

Date Submitted: 01/27/23 4:16 pm

# Viewing: **BS-CE : Bachelor of Science in Civil Engineering**

Last approved: 04/22/22 2:45 pm

Last edit: 01/27/23 4:16 pm

Changes proposed by: bstephe5

## Bachelor of Science in Civil Engineering

Catalog Pages  
Using this Program

Program Status	Active		
Requestor	Name	Brent Stephens	E-mail
	bstephe5@iit.edu		
Origination Date	<u>2023-1-27</u> <del>2022-1-14</del>		
Is this an interdisciplinary program?	No		
Academic Unit	Civil Archl Environ Engrg		
College	Armour College of Engineering		
Program Title	Bachelor of Science in Civil Engineering		
Effective Academic Year	<u>2023</u> <del>2022</del> - <u>2024</u>	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. 01/27/23 4:19 pm  
Brent Stephens (bstephe5):  
Approved for CAEE Chair
2. 01/27/23 6:00 pm  
Patty Johnson  
Winston (winston):  
Approved for Academic Affairs
3. 01/28/23 1:40 pm  
Joseph Gorzkowski (jgorzkow):  
Approved for Undergraduate Academic Affairs
4. 01/29/23 10:14 am  
Kevin Cassel (cassel):  
Approved for AC Dean

## History

1. Oct 18, 2017 by  
clmig-jwehrheim
2. Nov 8, 2017 by  
Sarah Pariseau (sparisea)

3. Apr 27, 2018 by Sarah Pariseau (sparisea)
4. Mar 25, 2021 by Brent Stephens (bstephe5)
5. Apr 22, 2022 by Brent Stephens (bstephe5)

14.0801 - Civil Engineering, General.

Is there more than one Academic Unit proposer?

No

Program Code            BS-CE

Program Attribute

Total Program            130 ~~131~~  
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.

adjusting typical fall/spring offerings to align with current offerings ~~adding ENVE 401~~  
~~requirement to better meet industry and licensure needs~~

## **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?

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## Proposed Bulletin Entry

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Admission  
Requirements

Course Requirements

## Required Courses

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Civil Engineering Requirements	(47)	
<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 302</a>	Fluid Mechanics	3
<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 312</a>	Engineering Systems Analysis	3
<a href="#">CAE 315</a>	Materials of Construction	3
<a href="#">CAE 323</a>	Intro Geotechnical Engineering	3
<a href="#">CAE 419</a>	Intro Transportation Engg/Dsgn	3
<a href="#">CAE 431</a>	Steel Structures II	3
<a href="#">CAE 432</a>	Concrete Structures II	3
<a href="#">CAE 457</a>	Geotechnical Foundation Dsgn	3
<a href="#">CAE 470</a>	Constrctn Methods&Cost Estmg	3
<a href="#">CAE 496</a>	FE Exam Prep <sup>1</sup>	0
<a href="#">ENVE 401</a>	Intro Water Resources Eng	3
CAE Technical Electives	(9)	
Select 9 credit hours <sup>2</sup>	9	
CAE Additional Science Requirement	(3)	
<a href="#">ENVE 201</a>	Earth Environ Sci <sup>3</sup>	3
or <a href="#">CAE 221</a>	Engineering Geology	
or <a href="#">BIOL 105</a>	Introduction to Biology	
or <a href="#">PHYS 360</a>	Introduction to Astrophysics	
Mathematics Requirements	(18)	
<a href="#">MATH 151</a>	Calculus I	5
<a href="#">MATH 152</a>	Calculus II	5
<a href="#">MATH 251</a>	Multivariate & Vector Calculus	4
<a href="#">MATH 252</a>	Introduction to Diff Equations	4
Physics Requirements	(8)	
<a href="#">PHYS 123</a>	General Physics I: Mechanics	4
<a href="#">PHYS 221</a>	Gen Physics II: Elect&Magntism	4
Capstone Design Requirement	(3)	

<a href="#">CAE 495</a>	Capstone Senior Design	3
Chemistry Requirement		(4)
<a href="#">CHEM 124</a>	Princ of Chemistry I with Lab	4
Computer Science Requirement		(2)
<a href="#">CS 104</a>	Intro to Comp Prgrm for Engrs	2
or <a href="#">CS 105</a>	Intro to Computer Programming	
Engineering Course Requirements		(9)
<a href="#">CAE 286</a>	Theory&Concpt of Struct Mechcs	3
<a href="#">CAE 287</a>	Mechanics Structural Materials	3
<a href="#">MMAE 305</a>	Dynamics	3
Interprofessional Projects (IPRO)		(6)
<a href="#">See Illinois Tech Core Curriculum, section E</a>		6
Humanities and Social Science Requirements		(21)
<a href="#">See Illinois Tech Core Curriculum, sections B and C</a>		21
Total Credit Hours		130

1

All civil 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.

2

All technical electives must be CAE, ENVE, or EG courses at the 400-level or above. A maximum of one EG course can be used as a CAEE technical elective.

3

Students are encouraged to take ENVE 201 but other listed additional science electives are acceptable with advisor approval.

Sample  
Curriculum/Program  
Requirements

## Bachelor of Science in Civil 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="#">MATH 152</a>	5
<a href="#">MATH 151</a>	5	<a href="#">CS 104</a> or <a href="#">105</a>	2
<a href="#">CHEM 124</a>	4	<a href="#">PHYS 123</a>	4
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="#">MATH 251</a>	4	<a href="#">MATH 252</a>	4
<a href="#">CAE 286</a>	3	<a href="#">CAE 287</a>	3

<u>ENVE 201</u> , <u>CAE 221</u> , <u>BIOL 105</u> , or <u>PHYS 360</u> <sup>1</sup>	3	<u>CAE 302</u>	<u>3</u>
<u>PHYS 221</u>	4	<u>CAE 312</u>	3
Humanities or Social Sciences Elective	3	<del>MMAE 305</del>	<del>3</del>
		Humanities or Social Sciences Elective	3
	17		16
Year 3			
Semester 1	Credit Hours	Semester 2	Credit Hours
<del>CAE 302</del>	<del>3</del>	<u>CAE 303</u>	<u>3</u>
<del>CAE 303</del>	<del>3</del>	<u>CAE 307</u>	3
<u>CAE 304</u>	3	<u>CAE 323</u>	3
<u>CAE 315</u>	3	<del>ENVE 401</del>	<del>3</del>
<u>ENVE 401</u>	<u>3</u>	IPRO Elective II	3
<u>MMAE 305</u>	<u>3</u>	Humanities or Social Sciences Elective	3
IPRO Elective I	3		
<u>Humanities or Social Sciences Elective</u>	<u>3</u>		
	18		15
Year 4			
Semester 1	Credit Hours	Semester 2	Credit Hours
<u>CAE 419</u>	3	<del>CAE 432</del>	<del>3</del>
<u>CAE 431</u>	3	<u>CAE 495</u>	3
<u>CAE 432</u>	<u>3</u>	<u>CAE 496</u>	0
<u>CAE 457</u>	3	CAEE Technical Elective <sup>2</sup>	3
<u>CAE 470</u>	3	CAEE Technical Elective <sup>2</sup>	3
<del>CAEE Technical Elective<sup>2</sup></del>	<del>3</del>	<u>CAEE Technical Elective<sup>2</sup></u>	<u>3</u>
<del>Humanities Elective (300+)</del>	<del>3</del>	Humanities or Social Sciences Elective	3
	15		15

Total Credit Hours: 130

<sup>1</sup>

Students are encouraged to take ENVE 201 but other listed additional science electives are acceptable with advisor approval.

<sup>2</sup>

All technical electives must be CAE, ENVE, or EG courses at the 400-level or above. A maximum of one EG course can be used as a CAEE technical elective.

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

All civil 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 Civil 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.

Three additional credit hours may be any 400-level CAE course taken with prior approval of the student's adviser and chair.

## Environmental Engineering

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Select a minimum of three courses from the following:		9
<a href="#">CAE 439</a>	Intro Geographic Info Syst	3
<a href="#">ENVE 402</a>	Introduction to Environmental	3
<a href="#">ENVE 403</a>	Occupational and Environmental	3
<a href="#">ENVE 404</a>	Water & Wastewater Engineering	3
<a href="#">ENVE 444</a>	<a href="#">Carbon Cap Util Stor</a>	<u>3</u>
<a href="#">ENVE 463</a>	Intro Air Pollution Control	3
Total Credit Hours		9

## Construction Engineering and Management

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<a href="#">CAE 471</a>	Construction Plan & Scheduling	3
<a href="#">CAE 472</a>	Construction Site Operation	3
<a href="#">CAE 473</a>	Construction Contract Admin	3
Total Credit Hours		9

## Geotechnical Engineering

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<a href="#">CAE 401</a>	Hydraulics, Hydrology, & Appl	3
<a href="#">CAE 415</a>	Pavement Design	4
<a href="#">CAE 486</a>	Soil Site Improvement	3
Total Credit Hours		10

## Structural Engineering

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<a href="#">CAE 411</a>	Structural Analysis II	3
Select a minimum of two courses from the following:		6
<a href="#">CAE 408</a>	Bridge Structural Design	3
<a href="#">CAE 410</a>	Intro to Wind/Earthquake Engg	3
<a href="#">CAE 435</a>	Experimental Anlys Structures	3
<a href="#">CAE 436</a>	Dsgn Masonry/Timber Structures	3
<a href="#">CAE 437</a>	Homeland Security Concerns	3
Other 400- or 500-level courses may be used towards the specialization with the prior approval of the student's adviser.		3
Total Credit Hours		9

## Transportation Engineering

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Select a minimum of three courses from the following:		9
<a href="#">CAE 416</a>	Facly Dsgn Trnsprtn Syst	3
<a href="#">CAE 417</a>	Railroad Engineering & Design	3
<a href="#">CAE 437</a>	Homeland Security Concerns	3
<a href="#">CAE 439</a>	Intro Geographic Info Syst	3
Total Credit Hours		9

## 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 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 to Faculty  
Council

Reviewer  
Comments