

CE Engineering Topics Electives List: 2024-2025 Catalog

According to ABET, the department's accrediting body, engineering topics consist of *engineering sciences and engineering design appropriate to the student's field of study. The engineering sciences have their roots in mathematics and basic sciences but carry knowledge further toward creative application. These studies provide a bridge between mathematics and basic sciences on the one hand and engineering practice on the other. Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative), in which the basic sciences, mathematics, and the engineering sciences are applied to convert resources optimally to meet these stated needs.* **Students may petition** the CE Curriculum Committee to accept a course not listed below as an engineering topics elective. The petition should explain how the proposed course involves engineering sciences or engineering design appropriate to the student's field of study. NOTE: Courses that are listed on more than one electives lists can count for only one requirement. The student is responsible for checking and abiding by the ISU catalog relative to official course details, prerequisites and narratives.

Course	CR.	Title	Offered	Notes	Environmetnal	Geotechnical	Transportation	Structural
ABE 3880 (CE, EE)	3	Sustainable Engineering & International Development	F	Prereq: Junior Classification in Engineering	<input checked="" type="checkbox"/>			
ABE 4780/5780	3	Wood Frame and Agri-Industrial Structures	Alt. S (odd years)	Prereq: EM 3240 (This course is on the design electives list.)				<input checked="" type="checkbox"/>
AERE 4170/5170 (EM)	3	Experimental Mechanics	Alt. F (even years)	Prereq: EM 3240, MATE 2730				<input checked="" type="checkbox"/>
AERE 4940	2-3	Make to Innovate II	F.S.	Prereq: Junior or Senior Classification				
AGRON 4040/5040 (ENSCI, ENV5, MTEOR)	3	Global Change	F.S		<input checked="" type="checkbox"/>			
CE 3330	3	Structural Steel Design I	F, S	Prereq: CE 3320, EM 3270				<input checked="" type="checkbox"/>
CE 3340	3	Reinforced Concrete Design I	F, S	Prereq: CE 3320, EM 3270				<input checked="" type="checkbox"/>

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CE 3880 (ABE, EE)	3	Sustainable Engineering & International Development	F	Junior Classification in Engineering	<input checked="" type="checkbox"/>			
CE 3950	3	Global Perspectives in Transportation	S	Repeatable (Can be used to fulfill IP and Engineering Topics only - not SSH)			<input checked="" type="checkbox"/>	
CE 4130/5130 (ENSCI, GEOL)	3	Applied and Environmental Geophysics	Alt. S (odd years)		<input checked="" type="checkbox"/>			
CE 4170	3	Boundary Surveys	S	Prereq: CE 1110			<input checked="" type="checkbox"/>	
CE 4280 (General Option Only)	3	Water & Wastewater Treatment Plant Design	S	Prereq: CE 3260 (This course is on the design electives list.)	<input checked="" type="checkbox"/>			
CE 4460/5460	3	Bridge Design	Alt. S (odd years)	Prereq: CE 3330 and 3340 (This course is on the design electives list.)				<input checked="" type="checkbox"/>
CE 4480/5480	3	Building Design	Alt. S (odd years)	Prereq: CE 3330 and 3340 (This course is on the design electives list.)				<input checked="" type="checkbox"/>
CE 4490/5490	3	Structural Health Monitoring		Prereq: Senior Classification in Engineering or Permission of Instructor				<input checked="" type="checkbox"/>
CE 4510/5510	3	Urban Transportation Planning Models	F	Prereq: CE 3550, STAT 2310 or STAT 3050			<input checked="" type="checkbox"/>	
CE 4530	3	Highway Design	F	CE 3060, CE 3550 (This course is on the design electives list.)				

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CE 4600	3	Foundation Engineering	F, S	Prereq: CE 3600 (This course is on the design electives list.)		<input checked="" type="checkbox"/>		
CE 4620	3	Site Evaluations for Civil Engineering Projects		Prereq: CE 3600 or Permission of Instructor				
CE 4670/5670	3	Geomaterials Stabilization		Prereq: CE 3600, CE 3820 or CE 3830, or Permission of Instructor (This course is on the design electives list.)		<input checked="" type="checkbox"/>		
CE 4730/5730	3	Groundwater Hydrology	F	Prereq: CE 3720 (This course is on the design electives list.)	<input checked="" type="checkbox"/>			
CE 4830/5830	3	Pavement Analysis & Design	S	Prereq: CE 3600 and CE 3820 (This course is on the design electives list.)		<input checked="" type="checkbox"/>		
CE 4840/5840	3	Advanced Design of Concretes		Prereq: CE 3820 (This course is on the design electives list.)		<input checked="" type="checkbox"/>		
CE 4880/5880	3	Sustainable Civil Infrastructure Systems	F	Prereq: Permission of Instructor (This course is on the design electives list.)	<input checked="" type="checkbox"/>			
CE 4890/5890	3	Pavement Preservation and Rehabilitation	F, S	CE 3820				
CE 4900/CONE 4900	1-3	Independent Study -- with a contract between the student and instructor at registration	F, S, SS	Repeatable with the maximum of 6 credits; applied as Engineering Topics Electives. Prereq: Department Permission	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CE 5010	3	Preconstruction Project Engineering and Management	Typically offered every 3 semesters	Prereq: CONE 4220 or CE 3060 or graduate standing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CE 5020	3	Construction Project Engineering and Management	Typically offered every 3 semesters	Prereq: (CONE 4220 or CE 5940A or permission of instructor) or graduate classification		<input checked="" type="checkbox"/>		
CE 5030	3	Construction Finance and Business Management	Typically offered every 3 semesters	Prereq: (CONE 4220 or CE 5940A or permission of instructor) or graduate classification				
CE 5050	3	Geomaterials Stabilization	Typically offered every 3 semesters	Prereq: CE 3600, CE 3820 or CE 3830, or Permission of Instructor (This course is on the design electives list.)		<input checked="" type="checkbox"/>		
CE 5100	3	Groundwater Hydrology	Typically offered every 3 semesters	Prereq: C E 372 (This course is on the design electives list.)	<input checked="" type="checkbox"/>			
CE 5130	3	Pavement Analysis & Design	Typically offered every 3 semesters	Prereq: CE 36 and CE 3820 (This course is on the design electives list.)		<input checked="" type="checkbox"/>		
CE 5190	3	Advanced Design of Concretes	Typically offered every 3 semesters	Prereq: CE 3820 (This course is on the design electives list.)		<input checked="" type="checkbox"/>		
CE 5200	3	Sustainable Civil Infrastructure Systems	Typically offered every 3 semesters	Prereq: Permission of Instructor (This course is on the design electives list.)	<input checked="" type="checkbox"/>			
CE 5210	3	Pavement Preservation and Rehabilitation	Typically offered every 3 semesters	CE 3820				
CE 5220	1-3	Independent Study -- with a contract between the student and instructor at registration	Typically offered every 3 semesters	Repeatable with the maximum of 6 credits; applied as Engineering Topics Electives. Prereq: Department Permission	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CE 5230	Vary	(except CE 5900, 5910, 5950 & 5990)	Typically offered every 3 semesters	Variable prereqs: See catalog. (Some of these courses are on the design electives list.)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHE 2100	3	Material & Energy Balances	F, S	Prereq: CHEM 1780, MATH 1660, CH E 1600	<input checked="" type="checkbox"/>			
COMS 2070 (can not also use COMS 2270)	3	Fundamentals of Computer Programming	F, S, SS	Prereq: MATH 1500 or placement into MATH 1400 or higher				
COMS 2270 (can not also use COMS 2070)	4	Object-Oriented Programming	F, S, SS	Prereq: Credit or enrollment in MATH 1430 or higher; COMS 1270 or CPRE 1850 or SE 1850 or EE 2850				
CONE 3220	3	Construction Equipment and Heavy Construction Methods	F	Prereq: CONE 2410 and (CONE 2220 or CE 3060)				
CONE 3400	3	Concrete and Steel Construction	F, S	Prereq: EM 3240 and (CONE 2220 or CE 3060)				
CONE 3800	3	Engineering Law	F	Junior Classification	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CRP 2510	3	Fundamentals of Geographic Information Systems	F					
CRP 2930 (ENVS)	3	Environmental Planning	F, S		<input checked="" type="checkbox"/>			
CRP 3510	3	Intermediate Geographic Information Systems	F, S	Prereq: CRP 2510				
CRP 4450/5450	3	Transportation Policy and Planning	F	Prereq: Junior Classification				

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CRP 4840/5840 (ENVS)	3	Sustainable Communities	S	Prereq: Junior Classification	<input checked="" type="checkbox"/>			
EE 2010	4	Electric Circuits	F, S	Prereq: PHYS 2310 and 2310L; credit or enrollment in MATH 2670	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
EE 3880 (ABE, CE)	3	Sustainable Engineering & International Development	F	Prereq: Junior Classification in Engineering	<input checked="" type="checkbox"/>			
EM 3620 & EM 3620L (MATE)	3 & 1	Principles of Non-Destructive Testing & Lab (optional)	S	Prereq: PHYS 1320 or PHYS 2320		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
EM 4170/5170 (AERE)	3	Experimental Mechanics	Alt. F (even years)	Prereq: EM 3240, MATE 2730		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
EM 4240	3	Intermediate Mechanics of Materials	F, S	Prereq: EM 3240		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
EM 4250	3	Introduction to the Finite Element Method	S	Prereq: EM 3240, (MATH 2660 or MATH 2670)	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
EM 5100	3	Continuum Mechanics	F					
EM 5250 (AERE)	3	Finite Element Analysis	S					
EM 5480	3	Advanced Engineering Dynamics	Alt. S (even years)	Prereq: EM 3450, (MATH 2660 or MATH 2670)		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

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EM 5690 (AERE, MSE)	3	Mechanics of Composite & Combined Materials	Alt. S (even years)	Prereq: EM 3240				<input checked="" type="checkbox"/>
EM 570 (AERE)	3	Wind Engineering	Alt. S (odd years)	Prereq: ABE 3780, ME 3450	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
ENSCI 3240 (ENVS, GEOL, MTEOR)	3	Energy & the Environment	S	Prereq: CHEM 1630, (CHEM 1670 or CHEM 1770)	<input checked="" type="checkbox"/>			
ENSCI 4020/5020 (GEOL, MTEOR, NREM)	3	Watershed Hydrology	F		<input checked="" type="checkbox"/>			
ENSCI 4040/5040 (AGRON, ENVS, MTEOR)	3	Global Change	F.S		<input checked="" type="checkbox"/>			
ENSCI 4110/5110 (GEOL)	4	Hydrogeology	S		<input checked="" type="checkbox"/>			
ENSCI 4130/5130 (CE, GEOL)	3	Applied and Enviornmental Geophysics	Alt S (odd years)					
ENSCI 4140/5140 (GEOL)	3	Applied Groundwater Flow Modeling	Alt. S (even years)	Prereq: (GEOL 4110 or CE 4730), MATH 1650	<input checked="" type="checkbox"/>			
ENSCI 4190/5190 (GEOL)	3	Aqueous & Environmental Geochemistry	Alt. S (even years)	Prereq: CHEM 1780, CHEM 1780L Junior Classification	<input checked="" type="checkbox"/>			
ENVE 4260	3	Environmental Engineering Science	F	Prereq: CE 3260, CHEM 2310, MICRO 2010	<input checked="" type="checkbox"/>			

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ENVE 4270	3	Environmental Engineering Systems	S	Prereq: MATH 2650, MATH 2660, CE 3260, CE 3720	<input checked="" type="checkbox"/>			
ENVE 4290	3	Air Pollution and Control	S	Prereq: MATH 2650, CE 3260	<input checked="" type="checkbox"/>			
ENVE 4300	3	Solid and Hazardous Waste Management	F	Prereq: CE 3260, credit or enrollment in ENVE 4260	<input checked="" type="checkbox"/>			
ENVS 3240 (ENSCI, GEOL, MTEOR)	3	Energy & the Environment	S	Prereq: CHEM 1630, (CHEM 1670 or CHEM 1770)	<input checked="" type="checkbox"/>			
ENVS 4040 (AGRON, ENSCI, MTEOR)	3	Global Change	F.S		<input checked="" type="checkbox"/>			
ENVS 4840 (CRP)	3	Sustainable Communities	S	Prereq: Junior Classification	<input checked="" type="checkbox"/>			
GEOL 3240 (ENSCI, ENVS, MTEOR)	3	Energy & the Environment	S	Prereq: CHEM 1630, (CHEM 1670 or CHEM 1770)	<input checked="" type="checkbox"/>			
GEOL 4020/5020 (ENSCI, MTEOR, NREM)	3	Watershed Hydrology	F		<input checked="" type="checkbox"/>			
GEOL 4110/5110 (ENSCI)	4	Hydrogeology	S		<input checked="" type="checkbox"/>			
GEOL 4130/5130 (CE, ENSCI)	3	Applied and Environmental Geophysics	Alt. S (odd years)		<input checked="" type="checkbox"/>			

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GEOL 4140/5140 (ENSCI)	3	Applied Groundwater Flow Modeling	Alt. S (even years)	Prereq: (GEOL 4110 or CE 4730), MATH 1650	<input checked="" type="checkbox"/>			
GEOL 4160/5160 (MTEOR, ENSCI)	3	Hydrologic Modeling & Analysis	Alt. S (odd years)		<input checked="" type="checkbox"/>			
GEOL 4390/5390 (CE)	3	Seismic Methods in Geology, Engineering and Petroleum Exploration	Alt. S (even years)					
GEOL 4520	3	GIS for Geoscientists	F, S					
IE 3610 (STAT)	3	Statistical Quality Assurance	F, S	Prereq: STAT 2310, STAT 3010, STAT 3260, or STAT 5870	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
IE 4300 (ENGR)	3	Entrepreneurial Product Engineering	F, S	Prereq: Junior Classification				
IE 4340X (ENGR)	Vary	Entrepreneurial Product Engineering Design Project	S	Prereqs: IE 4300 or ENGR 4300				
MATE 2730	3	Principles of Materials Science & Engineering	F, S	Prereq: (CHEM 1670 or CHEM 1770), MATH 1650				<input checked="" type="checkbox"/>
MATE 3620 & 3620L (EM)	3 & 1	Principles of Nondestructive Testing & Lab (optional)	S	Prereq: PHYS 1320 or PHYS 2320		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
MATE 3920	3	Principles of Materials Science & Engineering	SS	Prereq: (CHEM 1670 or CHEM 1770), MATH 1650, MATE 3910				

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ME 2310	3	Engineering Thermodynamics I	F, S, SS	Prereq: CHEM 1670, MATH 1660, PHYS 2310, PHYS 2310L	<input checked="" type="checkbox"/>			
ME 4330	3	Alternative Energy	F	Prereq: CHEM 1670, PHYS 2320, PHYS 2320L				
MTEOR 3240 (ENSCI, ENVS, GEOL)	3	Energy & the Environment	S	Prereq: CHEM 1630 or CHEM 1670 or CHEM 1770	<input checked="" type="checkbox"/>			
MTEOR 4040/5040 (AGRON, ENSCI, ENVS)	3	Global Change	F, S		<input checked="" type="checkbox"/>			
NS 3200	3	Naval Ship Systems I (Engineering)	F	Prereq: PHYS 2310, PHYS 2310L, Sophomore Classification				
NS 3300	3	Naval Ship Systems II (Weapons)	S	Prereq: PHYS 2310, Sophomore Classification				
SCM 3010	3	Supply Chain Management		Prereq: ECON 1010			<input checked="" type="checkbox"/>	
SCM 4600	3	Decision Tools for Logistics & Operations Management		Prereq: SCM 3010			<input checked="" type="checkbox"/>	
SCM 4610	3	Principles of Transportation		Prereq: SCM 3010			<input checked="" type="checkbox"/>	
SCM 4620	3	Transportation Carrier Management		Prereq: Credit or enrollment in SCM 4610			<input checked="" type="checkbox"/>	

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SCM 4660	3	Global Trade Management	F, S	Prereq: SCM 3010			<input checked="" type="checkbox"/>	
SCM 5010	3	Supply Chain Management		Prereq: Enrollment in MBA program or Permission of Department			<input checked="" type="checkbox"/>	
STAT 3610 (IE)	3	Statistical Quality Assurance	F, S	Prereq: STAT 2310 or STAT 3010 or STAT 3260 or STAT 5870	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Study Abroad Courses		Title		Institution, Country	Expiration Date			
ACEE334		Applied Energy Engineering		Korea University, South Korea	March 10, 2028			
ACEE348		Coastal Disaster Modelling		Korea University, South Korea	March 28, 2028			
ACEE369		Building Construction		Korea University, South Korea	February 10, 2028			
ACEE439		Intro to Computational Structural Analysis		Korea University, South Korea	March 10, 2028			
ACEE449		Building Energy Modeling and Analysis		Korea University, South Korea	February 10, 2028			
256-15502		Environmental Technology		Universidad Carlos III de Madrid, Spain	October 1, 2026			
CIVE09023		Fire Safety Engineering 3		University of Edinburgh, United Kingdom	October 1, 2026			
EASC08004		Oceanography		University of Edinburgh, United Kingdom	March 10, 2029			
CE4007		Water Management Systems		University of Limerick, Ireland	February 28, 2029			
ME4117		Vibrational Analysis		University of Limerick, Ireland	January 26, 2029			
ENME307		Performance of Engineering Materials		University of Canterbury, New Zealand	December 12, 2025			