

# 建筑环境与能源应用工程

## 一、培养目标

面向国家建设需要,适应科技进步,根据德、智、体、美全面发展,“知识、能力、人格”三位一体的培养目标,使学生在新的培养模式下,掌握建筑环境与能源应用工程的基本原理和基本知识,具有扎实的基础理论、宽广的专业知识,获得工程师的基本训练,具备良好职业素养、较好的工程实践训练、一定的工程研究及创新能力,培养具备从事建筑环境控制与建筑能源供给系统以及建筑设施智能化工程的规划、设计、施工、安装、设备调试、运行管理、设备研发、产品营销等工作所需的基础理论、专业技术知识和实践与创新能力,能够在设计研究院、工程公司、设备制造企业、管理部门等从事设计、研发、施工、管理等岗位工作的复合型工程技术应用人才。

## 二、基本规格要求

本专业学生要求具备以下核心能力:

1. 进行本专业工程规划与设计、系统运行与技术管理的能力。
2. 运用所学专业知知识分析、解决本专业一般工程实际问题的能力。
3. 较强的自学、多渠道获取、拓展和深化知识的能力。
4. 初步技术研究、产品开发和一定的技术创新能力。
5. 一定的应用计算机进行工程计算、系统模拟的能力。
6. 一定的阅读外文工程技术资料和利用外语进行技术交流的能力。
7. 良好的技术交流、沟通和协作能力。

## 三、培养特色

1. 立足湖南鲜明的气候特点,“冷”“热”并重,冬、夏兼顾,培养空调、制冷、通风、供热以及能源应用等方面技术全面、系统性强、知识宽广的工程应用型人才。
2. 以书院文化为依托,培养人文知识丰富、思维活跃、胸襟宽阔、踏实创新的复合型人才。

## 四、学制、毕业基本要求及学位授予

1. 本科基本学制 4 年,按照学分制度管理。
2. 专业学生毕业最低学分数为 175 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	40	19	25	8	32	175

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	
GE01105	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	高等数学 A (1)	5	
GE03026	高等数学 A (2)	5	
GE03003	线性代数 A	3	
GE03004	概率论与数理统计 A	3	
GE03005	普通物理 A (1)	3	
GE03006	普通物理 A (2)	3	
GE03007 (08)	普通物理实验 A	2	

### (三) 学类核心 (40 学分)

编码	课程名称	学分	备注
GE02009	电工技术	2	
GE02006	普通化学	2	
CE04034	工程图学	4	
CE04035	计算机图形学	1	
CE04012	工程力学 B	4	
CE04040	工程热力学 B	4	
CE04022	机械设计基础 A	3	
CE04041	流体力学 A	4	
CE04042	传热学 B	4	
CE04025	流体输配管网	3	
CE04026	建筑环境与测量技术	3	
CE04043	自动控制原理 A	3	
CE04044	热质交换原理与设备	3	

**(四) 专业核心 (19 学分)**

编码	课程名称	学分	备注
CE05021	建筑环境学	3	
CE05072	空气调节	3	
CE05025	建筑设备自动化系统	3	
CE05026	供热工程	3	
CE05022	空调用制冷技术	3	
CE05073	暖通空调工程设计方法	2	
CE05074	建筑能源供应系统	2	双语

**(五) 选修课 (25 学分)**

建议学生从以下课程中选修 25 个或更多学分,也可从本学院其他专业所列的“专业选修课程”中选修。

编码	课程名称	学分	备注
CE06037	建筑环境与能源应用工程导论	1	
CE06033	建筑概论	2	
CE06049	可持续建筑技术	2	
CE06069	燃气输配工程	2	
CE06128	暖通空调设备设计	2	
CE06041	建筑热湿过程	2	
CE06148	暖通空调施工组织技术与概预算	2	
CE06088	专业计算方法与最优化	2	
CE06149	专业英语	2	
CE06023	工业通风	2	
CE06039	建筑节能技术	2	
CE06150	锅炉及锅炉房设备	2	
CE06028	环境保护与可持续发展	2	
CE06151	建筑给排水	2	
CE06096	工程项目管理	2	
CE06001	城市固体废物处理	2	
CE06051	空调用热泵技术	2	

注:在读期间参加学科竞赛、SIT、公开发表学术论文、获专利或软件著作权以及其他经学院教学指导委员会认定的科技实践活动或成果,可替代专业选修课,但最高不超过 3 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	
GE09006	金工实习	2	
GE09021	电工实习	2	
CE10026	机械基础课程设计	1	
CE10087	供热与锅炉综合课程设计	3	
CE10097	空调与制冷综合课程设计	3	
CE10008	认识实习	1	
CE10060	安装及施工生产实习	3	
CE10050	毕业实习	2	
CE10071	毕业设计(论文)	14	

## 六、课程责任教师一览表

序号	姓名	职称	学历学位	专业特长	课程 (专业核心、专业选修、通识选修)
1	李念平	教授	博士	建筑环境与能源应用工程	建筑环境学等专业课
2	陈友明	教授	博士	建筑环境与能源应用工程	自动控制原理等专业课
3	张国强	教授	博士	建筑环境与能源应用工程	建筑环境与设备工程导论
4	杨昌智	教授	博士	建筑环境与能源应用工程	暖通空调设计方法等专业课
5	龚光彩	教授	博士	建筑环境与能源应用工程	流体输配管网等专业课
6	张 泉	教授	博士	建筑环境与能源应用工程	制冷技术等专业课
7	张 泠	教授	博士	建筑环境与能源应用工程	暖通空调工程等专业课
8	周 晋	副教授	博士	建筑环境与能源应用工程	建筑热湿过程等专业课
9	俞 准	副教授	博士	建筑环境与能源应用工程	供热工程等专业课
10	莫志姣	讲师	学士	建筑环境与能源应用工程	建筑环境测量技术等专业课
11	李洪强	副教授	博士	建筑环境与能源应用工程	传热学等专业课
12	彭晋卿	副教授	博士	建筑环境与能源应用工程	建筑能源供应系统
13	卢继龙	工程师	硕士	建筑环境与能源应用工程	专业实验课程
14	刘志友	工程师	学士	建筑环境与能源应用工程	专业实验课程
15	韩 杰	助研	博士	建筑环境与能源应用工程	可持续建筑技术

## 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	李念平	教授	博士	建筑环境与能源应用工程	建筑环境学等专业课

# Building Environment and Energy Engineering

## I . Objective

The major studies aim to help students learn basic principles and knowledge of building environment and energy engineering in a new way. Such education is targeted at improving the knowledge, ability and personality of students in order to meet the requirements of national construction and technical progress. With taking the courses, students will acquire the fundamental knowledge of HVAC systems as well as research ability. They will also be trained as an engineer so that will demonstrate the ability to properly plan, design, install, adjust, operate, manage, develop and sale relevant systems and products. Moreover, they will be able to work in consult companies, industry, manufacture factories and management departments.

## II . Basic requirements

Students are required to have:

1. Ability to design, operate and manage HVAC systems.
2. Ability to analyze and solve practical problems by using learned knowledge.
3. Ability to self-learn and expand knowledge.
4. Ability to conduct technical research, product development and technical creativity.
5. Ability to perform calculation and system simulation by using computers.
6. Ability to read English technical materials.
7. Ability to communicate and collaborate with others.

## III . Features

1. Based on the characteristics of Hunan climate, i. e. hot summer and cold winter, this major studies aim to help students develop an understanding of a variety of disciplines, including air-conditioning, refrigeration, ventilation, heating and energy application.

2. Based on university culture, this major studies aim to help students broaden their eyesight, keep them sharp their mind and to be creative.

## IV . Education system, basic requirements for graduation and degree

1. The time for university education is 4 years and credit system is used.
2. The minimum credit for graduation is 175 credits, as shown below:

Course	General education required courses	General core courses	Core courses of the discipline	Core courses of the major	Selected courses of the major	General education selected courses	Practice	Total
Credit	27	24	40	19	25	8	32	175

3. Students can graduate after they finish the required courses, selected courses and other courses as required in the education plan. They also need to finish other required courses that do not have credits. They will be awarded a bachelor of Engineering degree after they meet all the requirements.

## V. Courses and credits

### 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	
GE01105	Introduction to Computer Science and Programming	2.5	
GE01107(-13)	Psychological Health & Career Planning	1	
GE01089(-92)	Physical Education	4	

### 2. General core courses (24 credits)

Code	Course	Credit(s)	Remarks
GE03025	Higher Mathematics A( I )	5	
GE03026	Higher Mathematics A ( II )	5	
GE03003	Linear Algebra (A)	3	
GE03004	Probability Theory and Mathematical Statistics	3	
GE03005	Physics A( I )	3	
GE03006	Physics A ( II )	3	
GE03007(08)	Physical Experiments A	2	

### 3. Core courses of the discipline (40 credits)

Code	Course	Credit(s)	Remarks
GE02009	Electronic Technology	2	
GE02006	Chemistry	2	
CE04034	Engineering Drawing	4	
CE04035	Computer Aid Drawing	1	
CE04012	Engineering Mechanics B	4	
CE04040	Engineering Thermodynamics B	4	
CE04022	Fundamentals of Mechanical Design A	3	
CE04041	Fluid Mechanics A	4	
CE04042	Heat Transfer B	4	
CE04025	Fluid Supply Network	3	
CE04026	Testing Technology for Building Environment	3	
CE04043	Principle of Automatic Control A	3	
CE04044	Principle and Equipment of Heat Mass Transfer	3	

## 4. Core courses of the major(19 credits)

Code	Course	Credit(s)	Remarks
CE05021	Building Environment	3	
CE05072	HVAC	3	
CE05025	Architecture Equipment Automation System	3	
CE05026	Heat Supply Engineering	3	
CE05022	Refrigerating Technology for Air Conditioner	3	
CE05073	HVAC Design Method	2	
CE05074	Building Energy Supply System	2	bilingual course

## 5. Selected courses(25 credits)

Students are recommended to take 25 or more credits from the following table, or take other selected courses in other majors in our institute.

Code	Course	Course(s)	Remarks
CE06037	Introduction to Building Environment and Energy Engineering	1	
CE06033	Introduction to Architecture	2	
CE06049	Sustainable Building Technology	2	
CE06069	Gas Transportation and Distribution	2	
CE06128	Design of HVAC Facility	2	
CE06041	Building Thermal and Humidity Process	2	
CE06148	Construction Management Plan and Preliminary Budget of HVAC	2	
CE06088	Computational Method and Optimization	2	
CE06149	Professional English	2	
CE06023	Industrial Ventilation	2	
CE06039	Building Energy Conservation Technology	2	
CE06150	Boiler and Boiler Room Facilities	2	
CE06028	Environment Protection and Sustainable Development	2	
CE06151	Building Water Supply and Drainage	2	
CE06096	Project Management	2	
CE06001	Process of Civil Solid Waste	2	
CE06051	Heat Pump Technology for Air Conditioning	2	

Note: Through participating scientific activities or by demonstrating scientific achievements, students can obtain maximum 3 scientific practice credits upon the scientific activities and achievements are recognized by the college curriculum committee. The scientific activities and achievements could be scientific competitions, SIT, research papers, patents, copyrighted software, equipment/devises, etc. The scientific practice credits can substitute for selective credits.

## 6. Practice(32 credits)

Code	Course	Credit	Remarks
GE09030	Writing Training	1	
GE09006	Metal Work Practice	2	
GE09021	Electric Work Practice	2	
CE10026	Machinery Course Design	1	
CE10087	Course Design for Heat Supply and Boiler	3	
CE10097	Course Design for Air conditioner and Refrigeration	3	
CE10008	Cognition Practice	1	
CE10060	Production Practice	3	
CE10050	Graduation Field Work	2	
CE10071	Graduation Design (Thesis)	14	

## VI. Course leaders and instructors

Item	Name	Title	Degree	Major	Course
1	Li Nianping	Professor	Ph. D	Building Environment and Energy Engineering	Building Environment etc.
2	Chen Youming	Professor	Ph. D	Building Environment and Energy Engineering	Principle of Automatic Control etc.
3	Zhang Guoqiang	Professor	Ph. D	Building Environment and Energy Engineering	Introduction to Building Environment and Energy Engineering etc.
4	Yang Changzhi	Professor	Ph. D	Building Environment and Energy Engineering	HVAC Design Method etc.
5	Gong Guangcai	Professor	Ph. D	Building Environment and Energy Engineering	Fluid Supply Network
6	Zhang Quan	Professor	Ph. D	Building Environment and Energy Engineering	Refrigerating Technology for Air Conditioner etc.
7	Zhang Ling	Professor	Ph. D	Building Environment and Energy Engineering	HVAC etc.
8	Zhou Jin	Associate Professor	Ph. D	Building Environment and Energy Engineering	Building Thermal and Humidity Process etc.
9	Yu Zhun	Associate Professor	Ph. D	Building Environment and Energy Engineering	Heat Supply Engineering etc.
10	Mo Zhijiao	Lecturer	Bachelor	Building Environment and Energy Engineering	Testing Technology for Building Environment etc.
11	Li Hongqiang	Associate Professor	Ph. D	Building Environment and Energy Engineering	Heat Transfer etc.
12	Peng Jingqing	Associate Professor	Ph. D	Building Environment and Energy Engineering	Building Energy System
13	Lu Jilong	Engineer	Master	Building Environment and Energy Engineering	Experiment
14	Liu Zhiyou	Engineer	Bachelor	Building Environment and Energy Engineering	Experiment
15	Han Jie	Assistant Researcher	Ph. D	Building Environment and Energy Engineering	Sustainable Building Technology

## VII. Chair professor

Item	Name	Title	Degree	Major	Courses
1	Li Nianping	Professor	Ph. D	Building Environment and Energy Engineering	Building Environment etc.

(翻译人:俞淮)