

ARCHITECTURAL ENGINEERING, B.A.E.

Begin Campus: Any Penn State Campus

End Campus: University Park

Degree Requirements

For the Bachelor of Architectural Engineering degree in Architectural Engineering, a minimum of 160 credits is required:

Requirement	Credits
General Education	45
Requirements for the Major	148-151

33 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 3 credits of GA courses; 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GS courses; 9 credits of GWS courses; 3 credits of Integrative Studies.

Requirements for the Major

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/>).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
AE 202	Introduction to Architectural Engineering Concepts	3
AE 221	Architectural Building Materials	3
AE 222	Building Materials, Methods and Modeling II	3
AE 240	Programming and Data Science for Architectural Engineering	3
AE 309	Fundamentals of Architectural Acoustics	3
AE 441	Engineering Lifecycle Economic Analysis for Buildings	1
AE 481W	Comprehensive Architectural Engineering Senior Project I	4
AE 482	Comprehensive Architectural Engineering Senior Project II	4
ARCH 130A	Basic Design and Research I	3
ARCH 130B	Basic Design and Research II	3
ARCH 441	Architectural Design Analysis	3
ARTH 202N	Renaissance to Modern Architecture	3
CHEM 111	Experimental Chemistry I	1
EMCH 211	Statics	3
EMCH 212	Dynamics	3
EMCH 213	Strength of Materials	3
MATH 220	Matrices	3
PHYS 212	General Physics: Electricity and Magnetism	4
PHYS 213	General Physics: Fluids and Thermal Physics	2
<i>Prescribed Courses: Require a grade of C or better</i>		
AE 308	Introduction to Structural Analysis	4

AE 310	Fundamentals of Heating, Ventilating, and Air Conditioning	3
AE 311	Fundamentals of Electrical and Illumination Systems for Building	3
AE 372	Introduction to the Building Construction Industry	3
CHEM 110	Chemical Principles I	3
EDSGN 100	Cornerstone Engineering Design	3
ENGL 202C	Effective Writing: Technical Writing	3
MATH 140	Calculus With Analytic Geometry I	4
MATH 141	Calculus with Analytic Geometry II	4
PHYS 211	General Physics: Mechanics	4

Additional Courses

ARCH 100	Architecture and Ideas	3
or LARCH 60	Cultural History of Designed Places	
MATH 231	Calculus of Several Variables	2-4
or MATH 230	Calculus and Vector Analysis	
MATH 250	Ordinary Differential Equations	3-4
or MATH 251	Ordinary and Partial Differential Equations	
ME 201	Introduction to Thermal Science	3
or ME 300	Engineering Thermodynamics I	
STAT 401	Experimental Methods	3
or IE 424	Process Quality Engineering	

Select one of the following:

AE 124	Architectural Engineering Orientation	1
1 credit of another First-Year Seminar		

Select one of the following:

ECON 14	Principles of Economics	3
ECON 102	Introductory Microeconomic Analysis and Policy	
ECON 104	Introductory Macroeconomic Analysis and Policy	

Additional Courses: Require a grade of C or better

Select one of the following:

CAS 100A	Effective Speech	3
CAS 100B	Effective Speech	
CAS/ENGL 138T	Rhetoric and Civic Life II	

Select one of the following:

ENGL 15	Rhetoric and Composition	3
ENGL 30H	Honors Rhetoric and Composition	
ENGL/CAS 137H	Rhetoric and Civic Life I	

Requirements for the Option

Select an option 35

Requirements for the Option Construction Option (35 credits)

Code	Title	Credits
Prescribed Courses		
AE 404	Building Structural Systems in Steel and Concrete	3
AE 405	Geotechnical Engineering	4
AE 472	Building Construction Planning and Management	3
AE 473	Building Construction Management and Control	3
AE 475	Building Construction Engineering I	3
AE 476	Building Construction Engineering II	3
CE 209	Fundamentals of Surveying	2

MGMT 326 Organizational Behavior and Design ¹ 3

Additional Courses

AE 477 Material Science for Architectural Engineers 3-4
or CE 336 Materials Science for Civil Engineers
& CE 337 and Civil Engineering Materials Laboratory

Supporting Courses and Related Areas

Select 7-8 credits from technical courses on department list ¹ 7-8

¹ Students having successfully completed ROTC upon graduation, may apply 3 credits of ROTC to these courses. Additionally, 3 credits of ROTC may be applied to GHW.

Lighting/Electrical Option (35 credits)

Code	Title	Credits
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Prescribed Courses

AE 404	Building Structural Systems in Steel and Concrete	3
AE 461	Architectural Illumination Systems & Design	3
AE 462	Architectural Lighting Controls	3
AE 464	Advanced Architectural Illumination Systems & Design	3
AE 466	Computer Aided Lighting Design	3
AE 467	Advanced Building Electrical System Design	3
AE 468	Advanced Building Electrical and Communication Systems	3

Additional Courses

AE 453	Load and Energy Use Simulations for Buildings	3
or AE 454	Advanced Heating, Ventilating, and Air Conditioning	

Supporting Courses and Related Areas

Select 11 credits from technical courses on department option list ¹ 11

¹ Students having successfully completed ROTC upon graduation, may apply 3 credits of ROTC to these courses. Additionally, 3 credits of ROTC may be applied to GHW.

Mechanical Option (35 credits)

Code	Title	Credits
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Prescribed Courses

AE 404	Building Structural Systems in Steel and Concrete	3
AE 453	Load and Energy Use Simulations for Buildings	3
AE 454	Advanced Heating, Ventilating, and Air Conditioning	3
AE 455	Advanced Heating, Ventilating, and Air Conditioning System Design	3
AE 457	HVAC Control Systems	3
AE 458	Advanced Architectural Acoustics and Noise Control	3
AE 467	Advanced Building Electrical System Design	3
ME 320	Fluid Flow	3
ME 410	Heat Transfer	3

Supporting Courses and Related Areas

Select 8 credits from technical courses on department option list ¹ 8

¹ Students having successfully completed ROTC upon graduation, may apply 3 credits of ROTC to these courses. Additionally, 3 credits of ROTC may be applied to GHW.

Structural Option (35 credits)

Code	Title	Credits
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Prescribed Courses

AE 401	Design of Steel and Wood Structures for Buildings	3
AE 402	Design of Concrete Structures for Buildings	3
AE 403	Advanced Steel Design for Buildings	3
AE 405	Geotechnical Engineering	4
AE 430	Indeterminate Structures	3
AE 431	Advanced Concrete Design for Buildings	3
CE 209	Fundamentals of Surveying	2
EMCH 315	Mechanical Response of Engineering Materials	2
EMCH 316	Experimental Determination of Mechanical Response of Materials	1

Supporting Courses and Related Areas

Select 11 credits from technical courses on department list ¹ 11

¹ Students having successfully completed ROTC upon graduation, may apply 3 credits of ROTC to these courses. Additionally, 3 credits of ROTC may be applied to GHW.

General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/>) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required and Inter-Domain courses do not meet this requirement.)

- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)

- **Arts (GA):** 3 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 3 credits
- **Social and Behavioral Sciences (GS):** 3 credits
- **Natural Sciences (GN):** 3 credits

Integrative Studies

- **Inter-Domain Courses (Inter-Domain):** 6 credits

Exploration

- **GN**, may be completed with Inter-Domain courses: 3 credits
- **GA, GH, GN, GS, Inter-Domain courses**. This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher: 6 credits

University Degree Requirements

First Year Engagement

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80>)). For more information, check the Suggested Academic Plan for your intended program.