

## Architectural Engineering

In 1624, Sir Henry Wotton stated that a building should have “firmness, commodity, and delight.” Today these same properties are still of primary importance, although the statement might be rephrased to read “a building should be structurally sound and durable; it should provide a functional, comfortable, and economical environment; and it should be aesthetically pleasing.”

The task of an architectural engineer is to bring together various technological-ly advanced building systems and make them all work together as an integrated whole.

Architectural engineering at K-State is a five-year program that combines an engineering program (accredited by the Accreditation Board for Engineering Technology) with building systems courses. It covers engineering design theory and how to apply these tools to create completely functional buildings. The K-State architectural engineering program is one of only 18 accredited programs and is a leading source of building system design engineers.

### Employment

There is a tremendous demand for graduates of this program. Architectural engineering opens the door to a variety of interesting jobs with high starting salaries and exciting careers.

Some possible careers include:

- ▶ Consultants in structural design, either independently or in association with an architectural or engineering firm, work with structural engineers, who primarily design building structures.
- ▶ Associates with the building products industry aid with the development and marketing of new building products.

- ▶ Consultants in mechanical, electrical, lighting, or acoustical design either work independently or in association with an architectural or engineering firm.
- ▶ Mechanical designers engineer heating, ventilating, air conditioning, plumbing, and fire protection systems for buildings.
- ▶ Lighting designers create lighting systems for buildings.
- ▶ Electrical designers engineer power distribution and building communication and control systems.
- ▶ Acoustical engineers work to control sound through the use of proper materials and shapes of spaces.

The strength of the architectural engineering program lies in the fact that our graduates are not only capable in these engineering fields, but also understand building design and construction and how the systems are integrated into the building.

Senior students in this program are eligible to take the Fundamentals of Engineering examination to qualify as an engineer-in-training. Successful completion of this examination entitles them to pursue the professional registration examination according to state licensing laws.

### Curriculum

An architectural engineer must be aware of the practical, functional, and aesthetic possibilities of contemporary materials and mechanical, electrical, and structural systems. As an important member of the building design team, the engineer must be able to create designs that will answer the economic, safety, environmental, and aesthetic requirements of a project and must have a feeling for the total design.

In the program, you will complete extensive work in mathematics and engineering science, as well as take courses in architectural design, materials, graphics, and building systems. You will also learn to apply these principles to structural, mechanical, electrical, lighting, and acoustical requirements of building design.

You will graduate with a basic competency in structural, mechanical, lighting, and electrical design for buildings and may upon selection of the proper technical electives strengthen personal knowledge in any of these areas. The primary goal of most students is to practice as a consulting engineer in one of the above fields.

Because the curriculum is primarily engineering, this requires a good background in mathematics and science, particularly physics, and a talent for creative design and art.

### Admission to the pre-professional program

New and transfer students should submit an application for admission directly to the K-State Office of Admissions. The admission criteria are the same as those for the university and the College of Engineering.

### Admission to the professional program

Pre-professional architectural engineering students must complete the first four semesters of the program prior to taking any upper-division professional program courses in architectural engineering. This is based upon the criteria outlined in the undergraduate catalog for the professional program.

**BS in architectural engineering**  
(158 hours)

**Pre-professional program**

**Hrs. First semester**

4	MATH 220	Analytical Geometry and Calculus I
4	CHM 210	Chemistry I
3	DEN 210	History of Building and Construction
1	ARE 100	Architectural Engineering Orientation
3	GEOL 100	Earth in Action
0	ARE 020	Architectural Engineering Seminar

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**Hrs. Second semester**

2	CNS 320	Construction Materials
4	MATH 221	Analytical Geometry and Calculus II
4	CHM 210	Chemistry II
	or	
	BIOL 198	Principles of Biology
3	ECON 110	Principles of Macroeconomics
3	ENGL 100	Expository Writing I
0	ARE 020	Architectural Engineering Seminar

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**Hrs. Third semester**

5	PHYS 113	Engineering Physics I
2	COMM 105	Public Speaking IA
3	ENGL 200	Expository Writing II
4	MATH 222	Analytic Geometry and Calculus III
2	CNS 200	Computer Applications in Engineering and Construction
0	ARE 020	Architectural Engineering Seminar

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**Hrs. Fourth semester**

3	ART 100	2D Design
	or	
	ART 200	3D Design
	or	
	ART 190	Drawing I
3	CE 333	Statics
5	PHYS 214	Engineering Physics II
4	MATH 240	Elementary Differential Equations
0	ARE 020	Architectural Engineering Seminar

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**Professional program**

**Hrs. Fifth semester**

3	CNS 321	Construction Technology and Detailing
3	CE 533	Mechanics of Materials
1	CE 534	Mechanics of Materials Lab
3	ME 513	Thermodynamics I
2	ARE 532	Lighting Systems Design
2	IMSE 530	Engineering Economics
3	CE 212	Elementary Surveying Engineering
0	ARE 020	Architectural Engineering Seminar

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**Hrs. Sixth semester**

3	CNS 325	Construction Drawing
3	ARE 534	Thermal Systems
3	CE 537	Introduction to Structural Analysis
4	EECE 519	Electronic Circuits and Controls
2	ARE 522	Loading and Load Paths in Buildings
1	ARE 310	Introduction to AutoCAD
1	STAT 490	Statistics for Engineers
0	ARE 020	Architectural Engineering Seminar

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**Hrs. Seventh semester**

3	ARE 411	Architectural Engineering Design
3	ENGL 415	Written Communication for Engineering
3	ME 512	Dynamics
3	ARE 528	Reinforced Concrete Structures
3	ARE 533	Building Electrical Systems
2	ARE 537	Acoustic Systems

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**Hrs. Eighth semester**

3	ARE 524	Steel Structures
3	ARE 536	Plumb/Fire Protection Systems Design
3	ARE 540	Building Mechanical Systems
3	ME 571	Fluid Mechanics
3	UGE humanities or social science elective (upper level)*	
0	ARE 020	Architectural Engineering Seminar

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**Hrs. Ninth semester**

3	ARE 590	Integrated Building Systems Design
3	CE 522	Soil Mechanics I
3	Complementary elective**	
3	Complementary elective**	
3	Free elective	
0	ARE 020	Architectural Engineering Seminar

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**Hrs. Tenth semester**

3	ARE 690	Senior Project
3	ARE 539	Arch Engineering Management
3	Complementary elective**	
3	Complementary elective**	
3	UGE humanities or social science elective (upper level) *	
0	ARE 020	Architectural Engineering Seminar

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\* Humanities and social science electives are to be selected from the approved catalog list of UGE courses (see engineering UGE course requirements).

\*\* Complementary electives are to be selected from the approved departmental list.

**For more information about architectural engineering, contact:**

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