## 武汉理工大学资源与环境工程学院

School of Resources & Environmental Engineering of Wuhan University of Technology

# 2015 版本科培养方案

Undergraduate Education Plan (2015)

## 武汉理工大学教务处

Academic Affairs Office of Wuhan University of Technology

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## 【人文地理与城乡规划专业】2015版本科培养方案

# Undergraduate Education Plan for Specialty in Human Geography & Urban and Rural Planning (2015)

专业名称 人文地理与城乡规 主干学科 地理学、规划类

划

Major Human Geography Major Disciplines Geography, Urban and Rural

& Urban and Rural Planning

Planning

计划学制 四年 授予学位 理学学士

Duration 4 Years Degree Granted Bachelor of Science

所属大类 **地理科学类** 大类培养年限 **2年** Disciplinary Geography Duration 2 years

#### 最低毕业学分规定

#### **Graduation Credit Criteria**

课程类别							
Course	通识课程	学科大类课程	专业课程	个性课程	集中性实践	课外学	总学分
Classification	Public Basic	Basic Courses in	Courses in	Personalized	Practice	Extracurricular	Total
课程性质	Courses	General Discipline	Specialty	Course	Courses	Credits	Credits
Course Nature							
必修课	35	50.5	36.5	,	24.5	\	
Required Courses	33	30.3	30.3	\	24.3	\	190
选修课	0	4	10.5	10	\	10	190
Elective Courses	9	4	10.5	10	\	10	

#### 一、培养目标与毕业要求

#### I Educational Objectives & Requirement

#### (一) 培养目标

- (1) 身心健康,具备敬业精神、社会责任感和工程职业道德,关注当代全球和社会问题,具有可持续发展意识。
- (2) 具备从事人文地理与城乡规划领域科学研究、规划设计和管理服务等工作所需的自然科学知识和人文科学知识,并能熟练运用相关技术与方法来解决实际问题。
- (3) 具有综合运用人文地理理论和城乡规划技术从事区域规划、国土规划、城乡规划与建设管理、 土地资源管理、生态规划、环境保护等相关工作的能力。
- (4) 精通人文地理和城乡规划方面所要求的基础资料调研、数据整理分析、问题归纳综合、方案制定及实施管理等方法与技术。
- (5) 具有良好的口头和书面表达能力,沟通协调能力、良好的团队意识和合作精神,具有独立思考, 终身学习的能力。

#### **Educational Objectives**

The graduates of the Human geography and urban planning major will:

a. Be physical and mental health, has the good professional spirit, social responsibility and engineering ethics, and focus on human and social issues and the reality of the resource environment, the

- consciousness of sustainable development.
- b. Have the required knowledge of natural science and the humanities in the field of human geography and urban-rural planning scientific research, planning and design and management services, and proficiency in the use of related technologies and methods to solve practical problems.
- c. Has the ability to make comprehensive use of theories of human geography and urban and rural planning technology in regional planning, land planning, urban-rural planning and construction management, land resources management, ecological planning, environmental protection and other related work.
- d. Be Skillful at basic data investigation, data analysis, problem induction and synthesis, program formulation, implementation and management and technical method, which is required in the area of human geography and urban-rural planning.
- e. Have good oral and written expression ability, communication and coordination ability, good sense of team spirit and cooperation, independent thinking and the ability of life-long learning.

#### (二) 毕业要求

- (1) 学生掌握从事本专业领域所需的自然科学、人文科学、社会科学的相关知识。
- (2) 学生掌握本专业的基本理论知识和方法技术,能够利用原理性知识进行自主发现、自主分析和 自主解决与区域经济和城乡规划相关的科学技术问题。
- (3) 学生掌握计算机辅助设计技术,能掌握城乡规划制图的一般方法、步骤和规范。
- (4) 学生具备自然、社会、经济等基础资料调研的能力,以及对相关数据进行分析、发现问题、提出问题、解决问题的能力。
- (5) 学生能够了解国土规划、区域规划、城乡规划、土地规划、生态规划以及景观规划的一般原理、 理论与方法。
- (6) 学生具备 3S 技术、地理计量与统计、城市系统工程等工具手段的应用能力。
- (7) 学生具备进行实验和模拟仿真设计与操作的能力,并能够对实验方案进行分析和解释。
- (8) 学生了解本专业的发展动态和前沿,熟悉人文地理与城乡规划领域的最新技术手段和发展方向。
- (9) 学生具有良好的思想素质、身体素质、心理素质、文化修养、社会道德和责任担当等人文素养。
- (10) 学生了解当代全球问题和社会问题,熟悉国家在规划相关领域的法规、政策及技术规范要求, 在各类空间规划与发展规划中综合考虑自然、社会、经济、生态环境、文化历史等制约因素。
- (11) 学生具有逻辑思维和辩证思维的能力,具有批判意识和求真务实的科学思维方法,具有创新意识,掌握基本的创新方法。
- (12) 学生掌握运用现代信息技术跟踪并获取信息的方法,熟练进行文献检索和资料查询。
- (13) 学生具有良好的口头和书面表达和交流能力,至少熟练掌握一门外语进行技术沟通和交流能力。 具有良好的团队意识和合作精神。
- (14) 学生能够胜任本专业职业岗位,具备研究生课程学习所需的基础知识和能力。
- (15) 学生具有进行终身学习的愿望和能力,具有适应人文地理知识和城乡规划理念不断发展的能力。

#### Requirement

Graduating students should demonstrate that they attain the following:

- a. The knowledge required to engage in the professional field of natural science, humanities and social science.
- b. The professional basic theories and the technological methods, and the ability to employ the principles to accomplish the process of independent discovery, analysis and solution of the related scientific and technical issues of regional economy and urban-rural planning.
- c. The technique of computer aided design, general methods, procedures and specifications of urban-rural planning charting.
- d. The ability of researching natural, social, economic and other basic data, and the ability of related

- data analysis, problem discovery, putting forward and solving problems.
- e. The general principles, theories and methods of land planning, regional planning, urban planning, land use planning, ecological planning and landscape planning.
- f. Students have the ability of application of tools about 3S technology, geographic measurement and statistics, urban systems engineering.
- g. The ability to effectively test and simulate design and operation, and the ability to analyze and interpret the experimental scheme.
- h. Understand the development trends and frontier of the professional area, and be familiar with the latest technological tools and development direction of human geography and urban-rural planning field.
- i. Good psychological quality, physical quality, psychological quality, cultural cultivation, social morality and responsibility and other humanistic literacy.
- j. Familiar with the contemporary global and social issues, the national relative laws and regulations, policies and technical specifications in the planning field, and comprehensive consideration of nature, society, economy, ecological environment, cultural and historical constraints in various types of spatial and development planning.
- k. The ability of logical thinking and dialectical thinking and be equipped with critical consciousness, pragmatic scientific methods of thinking, innovative consciousness, and master the basic way of creation.
- I. The ability to employ methods of modern information technology to track and acquire information, and be skilled at document retrieval and data query.
- m. Good oral and written expression and communication skills, mastery of at least one kind of foreign language for technique communication, and having a good sense of team spirit and cooperation.
- n. Qualified for the entry-level of professional post in major field, and have the ability of cognitive and basic study that required by graduate courses.
- o. The desire and ability for lifelong learning, and capability to adapt to continuous development of human geography and urban-rural planning concept.

附:培养目标实现矩阵

	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	✓	✓	<b>√</b>	<b>✓</b>	✓
毕业要求 2	✓	✓	<b>√</b>	<b>✓</b>	✓
毕业要求 3	✓	✓	<b>√</b>	<b>✓</b>	
毕业要求 4		✓	<b>√</b>	<b>✓</b>	✓
毕业要求 5		✓	<b>√</b>	<b>✓</b>	
毕业要求 6		✓	<b>√</b>	<b>✓</b>	
毕业要求 7	✓	✓	<b>√</b>	<b>✓</b>	
毕业要求 8	✓	✓	<b>√</b>	<b>✓</b>	✓
毕业要求 9	✓				✓
毕业要求 10	✓		<b>√</b>		✓
毕业要求 11	✓	✓	<b>√</b>	<b>✓</b>	✓
毕业要求 12		✓	<b>√</b>	<b>✓</b>	
毕业要求 13					✓
毕业要求 14		✓	<b>√</b>	<b>√</b>	
毕业要求 15	✓				✓

#### 二、专业核心课程与专业特色课程

#### II Core Courses and Characteristic Courses

#### (一) 专业核心课程:

地质学、自然地理学、人文地理学、经济地理学、国土规划、地图学、遥感原理与应用、生态 环境规划、地理信息系统原理与应用、城市总体规划、区域分析与规划、资源环境信息系统、城市 详细规划、土地评价与土地管理。

Geology, Physical Geography, Human Geography, Economic Geography, Land Planning, Cartography, Principles and applications of Remote Sensing, Ecologic Environment Planning, Principles and Applications of Geographical Information System, Urban Comprehensive Planning, Regional Analyzing and Planning, Resource and Environmental Information System, Urban Detailed Planning, Land Estimating and Management.

#### (二) 专业特色课程:

区域资源与环境实时监测、计量地理学、资源环境信息系统、遥感原理与应用、地理信息系统原理及应用。

Regional Resources and Real-time Monitor, Quantitative Geography, Resource and Environmental Information System, Principles and Applications of Remote, GIS.

附: 毕业要求实现矩阵:

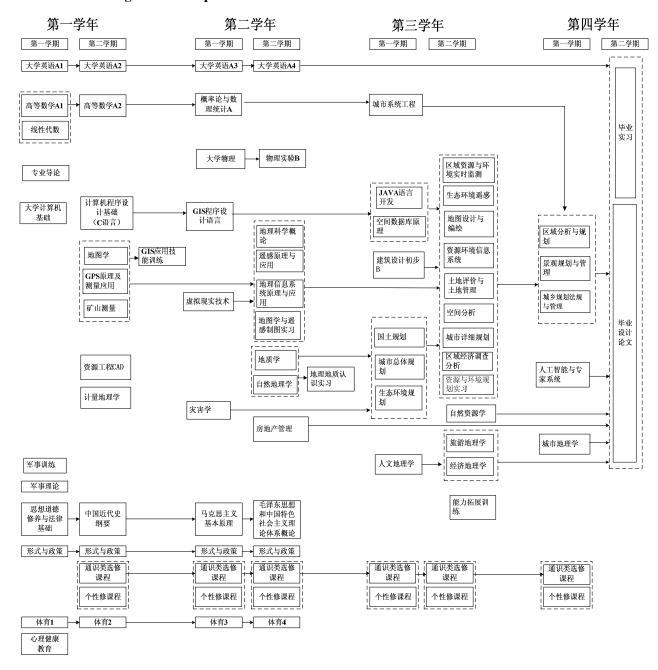
专业	专业						人	文地理	15城	乡规:	<b>以专</b> 以	<b>L</b> 毕业	要求				
核心 课程	特色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		思想道德修养与法律基础									<b>√</b>						
		中国近现代史纲要									<b>√</b>						
		毛泽东思想和中国特色社会 主义理论体系概论									<b>√</b>						
		马克思主义基本原理									<b>√</b>						
		军事理论									<b>√</b>						
		心理健康教育									<b>√</b>						
		体育									<b>√</b>						
		大学英语									<b>√</b>				<b>√</b>		
		大学计算机基础									<b>√</b>						
		计算机程序设计基础(C语言)		<b>√</b>	<b>√</b>						<b>√</b>						
		专业导论								<b>√</b>	<b>√</b>	<b>√</b>					<b>√</b>
		高等数学	√														
		线性代数	√														
	<b>√</b>	计量地理学				<b>√</b>		<b>√</b>									<b>√</b>
<b>√</b>		地图学		<b>√</b>	<b>√</b>					<b>√</b>							

专业	专业						人2	文地理	11年版	<b>乡规</b>	划专业	<b>L</b> 上 上 上	要求				
核心 课程	特色 课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		概率论与数理统计 A	√														
		大学物理	√														
		GIS 程序设计语言			<b>√</b>		<b>√</b>	<b>√</b>									
		物理实验 B	<b>√</b>														
<b>√</b>	<b>√</b>	遥感原理与应用		<b>√</b>				<b>√</b>		<b>√</b>							
√	<b>√</b>	地理信息系统原理与应用		<b>√</b>				<b>√</b>		√							
<b>√</b>		地质学		<b>√</b>		<b>√</b>	<b>√</b>										
√		自然地理学		<b>√</b>		<b>√</b>	<b>√</b>										
		GPS 原理及测量应用				<b>√</b>		<b>√</b>									
		矿山测量				~		√									
		资源工程 CAD		<b>√</b>	<b>√</b>												
		灾害学	<b>√</b>	<b>√</b>													
		虚拟现实技术		<b>√</b>	<b>√</b>				√	<b>√</b>							
		房地产管理	<b>√</b>									<b>√</b>					
		地理科学概论		<b>√</b>				<b>√</b>		<b>√</b>							
√		人文地理学		<b>√</b>		~	√										
		空间数据库原理			√			<b>√</b>									<b>√</b>
√		国土规划		<b>√</b>		~	√										
√		城市总体规划		<b>√</b>			√										
		城市系统工程						<b>√</b>									
√		生态环境规划		<b>√</b>			√										
√		经济地理学		<b>√</b>		<b>√</b>	√										
√	<b>√</b>	资源环境信息系统					<b>√</b>	<b>√</b>	<b>√</b>								
√		城市详细规划		√			√										
√		土地评价与土地管理		√			√										
√		区域分析与规划		<b>√</b>			<b>√</b>										

₹业	专业						人2	<b>文地</b> 理	里与城	乡规:	少专业	<b>LEA</b>	要求				
核心 课程	特色 课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		建筑设计初步 B			<b>√</b>												
		JAVA 语言开发			<b>√</b>												
		地图设计与编绘			<b>√</b>												
		生态环境遥感						<b>√</b>		<b>√</b>							
		空间分析						<b>√</b>									<b>√</b>
	<b>√</b>	区域资源与环境实时监测		<b>√</b>		<b>√</b>			<b>√</b>			<b>√</b>					<b>√</b>
		旅游地理学		<b>√</b>	<b>√</b>		<b>√</b>	<b>√</b>									
		自然资源学	<b>√</b>	<b>√</b>	<b>√</b>							<b>√</b>					
		景观规划与管理		<b>√</b>			<b>√</b>										
		城市地理学		<b>√</b>			<b>√</b>										
		城乡规划法规与管理										<b>√</b>					
		人工智能与专家系统						<b>√</b>		<b>√</b>							
		现代城市规划理论流派								<b>√</b>							
		武汉市自然地理综合分析方法										<b>√</b>					
		区域分析中的主要数学方法				<b>√</b>	<b>√</b>										
		地理学方法与创新性思维											<b>√</b>				
		定量遥感		<b>√</b>				<b>√</b>									
		军事训练									√						
		GIS 应用技能训练		<b>√</b>		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>					<b>√</b>			
		地理地质认识实习		<b>√</b>					<b>√</b>								
		地图学与遥感制图实习		<b>√</b>	<b>√</b>			<b>√</b>	<b>√</b>								
		资源与环境规划实习		<b>√</b>		<b>√</b>		<b>√</b>	<b>√</b>			<b>√</b>		<b>√</b>			
		区域经济调查分析		<b>√</b>			<b>√</b>	<b>√</b>									
		能力拓展训练		<b>√</b>		<b>√</b>		<b>√</b>	<b>√</b>			<b>√</b>		<b>√</b>			
		毕业实习								<b>√</b>		<b>√</b>					
		毕业设计(论文)											<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>

#### 三、课程教学进程图

#### **III** Teaching Process Map



## 四、理论教学建议进程表

## ${ m IV}$ Theory Course Schedule

课程	课程				7	学时分	·配 In	cludin	ıg	おいな		<b>络一</b>
类别	性质	课程编号	课程名称	学	总学时		上机	实践	课外	建议修 读学期	先修课程	第二专业
Course Classifi-	Course	Course Number	Course Title	分 Crs	Tot	实验	Ope-	Prac-		Suggested	Prerequisite Course	Second
cation	Nature			CIS	hrs.	Exp.	ration	tice	cur	Term		Major
		4220001110	思想道德修养与法律基础		40			0		1.6		
		4220001110	Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要	2	32					1-6		
		4220002110	Outline of Contemporary and Modern Chinese History		32					1-0		
			毛泽东思想和中国特色社会主义理论体系概论									
		4220003110	Introduction to Mao Zedong Thought and	4	96			32		1-6		
			Socialism with Chinese Characteristics									
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
			军事理论									
		1060003130	Military Theory	1	32			16		1-4		
	必		心理健康教育									
		1050001130	Mental health education	1	16					1-2		
通		4210001110	体育 1	1	32					1		
	修	4210001110	Physical Education I	1	32					1		
		4210002110	体育 2	1	32					2	体育 1	
识	课	.210002110	Physical Education II	1							11 13 2	
	in.	4210003110	体育 3	1	32					3	体育 2	
			Physical Education III 体育 4									
课	Rec	4210004110	Physical Education IV	1	32					4	体育3	
床	Required Courses		大学英语 A1									
	ed C	4030002110	College English A I	3	64				16	1		
111	ours	4030003110	大学英语 A2	3	64				16	2	大学英语	
程	ses	4030003110	College English A II	3	04				10	2	A1	
		4030004110	大学英语 A3	3	64				16	3	大学英语	
			College English A III								A2	
Pub		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
Public Basic Courses			大学计算机基础								AS	
Basi		4120017110	Foundation of Computer	2	32		12			1		
c Cc			计算机程序设计基础(C语言)	_	4.0					_		
erno		4120023110	Fundamentals of Computer Program Design(C Language)	3	48		12			2		
SS												
			小 计 Subtotal	35	736		24	64	64			
		创新创业类			全校的	<b></b> 学生   事	東東至	小取	得9イ	`学分.	且必须选修さ	大术体
			d Entrepreneurship Courses		课程。	中的さ	艺术类	相关i	课程,	取得至	少2个学分。	理工
	田诜	人文社科类	10: 0								经济管理类说	果程,
	lect	-	al Science Courses							×技术类		lmust
	Elective Courses	经济管理类 Fconomy and	Management Courses								9 credits, and Education Coun	
	Cou	科学技术类	Management Courses	obta	in at 1	least	2 cred	lits. S	Scienc	e and e	ngineering st	udents
	rses 课		echnology Courses								ts and Social S	
											Courses, and se from Scien	
		艺术体育类 Art and Physi	cal Education Courses		ents si nology			at R	cast 0	ne cours	e nom scien	e unu
		2 II Cana I Hysi	Car Education Courses		0.7							

课程	课程				77	乡时分	配 In	cludin	g	74 101 64		<i>አ</i> ⁄- →
类别	性质	课程编号	课程名称	学分	总学时		上机	实践	课外	建议修 读学期	先修课程 Prerequisite	第二 专业
Course Classifi-	Course	Course Number	Course Title	の Crs	Tot	实验 Exp.	Ope-		Extra-	Suggested	Course	Second
cation	Nature			CIS	hrs.	Exp.	ration	tice	cur	Term		Major
		4060215110	专业导论 Introduction to Materials Physics	1	16					1		
		4050063110	高等数学 A 上 Advanced Mathematics A I	5	80					1		
		4050229110	线性代数	2.5	40					1		
			Linear Algebra 高等数学 A 下								高等数学 A	
		4050064110	Advanced Mat	5	80					2	上	
		4060004110	计量地理学 Quantitative Geography	3	48	24				2		
		4060379150	地图学 Cartography	3.5	56	24				2		
学	必	4050057110	概率论与数理统计 A Probability and Mathematics A	4.5	72					3		
	修	4060001110	GIS 程序设计语言	3.5	56	24				3		
科		4050463130	GIS Programming Language 大学物理	5	80					3		
大	课		College Physics B 物理实验 B	1	32	32					- <b>1</b> - ≥ 4/m TH	
	Rec	4050224110	Physics Lab. B	1	32	32				4	大学物理	
类	luired	4060380150	遥感原理与应用 Principles and Applications of Remote Sensing	4	64	24				4		
	Required Courses	4060228120	地理信息系统原理与应用 Principles and Applications of Geographical	4	64	28				4	地图学	
课	es	4060027110	地质学 Physical Geology	2.5	40					4		
程		4060218120	自然地理学	2.5	40					4		
			Physical Geography 测量课程(二	<u></u> 选一	, 3.5 :	 学分)	)					
В			Surveying course cluster (					redits	s)			
Basic D		4060272120	GPS 原理及测量应用 GPS Principle and Its Application in Surveying	3.5	56		10	16		2		
asic Disciplinary Courses		4060241120	矿山测量 Mining Geodesy	3.5	56		10	16		2		
nary C			小 计 Subtotal	50.5	824	156	10	16				
ourses		4060128110	资源工程 CAD Resource Engineering CAD	2	32	24				2		
	选	4060125110	灾害学	2	32					3		
	修	4060277130	Disaster Science 虚拟现实技术	2	32	16				3		
	课	7000277130	Virtual Reality 房地产管理		52	10				3		
	Elec	4060030110	厉地)旨连 Real Estate Administration	2	32					4		
	tive C											
	Elective Courses		小 计 Subtotal	8	128	40						
	. •		要求至少选修 4 学分。									
		NOIE: Mini	mum subtotal credits:4.									

课程	课程				<u> </u>	乡时分	↑配 In	cludin	g	7事3以4女		- 公
类别 Course Classifi-	性质 Course	课程编号 Course Number	课程名称 Course Title	学分。	总学时 Tot	实验	上机 Ope-	实践 Prac-	课外 Extra-	建议修 读学期 Suggested	先修课程 Prerequisite Course	第二 专业 Second
cation	Nature			Crs	hrs.	Exp.	ration		cur	Term	Course	Major
		4060320130	地理科学概论 Introduction to Geography	2	32					4		
		4060303130	人文地理学 Human Geography	3.5	56	16				5		
		4060068110	空间数据库原理 Spatial Database Principle	3.5	56	24				5		
	è	4060287130	国土规划 Land Planning	2.5	40					5		
	必	4060020110	城市总体规划 Comprehensive Urban Planning	3	48					5		
	修	4060224120	城市系统工程 Urban Systems Engineering	3	48	12				5		
	课	4060316130	生态环境规划 Ecological Environment Planning	3	48			16		5		
+	Requi	4060318130	经济地理学 Economic Geography	2	32	8				6		
专	Required Courses	4060130110	资源环境信息系统 Resource Environment Information System	3.5	56	24				6	遥感原理与应用 地理信息系统原 理与应用	
业	Š	4060225120	城市详细规划 Urban Detailed Planning	4	64			32		6		
课		4060253120	土地评价与土地管理 Land Estimating and Management	3	48	24				6		
		4060302130	区域分析与规划 Region Analyzing and Planning	3.5	56	24				7		
程			小 计 Subtotal	36.5	584	132		48				
Spec		4130134110	建筑设计初步 B Preliminary Architectural Design B	2	32					5		
ecializ		4060222120	JAVA 语言开发 JAVA language	2.5	40		24			5		
cialized Courses		4060281130	地图设计与编绘 Map design and compilation	3	48	40				6	地图学	
rses	选	4060321130	生态环境遥感 Eco-Environmental Remote Sensing	3	48	16				6		
	修	4060237120	空间分析 Spatial Analysis	3	48	24				6	地理信息系 统原理与应	
	课 Elec	4060317130	区域资源与环境实时监测 Resources and Environmental Real-time Monitor	3	48	16				6		
	Elective Courses	4060095110	旅游地理学 Tourism Geography	2	32					6	自然地理学	
	ourses	4060135110	自然资源学 Natural Resource	3	48					6		
		4060065110	景观规划与管理 Landscape Planning and Management	2	32					7	自然地理学	
		4130438130	城市地理学 Urban geography	2.5	40					7		
		4060021110	城乡规划法规与管理 Urban and Rural planning Management	2	32					7		

课程	课程			2324	学	的分	配 In	cludin	g	建议修	J. 74 MIZE	第二
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学 分 Crs	总学时 Tot hrs.	实验 Exp.	上机 Ope- ration		课外 Extra- cur	读学期 Suggested Term	先修课程 Prerequisite Course	专业 Second Major
		4060100110	人工智能与专家系统 AI & ES	2	32					7		
			小 计 Subtotal	29	464	96	24	96				
			要求至少选修 10.5 学分。									
		NOTE: Mini	mum subtotal credits: 10.5.			1	1			1	1	
		4060321130	武汉市自然地理综合分析方法 Comprehensive Analysis of Natural Geographical Method in Wuhan	1	16				12	2		
		4060322130	区域分析中的主要数学方法 Main Mathematical Methods of Regional Analysis	2	32	16				4		
个 性 课 Personalized Course	选 & Elective	4060323130	地理学方法与创新性思维 Geography Method and Creative Thinking	2	32					6		
性 (ized Co	_ 1125	4060320130	现代城市规划理论流派 Schools of Modern City Planning Theory	1	16					6		
urse	ses	4060324130	定量遥感 Quantitative Remote Sensing	2	32	8		8		6		
			小 计 Subtotal	8	128	24		8	12			
		NOTE: Stude	产生可跨专业自主选择修读全校其他专业的 ents can choose any courses from the other s um subtotal credits: 10.									ourses

## 五、集中性实践教学环节建议进程表

#### **V** Practice Schedule

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
1060002110	军事训练 Military Training	3	1.5	1	
4060255120	GIS 应用技能训练 Practical Training on GIS	2	2	2	
4060220120	地理地质认识实习 Practice of Understanding Geographic and Geology	2	2	4	
4060282130	地图学与遥感制图实习 Practice of Cartographic and Remote sensing Cartography Experiment	2	2	4	
4060209110	资源与环境规划实习 Practice of Resources and Environmental Planning	2	2	6	
4060196110	区域经济调查分析 Regional economic Investigation and Analysis	2	2	6	
4060190110	能力拓展训练 Ability Development Training	1	1	6	
4060148110	毕业实习 Graduation Practice	2	2	8	
4060256120	毕业设计(论文) Graduation Thesis	15	10	8	
	小 计 Subtotal	31	24.5		

#### 六、修读指导

#### **VI Recommendations on Course Studies**

《形势与政策》课程,平均每学期 16 学时,一般按专题进行,在第七学期末考核,计 2 个课外学分,具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7<sup>th</sup> term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人: 袁艳斌 专业培养方案责任人: 黄解军

## 【地理信息科学专业】2015 版本科培养方案

## **Undergraduate Education Plan for Specialty in Geographic Information Science (2015)**

专业名称 地理信息科学 主干学科 地理学、计算机科学与技

术、遥感

Major Geographic Major Disciplines Geography, Computer

Information Science science and technology,

Remote Sensing

计划学制 四年 授予学位 理学学士

Duration 4 Years Degree Granted Bachelor of Science

所属大类 **地理科学类** 大类培养年限 2 **年** Disciplinary Geography Duration 2 years

#### 最低毕业学分规定

#### **Graduation Credit Criteria**

课程类别 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Courses in General Discipline	专业课程 Courses in Specialty	个性课程 Personali zed Course	集中性 实践 Practice Courses	课外学 Extracurric ular Credits	总学分 Total Credits
必修课 Required Courses	35	50.5	28	\	27.5	\	190
选修课 Elective Courses	9	4	16	10	\	10	190

#### 一、培养目标与毕业要求

#### I Educational Objectives & Requirement

#### (一) 培养目标

- (1) 身心健康,具备敬业精神、社会责任感和工程职业道德,关注当代全球和社会问题,具有可持续发展意识。
- (2) 具有从事地理空间信息领域科学研究、工程设计和技术服务等工作所需的数理知识、地理学知识和其它相关自然科学知识,并能将数学和科学工具运用于解决工程问题。
- (3) 具有综合运用科学理论和工程技术分析、设计、开发、测试和应用地理信息系统、遥感处理系统和全球定位系统的能力。
- (4) 精通设计、开发和测试地理信息系统的工具和软硬件技术,能够解决资源开发与灾害治理、城 乡规划、环境保护与管理等领域的实际问题。
- (5) 具有良好的口头和书面表达和交流沟通能力、良好的团队意识和合作精神,具有终身学习的能力。

#### **Educational Objectives**

The graduates of the Geographic Information System major will:

- a. Be physical and mental health, has the good professional spirit, social responsibility and engineering ethics, and focus on human and social issues and the reality of the resource environment, the consciousness of sustainable development.
- b. Have the required knowledge of mathematical knowledge, geography and other related knowledge of Natural Science in the field of geographic spatial information fields of scientific research, engineering

- design and technical services, and proficiency in the use of mathematical and scientific tools to solve engineering problems.
- c. Has the ability to make comprehensive use of theories of scientific theory and engineering design, development, testing and the ability of applying geographic information system, remote sensing processing system and global positioning system.
- d. Be proficient in tools and software and hardware technology in design, development and testing of the geographic information system, solving practical problems in fields of resources development and hazard control, urban planning, environmental protection and management etc..
- e. Have good oral and written expression ability, communication and coordination ability, good sense of team spirit and cooperation, independent thinking and the ability of life-long learning.

#### (二) 毕业要求

- (1) 学生掌握从事本专业领域所需的数学、地理学、计算机科学、遥感、地图学和管理等知识。
- (2) 学生掌握本专业的基本理论知识和工程基础知识,能够利用原理性知识进行自主发现、自主设计和自主解决与地理信息工程相关的科学问题。
- (3) 学生掌握地理信息系统的设计语言和开发平台,能理解地理信息系统的设计方法和步骤。
- (4) 学生能够设计和实现基于二次开发的应用系统以及实现对地理信息的采集、组织、存储、共享、 分析和表达。
- (5) 学生能够理解高级程序语言和 GIS 常用算法。
- (6) 学生具备有关地理信息系统、遥感图像处理系统、导航定位系统的应用知识,能理解资源开采、 灾害治理、环境保护等领域中地理信息科学和技术的应用模式和技术方法。
- (7) 学生具备有效进行实验和模拟仿真设计与操作的能力,并能够对实验结果进行分析和解释。
- (8) 学生了解本专业的发展动态和前沿,熟悉地理信息科学领域的最新开发工具种类和发展方向。
- (9) 学生具有良好的思想素质、身体素质、心理素质、文化修养、社会道德和责任担当等人文素养。
- (10) 学生了解当代全球问题和社会问题,在工程设计中综合考虑经济、环境、法律、安全和伦理等制约因素。
- (11) 学生具有逻辑思维和辩证思维的能力,具有批判意识和求真务实的科学思维方法,具有创新意识,掌握基本的创新方法。
- (12) 学生掌握运用现代信息技术跟踪并获取信息的方法,熟练进行文献检索和资料查询。
- (13) 学生具有良好的口头和书面表达和交流能力,至少熟练掌握一门外语进行技术沟通和交流能力。 具有良好的团队意识和合作精神。
- (14) 学生能够胜任本专业职业岗位,具备研究生课程学习所需的认知和基础能力。
- (15) 学生具有进行终身学习的愿望和能力,具有适应电子信息技术不断发展的能力。

#### Requirement

Graduating students should demonstrate that they attain the following:

- a. The knowledge required to engage in the professional field of mathematics, computer science, geography, cartography, remote sensing and management.
- b. The professional basic theories and knowledge of engineering, and the ability to employ the principles to accomplish the process of independent discovery, analysis and solution of the related scientific and technical issues of geographic information engineering.
- c. The technique of design language and the development platform of geographic information system, design method and step in understanding the geographic information system.
- d. The ability to design and implement application system based on secondary development and to realize of the geographic information acquisition, organization, storage, sharing, analysis and expression.

- e. Understanding the high-level language and data structure.
- f. The knowledge about the application of geographic information system, remote sensing image processing system, navigation and positioning system, understanding geographic information application mode and technical methods in the field of resources exploitation, hazard control, environmental protection science and technology.
- g. Ability to effectively carry out the experiment and simulation design and operation, and be able to analyze and interpret the experimental results.
- h. Grasp the development of dynamic and frontier of the professional field, familiar with the latest the types of development tools and development direction of Geographic Information Science field.
- i. Good psychological quality, physical quality, psychological quality, cultural cultivation, social morality and responsibility and other humanistic literacy.
- j. Familiar with the contemporary global and social issues, comprehensive consideration of economic, environmental, legal, safety and ethical constraints in engineering design.
- k. The ability of logical thinking and dialectical thinking and be equipped with critical consciousness, pragmatic scientific methods of thinking, innovative consciousness, and master the basic way of creation.
- I. The ability to employ methods of modern information technology to track and acquire information, and be skilled at document retrieval and data query.
- m. Good oral and written expression and communication skills, mastery of at least one kind of foreign language for technique communication, and having a good sense of team spirit and cooperation.
- n. Qualified for the entry-level of professional post in major field, and have the ability of cognitive and basic study that required by graduate courses.
- o. The desire and ability for lifelong learning, and capability to adapt to continuous development of human geography and urban-rural planning concept.

附:培养目标实现矩阵

	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		✓			
毕业要求 2		✓	<b>√</b>		
毕业要求 3		✓	<b>√</b>	<b>√</b>	
毕业要求 4		✓	✓	✓	
毕业要求 5		✓	<b>√</b>	<b>√</b>	
毕业要求 6			<b>√</b>	<b>√</b>	
毕业要求 7			<b>√</b>	<b>√</b>	
毕业要求 8				<b>√</b>	
毕业要求 9	<b>√</b>				
毕业要求 10	<b>√</b>				
毕业要求 11		✓	<b>√</b>		
毕业要求 12		✓	<b>√</b>	<b>√</b>	
毕业要求 13					✓
毕业要求 14		✓	<b>√</b>	<b>✓</b>	
毕业要求 15					<b>√</b>

#### 二、专业核心课程与专业特色课程

#### II Core Courses and Characteristic Courses

#### (一) 专业核心课程:

自然地理学、空间分析、地图学、空间数据库原理、遥感原理与应用、地理信息系统原理与应用、地理信息系统工程。

Physical Geography, Spatial Analysis, Cartography, Spatial Database Principle, Principles and Applications of Remote Sensing, Principles and Applications of Geographical Information System, and GIS Engineering.

#### (二) 专业特色课程:

资源环境信息系统、计量地理学、矿山 GIS、城市系统工程

Resource Environment Information System, Quantitative Geography, Mine GIS Courses, and Urban Systems Engineering.

附: 毕业要求实现矩阵:

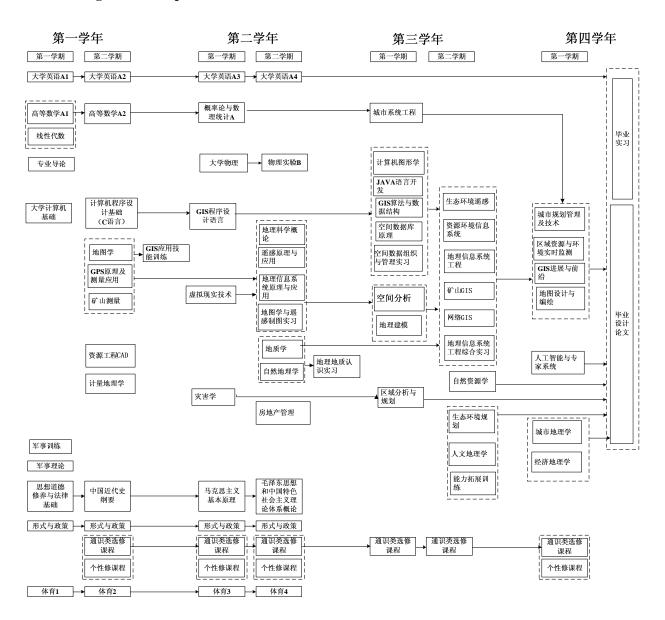
去业核	专业特						地	理信	息科	学专	业毕	业要	求				
心课程		课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		思想道德修养与法律基础									<b>√</b>						
		Morals, Ethics and Fundamentals of Law									ľ						
		中国近现代史纲要									<b>✓</b>						
		Outline of Contemporary and Modern Chinese History									Ť						
		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									✓	<b>✓</b>	<b>✓</b>				
		Socialism with Chinese Characteristics															
		马克思主义基本原理									<b>✓</b>	/	<b>✓</b>				
		Marxism Philosophy									Ť	·	·				
		军事理论									<b>✓</b>						
		Military Theory									Ť						
		心理健康教育									<b>✓</b>						
		Mental health education									·						
		体育									<b>✓</b>						
		Physical Education															
		大学英语									<b>✓</b>			<b>✓</b>	<b>✓</b>		
		College English															
		大学计算机基础	<b>✓</b>		<b>✓</b>												<b>√</b>
		Foundation of Computer															
		计算机程序设计基础(C语言)			<b>✓</b>		<b>✓</b>									<b>✓</b>	
		Fundamentals of Computer Program Design(C Language)															
		专业导论		<b>✓</b>						<b>✓</b>						<b>✓</b>	
		Introduction to Materials Physics															
		高等数学	<b>✓</b>						<b>✓</b>				<b>✓</b>				
		Advanced Mathematics															
		线性代数	<b>✓</b>						<b>✓</b>				<b>✓</b>				
		Linear Algebra															
	<b>√</b>	计量地理学	<b>✓</b>	<b>✓</b>				<b>✓</b>	<b>✓</b>				<b>✓</b>				
		Quantitative Geography															
<b>√</b>		地图学	<b>✓</b>	<b>√</b>				<b>√</b>	<b>√</b>							<b>✓</b>	
		Cartography															
		概率论与数理统计	<b>√</b>						<b>√</b>				<b>✓</b>				
		Probability and Mathematics															
		大学物理	<b>√</b>	<b>✓</b>				<b>√</b>	<b>√</b>				<b>✓</b>				
		College Physics															

专业核	专业特						地	理信	息科	学专	业毕	业要	求				
心课程		课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		物理实验 B Physics Lab. B	<b>✓</b>	<b>✓</b>				<b>✓</b>	<b>✓</b>				<b>√</b>				
		GIS 程序设计语言															-
		GIS Programming Language	✓		<b>✓</b>	✓	✓										<b>✓</b>
		遥感原理与应用															
✓		Principles and Applications of Remote Sensing	✓	<b>✓</b>				<b>✓</b>	<b>✓</b>	✓						✓	
		地理信息系统原理与应用															
✓		Principles and Applications of Geographical	✓	<b>✓</b>		✓		<b>✓</b>	<b>✓</b>	✓						✓	<b>✓</b>
		地质学															
		Physical Geology	✓	✓				✓	<b>✓</b>								
		自然地理学															
$\checkmark$		Physical Geography	✓	<b>✓</b>				✓								✓	
		GPS 原理及测量应用															
		GPS Principle and Its Application in Surveying		✓				✓	<b>✓</b>	✓						✓	
		矿山测量															<del>                                     </del>
		Mining Geodesy		<b>✓</b>				✓	<b>✓</b>	✓						✓	
		资源工程 CAD															
		Resource Engineering CAD		<b>✓</b>				<b>✓</b>								✓	
		灾害学															<del>                                     </del>
		Disaster Science						✓				✓					
		虚拟现实技术															<del>                                     </del>
		Virtual Reality	✓			✓		✓	<b>✓</b>								
		房地产管理															
		Real Estate Administration	✓													✓	
		地理科学概论								,			,			,	
		Introduction to Geography	✓	<b>√</b>				<b>✓</b>		✓			✓			✓	
		空间数据库原理				,										,	
✓		Spatial Database Principle	✓			✓	✓									✓	<b>✓</b>
		GIS 算法与数据结构				,											
		Algorithms and Data Structures of GIS		<b>✓</b>	<b>✓</b>	✓	✓										<b>✓</b>
		城市系统工程															
	<b>√</b>	Urban Systems Engineering	✓									✓	✓				
		空间分析														,	
✓		Spatial Analysis		✓				✓	<b>✓</b>							✓	
		生态环境遥感															
		Eco-Environmental Remote Sensing	✓	✓				✓	<b>✓</b>								
,		地理信息系统工程		,													
✓		GIS Engineering		<b>√</b>	<b>✓</b>	✓		✓				✓					<b>√</b>
	,	资源环境信息系统						_									
	✓	Resource Environment Information System				✓		✓				✓					
		网络 GIS															
		Web GIS						✓		✓							
	,	矿山 GIS						_									
	✓	GIS of Mines						✓	✓								
		计算机图形学	_														
		Computer Graphics	✓						✓								
		人文地理学	/									,				,	
		Human Geography	✓	✓								<b>✓</b>				✓	
		JAVA 语言开发			,	,	,			_							
		JAVA language			✓	✓	✓			✓							
		生态环境规划						,				,					
		Ecological Environment Planning						✓				✓					

专业核	专业特						地	理信	息科	学专	业毕	业要	求				
	色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		地图设计与编绘 Map Design and Compilation		<b>✓</b>				<b>✓</b>								<b>✓</b>	
		区域分析与规划															
		Region Analyzing and Planning		✓				✓									
		经济地理学															
		Economic Geography	✓	✓												✓	
		自然资源学															
		Natural Resource	✓	✓				✓									İ
		GIS 进展与前沿								,							
		GIS Development								<b>√</b>			<b>✓</b>				İ
		区域资源与环境实时监测															
		Resources and Environmental Real-time Monitor						✓									İ
		城市规划管理及技术															
		Urban Planning Management and Technology		✓				<b>✓</b>								✓	İ
		城市地理学															
		Urban geography	✓	✓				✓								✓	İ
		人工智能与专家系统															
		AI & ES	✓							✓							İ
		武汉市自然地理综合分析方法															
		Comprehensive Analysis of Natural						✓	<b>✓</b>							✓	
		Geographical Method in Wuhan															İ
		区域分析中的主要数学方法															
		Main Mathematical Methods of Regional	✓	<b>✓</b>				<b>✓</b>									İ
		Analysis															
		地理学方法与创新性思维	,								_						
		Geography Method and Creative Thinking	✓								✓		<b>√</b>			✓	İ
		定量遥感	_						,								
		Quantitative Remote Sensing	✓					✓	✓								İ
		军事训练									_						
		Military Training									✓						İ
		GIS 应用技能训练															
		Practical Training on GIS		✓				✓	✓							<b>√</b>	
		地理地质认识实习	,						_								
		Practice of Understanding Geographic and	✓					✓	✓							✓	İ
		地图学与遥感制图实习	,	_				_		_							
		Practice of Cartographic and Remote	✓	✓				✓		✓						<b>√</b>	İ
		空间数据组织与管理实习	<b>√</b>	_			_										
		Practice of Spatial Data Organization and	<b>V</b>	<b>√</b>		<b>√</b>	✓									✓	İ
		地理建模		<b>√</b>				<b>√</b>	_			<b>√</b>					
		Geographic modeling		*				<b>'</b>	<b>✓</b>			<b>'</b>					
		地理信息系统工程综合实习		<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>									
		Practice of GIS		<b>'</b>	<b>'</b>	<b>'</b>		<b>'</b>									
		能力拓展训练			<b>√</b>			<b>✓</b>		<b>✓</b>							
		Ability Development Training			<b>'</b>			<b>'</b>		<b>'</b>							Į
		毕业实习		<b>√</b>					<b>√</b>	<b>√</b>					<b>√</b>	<b>√</b>	
		Graduation Practice		<b>'</b>					<b>'</b>	<b>'</b>					ľ	<b>v</b>	
		毕业设计(论文)		<b>√</b>					<b>✓</b>	<b>√</b>	<b>√</b>		<b>✓</b>	<b>√</b>			<b>√</b>
		Graduation Thesis		*					*	*	*		*	*			ľ

#### 三、课程教学进程图

#### **III** Teaching Process Map



## 四、理论教学建议进程表

## IV Theory Course Schedule

课程	)III 4H				2	学时分	西フ In	cludin	n .			
类别	课程	、田 1日 /心 口	\H 4D 45	学		子可刀	1		1	建议修	先修课程	第二
Course	性质	课程编号 Course Number	课程名称 Course Title	分	总学时	实验	上机	实践		读学期 Suggested	Prerequisite	专业 Second
Classifi-	Course Nature	Course Number	Course little	Crs	Tot	Exp.	Ope-	Prac-	Extra-	Term	Course	Major
cation	Ivalule				hrs.	_	ration	tice	cur			,
		4220001110	思想道德修养与法律基础	3	48			8		1-6		
		4220001110	Morals, Ethics and Fundamentals of Law							1 0		
		4220002110	中国近现代史纲要	2	32					1-6		
		7220002110	Outline of Contemporary and Modern Chinese History							1 0		
			毛泽东思想和中国特色社会主义理论体系概论									
		4220003110		4	96			32		1-6		
			Socialism with Chinese Characteristics									
		4220005110	马克思主义基本原理	3	48			8		1-6		
			Marxism Philosophy									
		1060003130	军事理论	1	32			16		1-4		
			Military Theory									
		1050001130	心理健康教育	1	16					1-2		
	必	1030001130	Mental health education	1	10					1-2		
13%		4210001110	体育 1		22							
通	14	4210001110	Physical Education I	1	32					1		
	修	4210002110	体育 2	1	32					2	体育 1	
		4210002110	Physical Education II	1	32					2	平月 I	
识	课	4210003110	体育 3	1	32					3	体育 2	
	<b>K</b>	4210003110	Physical Education III	1	32					3	件月 2	
		4210004110	体育 4	1	32					4	体育 3	
课	R	4210004110	Physical Education IV	1	32					4	件月3	
床	Required Courses	4030002110	大学英语 A1	3	64				16	1		
	red	4030002110	College English A I	3	04				10	1		
	Cor	4030003110	大学英语 A2	3	64				16	2	大学英语 A1	
程	urse	4030003110	College English A II		0.				10		八丁八四四	
	Ö	4030004110	大学英语 A3	3	64				16	3	大学英语 A2	
		.020001110	College English A III								) ( ) ( ) ( iii : 12	
P		4030005110	大学英语 A4	3	64				16	4	大学英语 A3	
Public			College English A IV							•	) (	
с В		4120017110	大学计算机基础	2	32		12			1		
asic			Foundation of Computer									
Basic Courses			计算机程序设计基础(C语言)		4.0							
urse		4120023110	Fundamentals of Computer Program Design(C	3	48		12			2		
SS			Language)									
			小 计 Subtotal	35	736		24	64	64			
		创新创业类			J	J	<u> </u>		<u> </u>	<u> </u>	<u> </u>	
			nd Entrepreneurship Courses								L必须选修艺艺	
		人文社科类	as Endepreneursing Courses								个学分。理	
	Elective Courses		al Science Courses								理类课程,其	其他专
	ctive	经济管理类	an addition Courses	-业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits a							1	
	e e e		l Management Courses	muet	All students are required to obtain at least 9 credits, sust select art courses from Art and Physical Education Course							
	sınc	科学技术类		obtain at least 2 credits. Science a								
	g 课		Technology Courses								al Science Cou	
		艺术体育类	C, area								tudents should	select
			ical Education Courses	at lea	ast one	course	from	Science	e and T	echnolog	y Courses.	
	i											

\H ftt					ر	쓰마사	#I T	. 1 1				
课程 类别	课程	\B 40 (c) []	)	学		子刊 分 		cludin	1	建议修	先修课程	第二
Course	性质	课程编号	课程名称	分	总学时	实验	上机	实践	课外	读学期	Prerequisite	专业 Second
Classifi-	Course	Course Number	Course Title	Crs	Tot	Exp.	0pe-	Prac-	Extra-	Suggested Term	Course	Major
cation	Nature				hrs.	Bilp.	ration	tice	cur	TOTM		111ujoi
		4060215110	专业导论	1	16					1		
		4000213110	Introduction to Materials Physics	1	10					1		
		4050063110	高等数学 A 上	5	80					1		
		4030003110	Advanced Mathematics A I	3	80					1		
		4050229110	线性代数	2.5	40					1		
		4030229110	Linear Algebra	2.3	40					1		
		4050064110	高等数学 A 下	5	80					2	高等数学 A	
		4030004110	Advanced Mathematics A II	)	80					2	上	
		4060004110	计量地理学	3	48	24				2		
		4000004110	Quantitative Geography	3	40	24				2		
		4070270150	地图学	2.5	56	24				2		
		4060379150	Cartography	3.5	20	24				2		
	必	4050057110	概率论与数理统计 A	1.5	72					2		
学		4030037110	Probability and Mathematics A	4.5	12					3		
	ls.be	4050463130	大学物理 B	_	80					2		
	修	4030403130	College Physics B	5	80					3		
科		4060001110	GIS 程序设计语言	3.5	56	24				2		
	课	4060001110	GIS Programming Language	3.3	20	24				3		
		4050224110	物理实验 B	1	32	32				4	大学物理	
大		4030224110	Physics Lab. B	1	32	32				4	入子初垤	
	Re	4070290150	遥感原理与应用	4	64	24				4		
类	equi	4060380150	Principles and Applications of Remote	4	04	24				4		
	Required Courses		地理信息系统原理与应用									
	Co	4060228120	Principles and Applications of	4	64	28				4	地图学	
课	urse		Geographical Information System									
	Š	10 100 2 2 1 1 0	地质学	2 -	4.0							
		4060027110	Physical Geology	2.5	40					4		
程			自然地理学									
		4060218120	Physical Geography	2.5	40					4		
			测量课程	(一洗	一. 3	5 学4	( 4					ļ.
Bas			Surveying course clus					credit	s)			
ic I			GPS 原理及测量应用									
)isc		4060272120	GPS Principle and Its Application in	3.5	56		10	16		2		
ipli			矿山测量									
nary		4060241120	Mining Geodesy	3.5	56		10	16		2		
Basic Disciplinary Courses												
Smc			小 计 Subtotal	50.5	824	156	10	16				
es			资源工程 CAD	+_								
	选	4060128110	Resource Engineering CAD	2	32	24				2		
	<u> </u>	40 < 0.10 5 1.10	灾害学	1	22							
		4060125110	Disaster Science	2	32					3		
	修	4070227120	虚拟现实技术	2	32	16				2		
		4060227130	Virtual Reality		32	10				3		
	课 Courses	4060030110	房地产管理	2	32					4		
	rses	4000030110	Real Estate Administration		32					7		
	<b>3</b> 2											
				+								
	Ele		小 计 Subtotal	8	128	40						
	Elective	14.14.17.19		1								
	e		要求至少选修 4 学分。									
		NOTE: Min	imum subtotal credits: 4.									

細和	\W.40				2	学时分	而J In	cludin	or.			
课程 类别 Course Classifi- cation	课程 性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学 分 Crs	总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	第二 专业 Second Major
		4060320130	地理科学概论 Introduction to Geography	2	32					4		
		4060068110	空间数据库原理 Spatial Database Principle	3.5	56	24				5		
	必	4060003110	GIS 算法与数据结构 Algorithms and Data Structures of GIS	3.5	56	24				5	地理信息系统 原理与应用	
	修	4060224120	城市系统工程 Urban Systems Engineering	3	48	12				5		
		4060237120	空间分析 Spatial Analysis	3	48	24				5	地理信息系统 原理与应用	
	课	4060321130	生态环境遥感 Eco-Environmental Remote Sensing	3	48	16				6		
专	Requir	4060227120	地理信息系统工程 GIS Engineering	3.5	56	24				6	地理信息系统 原理与应用空 间数据库原理	
业	Required Courses	4060130110	资源环境信息系统 Resource Environment Information System	3.5	56	24				6	地理信息系统原 理与应用遥感原 理与应用 空间数据库原理	
		4060113110	网络 GIS Web GIS	3	48	18				6	地理信息系统 原理与应用	
课			小 计 Subtotal	28	448	166						
		4060060110	计算机图形学 Computer Graphics	2	32	12				5		
程		4060222120	JAVA 语言开发 JAVA language	2	32		16			5		
Sp		4060247120	区域分析与规划 Region Analyzing and Planning	4	64	24				5		
pecializ	选	4060249120	生态环境规划 Ecological Environment Planning	3	48			16		6	Islamin () and a ser ().	
ecialized Courses	修	4060239120	砂山 GIS GIS of Mines	3	48	20				6	地理信息系统 原理与应用	
ırses	课	4060135110	自然资源学 Natural Resource	3	48					6		
	床	4060221110	GIS 进展与前沿 GIS Development 地图设计与编绘	2	32					7		
	Electi	4060281130	Map design and compilation  人文地理学	3	48	40				7		
	Elective Courses	4060248120	Human Geography	2	32					6		
	rses	4060318130	经济地理学 Economic Geography	2	32	8				7		
		4060317130	区域资源与环境实时监测 Resources and Environmental Real-time	3	48	16				7		
		4060016110	城市规划管理及技术 Urban Planning Management and	2	32					7		
		4130438130	城市地理学 Urban geography	2	32					7		

课程	课程			337	7	学时分	西己 Ind	cludin	g	建议修	. L. VII. SEE	第二
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学 分 Crs	总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	读学期 Suggested Term	先修课程 Prerequisite Course	专业 Second Major
		4060100110	人工智能与专家系统 AI & ES	2	32					7		
			小 计 Subtotal	35	560	120	16	16				
			要求至少选修 16 学分。 imum subtotal credits:16.									
		4060321130	武汉市自然地理综合分析方法 Comprehensive Analysis of Natural	1	16				12	2		
<u>\</u>	选	4060322130	区域分析中的主要(基本)数学方法 Main Mathematical Methods of Regional	2	32	16				4		
性课	修	4060323130	地理学方法与创新性思维 Geography Method and Creative	2	32					7		
程 程 Pe	课 E	4060324130	定量遥感 Quantitative Remote Sensing	2	32	8		8		7		
Personalized Course	Elective											
zed Cou	Courses		小 计 Subtotal	7	112	24		8	12			
rse	'S'		学生可跨专业自主选择修读全校其他专业 ents can choose any courses from the other								少选修 10 学	分。

## 五、集中性实践教学环节建议进程表

## V Practice Schedule

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
1060002110	军事训练 Military Training	3	1.5	1	
4060255120	GIS 应用技能训练 Practical Training on GIS	2	2	2	
4060220120	地理地质认识实习 Practice of Understanding Geographic and Geology	2	2	4	
4060282130	地图学与遥感制图实习 Practice of Cartographic and Remote sensing Cartography Experiment	2	2	4	
4060298130	空间数据组织与管理实习 Practice of Spatial Data Organization and Management	2	2	5	
4060322130	地理建模 Geographic modeling	2	2	5	
4060262120	地理信息系统工程综合实习 Practice of GIS	2	2	6	
4060194110	能力拓展训练 Ability Development Training	2	2	6	
4060153110	毕业实习 Graduation Practice	2	2	8	
4060260120	毕业设计(论文) Graduation Thesis	15	10	8	
	小 计 Subtotal	34	27.5		

### 六、其它要求

#### **VI Recommendations on Course Studies**

《形势与政策》课程,平均每学期 16 学时,一般按专题进行,在第七学期末考核,计 2 个课外学分,具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the  $7^{th}$  term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人: 袁艳斌 专业培养方案责任人: 黄解军

## 【环境工程专业】2015 版本科培养方案

## **Undergraduate Education Plan for Specialty in Environmental Engineering (2015)**

专业名称 环境工程 主干学科 土木工程,化工与制药工程,生物工程

Major Environmental Major Civil engineering, Chemical and

Engineering Disciplines Pharmaceutical Engineering, Biological

Engineering

计划学制 四年 授予学位 工学学士

Duration 4 Years Degree Granted Bachelor of Engineering

所属大类 **环境科学与工程类** 大类培养年限 **2年** Disciplinary Environment Science & Duration 2 years

Engineering

#### 最低毕业学分规定

#### **Graduation Credit Criteria**

课程类别 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Courses in General Discipline	专业课程 Courses in Specialty	个性课程 Personalize d Course	集中性实践 Practice Courses	课外学 Extracurric ular Credits	总学分 Total Credits
必修课 Required Courses	35	49	29.5	\	28.5	\	190
选修课 Elective Courses	9	4	15	10	\	10	190

#### 一、培养目标与毕业要求

#### I Educational Objectives & Requirement

#### (一)培养目标

- (1) 身心健康,具备良好的敬业精神、社会责任感和工程职业道德,关注当代全球和社会问题,具有质量意识、环境意识和安全意识。
- (2) 具有从事环境工程与科学研究、工程设计和技术服务等工作所需的化学知识、工程知识和其它相关自然科学知识,并能将理论运用于解决工程问题。
- (3) 在设计单位、科研单位、施工单位,工矿企业、环保部门、政府部门、经济管理部门、学校等 从事设计、施工、管理、教育和研究开发方面工作
- (4) 具有良好的口头和书面表达和交流沟通能力、良好的团队意识和合作精神,具有终身学习的能力。

#### ( I ) Educational Objectives

- (1) Physical and mental health, have good professional dedication, sense of social responsibility and engineering ethics, focus on the contemporary global and social issues, quality consciousness, environmental awareness and safety awareness.
- (2) Have a good knowledge of chemistry, engineering and other related knowledge of natural science knowledge to be engaged in environmental engineering and scientific research, engineering design and technical services, and be able to apply theory to solve engineering problems.
- (3) Graduates of the program are sought by design institute, scientific research institute, construction company, mine corporation, local, regional, and national environmental protection department, government agencies, university and so on.

(4) With a good ability of expression and communication in oral and written, with good team consciousness and the spirit of cooperation, and with the ability of lifelong learning

#### (二) 毕业要求

- (1) 掌握无机化学、有机化学、分析化学、物理化学、工程制图、微生物学、力学等知识;
- (2) 学生掌握本专业的基本理论知识和工程基础知识,能够利用原理性知识进行自主发现、自主设计和自主解决与环境工程相关的科学问题;
- (3) 掌握水污染控制工程、大气污染控制工程、噪声污染控制工程、固体废物处理处置与资源化工程的基本原理和设计方法;
- (4) 具有污染物监测和分析、环境监测、环境质量评价、环境规划与管理的初步能力;
- (5) 学生了解本专业的发展动态和前沿;
- (6) 学生具有良好的思想素质、身体素质、心理素质、文化修养、社会道德和责任担当等人文素养;
- (7) 学生了解当代全球问题和社会问题,在工程设计中综合考虑经济、环境、法律、安全和伦理等制约因素。
- (8) 学生具有逻辑思维和辩证思维的能力,具有批判意识和求真务实的科学思维方法,具有创新意识,掌握基本的创新方法。
- (9) 掌握文献检索、资料查询的基本方法,具有初步的科学研究和实际工作能力。
- (10) 学生具有良好的口头和书面表达和交流能力,至少熟练掌握一门外语进行技术沟通和交流能力。 具有良好的团队意识和合作精神。
- (11) 学生能够胜任本专业入门级的职业岗位,具备研究生课程学习所需的认知和基础能力。
- (12) 学牛具有进行终身学习的愿望和能力,具有适应环境工程技术不断发展的能力。

#### (II) Graduation Requirement

- (1) An ability to apply the fundamental principle and knowledge of Inorganic Chemistry, Organic chemistry, analytic chemistry, physical chemistry, engineering drawing, microbiology, mechanics;
- (2) An ability to apply the basic theory knowledge and basic engineering knowledge, and an ability to discovery, design and solve the problem independently Using the original rational knowledge;
- (3) An ability for the design of water pollution control project, air pollution control project, noise pollution control project, disposing and resource project of solid waste;
- (4) The initial ability of monitoring and analyzing of pollutants, environmental monitoring, environmental quality assessment, environmental planning and managing;
  - (5) A knowledge of the theory cutting-edge and developments of Environmental science and technology;
- (6) With good thought quality, physical quality, psychological quality, culture, social morality and responsibility to bear such as the humanities;
- (7) Understand contemporary global issues and social problems, and consider economic, environmental, legal, safety and ethical constraints in engineering design;
- (8) An ability of logical thinking and dialectical thinking, and with critical awareness, practical scientific thinking method and innovation consciousness, and master the basic method of innovation;
- (9) An ability to grasp the fundamental methods of literature researching and information assessing , and having the initial ability of science researching and working;
- (10) A grasp of a foreign language well, and the strong ability to reading, writing, listening, speaking, translating and information of getting and treating;
  - (11) An ability to this professional entry-level jobs, graduate courses required basis and cognitive ability;
- (12) With the desire and ability of lifelong learning, and having the ability to adapt to the environment engineering technology development.

附:培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4
毕业要求 1		V		
毕业要求 2		V	√	
毕业要求 3		V	√	√
毕业要求 4		V	√	√
毕业要求 5			√	√
毕业要求 6	√			
毕业要求 7	√			
毕业要求 8		V	√	√
毕业要求 9		V	√	√
毕业要求 10				√
毕业要求 11				√ √
毕业要求 12				√ √

#### 二、专业核心课程与专业特色课程

#### II Core Courses and Characteristic Courses

#### (一) 专业核心课程:

环境工程原理、环境工程微生物学、环境监测、水污染控制工程、大气污染控制工程、固体废物处理处置工程、环境质量评价。

Core Courses: Environmental Engineering Principle, Environmental Engineering Microbiology, Environmental Monitoring, Water Pollution Control Engineering, Air Pollution Control Engineering, Solid Waste Treatment and Disposal, Environmental Quality Assessment.

#### (二) 专业特色课程:

水污染控制工程、大气污染控制工程、固体废物处理与处置工程、环境工程微生物学、环境质量评价。

Characteristic Courses: Water Pollution Control Engineering, Air Pollution Control Engineering, Solid Waste Treatment and Disposal Engineering, Environmental Engineering Microbiology, Environmental Quality Assessment.

附: 毕业要求实现矩阵:

<b>幸</b> 业	专业特					;	环境』	程专	业毕	<b>业要求</b>	ξ			
核心 课程	色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		思想道德修养与法律基础						V	J	V		V	J	V
		Morals, Ethics and Fundamentals of Law						•	•	٧		V	٧	٧
		中国近现代史纲要						اء	٦/			V	اما	V
		Outline of Contemporary and Modern Chinese History						V	V	V		V	٧	V
		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								V		V		$\sqrt{}$
		Socialism with Chinese Characteristics												
		马克思主义基本原理						ا	ا	.1		.1	اء	V
		Marxism Philosophy						٧	٧	V		V	٧	V
		军事理论						ا	ا	ا		ا	اء	ما
		Military Theory						٧	7	٠٧		V	-7	٧

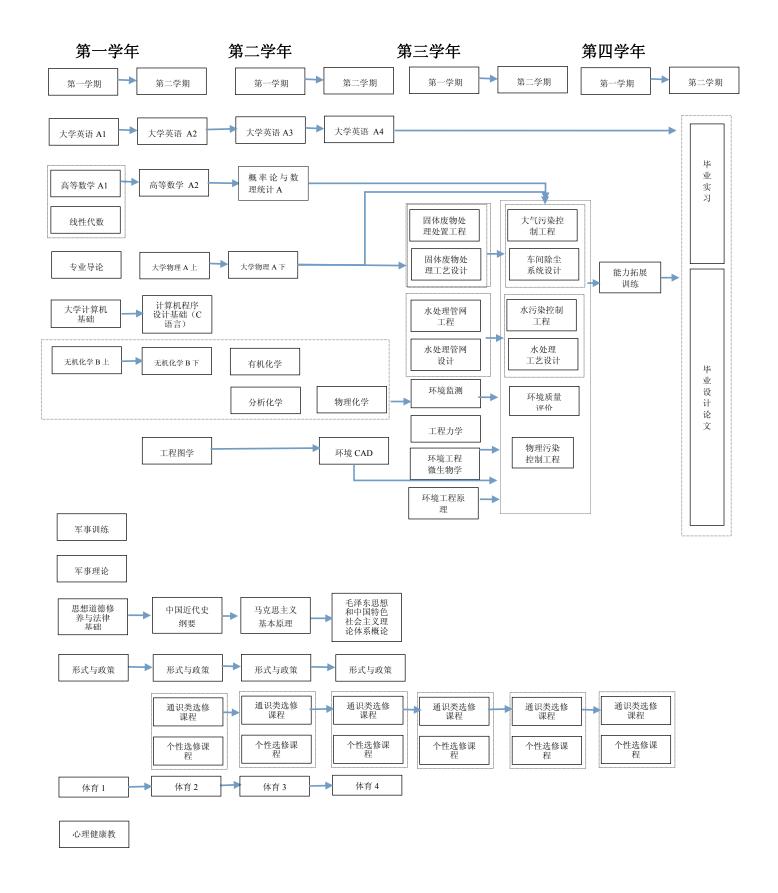
专业 核心	专业特 色课程	课程名称	环境工程专业毕业要求											
核心 课程			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		心理健康教育 Mental health education						<b>V</b>	<b>V</b>	<b>V</b>		<b>V</b>	<b>V</b>	<b>V</b>
		体育						ا	<b>V</b>					
		Physical Education						V	٧					
		大学英语		V								V		
		College English		'								'		
		大学计算机基础												
		Foundation of Computer	<u> </u>											'
		计算机程序设计基础(C语言)												<b>√</b>
		Fundamentals of Computer Program Design(C)												
		专业导论		$\checkmark$										
		Introduction to Environmental Science												
		高等数学	$\checkmark$	$\checkmark$										
		Advanced Mathematics												
		无机化学												
		Chemistry												
		工程图学 B	$\checkmark$	$\checkmark$										
		Engineering Drawing B												
		大学物理	$\checkmark$	$\checkmark$										
		Physics												
		线性代数	$\checkmark$	$\checkmark$		$\sqrt{}$								
		Linear Algebra 有机化学 C												
				$\sqrt{}$										
		Organic Chemistry C 物理化学 C												
			$\checkmark$	$\checkmark$		$\sqrt{}$								
		Physical Chemistry C 分析化学 B												
		ガが化学 B Analytical Chemistry B		$\checkmark$										
		环境 CAD												
		Environmental CAD	$\checkmark$	$\checkmark$										
		环境材料概论												
		Introduction to Environmental Materials												
		资源环境经济学												
		Resource and Environment Economics												
		流体力学 C												
		Fluid Mechanics D												
		清洁生产导论												
		Introduction of cleaner Production Technology										$\checkmark$		
,	,	环境工程微生物学	,	,	,	,								
		Environmental Engineering Microbiology												
		水处理管网工程	,	,	,									
		WaterTreatment Pipe Network Engineering												
		工程力学 A	,	,										
		Engineering Mechanics A												
1		环境工程原理	1	ı		,								
$\sqrt{}$		Environmental Engineering Principle		√		√								
		环境监测		ı	J	J								
		Environmental Monitoring		√	√	√								
,1	.1	水污染控制工程	.1	.1	.1									
	√	Water Pollution Control Engineering	√	√	√									
۱.	<b>V</b>	大气污染控制工程			.1									
$\checkmark$	٧	Air Pollution Control Engineering		√	√									

专业	土小肚	课程名称	环境工程专业毕业要求											
核心 课程	专业特 色课程		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<b>V</b>	1	固体废物处理处置工程 Solid Waste TreatmentandDisposal Engineering	<b>V</b>	<b>V</b>	<b>V</b>									
<b>√</b>		环境质量评价 Environmental Qulity Assessment		<b>V</b>	<b>√</b>	<b>V</b>								
		物理污染控制工程		<b>√</b>	<b>√</b>	V								
		Physical Pollution Control Engineering 环境工程设计基础		<u> </u>										
		Environmental Engineering Design		√	√									
		土建概论 Civil Engineering Introduction		<b>V</b>										
		空气污染气象学	V	<b>√</b>										
		Air pollution meteorology 环境毒理学	•											
		环境母理字 Environmental toxicology	$\sqrt{}$	$\checkmark$										
		自然灾害学			<b>√</b>	<b>V</b>	V							
		Natural Disaster 工程管理概论		<u>'</u>			· ·							
		Project Management Introduction				√								
		现代环境测试技术		<b>√</b>		V								
		Modern Environmental Testing Technology 环境科学专业英语		,		,								
		环境科学专业央暗 English for Environmental Science				√						√		
		水处理新工艺	V	V	<b>√</b>									
		New water Treatment Technology	'	<u>'</u>	'									
		环境化学 B Environmental Chemistry B	$\sqrt{}$	$\sqrt{}$										
		环境工程施工及概预算		.1	.1								.1	
		Environmental Project Budget		√									√	
		文献检索				√								
		Literature Searching 环境规划学												
		Environmental Planning				√								
		生物化学 C	V	<b>√</b>										
		Biological Chemistry C 生态工程学												
		主版工程子 Biology Engineering												
		环境管理与环境法规		<b>√</b>		<b>√</b>		<b>√</b>						
		Environmental Management and Laws		٧		V		, v						
		环境监理概论 Introduction to Environmental Supervision		<b>V</b>		√								
		环境科学与工程前沿 Frontiers of Environmental Science and Engineering		<b>V</b>		<b>V</b>	<b>V</b>							
		环境监察概论 Introduction to Environmental Monitoring		<b>V</b>		<b>V</b>								
		军事训练 Military Training	<b>V</b>											V
		基础强化训练 Foundation Strengthening Training		<b>√</b>	<b>√</b>	√					<b>√</b>			
		认识实习	<b>√</b>	<b>√</b>	<b>√</b>	V					<b>√</b>		<b>V</b>	V
		Understanding of Specialty	٧	٧	٧	٧					٧		V	V

专业	专业特 色课程		环境工程专业毕业要求											
核心 课程		课程名称		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		环境监测综合实验 Environmental Monitoring Experiment	<b>√</b>	<b>√</b>	<b>V</b>	√					<b>V</b>		<b>√</b>	<b>V</b>
		水处理管网设计 Design on Water Treatment Pipe Network	<b>√</b>	<b>V</b>	<b>V</b>						<b>V</b>		<b>V</b>	<b>V</b>
		水污染控制综合实验 Experiment of Water pollution Control		<b>V</b>	<b>V</b>						<b>V</b>		<b>V</b>	<b>V</b>
		大气污染控制实验技术 Experiment Technique of Air Pollution		<b>√</b>	<b>V</b>						<b>V</b>		<b>√</b>	<b>V</b>
		固体废物处理实验技术 Experiment Technique of Solid Waste Disposal		√	√						√		√	<b>√</b>
		水处理工艺设计 Design on Water Treatment Process		<b>√</b>	<b>V</b>						<b>V</b>		<b>√</b>	<b>V</b>
		车间除尘系统设计 Design on Workshop Dust Removal System		<b>√</b>	<b>√</b>						<b>√</b>		<b>√</b>	<b>√</b>
		固体废物处理工艺设计 Design on Solid Waste Treatment Process		<b>V</b>	<b>V</b>						<b>V</b>		√	<b>V</b>
		微生物学实验技术 Microbiology Experiment Technology		<b>V</b>	<b>V</b>						<b>V</b>		<b>V</b>	<b>√</b>
		生产实习 Practice of Specialty		√	<b>V</b>						<b>V</b>		√	<b>V</b>
		能力拓展训练 Ability to Develop Training		√	<b>V</b>						<b>V</b>		√	<b>V</b>
		毕业实习 Graduation Practice		√	√						√		√	<b>V</b>
		毕业设计(论文) Graduation Design (Thesis)		√							√		<b>V</b>	<b>V</b>

#### 三、课程教学进程图

#### **Ⅲ** Teaching Process Map



## 四、理论教学建议进程表

## IV Theory Course Schedule

课程	课程					学时分	r配 Ir	cludin	g	カンツを		第二
类别	性质	课程编号	课程名称	学分	总学		L <del>1</del> 11	实践	:田 <i>H</i> L	建议修 读学期	先修课程	专业
Course	Course	Course Number	Course Title	Crs	时	实验				Suggested	Prerequisite	Second
Classifi- cation	Nature	Course runnoer	Course Title	Cis	Tot	Exp.	Ope-	Prac-	Extra-	Term	Course	Major
cation	Nature				hrs.	Î	ration	tice	cur			
		4220001110	思想道德修养与法律基础	3	48			8		1-6		
		4220001110	Morals, Ethics and Fundamentals of Law	3	70			0		1-0		
		4220002110	中国近现代史纲要	_	22					1.6		
		4220002110	Outline of Contemporary and Modern Chinese History	2	32					1-6		
			毛泽东思想和中国特色社会主义理论体系概论									
		4220003110	Introduction to Mao Zedong Thought and	4	96			32		1-6		
			Socialism with Chinese Characteristics									
			马克思主义基本原理									
		4220005110	Marxism Philosophy	3	48			8		1-6		
			军事理论									
		1060003130	Military Theory	1	32			16		1-4		
			心理健康教育									
		1050001130		1	16					1-2		
			Mental health education									
通	必	4210001110	体育 1	1	32					1		
			Physical Education I									
	修	4210002110	体育 2	1	32					2	体育 1	
识			Physical Education II									
以		4210003110	体育 3	1	32					3	体育 2	
			Physical Education III								11 13 -	
	课	4210004110	体育 4	1	32					4	体育 3	
课		1210001110	Physical Education IV	1	J-						11-13-2	
		4030002110	大学英语 A1	3	64				16	1		
	Re	4030002110	College English A 1	3	0-7				10	1		
	Required Courses	4030003110	大学英语 A2	3	64				16	2	大学英语 A1	
程	red	4030003110	College English A II	3	04				10	2	入子英语 AI	
	Coı	4020004110	大学英语 A3	2 (	64				17	2	上光本,至 10	
	ırse	4030004110	College English A III	3	04				16	3	大学英语 A2	
P	S	4020005440	大学英语 A4	_	<i>C</i> 4				1.6		1 1/2 + 2	
Public		4030005110	College English A IV	3	64				16	4	大学英语 A3	
іс В			大学计算机基础									
		4120017110	Foundation of Computer	2	32		12			1		
c C			程序设计语言说	<b>具程组(</b>	三洗-	<b>一,</b> 3:	学分)			ı	l	
asic Courses			Computer Program Design					reelv)				
ses			计算机程序设计基础(C语言)			.,		- 11				
		4120023110	Fundamentals of Computer Program Design(C)	3	48		12			1-2		
			计算机程序设计基础(FORTRAN 语言)		1							
		4120024110	日 昇 切(在) ア 区 日 茎型 (FORTRAIN 信 音 ) Fundamentals of Computer Program Design(FORTRAN)	3	48		12			1-2		
			计算机程序设计基础(VB语言)									
		4120025110	下昇が作け及い基価(VB 语言) Fundamentals of Computer Program Design(VB)	3	48		12			1-2		
			rundamentals of Computer Program Design(VB)									
			小 计 Subtotal	35	736		24	64	64			
		시 하는 시 . 표 의사		,	/ キデ ン›	 4	やださ	, Fin /IP	0 & )	<b>以</b> 八 ロ:	ソスムルートリ	十字本
	Ele	创新创业类	1Estaman ali C								必须选修艺术(	
	cti.选		d Entrepreneurship Courses	_							学分。理工科等	
	选修课 Elective Courses	人文社科类	10:							7百理关	课程,其他专业	此子生
	ou课		al Science Courses			一门科 dents				tain at la-	st 9 credits, and	d must
	rses	经济管理类						_				
	<b>-</b>	Economy and	select art courses from Art and Physical Education Courses to obtain									

课程	课程					学时分	· · · · · · · · · · · · · · · · · · ·	ncludin	g	-t->>-11:		444
类别	保性 性质	课程编号	课程名称	学分	总学			1	Ī	建议修读学期	先修课程	第二专业
Course	Course	Course Number	Course Title	Crs	时	实验		实践		Suggested	Prerequisite	Second
Classifi- cation	Nature	Course runneer	Course True	CIS	Tot	Exp.	Ope- ration	Prac- tice	Extra- cur	Term	Course	Major
Cution		지 까 ++ - 12 - 14			hrs.							
		科学技术类	Fachnalagy Courses								dents should so	
		艺术体育类	Technology Courses								Science Cour other students	
			ical Education Courses								echnology Cou	
		_	专业导论									
		4060274130	Introduction to Environmental Science	1	16					1		
		4050063110	高等数学 A 上	5	80					1		
		4030003110	Advanced Mathematics A I	,	80					1		
		4050064110	高等数学 A 下	5	80					2	高等数学 A	
			Advanced Mathematics A II							_	上	
		4200307120	无机化学 B 上	3	48					1		
			Chemistry B I									
		4200308120	无机化学B下	1.5	24					2	无机化学 B	
			Chemistry B II 无机化学 B 实验上								上	
		4200309120	元机化字 B 头验上   Inorganic Chemistry B Experiment I	1	24	24				1		
			无机化学B实验下								无机化学 B	
学		4200310120	Inorganic Chemistry B Experiment II	0.5	24	24				2	实验上	
			工程图学 B								入極上	
科		4080041110	Engineering Drawing B	4	64		4			2		
		40.5000440	线性代数	1	4.0							
大		4050229110	Linear Algebra	2.5	40					2		
		4050021110	大学物理 A 上	3.5	56					2		
类		4030021110	Physics A I	3.3	36					2		
	必	4050022110	大学物理 A 下	3.5	56					3	大学物理 A	
课	修 Required	4030022110	Physics A II	3.3	30					3	上	
	uire	4050466130	物理实验A上	1	32	32				3		
程	d Co		Physics Lab. A I							_	dt em Net	
	Courses	4050467130	物理实验 A 下 Physics Lab. A II	1	32	32				4	物理实验 A	
Basi	g 课										上	
c D		4200274120	有机化学 C Organic Chemistry C	3	48					3		
isci			有机化学C实验									
plin		4200275120	Organic Chemistry C Experiment	0.5	16	16				3		
Basic Disciplinary Courses			分析化学 B									
Cou		4200199120	Analytical Chemistry B	2	32					3		
ırses		4200201120	分析化学 B 实验	1.5	40	40				2		
32		4200201120	Analytical Chemistry B Experiment	1.5	48	48				3		
		4200184120	物理化学 C	4	64					4		
		4200184120	Physical Chemistry C	4	04					4		
		4200185130	物理化学C实验	0.5	16	16				4		
		4200103130	Physical Chemistry C Experimental	0.5	10	10				7		
		4050058110	概率论与数理统计B	3	48					4		
			Probability and Mathematics B				W .:					
			计算机辅助制图 CARC				学分)	)				
			CAD Cour	ses(Cnoic	e one i	reery)				l	1	
		4060128110	资源工程 CAD Resource Engineering CAD	2	32		20			4		
			环境 CAD									
		4060039110	Environmental CAD	2	32		20			4		
		l		1	<u> </u>	1	1	l	1	ı	1	1

课程	课程					学时分	↑配 Ir	cludin	g	74. V.C. 45.		<i>k</i> *
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学 时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	第二 专业 Second Major
			小 计 Subtotal	49	880	192	24					
	Vel-	4060040110	环境材料概论 Introduction to Environmental Materials	2	32					3		
	选修	4200237120	生物化学 D Biological Chemistry D	2	32					3		
	课	4060115110	文献检索 Literature Searching	1	16					4		
	Щ	4050134110	流体力学 C Fluid Mechanics D	3	48	6				4		
	Elective Courses	4060097110	清洁生产导论 Introduction of cleaner Production Technology	2	32					4		
	Course		小 计 Subtotal	10	160	6						
	es		要求至少选修 4 学分。 imum subtotal credits: 4.									
		4060289130	环境工程微生物学 Environmental Engineering Microbiology	2	32					5		
		4060305130	水处理管网工程 WaterTreatment Pipe Network Engineering	2.5	40					5		
	必	4050071110	工程力学 A Engineering Mechanics A	4	64	4				5		
		4200290130	环境工程原理 Environmental Engineering Principle	3	48	8				5		
	修	4060292130	环境监测 Environmental Monitoring	3	48					5	分析化学 B	
	课 Required	4060307130	水污染控制工程 Water Pollution Control Engineering	3.5	56					6		
专	iired C	4060022110	大气污染控制工程 Air Pollution Control Engineering	3.5	56					6		
∯ Specia	Courses	4060035110	固体废物处理处置工程 Solid Waste Treatment and Disposal Engineering	2.5	40					5		
业 W Specialized Courses		4060365140	环境质量评价 Environmental Qulity Assessment	2.5	40			8		6		
ourses		4060366140	物理污染控制工程 Physical Pollution Control Engineering	3	48			16		6	大学物理 A 上	
程			小 计 Subtotal	29.5	472	20		24				
		4060041110	环境工程设计基础 Environmental Engineering Design	2	32					5		
	П и	4060288130	环境毒理学 Environmental toxicology	2	32					6		
	Elective Courses	4060379150	现代环境测试技术 Modern Environmental Testing Technology	2.5	40	20				6		
	e Courses	4060299130	空气污染气象学 Air pollution meteorology	2	32					7		
	S 床	4060134110	自然灾害学 Natural Disaster	2	32					7		
		4060051110	环境科学专业英语 English for Environmental Science	2	32					7		

课程	课程					学时分	产配 Ir	ncludin	g	建议修		第二
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学 时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	读学期 Suggested Term	先修课程 Prerequisite Course	专业 Second Major
		4060109110	水处理新工艺 New water Treatment Technology	2	32					7		
		4060048110	环境化学 B Environmental Chemistry B	2	32					5		
		4060380150	环境工程施工及概预算 Environmental Project Budget	2.5	40			8		7		
		4060046110	环境规划学 Environmental Planning	2	32					7		
		4060103110	生态工程学 Biology Engineering	2	32					7		
		4060045110	环境管理与环境法规 Environmental Management and Laws	2	32					7		
		4060129110	资源环境经济学 Resource and Environment Economics	2	32					7		
			小 计 Subtotal	27	432	20		8				
			要求至少选修 15 学分 num subtotal credits: 15		•		l .		l .			
			环境监理概论 Introduction to Environmental Supervision	2	32					6, 7		
个	选	4060326130	环境科学与工程前沿 Frontiers of Environmental Science and Engineering	2	32					4		
Personalized Course	Elective Courses	4060327130	环境监察概论 Introduction for Environmental Monitoring	2	32					6、7		
zed Cou	修 'e Course											
urse 程	s 课		小 计 Subtotal		96							
		NOTE: Stud	学生可跨专业自主选择修读全校其他专业的 lents can choose any courses from the other sp ototal credits: 10.									above.

# 五、集中性实践教学环节建议进程表

# **V** Practice Schedule

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
1060002110	军事训练 Military Training	3	1.5	1	
4060198110	认识实习 Understanding of Specialty	1	1	3	
4060177110	基础强化训练 Foundation Strengthening Training	1	1	4(暑期)	
4060293130	环境监测综合实验 Environmental Monitoring Experiment	1	1	5(分散)	
4060306130	水处理管网设计 Design on Water Treatment Pipe Network	2	2	5	
4060309130	水污染控制综合实验 Experiment of Water pollution Control	1	1	6(分散)	

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
4060156110	大气污染控制实验技术 Experiment Technique of Air pollution Control	1	1	6(分散)	
4060165110	固体废物处理实验技术 Experiment Technique of Solid waste disposal	1	1	5(分散)	
4060368140	水处理工艺设计 Design on Water Treatment Process	1	1	6	
4060278130	车间除尘系统设计 Design on Workshop Dust Removal System	1	1	6	
4060285130	固体废物处理工艺设计 Design on Solid Waste Treatment Process	1	1	5	
4060311130	微生物学实验技术 Microbiology Experiment Technology	1	1	6(分散)	
4060203110	生产实习 Practice of Specialty	2	2	6	
4060193110	能力拓展训练 Ability to Develop Training	1	1	7	
4060151110	毕业实习 Graduation Practice	2	2	8	
4060259120	毕业设计(论文) Graduation Design (Thesis)	15	10	8	
	小 计 Subtotal	36	28.5		

#### 六、其它要求

#### **VI Recommendations on Course Studies**

《形势与政策》课程,平均每学期 16 学时,一般按专题进行,在第七学期末考核,计 2 个课外学分,具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the  $7^{th}$  term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人: 袁艳斌 专业培养方案责任人: 张高科

# 【环境科学专业】2015 版本科培养方案

# **Undergraduate Education Plan for Specialty in Environmental Science (2015)**

专业名称 环境工程 主干学科 环境自然科学,环境技术科学,环

境人文社会科学

Major Environmental Science Major Environmental Science,

Disciplines Environmental Science and

Technology, the Environment of

**Humanities and Social Sciences** 

计划学制 四年 授予学位 理学学士

Duration 4 Years Degree Granted Bachelor of Science

所属大类 **环境科学与工程类** 大类培养年限 **2年** Disciplinary Environment Science & Duration 2 years

Engineering

#### 最低毕业学分规定

#### VI. Graduation Credit Criteria

课程类别 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课 程 Basic Courses in General Discipline	专业课程 Courses in Specialty	个性课程 Personalized Course	集中性实践 Practice Courses	课外学 Extracurricular Credits	总学分 Total Credits
必修课 Required Courses	35	49	32.5	\	25.5	\	100
选修课 Elective Courses	9	4	15	10	\	10	190

#### 一、培养目标与毕业要求

#### I Educational Objectives & Requirement

#### (一) 培养目标

- (1) 身心健康,具备良好的敬业精神、社会责任感和工程职业道德,关注当代全球和社会问题,具有质量意识、环境意识和安全意识。
- (2) 具有从事环境科学研究、工程设计和技术服务等工作所需的化学知识、工程知识和 其它相关自然科学知识,并能将理论运用于解决工程问题。
- (3) 在设计单位、科研单位、施工单位,工矿企业、环保部门、政府部门、经济管理部门、学校等从事设计、施工、管理、教育和研究开发方面工作
- (4) 具有良好的口头和书面表达和交流沟通能力、良好的团队意识和合作精神,具有终身学习的能力。

#### ( I ) Educational Objectives

- (1) Physical and mental health, have good professional dedication, sense of social responsibility and engineering ethics, focus on the contemporary global and social issues, quality consciousness, environmental awareness and safety awareness.
  - (2) Have a good knowledge of chemistry, engineering and other related knowledge of natural

science knowledge to be engaged in environmental scientific research, engineering design and technical services, and be able to apply theory to solve engineering problems.

- (3) Graduates of the program are sought by design institute, scientific research institute, construction company, mine corporation, local, regional, and national environmental protection department, government agencies, university and so on.
- (4) With a good ability of expression and communication in oral and written, with good team consciousness and the spirit of cooperation, and with the ability of lifelong learning

#### (二) 毕业要求

- (1) 掌握数学、物理、化学和微生物等方面的基本理论和基本知识;
- (2) 掌握环境监测、环境评价和环境管理等方面的基本理论、基本知识和基本技能:
- (3) 具有水、气、声、固等污染控制新技术和新工艺的研发与设计能力;
- (4) 熟悉国家环境保护、自然资源合理利用、可持续发展、知识产权等有关政策和法规;
- (5) 具有一定的实验设计能力,分析整理实验结果的能力以及撰写科技报告的能力.;
- (6) 学生了解本专业的发展动态和前沿;
- (7) 学生具有良好的思想素质、身体素质、心理素质、文化修养、社会道德和责任担当 等人文素养:
- (8) 学生了解当代全球问题和社会问题,在工程设计中综合考虑经济、环境、法律、安全和伦理等制约因素。
- (9) 学生具有逻辑思维和辩证思维的能力,具有批判意识和求真务实的科学思维方法, 具有创新意识,掌握基本的创新方法。
- (10) 掌握文献检索、资料查询的基本方法,具有初步的科学研究和实际工作能力。
- (11) 学生具有良好的口头和书面表达和交流能力,至少熟练掌握一门外语进行技术沟通和交流能力。具有良好的团队意识和合作精神。
- (12) 学生能够胜任本专业入门级的职业岗位,具备研究生课程学习所需的认知和基础能力。
- (13) 学生具有进行终身学习的愿望和能力,具有适应环境工程技术不断发展的能力。

#### (II) Graduation Requirement

- (1) A grasp of the fundamental theory of mathematics, physics, chemistry and microbiology.
- (2) A grasp of the fundamental theory, basic knowledge and skills of environmental monitoring, environmental evaluation, environmental management and so on.
- (3) Be proficient in researching and developing the new technology in water pollution control, air pollution control, noise pollution control and solid waste treating and disposal.
- (4) Be familiar with the policies and regulations about environmental protection, rational use of natural resources, sustainable development and intellectual property.
- (5) An ability to design and conduct experiments, to analyze and interpret data, as well as to write a technical report or proposal in the filed of Environmental Science.
- (6) A knowledge of the theory cutting-edge and developments of Environmental science and technology;
- (7) With good thought quality, physical quality, psychological quality, culture, social morality and responsibility to bear such as the humanities;
- (8) Understand contemporary global issues and social problems, and consider economic, environmental, legal, safety and ethical constraints in engineering design;

- (9) An ability of logical thinking and dialectical thinking, and with critical awareness, practical scientific thinking method and innovation consciousness, and master the basic method of innovation;
- (10) An ability to grasp the fundamental methods of literature researching and information assessing, and having the initial ability of science researching and working;
- (11) A grasp of a foreign language well, and the strong ability for reading, writing, listening, speaking, translating and information of getting and treating;
- (12) An ability to this professional entry-level jobs, graduate courses required basis and cognitive ability;
- (13) With the desire and ability of lifelong learning, and having the ability to adapt to the environment engineering technology development.

PD: ロクト	日你关奶尼件			
	培养目标 1	培养目标 2	培养目标3	培养目标 4
毕业要求 1		√		
毕业要求 2		√	√	
毕业要求 3		V	√	V
毕业要求 4	√	V	√	V
毕业要求 5		√	√	V
毕业要求 6			√	√
毕业要求 7	√			
毕业要求 8	√			√
毕业要求 9		√	√	√
毕业要求 10		√	√	√
毕业要求 11				√
毕业要求 12				√
毕业要求 13				V

附:培养目标实现矩阵

#### 二、专业核心课程与专业特色课程

#### II Core Courses and Characteristic Courses

#### (一) 专业核心课程:

环境生态学、环境化学、环境生物学、环境监测、水污染控制基础、大气污染控制基础、 固体废物处理处置基础、环境微生物学、环境质量评价

Environmental Ecology, Environmental Chemistry, Environmental Biology, Environmental Monitoring, Water Pollution Control, Air Pollution Control, Solid Waste Treatment and Disposal, Environmental Microbiology, Environmental Quality Assessment.

#### (二) 专业特色课程:

环境化学、环境监测、水污染控制基础、大气污染控制基础、环境质量评价、环境微生物学

Water Pollution Control Engineering, Air Pollution Control Engineering, Solid Waste Treatment and Disposal Engineering, Environmental Engineering Microbiology, Environmental Quality Assessment

环境化学、环境监测、水污染控制基础、大气污染控制基础、环境质量评价、环境微生

#### 物学

Environmental Chemistry, Environmental Monitoring, Water Pollution Control, Air Pollution Control, Environmental Quality Assessment, Environmental Microbiology

附: 毕业要求实现矩阵:

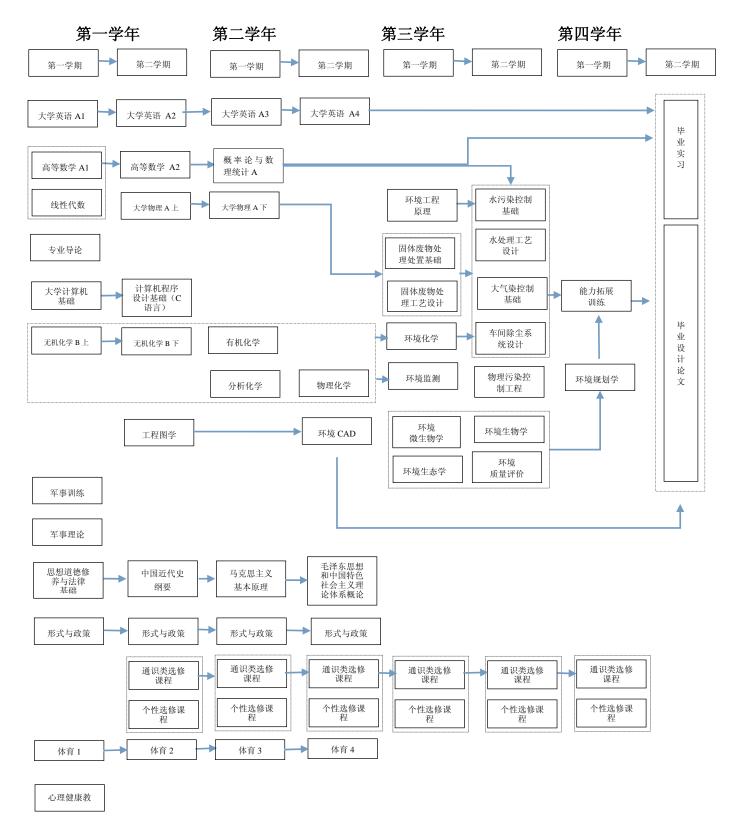
专业	专业	三业安水头现起阵:					环块	竟科学	<b>全</b>	毕业	要求				
核心 课程	特色 课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law				<b>V</b>			<b>V</b>	<b>V</b>	<b>V</b>			<b>√</b>	<b>√</b>
		中国近现代史纲要 Outline of Contemporary and Modern Chinese History				√			√	√	√			√	√
		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 Socialism with Chinese Characteristics				<b>V</b>			<b>V</b>	<b>V</b>	<b>V</b>			√	<b>V</b>
		马克思主义基本原理 Marxism Philosophy				<b>V</b>			√	<b>V</b>	√			√	√
		军事理论 Military Theory							<b>V</b>	<b>V</b>	<b>V</b>			<b>V</b>	<b>V</b>
		心理健康教育 Mental health education							<b>V</b>	<b>V</b>	<b>V</b>			<b>√</b>	<b>V</b>
		体育 Physical Education							<b>V</b>	<b>V</b>					
		大学英语 College English											√.		
		大学计算机基础 Foundation of Computer	<b>V</b>												
		计算机程序设计基础(C 语言) Fundamentals of Computer Program Design(C) 专业导论	1												
		专业寻论 Introduction to Environmental Science	√	√											
		高等数学 Advanced Mathematics	√												
		无机化学 Chemistry	√												
		工程图学 B Engineering Drawing B	<b>V</b>												
		大学物理 Physics	V												
		线性代数 Linear Algebra	√												
		有机化学 C Organic Chemistry C	√				√								
		物理化学 C Physical Chemistry C	<b>V</b>				<b>V</b>								
		分析化学 B Analytical Chemistry B	<b>V</b>				<b>V</b>								
		环境 CAD Environmental CAD	<b>V</b>		<b>V</b>		<b>V</b>							<b>V</b>	
		环境材料概论 Introduction to Environmental Materials			<b>V</b>		<b>V</b>	<b>V</b>						<b>√</b>	

<b>幸业</b>	专业	THAT A Ab					环块	竟科学	≥专业	毕业	要求				
核心 课程	特色 课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		资源环境经济学 Resource and Environment Economics		1	1		1	1		1				1	
		流体力学 C Fluid Mechanics D			<b>V</b>		1							√	
		清洁生产导论 Introduction of cleaner Production Technology		1	1		1	1					1	1	
		环境生态学 A Environmental Ecology A	1	V	√		1							√	
√	<b>V</b>	环境化学 Environment Chemistry A	1	<b>V</b>	<b>V</b>		1							<b>V</b>	
		环境工程原理 Environmental Engineering Principle	<b>V</b>	<b>V</b>	<b>V</b>		<b>V</b>							<b>V</b>	
√	<b>√</b>	环境监测 Environmental Monitoring		√	<b>V</b>		√							<b>V</b>	
		环境生物学 Environmental Biology	<b>V</b>	<b>V</b>	<b>V</b>		V							<b>V</b>	
<b>√</b>	<b>V</b>	水污染控制基础 Water Pollution Control		<b>V</b>	<b>V</b>		<b>V</b>							<b>V</b>	
<b>√</b>	1	大气污染控制基础 Air Pollution Control		<b>V</b>	<b>V</b>		<b>V</b>							<b>V</b>	
		固体废物处理处置基础 Solid Waste Treatment and Disposal		<b>V</b>	<b>V</b>		<b>V</b>							<b>V</b>	
<b>V</b>	<b>V</b>	环境质量评价 Environmental Quality Assessment		<b>V</b>	<b>V</b>		<b>V</b>							<b>V</b>	
		环境规划学 Environmental Planning		<b>V</b>	<b>V</b>		<b>V</b>			<b>V</b>				<b>V</b>	
<b>√</b>	<b>V</b>	环境微生物学 Environmental Microbiology		<b>V</b>	<b>V</b>		<b>V</b>							<b>V</b>	
		物理污染控制工程 Physical Pollution Control Engineering		<b>V</b>	<b>V</b>		<b>V</b>							<b>V</b>	
		环境土壤学 Environmental Soil	√	√										√	
		自然地理学 Physical Geography	√	√										<b>V</b>	
		水文学与水资源 Water Resources and Hydrology		√	<b>V</b>		√							<b>V</b>	
		空气污染气象学 Air pollution meteorology			√		√							√	
		环境工程设计基础 Environmental Engineering Design			<b>V</b>		V							<b>V</b>	
		自然灾害学 Natural Disaster		<b>V</b>	<b>V</b>		V			<b>V</b>				<b>V</b>	
		环境毒理学 Environmental toxicology	<b>V</b>	<b>V</b>	<b>V</b>		<b>V</b>							<b>V</b>	
		环境科学专业英语 English for Environmental Science	<b>V</b>	<b>V</b>	<b>V</b>								<b>V</b>	<b>V</b>	
		现代环境测试技术 Modern Environmental Testing Technology		<b>V</b>	1		1							1	
		环境信息系统 Environmental Information System		√	<b>V</b>		√				√			<b>V</b>	

专业	专业	VIII of the section o					环块	<b>竟科学</b>	专业	毕业	要求				
核心 课程	特色 课程		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		环境工程施工及概预算 Environmental Project Budget			<b>V</b>					<b>V</b>				<b>V</b>	
		文献检索 Literature Searching		<b>V</b>	<b>V</b>		<b>V</b>					<b>V</b>		<b>V</b>	
		生态工程学 Biology Engineering		<b>V</b>	√		V							<b>V</b>	
		生物化学 C Biological Chemistry C		<b>V</b>				<b>V</b>						<b>V</b>	
		环境管理与环境法规 Environmental Management and Laws		<b>V</b>		<b>V</b>				<b>V</b>				<b>V</b>	
		环境监理概论 Introduction to Environmental Supervision		<b>V</b>		1	1							1	
		环境科学与工程前沿 Frontiers of Environmental Science and Engineering		<b>V</b>	<b>V</b>			<b>V</b>		1				<b>V</b>	<b>V</b>
		环境监察概论 Introduction to Environmental Monitoring		7		1								<b>V</b>	
		军事训练 Military Training		<b>V</b>	<b>V</b>						<b>V</b>				
		基础强化训练 Foundation Strengthening Training		<b>V</b>	<b>V</b>		<b>V</b>			<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>
		认识实习 Understanding of Specialty		<b>V</b>	<b>V</b>		<b>V</b>			<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>
		环境监测综合实验 Environmental monitoring experiment		<b>V</b>	<b>V</b>		1			1	√	√	<b>V</b>	<b>V</b>	√
		环境工程综合实验 Envirionmental Engineering Experiment		<b>V</b>	<b>V</b>		1			1	√	√	<b>V</b>	<b>V</b>	<b>V</b>
		水处理工艺设计 Design on Water Treatment Process		V	<b>V</b>		V			V	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>
		车间除尘系统设计 Design on Workshop Dust Removal System design		<b>V</b>	<b>V</b>		1			1	1	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>
		固体废物处理工艺设计 Design on Solid Waste Treatment Process		<b>V</b>	<b>V</b>		1			1	1	<b>V</b>	1	1	<b>V</b>
		微生物学实验技术 Microbiology Experiment Technology		<b>V</b>	<b>V</b>		1			1	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>
		生产实习 Practice of Specialty		<b>V</b>	<b>V</b>		<b>V</b>			<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>
		能力拓展训练 Ability to Develop Training		<b>V</b>	<b>V</b>		<b>V</b>			<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>
		毕业实习 Graduation Practice		<b>V</b>	<b>V</b>		1			1	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	√
		毕业设计(论文) Graduation Design (Thesis)		<b>√</b>	√		√				√	√	√	√	

#### 三、课程教学进程图

#### **III** Teaching Process Map



# 四、理论教学建议进程表

# IV Theory Course Schedule

课程	课程				2	学时分	配 In	cluding	g	7キ2016タ		- 公 -
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	第二 专业 Second Major
		4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
		4220003110	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 Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060003130	军事理论 Military Theory	1	32			16		1-4		
		1050001130	心理健康教育 Mental health education	1	16					1-2		
通	必	4210001110	体育 1 Physical Education I	1	32					1		
识	修	4210002110	体育 2 Physical Education II	1	32					2	体育1	
以		4210003110	体育 3 Physical Education III	1	32					3	体育 2	
课	课	4210004110	体育 4 Physical Education IV	1	32					4	体育3	
	Reg	4030002110	大学英语 A1 College English A 【	3	64				16	1		
程	Required Courses	4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
	ourses	4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
Public		4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
Ва		4120017110	大学计算机基础 Foundation of Computer	2	32		12			1		
sic Courses			程序设计语言课 Computer Program Design L					elv)				
ses		4120023110	计算机程序设计基础(C语言)	3	48	(	12	,,		1-2		
			Fundamentals of Computer Program Design(C Language) 计算机程序设计基础(FORTRAN 语言)									
		4120024110	Fundamentals of Computer Program Design(FORTRAN 计算机程序设计基础(VB语言)	3	48		12			1-2		
		4120025110	Fundamentals of Computer Program Design(VB	3	48		12			1-2		
		A.I. der A.I. II. V	小 计 Subtotal	35	736	Al	24	64	64	ΛΛ P ::	77.14.16.31. b.	1
	Ele选	创新创业类 Innovation and	Entrepreneurship Courses								·须选修艺术体 4分。理工科专	
	) ctiv	人文社科类	Endepreneurship Courses	-1							果程,其他专业	
	e Cc		l Science Courses		选修一					– , • ,	, , , , , , , , ,	
	Elective Courses	经济管理类					_				9 credits, and	
	š ''	Economy and I	Management Courses	select	art co	urses	trom A	Art and	Physic	cal Educat	ion Courses to	obtain

VIII 4 EI					د	乡时分	·而己 In	cluding				
课程 类别	课程				-	产时刀	HL III	Cluding	3	建议修	先修课程	第二
Course	性质	课程编号	课程名称	学分	总学时	<b></b>	上机	实践	课外	读学期	Prerequisite	专业
Classifi-	Course	Course Number	Course Title	Crs	Tot hrs.	Exp.	Ope-	Prac-	Extra-	Suggested Term	Course	Second Major
cation	Nature					<u>F</u>	ration	tice	cur			
		科学技术类		at lea	st 2 cr	edits.	Scien	ce and	engin	eering st	udents should	select
		Science and Te	echnology Courses	at lea	ast one	cour	se fro	m Ar	ts and	Social	Science Cour	ses or
		艺术体育类									her students s	
		Art and Physic	al Education Courses	select	at leas	t one	course	from	Science	ce and Te	chnology Cou	rses.
		4060274130	专业导论	1	16					1		
		.00027.120	Introduction to Environmental Science	1	10							
		4050063110	高等数学A上	5	80					1		
			Advanced Mathematics A I 高等数学 A 下								古然料。 A	
		4050064110	同寺奴字 A 「Advanced Mathematics A II	5	80					2	高等数学 A 上	
			无机化学 B 上								<u> </u>	
		4200307120	Chemistry B I	3	48					1		
			无机化学 B 下	<b> </b>						_	无机化学 B	
207.		4200308120	Chemistry B II	1.5	24					2	上	
学		4200309120	无机化学 B 实验上	1	24	24				1		
		4200309120	Inorganic Chemistry B Experiment I	1	24	24				1		
科		4200310120	无机化学 B 实验下	0.5	24	24				2	无机化学 B	
		1200310120	Inorganic Chemistry B Experiment II	0.5							实验上	
		4080041110	工程图学B	4	64		4			2		
大	必		Engineering Drawing B									
		4050229110	线性代数 Linear Algebra	2.5	40					2		
类	修		大学物理A上									
	12	4050021110	Physics A I	3.5	56					2		
		10.700.22110	大学物理A下	1							大学物理 A	
课	课	4050022110	Physics A II	3.5	56					3	上	
		4050466130	物理实验 A 上	1	32	32				3		
程	R	4030400130	Physics Lab. A I	1	32	32				3		
任王	Requi	4050467130	物理实验A下	1	32	32				4	物理实验 A	
	ired	1030107130	Physics Lab. A II	1	32					•	上	
Ва	red Courses	4200274120	有机化学C	3	48					3		
sic	urse		Organic Chemistry C									
Disc	Š	4200275120	有机化学 C 实验 Organic Chemistry C Experiment	0.5	16	16				3		
Basic Disciplinary Courses			分析化学 B									
nary		4200199120	Analytical Chemistry B	2	32					3		
/ Cc			分析化学 B 实验									
erno		4200201120	Analytical Chemistry B Experiment	1.5	48	48				3		
es		1200101120	物理化学C		- 1					,		
		4200184120	Physical Chemistry C	4	64					4		
		4200185130	物理化学C实验	0.5	16	16				4		
		4200183130	Physical Chemistry C Experimental	0.5	10	10				4		
		4050058110	概率论与数理统计B	3	48					4		
		.020000110	Probability and Mathematics B									
			计算机辅助制图证				2分)					
			CAD Course	es(Choice	one fre	ely)						
		4060128110	资源工程 CAD Resource Engineering CAD	2	32		20			4		
		<u> </u>	Resource Engineering CAD									

课程	课程				7	学时分	·配 In	cluding	<u> </u>			
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	第二 专业 Second Major
		4060039110	环境 CAD Environmental CAD	2	32		20			4		
			小 计 Subtotal	49	880	192	24					
	选	4060040110	环境材料概论 Introduction to Environmental Materials	2	32					3		
	修	4200237120	生物化学 D Biological Chemistry D	2	32					3		
	课	4060115110	文献检索 Literature Searching	1	16					4		
	El	4050134110	流体力学 C Fluid Mechanics C	3	48	6				4		
	Elective Courses	4060097110	清洁生产导论 Introduction of cleaner Production Technology	2	32					4		
	Courses		小 计 Subtotal	10	160	6						
			求至少选修 4 学分。 num subtotal credits: 4.									
		4060294130	环境生态学 A Environmental Ecology A	3	48	16				5		
		4060381150	环境化学 A Environment Chemistry A	2.5	40					5		
		4200014110	环境工程原理 Environmental Engineering Principle	3	48	8				5		
专	必	4060292130	环境监测 Environmental Monitoring	3	48					5	分析化学 B	
业	修	4060057110	环境微生物学 Environmental Microbiology	2	32					5		
	课	4060286130	固体废物处理处置基础 Solid Waste Treatment and Disposal	2	32					5		
课		4060055110	环境生物学 Environmental Biology	2.5	40					6		
	Requi	4060308130	水污染控制基础 Water Pollution Control	3	48					6		
程	Required Courses	4060279130	大气污染控制基础 Air Pollution Control	3	48					6		
S	urses	4060296130	环境质量评价 Environmental Quality Assessment	2.5	40			8		6		
peciali		4060315130	物理污染控制工程 Physical Pollution Control Engineering	3	48			16		6	大学物理 A 上	
Specialized Courses		4060234120	环境规划学 Environmental Planning	3	48			16		7		
urses			小 计 Subtotal	32.5	520	24		40				
	选Electiv	4060218120	自然地理学 Physical Geography	2.5	40					5		
	选 修课 Elective Courses	4060110110	水文学与水资源 Water Resources and Hydrology	2	32					6		
	rses	4060041110	环境工程设计基础 Environmental Engineering Design	2	32					5		

课程	课程				2	学时分	配 In	cluding	3			***
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学时 Tot hrs.		上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	第二 专业 Second Major
		4060056110	环境土壤学 Environmental Soil	2	32					6		
		4060288130	环境毒理学 Environmental toxicology	2	32					6		
		4060379150	现代环境测试技术 Modern Environmental Testing Technology	2.5	40	20				6		
		4060382150	环境信息系统 Environmental Information System	2	32		8			6		
		4060110110	空气污染气象学 Air pollution meteorology	2	32					7		
		4060134110	自然灾害学 Natural Disaster	2	32					7		
		4060051110	环境科学专业英语 English for Environmental Science	2	32					7		
		4060042110	环境工程施工及概预算 Environmental Project Budget	2	32					7		
		4060103110	生态工程学 Biology Engineering	2	32					7		
		4060045110	环境管理与环境法规 Environmental Management and Laws	2	32					7		
		4060129110	资源环境经济学 Resource and Environment Economics	2	32					7		
			小 计 Subtotal	29	464	20	8					
			求至少选修 15 学分									
		NOTE: Minim	um subtotal credits: 15	ı	l					I		I
		4060325130	环境监理概论 Introduction to Environmental Supervision	2	32					6、7		
Per	选 E	4060326130	环境科学与工程前沿 Frontiers of Environmental Science and Engineering	2	32					4		
个 性 课 Personalized Course	修 Elective (	4060327130	环境监察概论 Introduction to Environmental Monitoring	2	32					6、7		
ed Cou	<u></u> Courses											
课	es 课		小 计 Subtotal	6	96							
		修读说明:学	生可跨专业自主选择修读全校其他专业的设	果程,	建议修	读以	上课和	呈。要	求至と	少选修 10	学分。	
			nts can choose any courses from the other spe	ecialtie	s, and	are es	pecial	ly sug	gested	to choose	e the courses	above.
		Minimum subt	otal credits: 10.									

#### 五、集中性实践教学环节建议进程表

#### V Practice Schedule

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
1060002110	军事训练 Military Training	3	1.5	1	
4060197110	认识实习 Understanding of Specialty	1	1	3	
4060175110	基础强化训练 Foundation Strengthening Training	1	1	4(暑期)	
4060293130	环境监测综合实验 Environmental monitoring experiment	1	1	5(分散)	
4060383150	环境化学实验 Environment Chemistry Experiment	1	1	5(分散)	
4060165110	固体废物处理实验技术 Experiment Technique of Solid waste disposal	1	1	5(分散)	
4060384150	环境工程综合设计 Design on Envirionmental Engineering	1	1	6	
4060309130	水污染控制综合实验 Experiment of Water pollution Control	1	1	6(分散)	
4060156110	大气污染控制实验技术 Experiment Technique of Air pollution Control	1	1	6(分散)	
4060311130	微生物学实验技术 Microbiology Experiment Technology	1	1	6(分散)	
4060201110	生产实习 Practice of Specialty	2	2	6	
4060191110	能力拓展训练 Ability to Develop Training	1	1	7	
4060149110	毕业实习 Graduation Practice	2	2	8	
4060257120	毕业设计(论文) Graduation Design (Thesis)	15	10	8	
	小 计 Subtotal	32	25.5		

#### 六、其它要求

#### **VI Recommendations on Course Studies**

《形势与政策》课程,平均每学期 16 学时,一般按专题进行,在第七学期末考核,计 2 个课外学分,具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the  $7^{th}$  term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人: 袁艳斌 专业培养方案责任人: 张高科

# 【采矿工程专业】2015 版本科培养方案 Undergraduate Education Plan for Specialty in Mining Engineering (2015)

专业名称 采矿工程 主干学科 矿业工程

Major Mining Engineering Major Disciplines Mineral Engineering

计划学制 **四年** 授予学位 工**学学士** 

Duration 4 Years Degree Granted Bachelor of Engineering

#### 最低毕业学分规定

#### **Graduation Credit Criteria**

课程类 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Disciplinary Courses	专业课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	35	40	38.5	\	25.5	\	100
选修课 Elective Courses	9	6	16	10	\	10	190

#### 一、培养目标与毕业要求

#### I Educational Objectives & Requirement

#### (一) 培养目标

采矿工程专业在秉承几十年专业建设的深厚积淀基础上,以培养基础宽、能力强、素质高、适应国内外现代矿山技术发展需要,具有较强实践能力、语言沟通能力、创新意识与创新能力,具备在固体矿床开采(含金属和非金属开采)、岩土工程、安全工程、爆破工程领域从事生产、管理、设计及科研能力的高级工程技术人才。

- (1) 具有良好的人文社会科学素养、较强的社会责任感和工程职业道德。
- (2) 具有较扎实的数学、物理、计算机科学等方面的自然科学基础,并能利用数学和科学理论和技术手段分析并解决工程问题,具有技术革新、新技术及新工艺研究的初步能力。
- (3) 掌握与矿山企业管理相关的国家有关科学技术、安全生产、劳动保护和环境保护等方面的政策和 法规,紧跟国际矿业工程的理论前沿和最新发展动态,以及矿业工程领域相关产业发展状况。
- (4) 具有利用所学专业基础知识和技术手段解决矿产资源露天开采以及地下开采过程中所遇到的工程问题的能力,能够进行矿产资源开采的设计、组织施工和生产管理。掌握矿山生产系统数字化和可视化的方法,基本具有构建和设计数字矿山的能力。
- (5) 掌握矿产资源开采工艺环节可能发生的主要安全问题及安全管理知识,具备运用安全科学与工程相关的理论和技术方法分析并解决所遇到的矿山安全生产问题的能力。
- (6) 具有较好的综合素质,具有良好的口头和书面表达和交流沟通能力,具有团结协作精神和与他人合作共事的能力,具有适应艰苦环境和胜任艰巨工作的能力,具有终身学习的能力。

#### **Educational Objectives**

Based on decades of professional conduction and development, Mining Engineering is aimed to cultivate senior engineering and technical personnel with solid foundation and high quality to meet the needs of modern mining technology both home and abroad. Furthermore, the excellent graduates are provided with good practical ability, communication skills, creativity, sense of innovation as well as the abilities of production, management, design and scientific research in the field of Mining (metal and nonmetal mines), safety, blasting and geotechnical engineering, etc. To be more specific, the high-level talents of Mining Engineering should be able to

- ① acquire the comprehensive quality of science and humanity as well as the sense of social responsibility and professional morality.
- 2 lay a solid foundation of natural sciences such as mathematics, physics, computer science, etc., with which they are able to analyze and solve engineering problems by mathematical and scientific methods. Furthermore, they should acquire initial ability of technological innovation.

- ③ grasp relevant policies and regulations about science and technology, production safety, labor and environmental protection, etc. in the field of mine enterprise management. In the meanwhile, they should keep in step with the cutting edge of the theories and development of Mining Engineering and relevant industries both home and abroad.
- ④ acquire the ability of solving engineering problems in both opencast and underground mining with professional theories and technologies and therefore be able to in charge of designing, organization, construction and production management during mineral resources exploitation. Simultaneously, they should master the digital and visualization methods of mining production system so as to design and build a digital mine
- ⑤ grasp the main knowledge about safety issues and management in the process of mineral resource exploitation and acquire the ability of analyzing and solving problems by relevant theories and techniques about safety science and engineering.
- ⑥ process good comprehensive quality, the oral and written expression ability as well as communication skills, the unity spirit and the capability to work in cooperation, the ability of adapting to harsh environment and arduous work, the sense of lifelong education, etc.

#### (二) 毕业要求

- (1) 学生掌握从事本专业领域所需的数学、相关自然科学知识以及一定的人文和社会科学知识。
- (2) 学生掌握扎实的矿业工程学科的基本知识和从事采矿工作所需的基础理论知识,了解本专业的 发展现状和趋势。
- (3) 学生掌握工程项目管理的基础理论与管理方法,具有初步的工程项目管理能力。
- (4) 学生掌握爆破工程的基本理论和基本知识,能够独立进行岩土工程爆破方案设计。
- (5) 学生掌握矿产资源露天开采所需的基础理论知识,具有利用所学专业基础知识和技术手段解决 露天开采过程中所遇到的工程问题的基本能力。
- (6) 学生掌握矿产资源地下开采所需的基础理论知识,具有利用所学专业基础知识和技术手段解决 地下开采过程中所遇到的工程问题的基本能力。
- (7) 学生掌握较扎实的安全工程技术理论知识和较强的专业技能,能够运用所学知识和技能从事安全工程与技术、安全科学研究、安全监察与管理、矿山通风管理、通风系统设计、安全检测与监测等方面的工作。
- (8) 学生能熟练地运用计算机及其相关软件(如: AutoCAD 或 Surpac)进行采矿工程开采及单体设计。
- (9) 学生具备有效进行采矿工程专业技术综合实验和模拟仿真设计与操作的能力,并能够对实验结果进行分析和解释。
- (10) 学生具有逻辑思维和辩证思维的能力,具有批判意识和求真务实的科学思维方法,具有创新意识,掌握基本的创新方法。
- (11) 学生掌握运用现代信息技术跟踪并获取信息的方法,熟练进行文献检索和资料查询。
- (12) 学生具有良好的口头和书面表达和交流能力,至少熟练掌握一门外语进行技术沟通和交流能力, 具有良好的团队意识和合作精神。
- (13) 学生具有良好的思想素质、身体素质、心理素质、文化修养、社会道德和责任担当等人文素养。
- (14) 学生具有较强的社会责任感、工作责任感,能不断检查自身的发展需求,制定并实施继续职业发展计划。

#### **Graduated Requirement**

- 1 Students should acquire the relevant knowledge in natural sciences, humanities and social sciences.
- 2 Students should master the basic theoretical knowledge in Mining Engineering and understand the state and trend of its development.
- 3 Students should master the basic theories and methods in engineering project management and therefore be capable to take charge of a project preliminarily.
- 4 Students should master the basic theories of blasting engineering and therefore be able to carry out the design of geotechnical blasting independently.
- 5 Students should acquire the basic knowledge of opencast mining and be able to solve engineering problems by professional theories and techniques.
- 6 Students should acquire the basic knowledge of underground mining and be able to solve engineering problems with professional theories and techniques.
- 7 Students should master solid theoretical knowledge and professional skills in safety engineering so as to carry out relevant works about safety engineering and technology, safety science research, safety supervision

and management, mine ventilation management, ventilation system design, safety testing and monitoring, etc.

- 8 Students should be able to skillfully use computers and relevant software (e.g. AutoCAD and Surpac) for mining and monomer design.
- 9 Students should acquire the ability to carry out technology comprehensive experiment, simulation design and operation in Mining Engineering and be able to analyze and interpret the experimental results.
- 10 Students should be provided with logical and dialectical thinking method, critical and pragmatic consciousness as well as innovation sense and methods.
- 11 Students should be able to master the methods for tracking and obtaining information by modern techniques as well as conduct literature retrieval and data query skillfully.
- 12 Students should not only acquire good oral and written expression ability and communication skills, but also master at least one foreign language in order to make daily and technical communication. Moreover, they should have a good sense of unity and cooperation.
- 13 Students should acquire good humanistic qualities including ideological quality, physical quality, psychological quality, cultural accomplishment as well as sense of social morality and responsibility.
- 14 Students should acquire strong sense of social and professional responsibility, be able to self-examine their own needs of development and draw up and implement their career development plan.

附: 培乔	目标头规矩阵					
	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	培养目标 6
毕业要求 1	V					
毕业要求 2		V	√			
毕业要求3			√			
毕业要求 4				√		
毕业要求 5				√		
毕业要求 6				V		
毕业要求 7					√	
毕业要求8		V		√		
毕业要求 9				√		
毕业要求 10		√				
毕业要求 11		V	√			
毕业要求 12			√			V
毕业要求 13	V					
比.川.亜.半.1.4		İ			İ	2

附:培养目标实现矩阵

#### 二、专业核心课程与专业特色课程

#### II Core Courses and Characteristic Courses

#### (一) 专业核心课程:

专业核心课程: 地质学、GPS 原理及测量应用、矿山测量、理论力学 B、材料力学 C、流体力学 D、岩体力学、爆破工程、矿山地质与工程地质、矿山工程测试技术、矿床露天开采、矿床地下开采、井巷与隧道工程、矿山提升与运输、工矿通风与空调、矿山设计原理、资源数字化技术。

**Core Courses:** Geology, Mining Engineering Surveying ,Theoretical Mechanics B, Mechanics of Materials C, Fluid Mechanics D, Rock Mechanics, Blasting Engineering, Mine geology and Engineering geology, Mine Engineering Testing Technology, Surface Mining, Underground Mining, Mine & Tunnel Engineering, Mine Lift and Transportation ,Mine and Industrial Ventilation & Air-Conditioning, Principles for Design of Mines, Digital Mine

#### (二) 专业特色课程:

矿山工程测试技术、爆破工程、矿业系统工程、井巷与隧道工程、工矿通风与空调、矿业工程前沿、 矿山企业管理、资源数字化技术。

**Characteristic Courses:** Mine Engineering Testing Technology, Blasting Engineering, Mining Systems Engineering, Mine & Tunnel Engineering, Mine and Industrial Ventilation & Air-Conditioning, Mining Engineering Frontier, Mine Enterprise Management, Digital Mine

#### 附: 毕业要求实现矩阵:

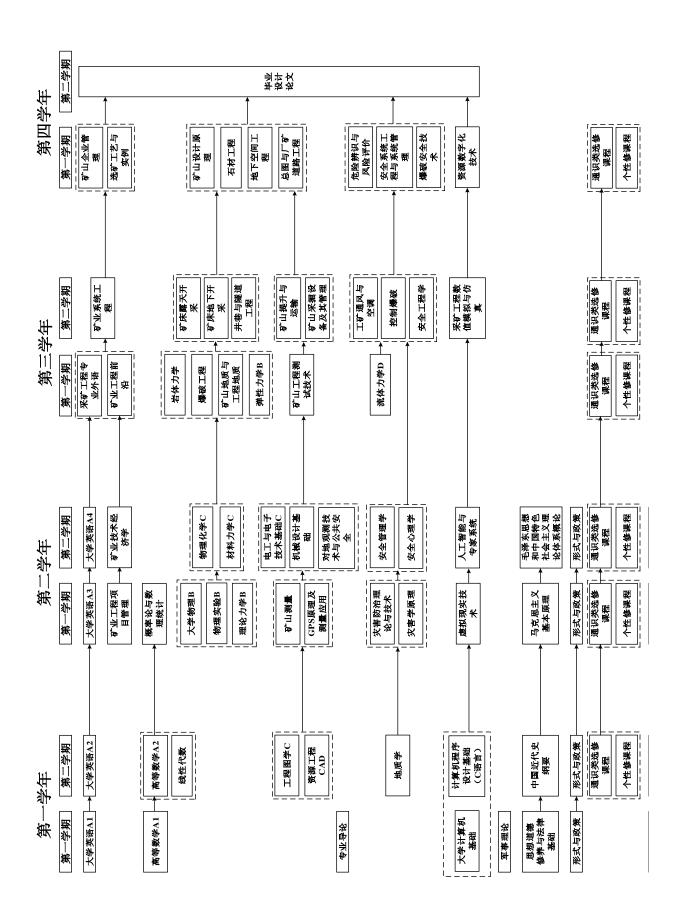
专业	专业特	要水头现矩阵:						采矿_	L程も	业毕	业要	求				
核心 课程	专业特  色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		思想道德修养与法律基础	√												<b>V</b>	
		中国近现代史纲要	<b>V</b>													
		毛泽东思想和中国特色社会主义 理论体系概论	<b>V</b>												<b>V</b>	
		马克思主义基本原理	1												<b>√</b>	
		军事理论	<b>V</b>													
		体育													<b>V</b>	
		大学英语												<b>V</b>		
		大学计算机基础	<b>V</b>							<b>V</b>			<b>V</b>			
		计算机程序设计基础	<b>V</b>							<b>V</b>						
		专业导论		<b>V</b>												
		高等数学	<b>V</b>													
		线性代数	<b>V</b>													
		概率论与数理统计 B	<b>V</b>													
1		地质学		<b>V</b>		<b>V</b>				<b>V</b>						
		工程图学C		<b>V</b>						√						
		大学物理 B	<b>V</b>													
		物理实验 B	<b>V</b>													
		电工与电子技术基础 C	<b>V</b>													
1		矿山测量							<b>V</b>							
1		GPS 原理及测量应用							<b>V</b>							
		资源工程 CAD								<b>V</b>						
		虚拟现实技术									<b>V</b>					
		灾害防治理论与技术							<b>V</b>							
		矿业工程项目管理			<b>V</b>											
		灾害学原理							<b>V</b>							

专业	专业特						:	<b>采矿</b>	工程も	业毕	业要	 求				
专业 核心 课程	色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		矿业技术经济学			<b>V</b>											
		安全管理学							√							
		安全心理学							<b>V</b>							
		人工智能与专家系统										<b>V</b>				
1		理论力学 B		<b>V</b>												
		机械设计基础	1													
<b>V</b>		材料力学 C		<b>V</b>												
<b>V</b>		流体力学 D		<b>V</b>												
<b>V</b>	<b>V</b>	爆破工程				<b>V</b>				<b>V</b>						
<b>V</b>		岩体力学		<b>V</b>												
$\sqrt{}$		矿山地质与工程地质		<b>√</b>												
$\sqrt{}$	<b>V</b>	矿山工程测试技术		<b>√</b>					<b>V</b>							
$\sqrt{}$		矿床露天开采					<b>√</b>									
$\sqrt{}$		矿床地下开采						<b>V</b>								
$\sqrt{}$	√	井巷与隧道工程				<b>V</b>		√								
$\sqrt{}$	√	工矿通风与空调						<b>V</b>	√							
$\sqrt{}$		矿山提升与运输						√								
$\sqrt{}$	√	资源数字化技术								√						
$\sqrt{}$		矿山设计原理				√			√	√						
		对地观测技术与公共安全					√		√							
	√	矿业工程前沿		√									√			
		采矿工程专业外语												√		
		弹性力学 B		√												
		控制爆破				√										
		采矿工程数值模拟与仿真									√					
_		矿山采掘设备及其管理					<b>√</b>	<b>V</b>								

专业	专业特							采矿_	工程も	业毕	业要	找				
核心 课程	色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		安全工程学							<b>V</b>							
	1	矿业系统工程			<b>V</b>							<b>V</b>				
		选矿工艺与实例			<b>V</b>											
		爆破安全技术							<b>V</b>							
		危险辨识与风险评价技术							<b>V</b>							
		安全系统工程与系统管理							<b>V</b>							
	1	矿山企业管理			<b>V</b>											
		总图与厂矿道路工程			<b>V</b>		<b>V</b>	<b>V</b>								
		石材工程					V									
		地下空间工程						<b>V</b>								
		军事训练													<b>V</b>	<b>√</b>
		认识实习(含地质实习)		<b>V</b>												
		机械制造工程实训 C	<b>V</b>													
		机械设计基础课程设计	<b>V</b>													
		能力拓展训练		<b>V</b>					<b>V</b>			<b>V</b>				
		工程技术综合实验				<b>V</b>					<b>V</b>					
		生产实习								<b>V</b>	<b>V</b>					
		工矿通风与空调课程设计						<b>V</b>	<b>V</b>							
		工程设计数字化训练								<b>V</b>						
		毕业实习													<b>√</b>	<b>√</b>
		毕业设计(论文)					<b>V</b>	<b>V</b>	<b>V</b>	√	<b>V</b>					

# 三、课程教学进程图

# **Ⅲ** Teaching Process Map



# 四、理论教学建议进程表

 ${
m IV}$  Theory Course Schedule

课程	课程	,	Schedule		Ä	学时分	配 In	cluding	3	建议修		第二
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	专业 Second Major
		4220001110	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1-6		
		4220002110	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					1-6		
			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 Socialism with Chinese Characteristics	4	96			32		1-6		
		4220005110	马克思主义基本原理 Marxism Philosophy	3	48			8		1-6		
		1060003130	军事理论 Military Theory	1	32			16		1-4		
		4210001110	体育 1 Physical Education I	1	32					1		
通	必	4210002110	体育 2 Physical Education II	1	32					2	体育 1	
\n_	修	4210003110	体育 3 Physical Education III	1	32					3	体育 2	
识		4210004110	体育 <b>4</b> Physical Education IV	1	32					4	体育 3	
课	课	1050001130	心理健康教育 Mental Health Education	1	16					1-2		
	Reg	4030002110	大学英语 A1 College English A 1	3	64				16	1		
程	Required	4030003110	大学英语 A2 College English A II	3	64				16	2	大学英语 A1	
	Courses	4030004110	大学英语 A3 College English A III	3	64				16	3	大学英语 A2	
Public	SG	4030005110	大学英语 A4 College English A IV	3	64				16	4	大学英语 A3	
c Basic		41200171101	大学计算机基础 Foundation of Computer	2	32		12			1		
			程序设计语言课 Courses of Computer Program De					ree, C	redits	: 3)		
Courses		71120023110	计算机程序设计基础(C 语言) Fundamentals of Computer Program	3	48		12	,		2		
		4120024110	计算机程序设计基础(FORTRAN 语言) Fundamentals of Computer Program	3	48		12			2		
		4120025110	计算机程序设计基础(VB 语言) Fundamentals of Computer Program	3	48		12			2		
	,		小 计 Subtotal	35	736		24	64	64			
	Elective Courses		d Entrepreneurship Courses	类课	程中的	艺术	<b></b> 본相关	课程	,取得	导至少 2~	必须选修艺z 个学分。理二 理类课程,其	L科专
	/e Cour		al Science Courses	业学生	生至少	选修	一门和	学技	术类说	果程。	east 9 credit	
	ses 课	经济管理类 Economy and	Management Courses								Education Cou gineering stu	

课程	\m <=				<u>~</u>	*时分	配 In	cluding	Ξ.			
类别 Course Classifi- cation	课程 性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学时 Tot hrs.	实验 Exp.		实践 Prac- tice		建议修 读学期 Suggested Term	先修课程 Prerequisite Course	第二 专业 Second Major
		科学技术类		shoul	d selec	t at le	east o	ne co	urse fi	rom Arts	and Social S	cience
		Science and T	echnology Courses	-			-		_		ourses, and	
		艺术体育类						at lea	ast on	e course	from Scienc	e and
		Art and Physi	cal Education Courses	recnr	ology (	Lourse	es.	ı	ı	П	T	
		4060212110	专业导论 Introduction to Specialty	1	16					1		
		4050063110	高等数学 A1 Advanced Mathematics A1	5	80					1		
		4050229110	线性代数 Linear Algebra	2. 5	40					2		
		4050064110	高等数学 A2 Advanced Mathematics A2	5	80					2		
	必	4060027110	地质学 Physical Geology	2. 5	40					2		
	11.	4080042110	工程图学 C Engineering Graphics C	4	64		8			2		
	修	4050058110	概率论与数理统计 B Probability and Statistics B	3	48					3		
	课	4050463130	大学物理 B Physics B	5	80					3		
学	×	4050224110	物理实验 B Physics Lab. B	1	32	32				4		
科	equired	4050012110	电工与电子技术基础 C Fundamentals of Electrical Engineering &	4	64	10				4		
大 米 Basic Disciplinary	Required Courses	4200184130	物理化学 C Physical Chemistry C	4	64					4		
大 Discipli	SS		测量课程组( Surveying courses (					.)				
nary			矿山测量			eery,c	18.3.3					
		4060369140	Mining Geodesy	3	48		10	16		3		
Courses 果		4060370140	GPS 原理及测量应用 GPS Principle and Its Application in Surveying	3	48		10	16		3		
程			小 计 Subtotal	40	656	42	18	16				
		4060128110	资源工程 CAD Resource Engineering CAD	2	32		24			2		
		4060118110	虚拟现实技术 Virtual Reality	2	32	12				3		
	选	4060124110	灾害防治理论与技术 Calamity Prevention theory and technology	2	32					3		
	Elective Courses	4060091110	矿业工程项目管理 Engineering project management	2	32					3		
	Course	4060125110	灾害学原理 Disaster Science	2	32					3		
	· 课	4060301130	矿业技术经济学 Mining Economics	2	32					4		
		4060129110	安全管理学 Safety Management	2	32					4		
		4060324130	安全心理学 Safety Psychology	2	32			8		4		

课程	课程				<u> </u>	乡时分	配 In	cluding	3	建议修	.1. 11. NH 4H	第二
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	专业 Second Major
		4060100110	人工智能与专家系统 AI & ES	2	32					4		
			小 计 Subtotal	18	288	12	24	8				
	·		要求至少选修 6 学分。 mum subtotal credits: 6.	•								•
		4050129110	理论力学 A Theoretical Mechanics A	4.5	72					3		
	,	4080061110	机械设计基础 Foundation of Machine Design	3. 5	56	6				4	工程图学 C	
		4050018110	材料力学 C Mechanics of Materials C	4	64	4				4	理论力学 B	
		4050136110	流体力学 D Fluid Mechanics D	2	32	6				5	理论力学 B	
	,	4060014110	爆破工程 Blasting Engineering	2. 5	40					5	理论力学 B	
	必	4060121110	岩体力学 Rock Mechanics	2. 5	40					5	理论力学 B	
专	修	4060077110	矿山地质与工程地质 Mining Geology & Engineering Geology	2	32					5		
	课	4060078110	矿山工程测试技术 Testing Techniques in mining	2	32					5		
业	и.	4060071110	矿床露天开采 Surface Mining	2	32					6	材料力学 C	
	Requi	4060070110	矿床地下开采 Underground Mining	2	32					6	材料力学 C	
课	Required Courses	4060236120	井巷与隧道工程 Mine & Tunnel Engineering	2	32					6	岩体力学	
程	ırses	4060230120	工矿通风与空调 Mine and Industry Ventilation & Air-Conditioning	2	32					6	矿床地下开采	
	·	4060081110	矿山提升与运输 Mine Lift and Transportation	2	32					6	矿床地下 开采	
Specia	•	4060131110	资源数字化技术 Digital Mine	2	32					7		
Specialized Courses	·	4060300130	矿山设计原理 Principles for Design of Mines	3. 5	56			28		7		
ourses	,		小 计 Subtotal	38. 5	616	16		28				
	选	4060329130	对地观测技术与公共安全 Earth Observation Technology and Public	2	32					4		
	修.	4060328130	矿业工程前沿 Mining Engineering Frontier	2	32					5		
	Elective	4060360130	采矿工程专业外语 Specialized English of Mining Engineering	2	32					5		
	tive	4050026110	弹性力学 B Mechanics of Elasticity B	3	48					5	材料力学C	
	Co	4060069110	控制爆破 Demolition Blasting	2	32					6	爆破工程	
	Courses	4060075110	矿山采掘设备及其管理 Excavation Equipment and Management	2	32					6	矿 床 露 天 开采	

课程	课程				7	丝时分	配 Ind	cluding		建议修		第二
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	读学期 Suggested Term	先修课程 Prerequisite Course	专业 Second Major
	•	4060009110	安全工程学 Safety Engineering	2	32					6		
	•	4060094110	矿业系统工程 Mining Systems Engineering	3	48					6	概 率 论 与 数理统计 B	
		4060119110	选矿工艺与实例 Technics and Examples of Mineral	2	32					7		
		4060013110	爆破安全技术 Security Techniques of Blasting	2	32					7	爆破工程	
		4060114110	危险辨识与风险评价技术 Hazard Identification & Risk Assessment	2	32					7		
		4060223110	安全系统工程与系统管理 Safety System Engineering and System	4	64			32		7		
		4060079120	矿山企业管理 Mine Enterprise Management	2	32					7		
		4060136110	总图与厂矿道路工程 Road Engineering	2	32					7		
		4060105110	石材工程 Stone Material Project	2	32					7		
		4060026110	地下空间工程 Underground Engineering	2	32					7		
			小 计 Subtotal	36	576			32				
			E求至少选修 16 学分。 um subtotal credits: 16.									
		4060329130	对地观测技术与公共安全 earth Observation Technology and Public	2	32					4		
<sub>P</sub> 个	选	4060328130	矿业工程前沿 Mining Engineering Frontier	2	32					5		
性 Personali	Electiv	4060330130	安全工程前沿 Safety Engineering Frontier	2	32					5		
课 lized Course	修 ve Courses	4060361130	采矿工程数值模拟与仿真 Numerical Modeling and Simulation of	2	32					6		
ourse 程	rses 课		小 计 Subtotal	8	128							
,		NOTE: Stude	乡生可跨专业自主选择修读全校其他专业的nts can choose any courses from the other spentotal credits: 10.									above.

# 五、集中性实践教学环节

#### **V** Practice Schedule

课程编号	实践环节名称	周数	学分	建议修读学期
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term
1 1060002110	军事训练 Military Training	3	1.5	1
1 4060314130	认识实习(含地质实习) Field trip I (including practice of geology)	1	1	4 (暑期)
1/1/0/11 11 11/1	机械制造工程实训 C Machinery Manufacturing Engineering Practice C	2	2	4
1 /10801/16110	机械设计基础课程设计 Course Design on Foundation of Machine Design	2	2	4

课程编号	实践环节名称	周数	学分	建议修读学期
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term
4060192110	能力拓展训练 Ability Development Training	1	1	5
4060264120	工程技术综合实验 Engineering Techniques Lab. Session	2	2	6
4060202110	生产实习 Field Trip	2	2	6 (暑期)
4060163110	工矿通风与空调课程设计 Mine and Industry Ventilation & Air-Condition	1	1	6
4060284130	工程设计数字化训练 Engineering Design Digital Training	1	1	7
4060150110	毕业实习 Graduation Practice	2	2	8
4060258120	毕业设计(论文) Graduation Thesis	15	10	8
	小 计 Subtotal	32	25. 5	

#### 六、修读指导

#### **VI** Recommendations on Course Studies

《形势与政策》课程,平均每学期 16 学时,一般按专题进行,在第七学期末考核,计 2 个课外学分,具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the  $7^{th}$  term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人: 袁艳斌 专业培养方案责任人: 任高峰

# 【矿物加工工程专业】2015 版本科培养方案

# Undergraduate Education Plan for Specialty in Mineral Processing Engineering Specialty (2015)

专业名称 矿物加工工程 主干学科 矿业工程

Major Mineral Processing Major Disciplines Mining Engineering

计划学制 **四年** 授予学位 工**学学士** 

Duration 4 Years Degree Granted Bachelor of Engineering

#### 最低毕业学分规定

#### **Graduation Credit Criteria**

课程类别 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Courses in General Discipline	专业课程 Courses in Specialty	个性课程 Personalized Course	集中性实践 Practice Courses	课外学 Extracurricul ar Credits	总学分 Total Credits
必修课 Required Courses	35	56	25.5	\	31	\	100
选修课 Elective Courses	9	5.5	8	10	\	10	190

#### 一、培养目标与毕业要求

#### I Educational Objectives & Requirement

#### (一) 培养目标

- (1) 具备矿物(非金属、金属)分选加工、矿物材料制备、矿产资源综合利用相关的基础知识和基本技能,了解专业发展前沿方向,具有创新意识和国际视野与对外交流能力。
- (2) 具有人文社会科学素养,身心健康,具备良好的敬业精神、社会责任感和工程职业道德,关注 当代全球和社会问题,具有与矿业工程相关的质量意识、矿产资源开发伴随的环境保护意识和 安全意识。
- (3) 具有从事矿物加工工程领域科学研究、工程设计和技术服务等工作所需的数理化知识和其它相 关自然科学知识,并能将化学和矿业相关知识运用于解决工程问题。
- (4) 具有综合运用矿物加工科学理论和工程技术分析、设计、开发矿产资源综进行合利用的能力。
- (5) 精通矿物加工工程工艺设计方法和设计软件,具备试验研究(实验室、工业)能力。
- (6) 具有良好的口头和书面表达和交流沟通能力、良好的团队意识和合作精神,具有终身学习的能力。
- (7) 能在矿物加工工程与矿物材料等相关领域从事建设规划、工程设计、生产与经营管理、研究开发等方面工作的工程技术人才,经过五年左右发展成为矿业工程师。

#### ( I ) Educational Objectives

- (1) To possess the basic knowledge and basic skills of mineral (non-metal and metal) separation processing, mineral materials preparation and comprehensive utilization of mineral resources, to understand the professional development direction of the frontier, and to possess innovative consciousness, international vision and the skill of external exchange.
- (2) To possess the humanities and social science literacy, physical and mental health, good professional spirit, the sense of social responsibility and engineering occupation morality, pay attention to contemporary global and social issues, and to possess the quality consciousness related to mining engineering, the environmental protection consciousness and safety consciousness accompany with mineral resources exploitation.
- (3) To possess the related knowledge of mathematics, physics, chemistry and some other natural science that are required in the mineral processing engineering fields of scientific research, engineering design and technical service work, and to possess the ability to apply the related knowledge of chemistry and mining to the settlement of engineering issues.
- (4) To possess the ability to apply mineral processing science theory and engineering technology to analyse, design, exploit and utilize mineral resources synthetically.

- (5) To be proficient in design methods and design software of mineral processing engineering process, and possess the ability to do the experimental studies both in laboratory and industry.
- (6) To possess good oral, writing and communicating abilities, and good team consciousness and cooperation spirit, and have the lifelong learning ability.
- (7) To be an engineering and technical personnel who is engaged in construction program, engineering design, production and operating management, and research and development(R & D) in the related fields of mineral processing engineering and mineral materials, and then to develop into a mining engineer in five years.

#### (二) 毕业要求

- (1) 学生应掌握从事本专业领域所需的数学、相关的化学、物理等自然科学及经济和管理知识。
- (2) 学生应掌握本专业的基本理论知识和工程基础知识,能够利用矿物加工原理性知识进行自主发现、自主设计和自主解决与矿物加工工程相关的科学问题。
- (3) 学生应掌握与矿业工程有关的地质学、矿石学、流体力学、机械设计、电工与电子技术、计算机应用的工程基础知识;应掌握矿物加工工艺、矿物材料技术、化学选矿及其相关的理论知识和专业知识;应具有包括专业认识实习、生产实习、毕业实习在内的系统工程实践的经历。
- (4) 学生应具备进行矿物加工工艺实验的能力,能够设计和实施矿石的可选性试验研究,熟悉生产规模的扩大选矿实验研究的方法,具备对实验的结果进行合理分析的能力。
- (5) 学生应掌握设计矿石的粉碎、选矿及矿物深加工工艺的方法,了解现场试验与生产运行的基本规律。
- (6) 具有综合运用矿物加工理论和技术手段设计矿物加工工艺的能力,设计过程中能够综合考虑与工厂和当地经济、环境、法律、安全、健康、伦理等制约因素;
- (7) 学生掌握运用现代信息技术跟踪并获取矿业技术信息的方法,熟练进行文献检索和资料查询。
- (8) 学生具有良好的组织管理、口头书面表达和人际交往能力,具有良好的团队意识和合作精神。
- (9) 学生具有良好的思想素质、身体素质、心理素质、文化修养、社会道德和责任担当等人文素养。
- (10) 学生具有逻辑思维和辩证思维的能力,具有批判意识和求真务实的科学思维方法,具有追求创新的态度和意识,掌握矿物加工领域基本的创新方法。对终身学习有正确认识,具有不断学习和适应矿业技术不断发展的能力。
- (11) 具有国际视野和跨文化的交流、竞争与合作能力,能熟练掌握一门外语进行技术沟通和交流。

#### (II) Requirement

- (1) Students should master the natural science knowledge including mathematics, related chemistry and physics, and the knowledge of economy and management.
- (2) Students are supposed to master the professional knowledge of basic theories and engineering and discover, design and solve the scientific problems related to mineral processing independently by utilizing mineral processing theories.
- (3) Students are supposed to master the basic knowledge of Geology, Ore Petrology, Hydromechanics, Mechanical Design, Electrician and Electronic Technology, Computer Application Engineering Foundation. They also should master the theoretical knowledge and specialized knowledge of Mineral processing, Mineral Material technology and chemical processing. And they should have system engineering practice experiences that include professional cognition practice, production practice and graduation practice.
- (4) Students are supposed to possess the ability of doing mineral processing experiments, and designing and conducting the feasibility experiments of ores. They also should be familiar with the expansion of production scale of ore dressing experiments, and able to analyze the results of experiments reasonably
- (5) Students should learn to design the process of crush, mineral processing and dressing of ores, and realize the basic rules of field tests and production runs.
- (6) Students should master the ability to design the mineral processing by using the theories and technological means synthetically. They should take factories, local economy, environment, law, safety, healthy, ethic and other factors into comprehensive consideration.
- (7) Students should learn to obtain information about mining technology by using modern information technology and search the literature to found useful data skillfully.
- (8) Students should possess good organization and management, oral and written expression and interpersonal communication abilities, and possess good team consciousness and cooperation spirit.

- (9) Students should possess humanistic qualities including good thinking quality, physical quality, mental quality, cultural cultivation, social morality and responsibility.
- (10) Students should have the ability of logical thinking and dialectical thinking, have critical awareness and realistic and pragmatic scientific thinking methods, have the attitude and consciousness of the pursuit of innovation, and master the basic method of innovation in the field of mineral processing. And they should have a correct understanding of lifelong learning, and possess the ability of continuous learning and adapting to the continuous development of mining technology.
- (11) Students should possess international vision and the ability of cross-cultural communication, competition and cooperation, and master a foreign language skillfully to make technical communication.

附:培养目标实现矩阵

	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	培养目标 6	培养目标7
毕业要求 1	✓	✓	✓				<b>√</b>
毕业要求 2	<b>√</b>		✓	✓			<b>√</b>
毕业要求3	✓		✓	✓	✓		<b>√</b>
毕业要求 4			<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>
毕业要求 5			<b>✓</b>	✓	<b>√</b>		<b>✓</b>
毕业要求 6		<b>✓</b>	<b>✓</b>	✓	<b>√</b>		<b>✓</b>
毕业要求7	<b>√</b>	<b>√</b>		✓	<b>√</b>		<b>✓</b>
毕业要求8		<b>✓</b>			<b>√</b>	<b>✓</b>	<b>✓</b>
毕业要求 9		✓				✓	<b>√</b>
毕业要求 10		<b>√</b>				<b>√</b>	<b>√</b>
毕业要求 11	<b>√</b>		<b>√</b>	<b>√</b>		<b>√</b>	<b>√</b>

#### 二、专业核心课程与专业特色课程

#### II Core Courses and Characteristic Courses

#### (一) 专业核心课程:

矿石学,粉碎工程,矿物加工工艺学,矿物材料工艺学,矿物加工试验研究方法,矿物加工厂工艺设计,化学选矿,矿物加工测试技术

#### Core Courses:

Lithology, Comminution Engineering, mineral processing technology, mineral material technology, mineral processing experimental research methods, mineral processing plant process design, chemical mineral processing, Mineral Material Testing Techniques.

#### (二) 专业特色课程:

地质学,二次资源开发利用,矿物粉体工程,非金属矿新型建筑材料,选矿工艺与实例,矿物生物技术,矿业技术经济学,烧结球团工艺学,采矿概论,矿物加工厂自动化

#### Characteristic Courses:

Physical Geology, Exploitation and Utilization of Secondary, Mineral Powder Technology, New Nonmetallic Mineral Building Materials, Technics and Examples of Mineral, Biotechnology of Minerals, Economics of Mining Technology, Sintering Pelletizing Process, Mining Introduction, Automation of Mineral Processing Plan.

附: 毕业要求实现矩阵:

专业核	专业特	课程名称	矿物加工工程专业毕业要求										
心课程	色课程		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		思想道德修养与法律基础						✓			✓		
		中国近现代史纲要									✓		
		毛泽东思想和中国特色社会主义理论体系 概论						<b>√</b>			<b>√</b>	<b>√</b>	
		马克思主义基本原理								<b>√</b>	<b>√</b>	<b>√</b>	

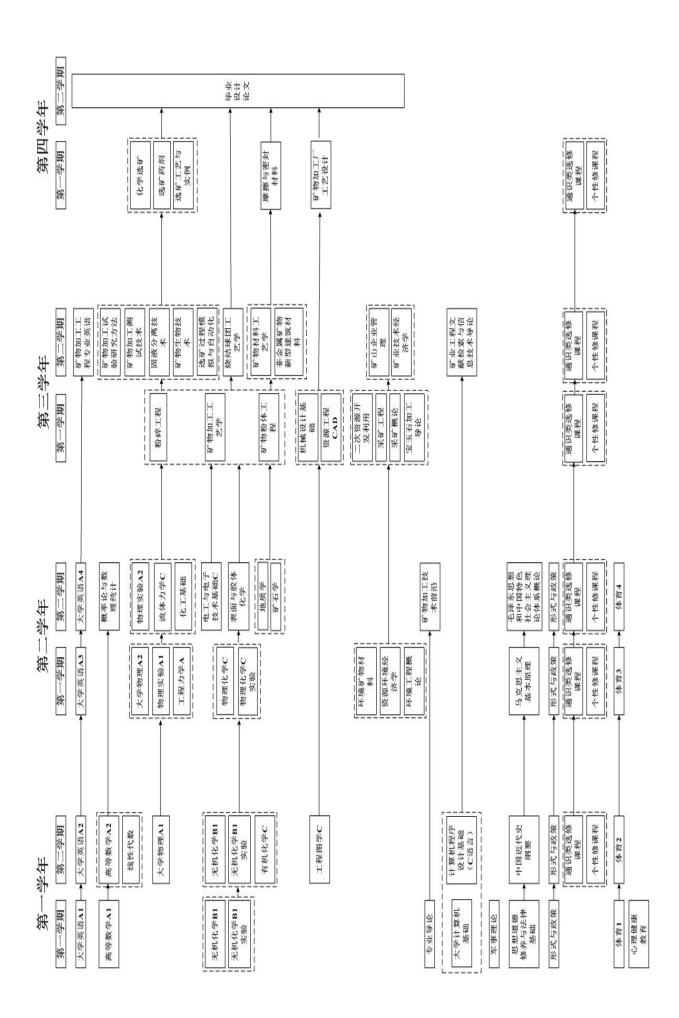
专业核	专业特	)#### ###				矿物	加工コ	[程专	<b>亚</b> 库和	と要求			
	色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		军事理论						<b>√</b>			<b>√</b>		
		体育								<b>√</b>	<b>√</b>		
		大学英语						<b>√</b>	<b>✓</b>	<b>√</b>			<b>✓</b>
		大学计算机基础		<b>√</b>	<b>√</b>				<b>√</b>				
		计算机程序设计基础		<b>√</b>	<b>√</b>								
		创新创业类公选课								<b>√</b>	<b>√</b>	<b>√</b>	
		人文社科类公选课								<b>√</b>	✓		
		经济管理类公选课	✓					<b>√</b>					
		科学技术类公选课						<b>√</b>	<b>√</b>			<b>√</b>	
		艺术体育类公选课									<b>√</b>		
		心理健康教育									✓		
		专业导论		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>					
		高等数学 A	✓										
		线性代数	✓										
		概率论与数理统计 B	✓										
		大学物理 A	✓										
		物理实验 A	✓										
		工程图学C		<b>✓</b>		<b>✓</b>	<b>√</b>						
		工程力学 A		<b>✓</b>									
		无机化学 B	✓	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>√</b>						
		无机化学实验 B	✓	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>√</b>						
		物理化学 C		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
		物理化学实验 C		<b>✓</b>	<b>√</b>	<b>✓</b>	<b>√</b>						
		资源工程 CAD		<b>✓</b>	<b>√</b>		<b>√</b>						
		表面与胶体化学		<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>					<b>√</b>	
		电工与电子技术基础 C		<b>✓</b>	<b>√</b>								
		机械设计基础		<b>✓</b>	<b>√</b>								

专业核	专业特	\W 41 64 46		矿物加工工程专业毕业要求										
	色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
		环境矿物材料		<b>✓</b>				<b>√</b>						
		有机化学 C	<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>							
		资源环境经济学	<b>✓</b>					<b>√</b>				<b>√</b>		
		流体力学		<b>√</b>	<b>√</b>		<b>√</b>							
	<b>✓</b>	地质学		<b>√</b>	<b>√</b>			<b>√</b>						
		化工基础		<b>√</b>	<b>√</b>	<b>√</b>								
✓		矿石学		<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>							
✓		粉碎工程		<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>✓</b>						
✓		矿物加工工艺学		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				<b>✓</b>		
✓		矿物加工试验研究方法		<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				<b>√</b>		
✓		矿物加工测试技术		<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
✓		化学选矿		<b>✓</b>	<b>√</b>	<b>✓</b>	<b>√</b>	<b>✓</b>						
✓		矿物加工厂工艺设计		<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
✓		矿物材料工艺学		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
		环境工程概论					<b>√</b>	<b>√</b>						
	✓	二次资源开发利用		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
	✓	矿物粉体工程		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
	<b>√</b>	矿物生物技术		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
		固液分离技术		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
	✓	矿物加工厂自动化		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
		矿山企业管理	✓			<b>√</b>		<b>√</b>						
	✓	选矿工艺与实例		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
	<b>√</b>	非金属矿物新型建筑材料		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
		选矿药剂		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
	<b>√</b>	矿业技术经济学	✓	<b>✓</b>								<b>√</b>		
		摩擦与密封材料		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						
	<b>✓</b>	烧结球团工艺学		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>						

专业核	专业特	VH CD At the				矿物	加工工	程专	<b>亚</b> 库亚	要求			
心课程	色课程	课程名称	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	✓	采矿概论		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>					
		宝玉石加工导论									✓		
		矿物加工工程专业英语							✓			<b>√</b>	<b>✓</b>
		矿物加工技术前沿										<b>√</b>	<b>✓</b>
		矿业工程文献检索与信息技术导论							✓			<b>√</b>	<b>✓</b>
		军事训练								<b>√</b>	✓		
		认识实习			✓	✓	✓	<b>√</b>					
		电工电子实习			✓								
		机械设计基础课程设计			✓		<b>√</b>	<b>√</b>					
		机械制造工程实训 C			✓			<b>✓</b>					
		矿物鉴定实验			✓	<b>√</b>	<b>√</b>						
		矿物加工工艺学实验		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				<b>√</b>	
		矿石可选性综合实验		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>					
		矿物材料工艺学实验		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>					
		专业实习		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>					
		毕业实习		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>					
		毕业设计(论文)		<b>√</b>	✓	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				

# 三、课程教学进程图

**III** Teaching Process Map



# 四、理论教学建议进程表

# IV Theory Course Schedule

课程	课程	-			:	学时分	♪配 In	ncludin	g	カキンハで	义修 上放进程	松 一	
类别	性质	课程编号	课程名称	学分	总学		上机.	实践	课外	建议修 读学期	先修课程	第二 专业	
Course Classifi-	Course	Course Number	Course Title	Crs	时 Tot	实验	Ope-	Prac-	Extra-	Suggested	Prerequisite Course	Second	
cation	Nature				hrs.	Ехр.	ration	tice	cur	Term		Major	
		4220001110	思想道德修养与法律基础	2	40			0		1.6			
		4220001110	Morals, Ethics and Fundamentals of Law	3	48			8		1-6			
		4220002110	中国近现代史纲要	2	32					1-6			
			Outline of Contemporary and Modern Chinese History										
		4220002110	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	4	96			32		1-6			
		4220003110	Socialism with Chinese Characteristics	4	30			32		1-0			
			马克思主义基本原理		40			_					
		4220005110	Marxism Philosophy	3	48			8		1-6			
		1050001130	心理健康教育	1	16					1-2			
			Mental health education										
		1060003130	军事理论 Military Theory	1	32			16		1-4			
			体育 1										
通	必	4210001110	Physical Education I	1	32					1			
		4210002110	体育 2	1	32					2	体育 1		
	修	4210002110	Physical Education II	1	32					2	件月 1		
识		4210003110	体育 3	1	32					3	体育 2		
	`Ш		Physical Education III 体育 4										
	课	4210004110	Physical Education IV	1	32					4	体育3		
课		4020002110	大学英语 A1	2	64				16	1			
	Rec	4030002110	College English A I	3	04				10	1			
	Required Courses	4030003110	大学英语 A2	3	64				16	2	大学英语 A1		
程	ed Co		College English A II 大学英语 A3										
	oursi	4030004110	大字夹借 A3 College English A III	3	64				16	3	大学英语 A2		
	SS		大学英语 A4		6.4				4.6	_	1. ₩ # > =		
Pub		4030005110	College English A $ { m IV} $	3	64				16	4	大学英语 A3		
Public B		4120017110	大学计算机基础	2	32		12			1			
asic			Foundation of Computer			2 3							
asic Courses			程序设计语言课》 Computer Program DesignC Li					(برام					
rses			计算机程序设计基础(C语言)					cciyy					
		4120023110	Fundamentals of Computer Program DesignC Language)	3	48		12			2			
		4120024110	计算机程序设计基础(FORTRAN 语言)	3	48		12			2			
		4120024110	Fundamentals of Computer Program Design(FORTRAN Language)	3	70		12			2			
		4120025110	计算机程序设计基础(VB 语言)	3	48		12			2			
			Fundamentals of Computer Program Design(VB Language)										
			小 计 Subtotal	35	736		24	64	64				
		创新创业类		全	<u>·</u> 校学	生要	求至と	少取得	9个	学分,且	必须选修艺术	(体育	
	Elec		d Entrepreneurship Courses				艺术类相关课程,取得至少2个学分。理工科						
	tive 仮	人文社科类		业学生至少选修一门人文社科类或经济管理类课程,其他专业学生至小选修一门科学技术类课程									
	© U	Arts and Socia	l Science Courses	业学生至少选修一门科学技术类课程。 —— All students are required to obtain at least 9 credits, and									
	选修课 Blective Courses	经济管理类								Education Cou			
		Economy and	Management Courses	obtain	at I	east 2	2 crec	lits. S	cience	and er	ngineering stu	idents	

课程 类别 Course Classifi- cation	课程 性质 Course Nature	课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	总学 时 Tot hrs.	学时夕 实验 Exp.		实践 Prac- tice	<u> </u>	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	第二 专业 Second Major
		科学技术类 Science and T	echnology Courses	Course	es or	Econ	omy	and N	∕Ianag	gement	s and Social Soc	other
		艺术体育类 Art and Physic	cal Education Courses	studer Techno				at le	ast or	ne cours	e from Scienc	e and
		4060214110	专业导论 Introduction to Materials Physics	1	16					1		
		4050063110	高等数学 A 上 Advanced Mathematics A I	5	80					1		
		4050064110	高等数学 A 下 Advanced Mathematics A II	5	80					2	高等数学 A 上	
		4200307120	无机化学 B 上 Chemistry B I	3	48					1		
		4200308120	无机化学 B 下 Chemistry B II	1.5	24					2	无机化学 B 上	
学		4200309120	无机化学 B 实验上 Inorganic Chemistry B Experiment I	1	24	24				1		
科		4200310120	无机化学 B 实验下 Inorganic Chemistry B Experiment II	0.5	24	24				2	无机化学 B 实验上	
什		4080042110	工程图学 C Engineering Drawing C	4	64		8			2		
大	必	4050229110	线性代数 Linear Algebra	2.5	40					2		
类	修	4050021110	大学物理 A 上 Physics A I	3.5	56					2		
	课	4050022110	大学物理 A 下 Physics A II	3.5	56					3	大学物理 A 上	
课	床	4050466130	物理实验 A 上 Physics Lab. A I	1	32	32				3		
程	Requi	405046713	物理实验 A 下 Physics Lab. A II	1	32	32				4	物理实验 A 上	
Ba	equired Courses	4050071110	工程力学 A Engineering Mechanics A	4	64	4				3		
Basic Disciplinary Courses	urses	4200184130	物理化学 C Physical Chemistry C	4	64					3		
ciplinar		4200185130	Physical Chemistry C Experimental	0.5	16	16				3		
y Cours		4050058110	概率论与数理统计 B Probability and Mathematics B	3	48					4		
es		4060015110	表面与胶体化学 Surface and Colloid Chemistry	2.5	40					4	物理化学C	
		4100012110	电工与电子技术基础 C	4	64	4	10			4	大学物理 A下	
		4060128110	资源工程 CAD Resource Engineering CAD	2	32	24				5		
		4080061110	机械设计基础 Mechanical Design Basis	3.5	56	6				5		
			小 计 Subtotal	56	952	164	8					

课程	28140					学时を	大配 Ir	ncludin	g			I 1
类别 Course Classifi- cation	课程 性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学 时 Tot hrs.	实验 Exp.		实践 Prac- tice		建议修 读学期 Suggested Term	先修课程 Prerequisite Course	第二 专业 Second Major
		4200247120	有机化学 C Organic Chemistry	3	48					2		
	s at	4060052110	环境矿物材料 Environmental Mineral Materials	2	32					3		
	选 Elect	4060129110	资源环境经济学 Resource and Environment Economics	2	32					3		
	修 Elective Courses	4050134110	流体力学 C Fluid Mechanics C	3	48	6				4		
	ırses 课	4060027110	地质学 Physical Geology	2.5	40					4		
			小 计 Subtotal	12.5	200	6						
			要求至少选修 5.5 学分。 num subtotal credits: 5.5.									
		4200014110	化工基础 Elementary Chemical Industry	3	48	8				4		
		4060243120	矿石学 Lithology	3	48	16				4		
	必	4060229120	粉碎工程 Comminution Engineering	3	48			16		5		
专	修	4060246120	矿物加工工艺学 Mineral Processing Technology	5	80						表面与胶体 化学	
业	课	4060088110	矿物加工试验研究方法 Experimental Research Methods of Mineral Processing	2	32					6	表面与胶体 化学 矿物加工工 艺学	
	Re	4060085110	矿物加工测试技术 Mineral Material Testing Techniques	2	32					6	矿石学	
课	Required	4060083110	矿物材料工艺学 Mineral Material Technology	2.5	40					6	矿物加工工 艺学	
<b>1</b> 11	Courses	4060232120	化学选矿 Chemical Mineral Processing	2	32					7	表面与胶体 化学 无机化学 B	
程		4060244120	矿物加工厂工艺设计 Process Design of Mineral Processing Plant	3	48			16		7	矿物加工工 艺学	
Sp			小 计 Subtotal	25.5	408	24		32				
Specialized Courses		4060276130	环境工程概论 Environment Engineering Introduction	2	32					3		
d Cour	选	4060028110	二次资源开发利用 Exploitation and Utilization of Secondary	2	32					5		
ses	修 Elective Courses	4060084110	矿物粉体工程 Mineral Powder Technology	2	32					5		
	修 e Course	4060089110	矿物生物技术 Biotechnology of Minerals	2	32					6		
	es 课	4060036110	固液分离技术 Solid-liquid Separation Techniques	2	32					6		
		4060312130	矿物加工厂自动化 Automation of Mineral Processing Plan	2	32					6	矿物加工工 艺学	

课程	课程				:	学时分	♪配 Ir	ncludin	ıg	建议依		第二
类别 Course Classifi- cation	性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学分 Crs	总学 时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	建议修 读学期 Suggested Term	先修课程 Prerequisite Course	专业 Second Major
		4060079110	矿山企业管理 Mine Corporation Management	2	32					6		
		4060031110	非金属矿物新型建筑材料 New Nonmetallic Mineral Building Materials	2	32					6		
		4060093110	矿业技术经济学 Economics of Mining Technology	2	32					6		
		4060119110	选矿工艺与实例 Technics and Examples of Mineral	2	32					7	矿物加工工 艺学	
		4060120110	选矿药剂 Mineral Processing Reagents	2	32					7	矿物加工工 艺学	
			小 计 Subtotal	22	352							
		修读说明: 要	要求至少选修8学分									
		NOTE: Minim	um subtotal credits:8.	1					1		r	
		4060335130	矿物加工技术前沿 Advanced Mineral Processing Technology	2	32					4		
		4060217110	采矿概论 Mining Introduction	2	32					5		
		4060333130	宝玉石加工导论 Itroduction of Gem Processing	2	32					5		
个Per	选 E	4060102110	烧结球团工艺学 Sintering Pelletizing Process	2	32					6		
性sonaliz	lective C	4060334130	矿物加工工程专业英语 Specialty English	2	32					6		
Personalized Course	Elective Courses 课	4060336130	矿业工程文献检索与信息技术导论 Mining Engineering Literature and Introduction to Information Technology	2	32					6		
程		4060096110	摩擦与密封材料 Frictional and Sealing Material	2	32					7		
			小 计 Subtotal	14	224							
		NOTE: Stude	学生可跨专业自主选择修读全校其他专业的 ints can choose any courses from the other s um subtotal credits: 10.									ourses

## 五、集中性实践教学环节

## V Practice Schedule

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
1060002110	军事训练	3	1.5	1	
	Military Training		_		
4060199110	认识实习	1	1	2 (暑期)	
4000133110	Cognition Practice	_	_	<b>2</b> (1979)	
4100069110	电工电子实习 B	1	1	4	
4100003110	Electric Practice	1	1	7	
4080146110	机械设计基础课程设计 Course Design on Foundation of Machine Design	2	2	5	
4080151110	机械制造工程实训 C Machinery Manufacturing Engineering Practice C	2	2	5	

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
4060269120	矿物系统鉴定实验 Mineral Identify	2	2	5	
4060207110	专业实习(生产实习) Professional (Production) Practice	3	3	6	
4060267120	矿物加工工艺学系统实验 1 Systematic Experiments of Mineral Processing Technology I	1.5	1.5	6	
4060268120	矿物加工工艺学系统实验 2 Systematic Experiments of Mineral Processing Technology II	2	2	7	
4060184110	矿石可选性综合实验 Serial Experiments of Ore Beneficiation Feasibility	1.5	1.5	7	
4060186110	矿物材料工艺学系统实验 Systematic Experiments of Mineral material Technology	1.5	1.5	7	
4060152110	毕业实习 Graduation Practice	2	2	8	
4060261120	毕业设计(论文) Graduation Design (Dissertation)	15	10	8	
	小 计 Subtotal	37.5	31		

#### 六、修读指导

#### **VI** Recommendations on Course Studies

《形势与政策》课程,平均每学期 16 学时,一般按专题进行,在第七学期末考核,计 2 个课外学分,具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人: 袁艳斌 专业培养方案责任人: 张凌燕

## 【矿物加工工程专业(卓越工程师班)】 2015 版本科培养方案

# **Undergraduate Education Plan for Specialty in Mineral Processing Engineering (Excellent Engineer Class) (2015)**

专业名称 矿物加工工程 主干学科 矿业工程

Major Mineral Processing Major Disciplines Mining Engineering

计划学制 四年 授予学位 工学学士

Duration 4 Years Degree Granted Bachelor of Engineering

#### 最低毕业学分规定

#### **Graduation Credit Criteria**

课程类别 Course Classification 课程性质 Course Nature	通识课程 Public Basic Courses	学科大类课程 Basic Courses in General Discipline	专业课程 Courses in Specialty	个性课程 Personalized Course	集中性实践 Practice Courses	课外学 Extracurricular Credits	总学分 Total Credits
必修课 Required Courses	35	56	25.5	\	36.5	\	100
选修课 Elective Courses	9	6	12	\	\	10	190

#### 一、培养目标与毕业要求

#### I Educational Objectives & Requirement

#### (一) 培养目标

- (1) 具备矿物(非金属、金属)分选加工、矿物材料制备、矿产资源综合利用相关的基础知识和基本技能,了解专业发展前沿方向,具有创新意识和国际视野与对外交流能力。
- (2) 具有人文社会科学素养,身心健康,具备良好的敬业精神、社会责任感和工程职业 道德,关注当代全球和社会问题,具有与矿业工程相关的质量意识、矿产资源开发 伴随的环境保护意识和安全意识。
- (3) 具有从事矿物加工工程领域科学研究、工程设计和技术服务等工作所需的数理化知识和其它相关自然科学知识,并能将化学和矿业相关知识运用于解决工程问题。
- (4) 具有综合运用矿物加工科学理论和工程技术分析、设计、开发矿产资源综进行合利 用的能力。
- (5) 精通矿物加工工程工艺设计方法和设计软件,具备试验研究(实验室、工业)能力。
- (6) 具有良好的口头和书面表达和交流沟通能力、良好的团队意识和合作精神,具有终身学习的能力。
- (7) 能在矿物加工工程与矿物材料等相关领域从事建设规划、工程设计、生产与经营管理、研究开发等方面工作的工程技术人才,经过五年左右发展成为矿业工程师。

#### ( I ) Educational Objectives

(1) To possess the basic knowledge and basic skills of mineral (non-metal and metal) separation processing, mineral materials preparation and comprehensive utilization of mineral resources, to understand the professional development direction of the frontier,

- and to possess innovative consciousness, international vision and the skill of external exchange.
- (2) To possess the humanities and social science literacy, physical and mental health, good professional spirit, the sense of social responsibility and engineering occupation morality, pay attention to contemporary global and social issues, and to possess the quality consciousness related to mining engineering, the environmental protection consciousness and safety consciousness accompany with mineral resources exploitation.
- (3) To possess the related knowledge of mathematics, physics, chemistry and some other natural science that are required in the mineral processing engineering fields of scientific research, engineering design and technical service work, and to possess the ability to apply the related knowledge of chemistry and mining to the settlement of engineering issues.
- (4) To possess the ability to apply mineral processing science theory and engineering technology to analyse, design, exploit and utilize mineral resources synthetically.
- (5) To be proficient in design methods and design software of mineral processing engineering process, and possess the ability to do the experimental studies both in laboratory and industry.
- (6) To possess good oral, writing and communicating abilities, and good team consciousness and cooperation spirit, and have the lifelong learning ability.
- (7) To be an engineering and technical personnel who is engaged in construction program, engineering design, production and operating management, and research and development(R & D) in the related fields of mineral processing engineering and mineral materials, and then to develop into a mining engineer in five years.

#### (二) 毕业要求

- (1) 学生应掌握从事本专业领域所需的数学、相关的化学、物理等自然科学及经济和管理知识。
- (2) 学生应掌握本专业的基本理论知识和工程基础知识,能够利用矿物加工原理性知识进行自主发现、自主设计和自主解决与矿物加工工程相关的科学问题。
- (3) 学生应掌握与矿业工程有关的地质学、矿石学、流体力学、机械设计、电工与电子技术、计算机应用的工程基础知识;应掌握矿物加工工艺、矿物材料技术、化学选矿及其相关的理论知识和专业知识;应具有包括专业认识实习、生产实习、岗位实习、毕业实习在内的系统工程实践的经历。
- (4) 学生应具备进行矿物加工工艺实验的能力,能够设计和实施矿石的可选性试验研究, 熟悉生产规模的扩大选矿实验研究的方法,具备对实验的结果进行合理分析的能力。
- (5) 学生应掌握设计矿石的粉碎、选矿及矿物深加工工艺的方法,了解现场试验与生产 运行的基本规律。
- (6) 具有综合运用矿物加工理论和技术手段设计矿物加工工艺的能力,设计过程中能够综合考虑与工厂和当地经济、环境、法律、安全、健康、伦理等制约因素;
- (7) 学生掌握运用现代信息技术跟踪并获取矿业技术信息的方法,熟练进行文献检索和 资料查询。
- (8) 学生具有良好的组织管理、口头书面表达和人际交往能力,具有良好的团队意识和 合作精神。
- (9) 学生具有良好的思想素质、身体素质、心理素质、文化修养、社会道德和责任担当

等人文素养。

- (10) 学生具有逻辑思维和辩证思维的能力,具有批判意识和求真务实的科学思维方法, 具有追求创新的态度和意识,掌握矿物加工领域基本的创新方法。对终身学习有正确认识,具有不断学习和适应矿业技术不断发展的能力。
- (11) 具有国际视野和跨文化的交流、竞争与合作能力,能熟练掌握一门外语进行技术沟通和交流。

#### (II) Requirement

- (1) Students should master the natural science knowledge including mathematics, related chemistry and physics, and the knowledge of economy and management.
- (2) Students are supposed to master the professional knowledge of basic theories and engineering and discover, design and solve the scientific problems related to mineral processing independently by utilizing mineral processing theories.
- (3) Students are supposed to master the basic knowledge of Geology, Ore Petrology, Hydromechanics, Mechanical Design, Electrician and Electronic Technology, Computer Application Engineering Foundation. They also should master the theoretical knowledge and specialized knowledge of Mineral processing, Mineral Material technology and chemical processing. And they should have system engineering practice experiences that include professional cognition practice, production practice and graduation practice.
- (4) Students are supposed to possess the ability of doing mineral processing experiments, and designing and conducting the feasibility experiments of ores. They also should be familiar with the expansion of production scale of ore dressing experiments, and able to analyze the results of experiments reasonably
- (5) Students should learn to design the process of crush, mineral processing and dressing of ores, and realize the basic rules of field tests and production runs.
- (6) Students should master the ability to design the mineral processing by using the theories and technological means synthetically. They should take factories, local economy, environment, law, safety, healthy, ethic and other factors into comprehensive consideration.
- (7) Students should learn to obtain information about mining technology by using modern information technology and search the literature to found useful data skillfully.
- (8) Students should possess good organization and management, oral and written expression and interpersonal communication abilities, and possess good team consciousness and cooperation spirit.
- (9) Students should possess humanistic qualities including good thinking quality, physical quality, mental quality, cultural cultivation, social morality and responsibility.
- (10) Students should have the ability of logical thinking and dialectical thinking, have critical awareness and realistic and pragmatic scientific thinking methods, have the attitude and consciousness of the pursuit of innovation, and master the basic method of innovation in the field of mineral processing. And they should have a correct understanding of lifelong learning, and possess the ability of continuous learning and adapting to the continuous development of mining technology.
- (11) Students should possess international vision and the ability of cross-cultural communication, competition and cooperation, and master a foreign language skillfully to

make technical communication.

附:培养目标实现矩阵

	培养	培养	培养	培养	培养	培养	培养
	目标 1	目标 2	目标3	目标 4	目标 5	目标 6	目标 7
毕业要求 1	✓	✓	✓				✓
毕业要求 2	✓		✓	✓			✓
毕业要求 3	✓		✓	✓	✓		✓
毕业要求 4			✓	✓	✓		✓
毕业要求 5			✓	✓	✓		✓
毕业要求 6		✓	✓	✓	✓		✓
毕业要求 7	✓	✓		✓	✓		✓
毕业要求 8		✓			✓	✓	✓
毕业要求 9		✓				✓	✓
毕业要求 10		✓				✓	✓
毕业要求 11	✓		✓	✓		✓	✓

#### 二、专业核心课程与专业特色课程

#### II Core Courses and Characteristic Courses

## (一) 专业核心课程:

矿石学,粉碎工程,矿物加工工艺学,矿物材料工艺学,矿物加工试验研究方法,矿物加工厂工艺设计,化学选矿,矿物加工测试技术

#### Core Courses:

Lithology, Comminution Engineering, mineral processing technology, mineral material technology, mineral processing experimental research methods, mineral processing plant process design, chemical mineral processing, Mineral Material Testing Techniques.

#### (二) 专业特色课程:

地质学,二次资源开发利用,矿物粉体工程,非金属矿新型建筑材料,选矿工艺与实例,矿业技术经济学,烧结球团工艺学,采矿概论,矿物加工厂自动化、机电一体化Characteristic Courses:

Physical Geology, Exploitation and Utilization of Secondary, Mineral Powder Technology, New Nonmetallic Mineral Building Materials, Technics and Examples of Mineral, Biotechnology of Minerals, Economics of Mining Technology, Sintering Pelletizing Process, Mining Introduction, Automation of Mineral Processing Plan, Mechanical and Electrical Integration.

附: 毕业要求实现矩阵:

专业 核心	专业 特色	课程名称		矿物	加工	工程も	∳业 (	〔卓越	工程	师班)	ト ト 1	<b>と要求</b>	
课程	课程	אייזבינויועי	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		思想道德修养与法律基础						<b>✓</b>			<b>✓</b>		
		中国近现代史纲要									<b>✓</b>		
		毛泽东思想和中国特色社会主义理论 体系概论						<b>✓</b>			✓	✓	

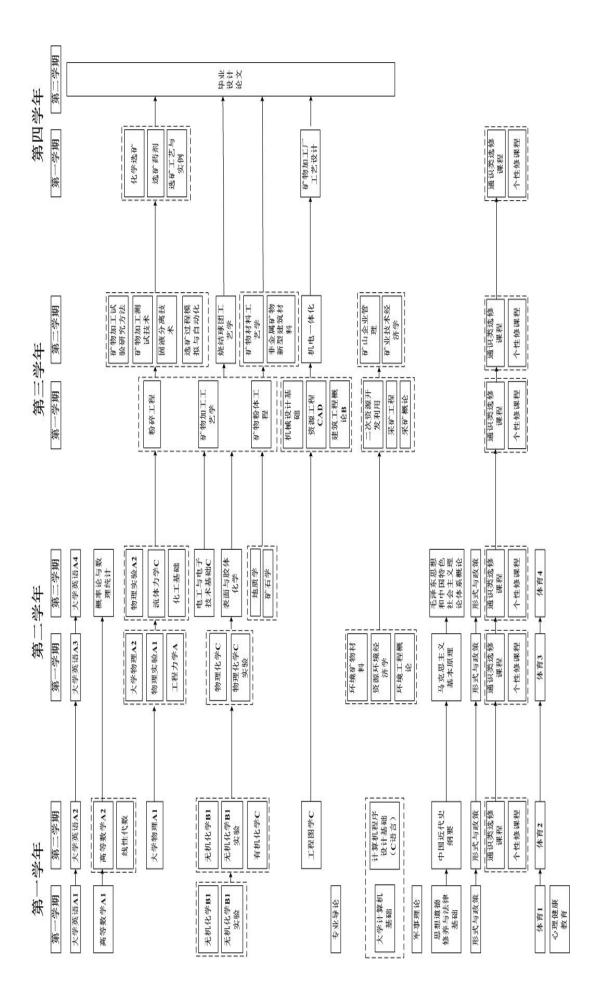
专业 核心	专业 特色	课程名称		矿物	加工	工程	∮业	(卓越	工程	师班)	毕』	L要求	
课程	课程	<b>冰性石</b> 柳	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		马克思主义基本原理								✓	✓	✓	
		军事理论						✓			✓		
		体育								<b>✓</b>	✓		
		大学英语						<b>✓</b>	<b>✓</b>	<b>✓</b>			<b>✓</b>
		大学计算机基础		<b>√</b>	<b>✓</b>				<b>✓</b>				
		计算机程序设计基础		✓	<b>✓</b>								
		创新创业类公选课								<b>√</b>	<b>√</b>	<b>√</b>	
		人文社科类公选课								<b>✓</b>	✓		
		经济管理类公选课	<b>✓</b>					<b>✓</b>					
		科学技术类公选课						<b>✓</b>	<b>✓</b>			<b>✓</b>	
		艺术体育类公选课									<b>✓</b>		
		心理健康教育									<b>✓</b>		
		专业导论		<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>					
		高等数学 A	✓										
		线性代数	✓										
		概率论与数理统计 B	✓										
		大学物理 A	✓										
		物理实验 A	✓										
		工程图学C		<b>✓</b>		<b>✓</b>	<b>✓</b>						
		工程力学 A		<b>✓</b>									
		无机化学 B	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>						
		无机化学实验 B	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>√</b>	<b>✓</b>						
		物理化学 C		<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>						
		物理化学实验 C		<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>						
		资源工程 CAD		<b>✓</b>	✓		<b>√</b>						

专业 核心	专业 特色	课程名称		矿物	加工	工程	∳业	(卓越	工程	师班)	毕』	上要求	
课程	课程	<b>冰</b> 往右70	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		表面与胶体化学		✓	✓	<b>✓</b>	✓					✓	
		电工与电子技术基础 C		<b>✓</b>	<b>✓</b>								
		机械设计基础		<b>√</b>	<b>✓</b>								
		有机化学 C	✓	✓	<b>✓</b>	<b>√</b>	✓						
		环境矿物材料		✓				<b>✓</b>					
		资源环境经济学	✓					<b>✓</b>				<b>√</b>	
	<b>√</b>	地质学		<b>√</b>	<b>✓</b>			<b>✓</b>					
		流体力学		<b>√</b>	<b>✓</b>		<b>√</b>						
		建筑工程概论 B		<b>✓</b>	<b>✓</b>			<b>✓</b>					
	<b>√</b>	采矿概论		<b>✓</b>	<b>✓</b>	✓	✓	<b>✓</b>					
	<b>√</b>	机电一体化		<b>✓</b>	<b>✓</b>			<b>✓</b>					
		化工基础		<b>√</b>	<b>✓</b>	<b>√</b>							
✓		矿石学		<b>✓</b>	<b>✓</b>	<b>√</b>	<b>√</b>						
✓		粉碎工程		<b>√</b>	<b>✓</b>	<b>√</b>	<b>√</b>	<b>✓</b>					
✓		矿物加工工艺学		<b>✓</b>	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>✓</b>				<b>√</b>	
✓		矿物加工试验研究方法		<b>✓</b>	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>✓</b>				<b>√</b>	
✓		矿物加工测试技术		<b>✓</b>	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>✓</b>					
✓		化学选矿		<b>√</b>	<b>✓</b>	<b>√</b>	<b>√</b>	<b>✓</b>					
✓		矿物加工厂工艺设计		<b>✓</b>	<b>✓</b>	<b>√</b>	<b>√</b>	<b>✓</b>					
✓		矿物材料工艺学		<b>✓</b>	<b>✓</b>	<b>√</b>	<b>√</b>	<b>✓</b>					
		环境工程概论					<b>✓</b>	<b>✓</b>					
	<b>√</b>	二次资源开发利用		✓	<b>✓</b>	<b>√</b>	<b>√</b>	<b>✓</b>					
	<b>√</b>	矿物粉体工程		✓	<b>✓</b>	<b>√</b>	<b>√</b>	<b>✓</b>					
	<b>√</b>	矿业技术经济学	✓	<b>✓</b>								<b>✓</b>	
	<b>√</b>	烧结球团工艺学		<b>√</b>	<b>√</b>	✓	✓	<b>√</b>					

专业 核心	专业 特色	课程名称		矿物	加工	工程	∮业	(卓越	工程	师班)	毕』	L要求	
课程	课程	OK-1X-1J-1A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	✓	矿物加工厂自动化		✓	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>					
	✓	非金属矿物新型建筑材料		✓	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>✓</b>					
		固液分离技术		✓	<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>					
		选矿药剂		<b>√</b>	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>✓</b>					
		矿山企业管理	<b>√</b>			<b>✓</b>		<b>✓</b>					
	<b>√</b>	选矿工艺与实例		✓	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>√</b>					
		军事训练								<b>✓</b>	<b>✓</b>		
		认识实习			<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>					
		电工电子实习			<b>✓</b>								
		机械设计基础课程设计			<b>✓</b>		<b>✓</b>	<b>✓</b>					
		机械制造工程实训 C			<b>✓</b>			<b>✓</b>					
		矿物鉴定实验			<b>✓</b>	<b>✓</b>	<b>✓</b>						
		矿物加工工艺学实验		✓	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>√</b>				<b>✓</b>	
		专业实习		<b>√</b>	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>✓</b>					
		岗位实习		<b>√</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>					
		矿物材料工艺学实验		✓	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>					
		矿石可选性综合实验		<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>					
		毕业实习		<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>					
		毕业设计(论文)		<b>√</b>	<b>✓</b>	<b>√</b>	<b>✓</b>	<b>√</b>	<b>✓</b>				

## 三、课程教学进程图

## **III** Teaching Process Map



## 四、理论教学建议进程表

## **IV** Theory Course Schedule

接着	课程	课程				<u>در</u>	乡时分	配 In	cluding	Ţ	-t- \\\ //-		haha .
Course   Course   Course   Nature   Course   Tale   Or   To   To   To   To   To   To   Sept   Sept   Course   Sept   Course   Nature	类别		课程编号	课程名称						· 	建议修造学期		第二
Marker													
### Page 1-6 ###		Nature			Crs	Tot hrs.	Exp.				Term	Course	Major
### Page 1-6 ###				思想道德修养与法律基础									
### 4220002110 中国逆现代史邻要 Outline of Contemporary and Modern Chinese History			4220001110		3	48			8		1-6		
### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  ### Public Bassic Courses  #### Public Bassic Courses  #### Public Bassic Courses  #### Public Bassic Courses  #### Public Bassic Courses  ##### Public Bassic Courses  ##################################						22							
### ### ### ### #####################			4220002110		2	32					1-6		
Socialism with Chinese Characteristics				毛泽东思想和中国特色社会主义理论体系概论									
A220005110   马克思主义基本原理			4220003110		4	96			32		1-6		
### PUBLIC Basic Courses  ### A 2,0005110 Marxism Philosophy 1050001130 心理健康教育 Military Theory 1 1 32 16 2-4  ### A 21000110 Physical Education I 1 32 16 2-4  ### A 21000110 Physical Education I 1 32 16 2-4  ### A 21000110 Physical Education I 1 1 32 2 6 6 1 1  ### A 21000110 Physical Education I 1 1 32 2 6 6 1 1  ### A 21000110 Physical Education I 1 1 32 2 6 6 1 1  ### A 21000110 Physical Education I 1 1 32 2 6 6 1 1  ### A 21000110 Physical Education I 1 1 32 8 8 6 6 1 1  ### A 21000110 Physical Education I 1 1 32 8 8 6 6 1 1  ### A 21000110 Physical Education I 1 1 32 8 8 6 7 8 7 8 7 8 8 8 1 8 1 8 1													
1050001130			4220005110		3	48			8		1-6		
1050001130   Mental health education   1   16   1-2   16   1-2   16   16   16   16   16   16   16   1													
1			1050001130		1	16					1-2		
1   32   16   2-4   16   2-4   17   17   18   19   2-4   19   19   19   19   19   19   19   1													
### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Courses  ### Public Basic Course  #### Public Basic Course  #### Public Basic Course  ### Public Basic Course  ##### Public Basic Course  ##### Public Basic Course  ##### Public Basic Course  ##### Public Basic Course  ########### Public Basic Course  ###################################			1060003130		1	32			16		2-4		
### Public Basic Courses  ### Public Basic Education III  ### Public Basic Education III													
## Public Basic Courses    A	通	必	4210001110		1	32					1		
## A210003110 作育 3 Physical Education III			4210002110	体育 2	1	22					2	休育 1	
## 210003110		修	4210002110		1	32					2	件月1	
理 Public Basic Courses  Public Basic B	识	12	4210003110		1	32					3	体育 2	
Poblic Basic Courses  Required Courses  Required Courses  Required Courses  4210004110												11.14 -	
程 Public Basic Courses  Public Basic Courses  ### 4030002110 大学英语 A1 College English A II		课	4210004110		1	32					4	体育 3	
### Public Basic Courses  ### Public Basic Piper Basic A III  ### Public Basic Course I	课			i									
Public Basic Courses  4030003110 大学英语 A2 College English A III 3 64 16 2 大学英语 A1		<sub>Z</sub> D	4030002110		3	64				16	1		
大学英语 A4 College English A IV 4120017110 大学计算机基础 Foundation of Computer Program Design Language Courses (Choice One, Crs.: 3)  4120023110 计算机程序设计基础(C语言) Fundamentals of Computer Program Design(C Language) 3 48 12 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		equ											
大学英语 A4 College English A IV 4120017110 大学计算机基础 Foundation of Computer Program Design Language Courses (Choice One, Crs.: 3)  4120023110 计算机程序设计基础(C语言) Fundamentals of Computer Program Design(C Language) 3 48 12 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	程	red	4030003110		3	64				16	2	大学英语 A1	
大学英语 A4 College English A IV 4120017110 大学计算机基础 Foundation of Computer Program Design Language Courses (Choice One, Crs.: 3)  4120023110 计算机程序设计基础(C语言) Fundamentals of Computer Program Design(C Language) 3 48 12 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	生	Соц	4020004110	大学英语 A3	2	6.1				16	2	上兴幸海 42	
大学英语 A4 College English A IV 4120017110 大学计算机基础 Foundation of Computer Program Design Language Courses (Choice One, Crs.: 3)  4120023110 计算机程序设计基础(C语言) Fundamentals of Computer Program Design(C Language) 3 48 12 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		ırses	4030004110	College English A III	3	04				10	3	入子央店 AZ	
College English A IV	<sub>_</sub>	0,	4030005110		3	64				16	4	大学英语 A3	
### Program Design Language Courses (Choice One, Crs.: 3)  ### Alt20023110	ldυ			i								) ( ) ( ) ( ) ( ) ( ) ( ) ( )	
# 12	Φ		4120017110		2	32		12			1		
# 12	asic			·	EU 40 1	一班	. 24	タムい			1		
# 12	Cou								: 31				
# 12	rses								51				
### data			4120023110		3	48		12			2		
Fundamentals of Computer Program DesignFORTRAN Language)  中華 中華 中華 中華 中華 中華 中華 中華 中華 中華 中華 中華 中華 中						40		42					
4120025110   Fundamentals of Computer Program Design(VB Language)   3   48   12   2   2   12   2   12   12   12			4120024110	Fundamentals of Computer Program DesignFORTRAN Language)	3	48		12			2		
Fundamentals of Computer Program Design(VB Language)   小 计 Subtotal 35 736 24 64 64   公新创业类   全校学生要求至少取得 9 个学分,且必须选修艺术体育   大文社科类   人文社科类   人文社科类   人文社科类   人文社科类   Arts and Social Science Courses   经济管理类   经济管理类   日本の			/120025110	计算机程序设计基础(VB 语言)	2	18		12			2		
位新创业类 Innovation and Entrepreneurship Courses  V文社科类 Arts and Social Science Courses  经济管理类  位新创业类 上文社科类 Arts and Social Science Courses  经济管理类  All students are required to obtain at least 9 credits, and must select art courses from Art and Physical Education Courses to			4120023110	Fundamentals of Computer Program Design(VB Language)	3	40		12					
位新创业类 Innovation and Entrepreneurship Courses  V文社科类 Arts and Social Science Courses  经济管理类  位新创业类 上文社科类 Arts and Social Science Courses  经济管理类  All students are required to obtain at least 9 credits, and must select art courses from Art and Physical Education Courses to				小 计 Subtotal	35	736		24	64	64			
Innovation and Entrepreneurship Courses   英课程中的艺术类相关课程,取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程,其他专业学生至少选修一门科学技术类课程。   All students are required to obtain at least 9 credits, and must select art courses from Art and Physical Education Courses to							<u> </u>				<u> </u>	かなか か 土	▷ /⊥→-
		四选			米油								
		į) lecti		d Entrepreneurship Courses									
		ve (									コペエス・外作りす	4 IE 4	
		Cour	Arts and Socia								least 9 credit	s, and	
		rses 课											
		V 1+	Economy and	Management Courses	obta	in at l	east 2	2 crec	lits. S	cience	e and er	ngineering stu	ıdents

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	课程	ነጠ ተጠ ሌት ጠ	NH TU by Tb	学	Ę	四分	I	cluding		建议修	先修课程	第二
Course	性质	课程编号	课 程 名 称 Course Title	分	总学时	实验		实践		读学期 Suggested	Prerequisite	专业 Second
Classili	Course Nature	Course Number	Course Title	Crs	Tot hrs.	Exp.	Ope-	Prac-	Extra-	Term	Course	Major
cation N							ration	tice	cur			
		科学技术类		shou	ld sele	ct at I	east c	ne co	urse f	from Art	s and Social So	cience
	-	Science and Te	echnology Courses						_		Courses, and	
		艺术体育类						at le	ast or	ne cours	e from Scienc	e and
		Art and Physic	al Education Courses	lecn	nology	Cours	ses.			1	T	
		4060214110	专业导论	1	16					1		
	-		Introduction to Materials Physics	+								
		4050063110	高等数学 A 上 Advanced Mathematics A I	5	80					1		
	-		高等数学 A 下									
		4050064110	向守奴子 A 「Advanced Mathematics A II	5	80					2		
	-		无机化学 B 上									
		4200307120	Chemistry B I	3	48					1		
	=		无机化学 B 下									
		4200308120	Chemistry B II	1.5	24					2		
学	•		无机化学 B 实验上							_		
		4200309120	Inorganic Chemistry B Experimen $\operatorname{t} I$	1	24	24				1		
科		4200310120	无机化学 B 实验下	0.5	24	24				2		
77		4200310120	Inorganic Chemistry B Experimen $\operatorname{t} \operatorname{II}$	0.5	24	24				2		
		4080041110	工程图学 B	4	64		4			2		
大	必	+00000+1110	Engineering Drawing B		07							
		4050229110	线性代数	2.5	40					2		
	li/s		Linear Algebra							_		
类	修	4050021110	大学物理 A 上	3.5	56					2		
	-		Physics A I 大学物理 A 下									
课	课	4050022110	Physics A II	3.5	56					3		
	-		物理实验A上									
		4050222110	Physics Lab. A I	1	28	28				3		
程	Requi		物理实验A下									
		4050223110	Physics Lab. A II	1	28	28				4		
	red Courses	4050074440	工程力学 A	_	6.4	4				2		
3asi	ours	4050071110	Engineering Mechanics A	4	64	4				3		
Basic Disciplinary Courses	es	4200184120	物理化学C	4	64					3	无机化学 B 上	
scip		4200184120	Physical Chemistry C	-	04					3	无机化学 B 下	
lina		4200185130	物理化学C实验	0.5	16	16				3		
γ (	-		Physical Chemistry C Experimental	-						_		
ours		4050058110	概率论与数理统计 B	3	48					4	高等数学 A 上 高等数学 A 下	
Ses	-		Probability and Mathematics B	+							同守奴子A「	
		4060015110	表面与胶体化学	2.5	40					4	物理化学 C	
	-		Surface and Colloid Chemistry									
		4100012110	电工与电子技术基础 C	4	64	4	10			4	大学物理 A 下	
	-		资源工程 CAD								大学计算机	
		4060128110	Resource Engineering CAD	2	32	24				5	基础	
	ļ		机械设计基础	1_	F.C	_				_		
		4080061110	Mechanical Design Basis	3.5	56	6				5		
	ļ			F.C	053	164	14					
			小 计 Subtotal	56	952	164	14	1				

课程	课程				芦	/ 世分	配 Inc	cluding	<u> </u>	74 101 64		<i>/*/</i> *
类别 Course Classifi-	性质 Course	课程编号 Course Number	课程名称 Course Title	学分	总学时	实验		实践 Prac-		建议修 读学期 Suggested	先修课程 Prerequisite Course	第二 专业 Second
cation	Nature			Crs	Tot hrs.	Ехр.	ration	tice	cur	Term	Course	Major
		4200274120	有机化学 C Organic Chemistry	3	48					2		
	选	4060052110	环境矿物材料 Environmental Mineral Materials	2	32					3		
	20	4060129110	资源环境经济学 Resource and Environment Economics	2	32					3		
	修	4060027110	地质学 Physical Geology	2.5	40					4		
	课	4050134110	流体力学 C Fluid Mechanics C	3	48	6				4		
		4070093110	建筑工程概论 B Architecture Introduction B	1	16					5		
	Electiv	4060217110	采矿概论 Mining Introduction	2	32					5		
	Elective Courses	4080056110	机电一体化 Mechanical and Electrical Integration Introduction	2	32					6		
	es		小 计 Subtotal	17.5	216	6						
			要求至少选修 6 学分。 num subtotal class credits:6	ı								ı
		4200014110	化工基础 Elementary Chemical Industry	3	48	8				4	流体力学 C	
	必	4060243120	矿石学 Lithology	3	48	16				4		
专	יבלי	4060229120	粉碎工程 Comminution Engineering	3	48			16		5		
	修	4060246120	矿物加工工艺学 Mineral Processing Technology	5	80					5	表面与胶体 化学	
业	课	4060088110	矿物加工试验研究方法 Experimental Research Methods of Mineral Processing	2	32					6	表面与胶体 化学	
		4060085110	矿物加工测试技术 Mineral Material Testing Techniques	2	32					6	矿石学	
课	Required Courses	4060083110	矿物材料工艺学 Mineral Material Technology	2.5	40					6	矿物加工工 艺学	
	d Coun	4060232120	化学选矿 Chemical Mineral Processing	2	32					7	表面与胶体 化学	
程	ses	4060244120	矿物加工厂工艺设计 Process Design of Mineral Processing Plant	3	48			16		7	矿物加工工 艺学	
S			小 计 Subtotal	25.5	408	24		32				
pecializ		4060276130	环境工程概论 Environment Engineering Introduction	2	32					3		
Specialized Courses	选 Elect	4060028110	二次资源开发利用 Exploitation and Utilization of Secondary	2	32					5		
rses	修 Elective Courses	4060084110	矿物粉体工程 Mineral Powder Technology	2	32					5		
	urses 课	4060093110	矿业技术经济学 Economics of Mining Technology	2	32					5		
	体	4060102110	烧结球团工艺学 Sintering Pelletizing Process	2	32					6		

课程	课程 性质 Course Nature	课程编号 Course Number	课程名称 Course Title	学 分 Crs	学时分配 Including				建议修		第二	
类别 Course Classifi- cation					总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur	读学期 Suggested Term	元 修 床在 Prerequisite	专业 Second Major
		4060312130	矿物加工厂自动化 Automation of Mineral Processing Plan	2	32					6	矿物加工工 艺学	
		4060031110	非金属矿物新型建筑材料 New Nonmetallic Mineral Building Materials	2	32					6		
		4060036110	固液分离技术 Solid-liquid Separation Techniques	2	32					6		
		4060079110	矿山企业管理 Mine Corporation Management	2	32					6		
		4060120110	选矿药剂 Mineral Processing Reagents	2	32					7	矿物加工工 艺学	
		4060119110	选矿工艺与实例 Technics and Examples of Mineral	2	32					7	矿物加工工 艺学	
			小 计 Subtotal	22	352							
修读说明:要求至少选修 12 学分 NOTE: Minimum subtotal credits:12												

## 五、集中性实践教学环节

## V Practice Schedule

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
1060002110	军事训练	3	1.5	1	
1000002110	Military Training	,	1.5		
4060199110	认识实习	1	1	2(暑期)	
	Cognition Practice	•	_	-( 🗆 ////	
4100069110	电工电子实习	1	1	4	
1100003110	Electric Practice	•	_		
4080146110	机械设计基础课程设计	2	2	5	
	Course Design on Foundation of Machine Design				
4080151110	机械制造工程实训 C	2	2	5	
	Machinery Manufacturing Engineering Practice C	_	_		
4060269120	矿物系统鉴定实验	2	2	5	
1000203120	Mineral Identify	_	_		
4060207110	专业实习(生产实习)	3	3	6	
4000207110	Professional (Production) Practice	<u> </u>		Ů	
4060267120	矿物加工工艺学系统实验 1	1.5	1.5	6	
1000207120	Systematic Experiments of Mineral Processing Technology	1.5	1.5		
4060268120	矿物加工工艺学系统实验 2	2	2	7	
+000200120	Systematic Experiments of Mineral Processing Technology				
4060263120	岗位实习	5.5	5.5	7	
4000203120	Occupation Practice	5.5	5.5	,	
4060186110	矿物材料工艺学系统实验	1.5	1.5	7	
4000100110	Systematic Experiments of Mineral material Technology	1.3	1.5	,	
4060184110	矿石可选性综合实验	1.5	1.5	7	
4000184110	Serial Experiments of Ore Beneficiation Feasibility	1.5	1.5	,	
4060152110	毕业实习	2	2	8	
4000132110	Graduation Practice			0	
4060261120	毕业设计(论文)	15	10	8	
4000201120	Graduation Design (Dissertation)	13	10	G	

课程编号	实践环节名称	周数	学分	建议修读学期	第二专业
Course Number	Practice Courses Name	Weeks	Crs	Suggested Term	Second Major
	小 计 Subtotal	42.5	36.5		

## 六、修读指导

## **VI** Recommendations on Course Studies

《形势与政策》课程,平均每学期 16 学时,一般按专题进行,在第七学期末考核,计 2 个课外学分,具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人: 袁艳斌 专业培养方案责任人: 张凌燕