自主学习 Freedom Study	学时总计 Total Hour	学分总计 Total Credits
	必修	选修							
学时/学分	552/34.5	192/12	760/47.5	536/33.5	272/17	35 周/35	5	2392+35 周	184.5
学分所占比例	25.2%		25.7%	18.2%	9.2%	19%	2.7%		100%