Date Submitted: 01/30/24 10:09 pm

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

Last approved: 03/15/23 6:00 pm

Last edit: 01/31/24 11:51 am

Changes proposed by: bstephe5

Catalog Pages Using this Program	Bachelor of Science in Civil Engineering

Program Status	Active			
Requestor	Name	Brent Stephens	E-mail	bstephe5@iit.edu
Origination Date	2024-1-30 ~~2023-1-27~~			
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	2024 ~~2023~~ - 2025 ~~2024~~		Effective Term	Fall 2024
Academic Level	Undergraduate			

If all courses in a subject in your department are required, please enter each subject followed by the number ranges in the "Quick Add" field in the pop up box when you click the green plus button below. For example: ARCH 100-499.

What courses will factor the major GPA?	
Program Type	Degree
Degree Type	Bachelor of Science (BS)
CIP Code	14.0801 - Civil Engineering, General.
Is there more than one Academic Unit proposer?	No
Program Code	BS-CE
Program Attribute	
Total Program Credit Hours	130
Please provide a summary and rationale for the requested program revision.	Revising specializations ~~adjusting typical fall/spring offerings~~ to match ~~align with~~ current offerings

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. 01/30/24 10:25 pm Brent Stephens (bstephe5): Approved for CAEE Chair
2. 01/31/24 11:51 am Ayesha Qamer (aqamer): Approved for Academic Affairs
3. 01/31/24 4:02 pm Joseph Gorzkowski (jgorzkow): Approved for Undergraduate Academic Affairs
4. 01/31/24 4:16 pm 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)
6. Mar 15, 2023 by Brent Stephens (bstephe5)

Program Narrative and Justification

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 initative 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.

Admission Entry Details

What are the enrollment estimates?

Year 1 Year 2 Year 3

Attach Additional Program Justification Document(s)

Academic Information

Advising

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

Which program resources are necessary to offer this program?

Proposed Bulletin Entry

Admission Requirements

Course Requirements

Required Courses

Civil Engineering Requirements		(47)
CAE 100	Introduction to Engineering Drawing and Design	2
CAE 101	Introduction to AutoCAD Drawing and Design	2
CAE 105	Surveying	2

CAE 110	Professional Practice I	1
CAE 111	Professional Practice II	1
CAE 302	Fluid Mechanics	3
CAE 303	Steel Structures I	3
CAE 304	Structural Analysis I	3
CAE 307	Concrete Structures I	3
CAE 312	Engineering Systems Analysis	3
CAE 315	Materials of Construction	3
CAE 323	Introduction to Geotechnical Engineering	3
CAE 419	Introduction to Transportation Engineering and Design	3
CAE 431	Steel Structures II	3
CAE 432	Concrete Structures II	3
CAE 457	Geotechnical Foundation Design	3
CAE 470	Construction Methods and Cost Estimating	3
CAE 496	Fundamentals of Engineering Preparation [1]	0
ENVE 401	Introduction to Water Resources Engineering	3
CAE Technical Electives		**(9)**
Select 9 credit hours [2]		9
CAE Additional Science Requirement		**(3)**
ENVE 201	Earth Environ Sci [3]	3
or CAE 221	Engineering Geology	
or BIOL 105	Introduction to Biology	
or PHYS 360	Introduction to Astrophysics	
Mathematics Requirements		**(18)**
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4
Physics Requirements		**(8)**
PHYS 123	General Physics I: Mechanics	4
PHYS 221	General Physics II: Electricity and Magnetism	4
Capstone Design Requirement		**(3)**
CAE 495	Capstone Senior Design	3
Chemistry Requirement		**(4)**
CHEM 124	Principles of Chemistry I with Laboratory	4
Computer Science Requirement		**(2)**
CS 104	Introduction to Computer Programming for Engineers	2
or CS 105	Introduction to Computer Programming	
Engineering Course Requirements		**(9)**
CAE 286	Theory and Concept of Structural Mechanics	3
CAE 287	Mechanics of Structural Materials	3
MMAE 305	Dynamics	3
Interprofessional Projects (IPRO)		**(6)**
See Illinois Tech Core Curriculum, section E		6

Humanities and Social Science Requirements	(21)
See Illinois Tech Core Curriculum, sections B and C	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
CAE 100	2	CAE 101		2
CAE 110	1	CAE 111		1
CAE 105	2	MATH 152		5
MATH 151	5	CS 104 or 105		2
CHEM 124	4	PHYS 123		4
Humanities 200-level Course	3	Humanities or Social Sciences Elective		3
	17			17
				Year 2
Semester 1	Credit Hours	Semester 2		Credit Hours
MATH 251	4	MATH 252		4
CAE 286	3	CAE 287		3
ENVE 201, CAE 221, BIOL 105, or PHYS 360[1]	3	CAE 302		3
PHYS 221	4	CAE 312		3
Humanities or Social Sciences Elective	3	Humanities or Social Sciences Elective		3
	17			16
				Year 3
Semester 1	Credit Hours	Semester 2		Credit Hours
CAE 304	3	CAE 303		3
CAE 315	3	CAE 307		3
ENVE 401	3	CAE 323		3
MMAE 305	3	IPRO Elective II		3
IPRO Elective I	3	Humanities or Social Sciences Elective		3
Humanities or Social Sciences Elective	3			
	18			15
				Year 4
Semester 1	Credit Hours	Semester 2		Credit Hours
CAE 419	3	CAE 495		3
CAE 431	3	CAE 496		0
CAE 432	3	CAEE Technical Elective[2]		3
CAE 457	3	CAEE Technical Elective[2]		3
CAE 470	3	CAEE Technical Elective[2]		3
		Humanities or Social Sciences Elective		3
	15			15

Total Credit Hours: 130

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

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.

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

Select a minimum of nine credit hours from the following courses:		9
CAE 439	Introduction to Geographic Information Systems	3
ENVE 402	Introduction to Environmental Engineering and Sustainable Design	3
ENVE 403	Occupational and Environmental Health and Safety	3
ENVE 404	Water and Wastewater Engineering	3
ENVE 422	Global Environmental Change and Sustainability Analysis	3
ENVE 423	Geoenvironmental Engineering	3
ENVE 444	Carbon Capture, Utilization, and Storage	3
ENVE 463	Introduction to Air Pollution Control	3
Total Credit Hours		9

Construction Engineering and Management

CAE 471	Construction Planning and Scheduling	3
CAE 472	Construction Site Operation	3
CAE 473	Construction Contract Administration	3
Total Credit Hours		9

Geotechnical Engineering

Select a minimum of nine credit hours from the following courses:		9
CAE 401	Hydraulics, Hydrology, and Their Applications	3
CAE 415	Pavement Design, Construction and Maintenance	4
CAE 486	Soil and Site Improvement	3
ENVE 423	Geoenvironmental Engineering	3
ENVE 444	Carbon Capture, Utilization, and Storage	3
Total Credit Hours		9

Structural Engineering

CAE 411	Structural Analysis II	3
Select a minimum of six credit hours from the following courses:		6
CAE 408	Bridge and Structural Design	3
CAE 410	Introduction to Wind and Earthquake Engineering	3
~~CAE 435~~	~~Experimental Analysis of Structures~~	~~3~~
CAE 436	Design of Masonry and Timber Structures	3
CAE 437	Homeland Security Concerns in Engineering Systems	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

Select a minimum of three courses from the following:		9
CAE 416	Facility Design of Transportation Systems	3
CAE 417	Railroad Engineering and Design	3
CAE 437	Homeland Security Concerns in Engineering Systems	3
CAE 439	Introduction to Geographic Information Systems	3
Total Credit Hours		9

Program Outcomes and Assessment Process

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

What courses will factor the major GPA?

Undergraduate Degree Requirements

Minimum credit hours	130
Specialization required?	Optional

Notes about specialization requirement	
Minor required?	No

Proposed General Curriculum

Degree credit hours required	121 ~~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

Report to Faculty Council	
Reviewer Comments	**Ayesha Qamer (aqamer) (01/31/24 11:51 am):** 1/31/2024, AQ: Revised proposed general curriculum section. Degree credit hours required changed from 131 credit hours to 121 credit hours to accurately reflect the required course credit hours as presented in the CIM proposal.

Key: 9