

环境科学

一、培养目标

本专业旨在培养具有扎实而系统的环境科学专业基础理论、发展全面的科学文化素质、良好的政治思想和道德品质、较高的外语和计算机应用能力，能在环境影响评价、环境规划与管理、环境监测、环境系统分析、生态环境恢复及环境工程所涉及的水污染控制、大气污染控制、固体废物污染控制、物理性污染控制等相关领域从事科学研究、教学和技术管理的环境科学专门人才。

二、基本规格要求

1. 要求受到良好的科学思维、科学实验等基本训练，具有较好的人文社会科学素养、较强的社会责任感和良好的职业道德。

2. 要求掌握扎实的环境科学基本理论、基本知识和基本技能与方法，强化环工原理、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、物理性污染控制、生态恢复（修复）等方面的应用能力。

3. 要求了解环境科学的理论前沿、应用前景和最新发展动态，以及环境保护产业的发展状况，要求熟悉国家环境保护、自然资源合理利用、可持续发展等有关政策和法规。

4. 要求具有较熟练的外语和计算机应用能力，掌握文献资料查询及运用现代信息技术获取相关信息的基本方法；具有一定实验设计的能力，归纳、整理、分析实验结果的能力，撰写论文和参与学术交流的能力。

三、培养特色

理工文融合，教学和科研结合，与国际接轨，培养创新型环境科学与工程人才。

四、学制、毕业基本要求及学位授予

1. 本科基本学制 4 年，弹性学习年限 3—6 年，按照学分管理制度管理。

2. 环境科学专业学生毕业最低学分数为 155 学分，其中各类别课程及环节要求学分数如下表：

课程类别	通识必修	学门核心	学类核心	专业核心	专业选修	通识选修	集中实践	合计
学分数	27	24	31	12	21	8	32	155

3. 学生修满培养方案规定的必修课、选修课及有关环节，达到规定的最低毕业学分数，并修完规定必修但不记学分的所有课程和环节，德、智、体合格，即可毕业。满足学位授予相关文件要求的，授予工学学士学位。

五、课程设置及学分分布

（一）通识教育课程〔必修 27+（6）学分+选修 8 学分〕

通识教育课程包括必修和选修两部分。通识选修课程按《湖南大学通识选修（文化素质教育）课程方案》实施，通识必修课程如下：

编码	课程名称	学分	备注
GE01101	毛泽东思想和中国特色社会主义理论体系概论	3+ (3)	
GE01039	思想道德修养与法律基础	1.5+ (1.5)	
GE01100	形势与政策	0.5+ (1.5)	
GE01102	中国近现代史纲要	2	
GE01103	马克思主义基本原理 (上)	2	
GE01104	马克思主义基本原理 (下)	2	
GE01012 (-15)	大学英语	8	
GE01088	计算机基本能力测试	0.5	
GE01093	计算机导论与程序设计	2.5	
GE01107 (-13)	心理素质与生涯发展	1	
GE01089 (-92)	体育	4	

(二) 学门核心 (24 学分)

编码	课程名称	学分	备注
GE03025 (26)	高等数学 A	10	
GE03003	线性代数 A	3	
GE03004	概率论与数理统计 A	3	
GE03005 (06)	普通物理 A	6	
GE03007 (08)	普通物理实验 A	2	

(三) 学类核心 (31 学分)

编码	课程名称	学分	备注
ES04001	无机化学 A	4	
ES04002	有机化学 A	4	
ES05004	基础化学实验	2	
ES04005	物理化学 A	4	
GE02018	土木工程制图	2	
ES04003	工程力学	2	
ES04004	流体力学	2	
ES04007	环工原理与设备	4	
ES05008	环境监测与分析化学	4	
ES05009	环境工程微生物	3	

(四) 专业核心 (12 学分)

编码	课程名称	学分	备注
ES05011	大气污染控制工程	3	
ES05012	水污染控制工程	3	
ES05017	环境影响评价与规划	3	
ES05018	环境毒理学	3	

(五) 专业选修课 (34 学分, 必须选满 21 学分)

编码	课程名称	学分	备注
ES06044	环境化学	2	
ES06018	生态学	2	
ES06045	给水排水管道工程	2	

续表

编码	课程名称	学分	备注
ES06020	仪器分析	2	
ES06046	环境生物化学	2	
ES06003	固体废物处理与处置	2	
ES06006	环境工程 CAD	2	
ES06021	物理性污染控制 (噪声)	2	
ES06015	景观生态学	2	
ES06017	生态工程	2	
ES06019	环境土壤学	2	
ES06013	环境专业英语	2	
ES06001	地理信息系统	2	
ES06002	环境地质学	2	
ES06040	环境地理学	2	
ES06016	环境与发展	2	
ES06039	环境问题与对策 (新生研讨课)	1	
ES06043	环境科学前沿 (高级研讨课)	1	

说明: 1) 本专业选修不低于 10 学分, 其他学分可在全校范围的选修课内任选;

2) 在读期间参加学科竞赛、公开发表学术论文经学院认定 (详见《湖南大学环境科学与工程学院实践创新学分认定标准》), 可以替代专业选修学分, 但最高不超过 2 个学分。

(六) 集中实践 (32 学分)

编码	课程名称	学分	备注
GE09030	中文写作实训	1	
GE09028	英文应用写作实训	1	
ES10006	公民教育与社会实践	1	
GE09006	金工实习	2	
ES10004	专业认知实习	2	
ES10002	专业生产实习	2	
ES10003	毕业实习 (导师研讨课)	2	
ES10006	环工原理课程设计	2	
ES10007	水污染控制课程设计	2	
ES10008	大气污染控制课程设计	2	
ES10009	环境影响评价与规划课程设计	3	
ES10010	毕业论文或设计	12	

六、学院课程讲授团队汇总表

课程名称	类型	主讲教师 (非本院开设仅需填开课单位)	参与教师
环境监测与分析化学	学类核心	牛承岗、彭艳蓉	龚继来、汤琳
环工原理与设备	学类核心	胡天觉、杨春平	李珊红、董浩然、单文伟
环境工程微生物	学类核心	黄丹莲、徐卫华、张亚新	杨朝晖、牛秋雅

续表

课程名称	类型	主讲教授（非本院开设仅需填开课单位）	参与教授
水污染控制工程	专业核心	李小明、杨麒	张长、文嘉
大气污染控制工程	专业核心	翟云波、李彩亭	李珊红、单文伟
环境毒理学	专业核心	牛秋雅、刘云国	刘红玉、黄丹莲
环境影响评价与规划	专业核心	李欣、梁婕	袁兴中、黄瑾辉
固体废物处理与处置	专业选修	陈桂秋、陈耀宁	黄彬彬
环境生物化学	专业选修	黄彬彬、牛秋雅	彭艳蓉、陈耀宁
环境问题与对策	专业选修	曾光明、刘云国、李彩亭、袁兴中、李小明、杨春平、牛承岗、李忠武	
环境科学前沿	专业选修	汤琳、杨朝晖、刘红玉、陈桂秋、黄丹莲、张长、陈耀宁、徐卫华	
生态学	专业选修	刘云国、徐卫华	曾光明、彭艳蓉
环境土壤学	专业选修	陈桂秋、文嘉	胡天觉、杨朝晖、张盼月
景观生态学	专业选修	李忠武、李欣	曾光明、徐卫华
环境地质学	专业选修	翟云波、李珊红	李忠武、刘红玉
环境工程 CAD	专业选修	杨麒、李小明	李彩亭、张长
环境化学	专业选修	陈耀宁、董浩然	袁兴中、李欣
环境地理学	专业选修	李忠武、张亚新	李欣、翟云波
地理信息系统	专业选修	李忠武、文嘉	李晓东、梁婕
给水排水管道工程	专业选修	黄瑾辉、梁婕、李晓东	曾光明、张长
环境专业英语	专业选修	黄彬彬、张亚新	汤琳、李小明
生态工程	专业选修	李欣、龚继来	刘云国、牛秋雅、钟华
物理性污染控制（噪声）	专业选修	李珊红、董浩然	李彩亭、翟云波
仪器分析	专业选修	龚继来、彭艳蓉	张亚新、牛承岗
环境与发展	专业选修	汤琳、李晓东	袁兴中、黄丹莲

七、专业责任教授

序号	姓名	职称	学历学位	专业特长	承担授课课程
1	刘云国	教授	博士	生态修复理论与技术、旅游规划与旅游资源开发	环境问题与对策（专业选修）、生态学（专业选修）、生态工程（专业选修）、环境生物学（专业选修）

Environmental Science

I . Program Objective

The discipline aims at training Environmental Science specialized top talents with systematic fundamental professional theory and engineering practice ability, comprehensive scientific and cultural quality, good political thought and moral traits, high communication skill using English and computational operating ability. Students would be able to conduct technical work in Water Pollution Control, Air Pollution Control, Solid Waste Pollution Control and Physical Pollution Control within the areas of Environmental Impact Assessment, Environmental Monitoring, Environmental System Analysis, Ecological Environment Remediation, etc. Graduates could also perform scientific research, lecturing and technical management work in the above areas.

II . Basic Specifications

The students are required to

1. Be trained with good scientific logic and experiments, possess good quality of humanistic and social science, and have relative strong social responsibility and professional ethics.
2. Master basic principle, methods and techniques of Environmental Science; Strengthen the application ability in Environmental Engineering Principles, Water Pollution Control, Air Pollution Control, Physical Pollution Control and Ecological Recovering (Remediation).
3. Understand the frontier theory, application prospect and up-to-date development of environmental science; be familiar with policies and regulations pertaining to national environmental protection, rational uses of natural resource and sustainable development.
4. Have fluent English and computer skills; master fundamental methods of literature research and obtaining relative information utilizing modern technologies; be able to design experiments, to conclude, sort and analyze results, and to write scientific papers and participate in academic exchanges.

III . Program Features

Cultural fusion, teaching and research combination, in line with international conventions, cultivating innovative environmental science and engineering talents.

IV . Academic structure, graduation requirements and degree awarding

1. Duration for undergraduates is normally 4 years with a flexible time between 3 to 6 years, according to the credit system management.
2. The minimum credit for students graduating under the environmental engineering program is 155, with the specifications of each course listed below:

Course Type	General Required	Phylum Core	Category Core	Discipline Core	Discipline Optional	General Optional	Practice	Total
Credit	27	24	31	12	21	8	32	155

3. Students can be deemed to graduate upon completion of all required, optional and extracurricu-

lar courses stipulated in the program scheme with the minimum graduation credits, meanwhile completing all required non-credits courses. Those meet the degree conferring-related documents will be awarded the Bachelor of Engineering Degree.

V. Curriculum setting and credit distribution

1. General Education Courses [required 27+(6) + elective 8 credits]

The general education courses consist of required courses and elective courses. General education electives are designed according to the *Curriculum Design of General Education Electives of Hunan University*. Required general education courses are illustrated in the following table.

Code	Course Title	Credit(s)	Remarks
GE01101	Introduction to Maoism and Theoretical System of Socialism with Chinese Characteristics	3+(3)	
GE01039	Moral Cultivation and Law Basics	1.5+(1.5)	
GE01100	Current Situation and Policies	0.5+(1.5)	
GE01102	Outline of Modern Chinese History	2	
GE01103	Fundamentals of Marxism I	2	
GE01104	Fundamentals of Marxism II	2	
GE01012(-15)	College English	8	
GE01088	Computer Proficiency Test	0.5	
GE01093	Introduction to Computer Science and Programming	2.5	
GE01107(-13)	Psychological Health & Career Planning	1	
GE01089(-92)	Physical Education	4	

2. Phylum Core (24 credits)

Code	Course title	Credit(s)	Remarks
GE03025(26)	Advanced Mathematics A	10	
GE03003	Linear Algebra A	3	
GE03004	Probability and Statistics A	3	
GE03005(06)	General Physics A	6	
GE03007(08)	General Physics Experiment A	2	

3. Category Core (31 credits)

Code	Course title	Credit(s)	Remarks
ES04001	Inorganic Chemistry A	4	
ES04002	Organic Chemistry A	4	
ES05004	Fundamental Chemistry Experiment	2	
ES04005	Physical Chemistry A	2	
GE02018	Civil Engineering Drawing	4	
ES04003	Engineering Mechanics	2	
ES04004	Hydromechanics	2	
ES04007	Environmental Engineering Principle and Equipments	4	
ES05008	Environmental Monitoring and Analytic Chemistry	4	
ES05009	Environmental Engineering Microbiology	3	

4. Discipline Core (12 credits)

Code	Course title	Credit(s)	Remarks
ES05011	Air Pollution Control Engineering	3	
ES05012	Water Pollution Control Engineering	3	
ES05017	Environmental Impact Assessment and Planning	3	
ES05016	Environmental Toxicology	3	

5. Optional Course (34 credits, choose 21 credits)

Code	Course Title	Credit(s)	Remarks
ES06044	Environmental Chemistry	2	
ES06018	Ecology	2	
ES06045	Water Supply and Drainage Pipeline Engineering	2	
ES06020	Instrumental Analysis	2	
ES06046	Environmental Biochemistry	2	
ES06003	Solid Waste Disposal and Treatment	2	
ES06006	Environmental Engineering CAD	2	
ES06021	Physical Pollution Control (Noise)	2	
ES06015	Landscape Ecology	2	
ES06017	Ecological Engineering	2	
ES06019	Environmental Edaphology	2	
ES06013	Environmental Professional English	2	
ES06001	Global Information System	2	
ES06002	Environmental Geology	2	
ES06040	Environmental Geography	2	
ES06016	Environment and Development	2	
ES06039	Environmental Problems and Strategies (Freshman Seminar)	1	
ES06043	Environmental Engineering Technical Frontier (Senior Seminar)	1	

Note: 1) The professional optional courses are required not less than 10 credits, while the other credits can be selected from the optional courses within the university-wide;

2) Those who satisfy either conditions of participating in academic competition and publishing paper during study can replace the professional optional credits, but no more than 2 credits. Please review: the practical innovation credits recognized standards by College of Environmental Science & Engineering of HNU.

6. Practice (32 credits)

Core	Course title	Credit(s)	Remarks
GE09030	Chinese Writing Training	1	
GE09028	English Writing Training	1	
ES10006	Civilian Education and Social Practice	1	
GE09006	Metal Working Practice	2	
ES10004	Major Cognitive Practice	2	
ES10002	Major Production Practice	2	
ES10003	Graduation Practice (Supervision)	2	
ES10006	Curriculum Design of Environmental Engineering Principle	2	
ES10007	Curriculum Design of Water Pollution Control	2	
ES10008	Curriculum Design of Air Pollution Control	2	
ES10009	Curriculum Design of Environmental Impact Assessment and Planning	3	
ES10010	Graduation Thesis	12	

VI. College Course Lecturing Team

Course Title	Type	Principal Lecturer	Joining Lecturer
Environmental Monitoring & Analytic Chemistry	Category Core	Niu Chenggang, Peng Yanrong	Gong Jilai, Tang Lin
Environmental Engineering Principle & Equipments	Category Core	Hu Tianjue, Yang Chunping	Li Shanhong, Dong Haoran, Shan Wenwei
Environmental Engineering Microbiology	Category Core	Huang Danlian, Xu Weihua, Zhang Yaxin	Yang Zhaohui, Niu Qiuya
Water Pollution Control Engineering	Discipline Core	Li Xiaoming, Yang Qi	Zhang Chang, Wen Jia
Air Pollution Control Engineering	Discipline Core	Zhai Yunbo, Li Caiting	Li Shanhong, Shan Wenwei
Environmental Toxicology	Discipline Core	Niu Qiuya, Liu Yunguo	Liu Hongyu, Huang Danlian
Environmental Impact Assessment and Planning	Discipline Core	Li Xin, Liang Jie	Yuan Xingzhong, Huang Jinhui
Solid Waste Treatment and Disposal	Discipline Optional	Chen Guiqiu, Chen Yaoning	Huang Binbin
Environmental Biochemistry	Discipline Optional	Huang Binbin, Niu Qiuya	Peng Yanrong, Chen Yaoning
Environmental Problems and Strategies	Discipline Optional	Zeng Guangming, Liu Yunguo, Li Caiting, Yuan Xingzhong, Li Xiaoming, Yang Chunping, Niu Chenggang, Li Zhongwu	
Environmental Science Frontier	Discipline Optional	Tang Lin, Yang Zhaohui, Liu Hongyu, Chen Guiqiu, Huang Danlian, Zhang Chang, Chen Yaoning, Xu Weihua	
Ecology	Discipline Optional	Liu Yunguo, Xu Weihua	Zeng Guangming, Peng Yanrong
Environmental Edaphology	Discipline Optional	Chen Guiqiu, Wen Jia	Hu Tianjue, Yang Zhaohui, Zhang Panyue
Landscape Ecology	Discipline Optional	Li Zhongwu, Li Xin	Zeng Guangming, Xu Weihua
Environmental Geology	Discipline Optional	Zhai Yunbo, Li Shanhong	Li Zhongwu, Liu Hongyu
Environmental Engineering CAD	Discipline Optional	Yang Qi, Li Xiaoming	Li Caiting, Zhang Chang
Environmental Chemistry	Discipline Optional	Chen Yaoning, Dong Haoran	Yuan Xingzhong, Li Xin
Environmental Geography	Discipline Optional	Li Zhongwu, Zhang Yaxin	Li Xin, Zhai Yunbo
Global Information System	Discipline Optional	Li Zhongwu, Wen Jia	Li Xiaodong, Liang Jie

Cont

Course Title	Type	Principal Lecturer	Joining Lecturer
Water Supply and Drainage Pipeline Engineering	Discipline Optional	Huang Jinhui, Liang Jie, Li Xiaodong	Zeng Guangming, Zhang Chang
Environmental Professional English	Discipline Optional	Huang Binbin, Zhang Yaxin	Tang Lin, Li Xiaoming
Ecological Engineering	Discipline Optional	Li Xin, Gong Jilai	Liu Yunguo, Niu Qiuya, Zhong Hua
Physical Pollution Control (Noise)	Discipline Optional	Li Shanhong, Dong Haoran	Li Caiting, Zhai Yunbo
Instrumental Analysis	Discipline Optional	Gong Jilai, Peng Yanrong	Zhang Yaxin, Niu Chenggang
Environment and Development	Discipline Optional	Tang Lin, Li Xiaodong	Yuan Xingzhong, Huang Danlian

VII. Professional Responsible Professors

No.	Name	Title	Education	Specialty	Courses undertaken
1	Liu Yunguo	Professor	Ph. D	Ecological Remediation Principles and Technologies, Tourism Planning and Tourism Resource Development	Environmental Problems and Strategies (Optional), Landscape Ecology (Optional), Ecological Engineering (Optional), Environmental Toxicology (Discipline Core)

(翻译人:文嘉、黄彬彬)