2025-2026 Civil Engineering Topic Electives

Students in the General option must take 9 credits from the courses listed below. At least six of the nine credits must be CE or CONE courses. Courses are organized by sub-discipline to help students identify courses of interest, but all count toward the engineering topics requirement.

NOTE:

1. Courses that appear on multiple lists, shown below with yellow shading, may NOT be double counted.
2. The student is responsible for checking and abiding by the ISU catalog regarding official course details.
3. Students may propose a course not on this list by petitioning the CE Curriculum Committee. The course must conform to the definitions of engineering science or engineering design as stated by ABET, the CE program's accrediting body.

ENVIRONMENTAL

Course	CR	Title	Typically Offered*	Pre-requisites
ABE 3880 CE 3880 EE 3880	3	Sustainable Engineering and International Development	F	Junior Classification in an Engineering Major
AERE 5700 EM 5700	3	Wind Engineering	S (odd)	ABE 3780, ME 3450
AGRON 4040/5040 ENSCI 4040/5040 ENVE 4040/5040 MTEOR 4040/5040	3	Global Change	F, S	
CE 4130/5130 ENSCI 4130/5130 GEOL 4130/5130	3	Applied and Environmental Geophysics	S (odd)	
CE 4280 ENVE 4280 ***General Option Only***	3	Water and Wastewater Treatment Plant Design	S	CE 3260
CE 4390/5390 GEOL 4390/5390	3	Seismic Methods in Geology, Engineering, and Petroleum Exploration	S (even)	
CE 4600	3	Foundation Engineering	F, S	CE 3600

Course	CR	Title	Typically Offered*	Pre-requisites
CE 4730/5730 ENSCI 5730	3	Groundwater Hydrology	F	CE 3720
CE 4880/5880	3	Sustainable Civil Infrastructure Systems	F	Permission of Instructor
CE 5200 ENSCI 5200	3	Environmental Engineering Chemistry		(CE 3260 and CHEM 1780) or Graduate classification
CE 5210 ENSCI 5210	3	Environmental Biotechnology		CE 3260 or Graduate classification
CE 5220 ENSCI 5220	3	Water Pollution Control Processes		CE 5210 or Graduate classification
CE 5230 ENSCI 5230	3	Physical-Chemical Treatment Process		(ENVE 4260 or ABE 4510 or AGRON 4590 or CE 5200 or ENSCI 3820) or permission of instructor
CHE 2100	3	Material and Energy Balances	F, S	CHEM 1780, MATH 1660, CHE 1600
CRP 2930 ENVS 2930	3	Environmental Planning	F, S	
CRP 4840/5840 ENVS 4840	3	Sustainable Communities	S	Junior classification
EM 4250	3	Introduction to the Finite Element Method	S	EM 3240 and (MATH 2660 or MATH 2670)
ENSCI 3240 ENVS 3240 GEOL 3240 MTEOR 3240	3	Energy and the Environment	S	
ENSCI 4020/5020 GEOL 4020/5020 MTEOR 4020/5020 NREM 4020/5020	3	Watershed Hydrology	F	
ENSCI 4110/5110 GEOL 4110/5110	4	Hydrogeology	S	
ENSCI 4140/5140 GEOL 4140/5140	3	Applied Groundwater Flow Modeling	S (even)	(GEOL 4110 or CE 4730) and MATH 1650
ENSCI 4160/5160 GEOL 4160/5160 MTEOR 4160/5160	3	Hydrologic Modeling and Analysis	S (odd)	

Course	CR	Title	Typically Offered*	Pre-requisites
ENSCI 4190/5190 GEOL 4190/5190	3	Aqueous and Environmental Geochemistry	S (even)	CHEM 1780 and CHEM 1780L
ENVE 4260	3	Environmental Engineering Science	F	CE 3260 and CHEM 2310 and (credit or enrollment in MICRO 2010)
ENVE 4270	3	Environmental Engineering Systems	S	MATH 2650, MATH 2660, CE 3260, CE 3720
ENVE 4290	3	Air Pollution and Control	S	MATH 2650 and CE 3260
ENVE 4300	3	Solid and Hazardous Waste Management	F	CE 3260 and (credit or concurrent enrollment in ENVE 4260)
ME 4330	3	Alternative Energy	F	CHEM 1670, PHYS 2320, PHYS 2320L

GEOTECHNICAL/MATERIALS

Course	CR	Title	Typically Offered*	Pre-requisites
CE 4600	3	Foundation Engineering	F, S	CE 3600
CE 4620/5620	3	Site Evaluations for Civil Engineering Projects		CE 3600 or Permission of Instructor
CE 4670/5670	3	Geomaterials Stabilization		[CE 3600 and (CE 3820 or CE 3830)] or Permission of Instructor
CE 4830/5830	3	Pavement Analysis and Design	S	CE 3600 and CE 3820
CE 4840/5840	3	Advanced Design of Concretes		CE 3820
CE 4880/5880	3	Sustainable Civil Infrastructure Systems	F	Permission of Instructor
CE 4890/5890	3	Pavement Preservation and Rehabilitation	F, S	CE 3820
EM 3620 MATE 3620	3	Principles of Nondestructive Testing	F, S	PHYS 1320 or PHYS 2320

Course	CR	Title	Typically Offered*	Pre-requisites
EM 3620L MATE 3620L	1	Nondestructive Testing Laboratory	F, S	Credit or enrollment in MATH 3620 or EM 3620

TRANSPORTATION

Course	CR	Title	Typically Offered*	Pre-requisites
CE 3950	3	Global Perspectives in Transportation	S	*Repeatable up to 2 times (Can fulfill IP or Engineering Topic only – not SSH)
CE 4170	3	Boundary Surveys	S	CE 1110
CE 4510/5510	3	Urban Transportation Planning Models	F	CE 3550 and (STAT 2310 or STAT 3050)
CE 4530	3	Highway Design	F	CE 3060 and CE 3550
CE 4880/5880	3	Sustainable Civil Infrastructure Systems	F	Permission of Instructor
CRP 4450/5450	3	Transportation Policy and Planning	F	Junior classification
SCM 3010	3	Supply Chain Management		ECON 1010
SCM 4600	3	Decision Tools for Logistics and Operations Management		SCM 3010
SCM 4610	3	Principles of Transportation		SCM 3010
SCM 4620	3	Transportation Carrier Management		Credit or enrollment in SCM 4610
SCM 4660	3	Global Trade Management		SCM 3010
SCM 5010	3	Supply Chain Management		Ivy College of Business Graduate Student or instructor permission

STRUCTURAL/CONSTRUCTION

Course	CR	Title	Typically Offered*	Pre-requisites
ABE 4780/5780	3	Wood Frame and Agri-Industrial Structures	S (odd)	EM 3240
AERE 4170/5170 EM 4170/5170	3	Experimental Mechanics	F (even)	EM 3240 and MATE 2730
AERE 5690 EM 5690 MSE 5690	3	Mechanics of Composite and Combined Materials	S (even)	EM 3240
AERE 5700 EM 5700	3	Wind Engineering	S (odd)	ABE 3780, ME 3450
CE 3330	3	Structural Steel Design I	F, S	CE 3320 and EM 3270
CE 3340	3	Reinforced Concrete Design I	F, S	CE 3320 and EM 3270
CE 4460/5460	3	Bridge Design	S (odd)	CE 3330 and 3340
CE 4480/5480	3	Building Design	S (even)	CE 3330 and 3340
CE 4490/5490	3	Structural Health Monitoring		Senior Classification in an Engineering major or Permission of Instructor
CE 4880/5880	3	Sustainable Civil Infrastructure Systems	F	Permission of Instructor
CE 5010	3	Preconstruction Project Engineering and Management	Every 3 semesters	Credit or enrollment in CONE 4220 or CE 3060 or graduate standing
CE 5020	3	Construction Project Engineering and Management	Every 3 semesters	(Credit or enrollment in CONE 4220 or CE 5940A or permission of instructor) or graduate classification
CE 5030	3	Construction Finance and Business Management	Every 3 semesters	(Credit or enrollment in CONE 4220 or CE 5940A or permission of instructor) or graduate classification
CE 5050	3	Design of Construction Systems	Every 3 semesters	(CE 3330, CE 3600, CONE 3220, CONE 3400)
CE 5100	3	Information Technologies for Construction	Every 3 semesters	Graduate Standing or Permission of Instructor

Course	CR	Title	Typically Offered*	Pre-requisites
CONE 3220	3	Construction Equipment and Heavy Construction Methods	F	CE 3060 or (CONE 2220 and CONE 2410)
CONE 3400	3	Concrete and Steel Construction	F, S	(EM 3240 and CONE 2220) or CE 3060
CONE 3520	3	Mechanical Systems in Buildings	F, S	CONE 2220, CONE 2510, PHYS 2320, PHYS 2320L
CONE 3530	3	Electrical Systems in Buildings	F, S	Credit or concurrent enrollment in CONE 3520, PHYS 2320, and PHYS 2320L
EM 4240	3	Intermediate Mechanics of Materials	F, S	EM 3240
EM 4250	3	Introduction to the Finite Element Method	S	EM 3240 and (MATH 2660 or MATH 2670)
EM 5480	3	Advanced Engineering Dynamics	S (even)	EM 3450 and (MATH 2660 or MATH 2670)
MATE 2730	3	Principles of Materials Science and Engineering	F, S	MATH 1650 and (CHEM 1670 or CHEM 1770)

OTHER

Course	CR	Title	Typically Offered*	Pre-requisites
ABE 3780L	1	Mechanics of Fluids Laboratory	F, S	Credit or enrollment in EM 3780
AERE 4940	2-3	Make to Innovate II	F, S	Junior or Senior Classification
AERE 5250 EM 5250	3	Finite Element Analysis	S	Graduate Standing or Permission of Instructor
AGRON 4520/5520 ENSCI 4520/5520 GEOL 4250/5520	3	Intro GIS for Geoscientists	F, S	
CE 4900	1-3	Independent Study – with a contract between the student and instructor	F, S, SS	Department Permission *Repeatable with a maximum of 6 credits; applied as Engineering Topic Elective

Course	CR	Title	Typically Offered*	Pre-requisites
CE 5190	3	Methods for Data-Driven Computational Engineering Research		Instructor Permission
COMS 2070 (cannot also use COMS 2270)	3	Fundamentals of Computer Programming	F, S, SS	MATH 1500 or credit or enrollment in MATH 1400 or higher
COMS 2270 (cannot also use COMS 2070)	4	Object-oriented Programming	F, S, SS	(COMS 1270 or CPRE 1850 or SE 1850 or EE 2850) and credit or concurrent enrollment in MATH 1430 or higher
CONE 3800	3	Engineering Law	F	Junior classification
CONE 4900	1-3	Independent Study – with a contract between the student and instructor	F, S, SS	Department Permission
CRP 2510	3	Fundamentals of Geographic Information Systems	F	
CRP 3510	3	Geospatial Analysis and Visualization	F, S	CRP 2510
EE 2010	4	Electric Circuits	F, S	(PHYS 2310 or PHYS 2310H), (PHYS 2310L or PHYS 2210), credit or concurrent enrollment in MATH 2670
EM 5100	3	Continuum Mechanics	F	Graduate Standing or Permission of Instructor
ENGR 4300 IE 4300	3	Entrepreneurial Product Engineering	F, S	Junior classification
ENGR 4340X IE 4340X	0-99	Entrepreneurial Product Engineering Design Project	S	IE 4300 or ENGR 4300
IE 3610 STAT 3610	3	Statistical Quality Assurance	F, S	STAT 2310 or STAT 3010 or STAT 3260 or STAT 5870
ME 2310	3	Engineering Thermodynamics I	F, S, SS	CHEM 1670, MATH 1660, PHYS 2310, PHYS 2310L
ME 2700	3	Introduction to Mechanical Engineering Design	F, S	(ABE 1600 or AERE 1600 or BME 1600 or CE 1600 or CHE 1600 or CPRE 1850 or EE 1850 or ENGR 1600 or IE 1600 or ME 1600 or SE 1850), (ME 1700 or ENGR 1700), PHYS 2310, PHYS 2310L

Course	CR	Title	Typically Offered*	Pre-requisites
NS 3200	3	Naval Ship Systems I (Engineering)	F	PHYS 2310, PHYS 2310L, Sophomore classification
NS 3300	3	Naval Ship Systems II (Weapons)	S	PHYS 2310, Sophomore classification

*F = Fall, S = Spring, SS = Summer

Approved by the CE Curriculum Committee
Updated 8/20/25