

Date Submitted: 02/05/23 7:13 am

# Viewing: **BS-ARCE : Bachelor of Science in Architectural Engineering**

Last approved: 03/16/21 9:20 pm

Last edit: 02/05/23 7:13 am

Changes proposed by: bstephe5

## Bachelor of Science in Architectural Engineering

Catalog Pages

Using this Program

Program Status Active

Is this a significant curriculum change?

Requestor Name  
bstephe5@iit.edu

Name Brent Stephens

E-mail

Origination Date 2023-2-5 ~~2021-2-1~~

Is this an interdisciplinary program? No

Academic Unit College  
Civil Archl Environ Engrg  
Armour College of Engineering

Program Title  
Bachelor of Science in Architectural Engineering

Effective Academic Year 2023 ~~2021~~ - 2024  
~~2022~~ Effective Term Fall 2023

Academic Level Undergraduate

Program Type Degree

Degree Type  
Bachelor of Science (BS)

CIP Code

## In Workflow

1. CAEE Chair
2. Academic Affairs
3. Undergraduate Academic Affairs
4. AC Dean
5. Undergraduate Studies Committee Chair
6. Faculty Council Chair
7. Academic Affairs

## Approval Path

1. 02/05/23 7:27 am  
Brent Stephens (bstephe5):  
Approved for CAEE Chair
2. 02/09/23 8:49 pm  
Patty Johnson Winston (winston):  
Approved for Academic Affairs
3. 02/13/23 3:36 pm  
Joseph Gorzkowski (jgorzkow):  
Approved for Undergraduate Academic Affairs
4. 02/13/23 3:39 pm  
Kevin Cassel (cassel): Approved for AC Dean
5. 02/27/23 12:11 am  
Fred Weening (fweening):  
Approved for Undergraduate Studies Committee Chair

## History

1. Oct 18, 2017 by clmig-jwehrheim
2. Oct 18, 2017 by clmig-jwehrheim
3. Oct 18, 2017 by clmig-jwehrheim
4. Nov 3, 2017 by Sarah Pariseau (sparisea)
5. Apr 27, 2018 by Sarah Pariseau (sparisea)
6. Mar 16, 2021 by Brent Stephens (bstephe5)

14.0401 - Architectural Engineering.

Is there more than one Academic Unit proposer?

No

Program Code            BS-ARCE

Program Attribute

Total Program            130 ~~134~~  
Credit Hours

Rationale for  
change in program  
credit hours.

[we submitted a request to the registrar to reduce CAE 105 from 3 to 2 hours, so the program will naturally go to 130 hours.](#)

Please provide a  
summary and  
rationale for the  
requested program  
revision.

[updating a couple course requirements and also the study plan grid to align with current offerings](#) Minor changes include: 1) limiting number of EG electives to ensure engineering electives are chosen, 2) merging building electrical and lighting and building mechanical and energy specializations into one broader "building systems engineering" specialization that better aligns with our typical course offerings, 3) adding CAE 496 FE Exam prep requirement, 4) editing language around FE exam registration requirement.

## Program Narrative and Justification

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Narrative description of how the institution determined the need for the program. For example, describe what need this program will address and how the institution became aware of that need. If the program is replacing a current program(s), identify the current program(s) that is being replaced by the new program(s) and provide details describing the benefits of the new program(s). If the program will be offered in connection with, or in response to, an initiative by a governmental entity, provide details of that initiative.

Narrative description of how the program was designed to meet local market needs, or for an online program, regional or national market needs. For example, indicate if Bureau of Labor Statistics data or State labor data systems information was used, and/or if State, regional, or local workforce agencies were consulted. Include how the course content, program length, academic level, admission requirements, and prerequisites were decided; including information received from potential employers about course content; and information regarding the target students and employers.

Narrative description of any wage analysis the institution may have performed, including any consideration of Bureau of Labor Statistics wage data related to the new program.

Narrative description of how the program was reviewed or approved by, or developed in conjunction with, one or more of the following: a) business advisory committees; b) program integrity boards; c) public or private oversight or regulatory agencies (not including the state licensing/authorization agency and accrediting agency); and d) businesses that would likely employ graduates of the program. For example, describe the steps taken to develop the program, identify when and with whom discussions were held, provide relevant details of any proposals or correspondence generated, and/or describe any process used to evaluate the program.

What are the enrollment estimates?

Year 1

Year 2

Year 3

Attach Additional  
Program  
Justification  
Document(s)

## Academic Information

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### Advising

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Since quality advising is a key component of good retention, graduation, and career placement, how will students be mentored? What student professional organizations will be formed? How will the department work with the Career Services office to develop industry connections?

## Program Resources

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Which program resources are necessary to offer this program?

## Proposed Bulletin Entry

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Admission Requirements

Course Requirements

# Required Courses

Architectural Engineering Requirements		(50)
<a href="#">CAE 100</a>	Intro to Engg Drawing & Design	2
<a href="#">CAE 101</a>	Intro to AutoCAD Draw Design	2
<a href="#">CAE 105</a>	Surveying	2
<a href="#">CAE 110</a>	Professional Practice I	1
<a href="#">CAE 111</a>	Professional Practice II	1
<a href="#">CAE 208</a>	Thermodynamics	3
or <a href="#">MMAE 320</a>	Thermodynamics	
<del>CAE 209</del>	<del>Fluid Mech and Heat Transfer</del>	<del>3</del>
<a href="#">CAE 302</a>	<a href="#">Fluid Mechanics</a>	<u>3</u>
or <a href="#">CAE 209</a>	<a href="#">Fluid Mech and Heat Transfer</a>	
or <a href="#">MMAE 313</a>	<a href="#">Fluid Mechanics</a>	
<a href="#">CAE 303</a>	Steel Structures I	3
<a href="#">CAE 304</a>	Structural Analysis I	3
<a href="#">CAE 307</a>	Concrete Structures I	3
<a href="#">CAE 315</a>	Materials of Construction	3
<del>CAE 323</del>	<del>Intro-Geotechnical Engineering</del>	<del>3</del>
<a href="#">CAE 331</a>	Building Science	3
<a href="#">CAE 383</a>	Electrical Electronic Circuits	3
<a href="#">CAE 461</a>	Plumbing/Fire Protection Dsgn	3
<a href="#">CAE 464</a>	HVAC Systems Design	3
<a href="#">CAE 466</a>	<a href="#">Building Electrical/Lighting</a> <sup>1</sup>	<u>3</u>

<a href="#"><u>or CAE 323</u></a>	<a href="#"><u>Intro Geotechnical Engineering</u></a>	
<a href="#"><u>CAE 468</u></a>	Architectural Design	3
<a href="#"><u>CAE 470</u></a>	Constrctn Methods&Cost Estmg	3
<a href="#"><u>CAE 471</u></a>	Construction Plan & Scheduling	3
<a href="#"><u>CAE 496</u></a>	FE Exam Prep	0
Capstone Design Requirement		(3)
<a href="#"><u>CAE 495</u></a>	Capstone Senior Design	3
CAE Technical Electives		(9)
Select nine credit hours <sup>2</sup>		9
Mathematics Requirements		(21)
<a href="#"><u>CAE 312</u></a>	Engineering Systems Analysis	3
<a href="#"><u>MATH 151</u></a>	Calculus I	5
<a href="#"><u>MATH 152</u></a>	Calculus II	5
<a href="#"><u>MATH 251</u></a>	Multivariate & Vector Calculus	4
<a href="#"><u>MATH 252</u></a>	Introduction to Diff Equations	4
Physics Requirements		(8)
<a href="#"><u>PHYS 123</u></a>	General Physics I: Mechanics	4
<a href="#"><u>PHYS 221</u></a>	Gen Physics II: Elect&Magntism	4
Chemistry Requirement		(4)
<a href="#"><u>CHEM 124</u></a>	Princ of Chemistry I with Lab	4
Computer Science Requirement		(2)
<a href="#"><u>CS 104</u></a>	Intro to Comp Prgm for Engrs	2
or <a href="#"><u>CS 105</u></a>	Intro to Computer Programming	
Engineering Course Requirements		(6)
<a href="#"><u>CAE 286</u></a>	Theory&Concpt of Struct Mechcs	3
<a href="#"><u>CAE 287</u></a>	Mechanics Structural Materials	3
Humanities Requirements		(3)
<a href="#"><u>AAH 119</u></a>	Hist of World Architecture I	3
or <a href="#"><u>AAH 120</u></a>	Hist of World Architecture II	
Interprofessional Projects (IPRO)		(6)
<a href="#"><u>See Illinois Tech Core Curriculum, section E</u></a>		6
Humanities and Social Sciences Requirements		(18)
<a href="#"><u>See Illinois Tech Core Curriculum, sections B and C</u></a>		18
Total Credit Hours		130

<sup>1</sup> Students who intend to take electives in structural engineering should take CAE 323 (CAE 466 can still be taken as a technical elective if desired).

<sup>2</sup> All technical electives must be CAE, EG, or ENVE courses at the 400-level or above. Students are limited to only one EG elective course.

All architectural engineering students are required to register for the Fundamentals of Engineering (FE) examination during their senior year. The examination is offered by the National Council of Examiners for Engineering and Surveying (NCEES) throughout the year.

# Bachelor of Science in Architectural Engineering Curriculum

		Year 1	
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#">CAE 100</a>	2	<a href="#">CAE 101</a>	2
<a href="#">CAE 110</a>	1	<a href="#">CAE 111</a>	1
<a href="#">CAE 105</a>	2	<a href="#">CS 104</a> or <a href="#">105</a>	2
<a href="#">CHEM 124</a>	4	<a href="#">PHYS 123</a>	4
<a href="#">MATH 151</a>	5	<a href="#">MATH 152</a>	5
Humanities 200-level Course	3	Humanities or Social Sciences Elective	3
	17		17
		Year 2	
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#">CAE 208</a> or <a href="#">MMAE 320</a>	3	<del>CAE 209</del>	<del>3</del>
<a href="#">CAE 286</a>	3	<a href="#">CAE 287</a>	3
<a href="#">PHYS 221</a>	4	<a href="#">CAE 302, 209, or MMAE 313</a>	<u>3</u>
<a href="#">MATH 251</a>	4	<a href="#">CAE 312</a>	3
<a href="#">AAH 119</a>	3	<a href="#">MATH 252</a>	4
	17	Humanities or Social Sciences Elective	3
			16
		Year 3	
Semester 1	Credit Hours	Semester 2	Credit Hours
<del>CAE 303</del>	<del>3</del>	<a href="#">CAE 303</a>	<u>3</u>
<a href="#">CAE 304</a>	3	<a href="#">CAE 307</a>	3
<a href="#">CAE 315</a>	3	<del>CAE 323</del>	<del>3</del>
<a href="#">CAE 331</a>	3	<a href="#">CAE 464</a>	3
<a href="#">CAE 383</a>	3	<a href="#">CAE 466 or 323</a> <sup>1</sup>	<u>3</u>
IPRO Elective I	3	IPRO Elective II	3
	15	Humanities or Social Sciences Elective	3
			18
		Year 4	
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#">CAE 461</a>	3	<a href="#">CAE 471</a>	3
<a href="#">CAE 468</a>	3	<a href="#">CAE 495</a>	3
<a href="#">CAE 470</a>	3	<a href="#">CAE 496</a>	0
<del>CAE Technical Elective</del> <sup>1</sup>	<del>3</del>	<del>CAE Technical Elective</del> <sup>1</sup>	<del>3</del>
<a href="#">CAEE Technical Elective</a> <sup>2</sup>	<u>3</u>	<del>CAE Technical Elective</del> <sup>1</sup>	3

Humanities or Social Sciences Elective	3	<u>CAEE Technical Elective<sup>2</sup></u>	<u>3</u>
		<u>CAEE Technical Elective<sup>2</sup></u>	<u>3</u>
	15	Humanities or Social Sciences Elective	3
			15

Total Credit Hours: 130

<sup>1</sup> Students who intend to take electives in structural engineering should take CAE 323 (CAE 466 can still be taken as a technical elective if desired).

<sup>2</sup> All technical electives must be CAE, EG, or ENVE courses at the 400-level or above. Students are limited to only one EG elective course.

This program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

All architectural engineering students are required to register for the Fundamentals of Engineering (FE) examination during their senior year. The examination is offered by the National Council of Examiners for Engineering and Surveying (NCEES) throughout the year.

Specialization  
Requirements

## Professional Specializations in Architectural Engineering

Students who select an area of specialization must take a minimum of nine credit hours from the following technical electives listed under the respective area of specialization. Other 400- or 500-level courses may be used towards a specialization with the prior approval of the student's adviser.

### Building SYSTEMS ENGINEERING

Select a minimum of nine credit hours from the following courses: 9

<u>CAE 405</u>	<u>Applications of CFD in Eng.</u>	<u>3</u>
<u>CAE 438</u>	Control of Building Env. Sys.	3
<u>CAE 453</u>	Measurement & Instrumentation	3
<u>CAE 454</u>	<u>Building Commissioning</u>	<u>3</u>
<u>CAE 463</u>	Building Enclosure Design	3
<u>CAE 465</u>	Building Energy Conservation	3
<u>CAE 466</u>	Building Electrical/Lighting	3
<u>CAE 467</u>	Lighting Systems Design	3

### Construction and Engineering Management

<u>CAE 472</u>	Construction Site Operation	3
<u>CAE 473</u>	Construction Contract Admin	3
<u>EG 430</u>	<del>Intro Building Info Modeling</del>	<del>3</del>
<u>CAE 474</u>	<u>Intro Building Info Modeling</u>	<u>3</u>

### Fire Protection and Life Safety

<u>CAE 422</u>	Sprinklers Standpipes Fire Pum	3
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<u>CAE 424</u>	Intro Fire Dynamics	3
<u>CAE 425</u>	Fire Protection & Life Safety	3

## Structural Engineering

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<u>CAE 411</u>	Structural Analysis II	3
<u>CAE 431</u>	Steel Structures II	3
<u>CAE 432</u>	Concrete Structures II	3

### Program Outcomes and Assessment Process

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What are the learning goals for this program?

In what semesters will the data be collected to assess this learning goal, and by whom?

Provide the name of the rubric that will be used to assess the extent to which students are achieving this learning goal.

How often and by whom will the data be analyzed? What benchmarks or targets will be used to interpret your results?

Briefly describe the process that will be used to share the results with faculty and use these to motivate program improvement.



Attach Additional  
Assessment  
Document(s)

## Undergraduate Program Requirements

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### Undergraduate Degree Requirements

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Minimum credit hours 130 ~~131~~

Specialization  
required?  
Optional

Notes about  
specialization  
requirement

Minor required?  
No

### Proposed General Curriculum

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Degree credit hours required 130 ~~131~~

Specialization  
credit hour  
requirement 9

List Major Course  
Requirements

List Mathematics  
Requirements

List Science  
Requirements

List Computer  
Science  
Requirements

List Humanities and  
Social Sciences  
Requirements

List  
Interprofessional  
Project (IPRO)  
Requirements

List Technical  
Elective Course  
Options

List Free Elective  
Credit Hours (if  
applicable)

Semester-by-  
semester plan of  
study for the  
degree program

## Specialization

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Report from Faculty  
Council

Reviewer  
Comments