CEES Professional Electives

Professional Electives are 3000-4000 level undergraduate and 5000 level graduate CEES courses.

Under special circumstances, 3000-5000 level courses from other departments are acceptable professional electives if they are part of a coherent elective program (with faculty advisor approval).

University of Oklahoma regulations and CEES policy impose certain restrictions when selecting professional electives. No 6000-level courses can be taken by undergraduate students, nor can 5000-level courses be taken by students with junior standing. Also, correspondence courses and the generic course, CEES 5020—Special Topics in CEES, are unacceptable as professional electives.

Appropriate electives can be found in: *Aerospace Engineering, Architecture, Biological Engineering, Biology, Chemical Engineering, Chemistry, Computer Science, Electrical Engineering, Industrial & Systems Engineering, Mathematics, Mechanical Engineering, Microbiology, Petroleum Engineering, Physics, Statistics, Meteorology, and Geology.*

ARCHITECTURAL ENGINEERING

Some suggested professional electives and areas of emphasis for a Bachelor of Science in Architectural Engineering degree are below.

Geotechnical Engineering	Environmental Engineering	Structural Design	Structural Analysis	Structural Systems	Construction
CEES 5313	CEES 4243G	CEES 4253G	CEES 4663G	CEES 5653	CEES 3453
CEES 5343	CEES 4273G	CEES 5693	CEES 5663	CEES 5683	
CEES 5353	ENGR 4513G	CEES 5773		CEES 5763	
CEES 5413		CEES 5783			
CEES 5433		CEES 5793			
CEES 5693					

Course No.	Title	Course No.	Title
CEES 3453	Introduction to Construction Management	CEES 5433	In-Situ Soil Testing
CEES 4253G	Statistics and Probability	CEES 5653	Advanced Mechanics of Materials
CEES 4273G	WaTER Technical Field Methods	CEES 5663	Structural Analysis II
CEES 4423	Professional Internship	CEES 5683	Dynamics of Structures
CEES 4453G	Geomatics Engineering	CEES 5693	Structural Design of Pavements
CEES 4663G	Matrix Methods in Structural Analysis	CEES 5763	Introduction to Finite Element Method
CEES 5313	Engineering Geology	CEES 5773	Structural Design - Steel II
CEES 5343	Advanced Soil Mechanics	CEES 5783	Structural Design - Concrete II
CEES 5353	Introduction to Soil Dynamics	CEES 5793	Design of Prestressed Concrete Structures
CEES 5313	Engineering Geology	ENGR 4513G	Introduction to Sustainable Engineering
CEES 5413	Soil-Structure Interaction		

CEES Professional Electives

CIVIL ENGINEERING

Some suggested professional electives and areas of emphasis for Bachelor of Science in Civil Engineering degree are below.

Geotechnical Engineering	Environmental Engineering	Structural Design	Structural Analysis	Structural Systems	Construction
CEES 4333G	CEES 4114/5114	CEES 4753G	CEES 4663G	CEES 5653	CEES 3453
CEES 5313	CEES 4123G	CEES 5693	CEES 5663	CEES 5683	
CEES 5323	CEES 4243G	CEES 5773		CEES 5763	
CEES 5343	CEES 4263G	CEES 5783			
CEES 5353	CEES 4273G	CEES 5793			
CEES 5413	CEES 4373/5373	CEES 5693			
CEES 5433	CEES 4943				
CEES 5693	CEES 5283				
	CEES 5363				
	CEES 5673				
	CEES 5833				
	CEES 5843				
	CEES 5853				
	CEES 5883				
	ENGR 4513G				

Course No.	Title	Course No.	Title
CEES 3453	Introduction to Construction Management	CEES 5353	Introduction to Soil Dynamics
CEES 4114/5114	Aquatic Chemistry	CEES 5363	Ecological Engineering Science
CEES 4123	Open Channel Flow	CEES 5413	Soil-Structure Interaction
CEES 4243	Water Technologies for Emerging Regions	CEES 5433	In-Situ Soil Testing
CEES 4273G	WaTER Technical Field Methods	CEES 5653	Advanced Mechanics of Materials
CEES 4333	Foundation Engineering	CEES 5663	Structural Analysis II
CEES 4373/5373	Water Resources Management	CEES 5673	Colloid Surface Science
CEES 4423	Professional Internship	CEES 5673g	Dynamics of Structures
CEES 4663	Matrix Methods in Structural Analysis	CEES 5693	Structural Design of Pavement
CEES 4753G	Structural Design - Wood	CEES 5763	Introduction to Finite Element Method
CEES 4943	Air Quality	CEES 5773	Structural Design – Steel II
CEES 5283	Environmental Organic Chemistry	CEES 5793	Design of Prestressed Concrete Structures
CEES 5313	Engineering Geology	CEES 5833	Ground Water Quality Protection
CEES 5323	Geosynthetics	CEES 5843	Hydrology
CEES 5343	Advanced Soil Mechanics	ENGR 4513	Intro. to Sustainable Engineering

CEES Professional Electives

ENVIRONMENTAL ENGINEERING

Some suggested professional electives and areas of emphasis for Bachelor of Science in Environmental Engineering degree are below. One elective can be chosen from list of approved science electives.

Water Supply & Resources	Environmental Systems Modeling	Environmental Chemistry and Biology	Wastewater Management	Solid & Hazardous Waste Management	Construction
CEES 4123G	CEES 5883	CEES 5283	CEES 4123G	CEES 5343	CEES 3453
CEES 4243G	MATH 4753G	CEES 5363	CEES 4324	CEES 5423	CEES 4453
CEES 4273G		CEES 5673	CEES 5244		
CEES 4373/5373			CEES 5624		
CEES 5833					
CEES 5843					
CEES 5853					
CEES 5873					

Course No.	Title	Course No.	Title
CEES 3453	Introduction to Construction Management	CEES 5363	Ecological Engineering Science
CEES 4123G	Open Channel Flow	CEES 5423	Environmental Geotechnology
CEES 4243G	Water Technologies for Emerging Regions	CEES 5624	Biological Waste Treatment
CEES 4273G	WaTER Technical Field Methods	CEES 5673	Colloid and Surface Science
CEES 4324	Environmental Biology and Ecology	CEES 5833	Ground Water Quality Protection
CEES 4373/5373	Water Resources Management	CEES 5843	Hydrology
CEES 4423	Professional Internship	CEES 5853	Groundwater and Seepage
CEES 4453	Geomatics Engineering	CEES 5873	Water Quality Management
CEES 5283	Environmental Organic Chemistry	CEES 5883	Environmental Modeling
CEES 5343	Advanced Soil Mechanics	MATH 4753G	Applied Statistical Methods

CEES Professional Electives

ENVIRONMENTAL SCIENCE

The Bachelor of Science in Environmental Science degree requires 9 hours of CEES professional electives and 9 hours of track electives.

Professional Electives:

Students must choose 9 hours of CEES professional electives.

Suggested professional electives for a Bachelor of Science in Environmental Science are listed in Table 1. Under special circumstances, one professional elective from outside CEES in the physical or life sciences (with one of the following course prefixes: BIOL, CHEM, GEOG, GEOL, METR, MBIO, PBIO, or PHYS) or mathematics (prefix: MATH) may be approved by the student's faculty advisor. Any professional elective outside CEES must be an upper division course.

Table 1

Course No.	Title	Course No.	Title
CEES 4243G	Water Technologies for Emerging Regions	CEES 5363	Ecological Engineering Science
CEES 4423	Professional Internship*	CEES 5853	Groundwater and Seepage
CEES 4453G	Geomatics Engineering	CEES 5873	Water Quality Management
CEES 4980	Environmental Science Senior Research	CEES 5883	Environmental Modeling
CEES 5283	Environmental Organic Chemistry	ENGR 4513G	Introduction to Sustainable Engineering

Track Electives:

Students must choose 9 hours from one of the 7 track options below:

- Track 1. Biological/Ecological Sciences
- Track 2: Chemical Sciences
- Track 3: Earth and Atmospheric Sciences
- Track 4: Geography/Geographic Information Systems
- Track 5: Environmental Planning and Management
- Track 6: Mathematics and Computer Science
- Track 7: Premedical

For complete track elective rules and regulations, review Section 4.2 of the CEES Undergraduate Guide for Environmental Science Students. *www.ou.edu/coe/cees/undergrad_programs/student_resources*

Track 1. Biological/Ecological Sciences: Track electives must be courses offered in the following departments: Biology (prefix BIO) or Microbiology and Plant Biology (prefixes MBIO and PBIO). At least six credit hours must be upper division (3000-level or higher). One biological-sciences related course may be chosen from another department, if approved by the student's advisor and recorded in degree navigator.

Track 2: Chemical Sciences: Track electives must be courses offered in the Department of Chemistry and Biochemistry (prefix CHEM). At least six credit hours must be upper division. One chemistry-related course may be chosen from another department, if approved by the student's advisor and recorded in degree navigator.

Track 3: Earth and Atmospheric Sciences: Track electives must be courses offered in the School of Geology and Geophysics (prefix: GEOL) or the School of Meteorology (prefix: METR). One earth or atmospheric science-related course may be chosen from another department, if approved by the student's advisor and recorded in degree navigator. At least three credit hours must be upper division.

Track 4: Geography/Geographic Information Systems: Track electives must be courses in the Department of Geography and Environmental Sustainability (prefix GEOG or GIS). One related course may be chosen from another department, if approved by the student's advisor and recorded in degree navigator. At least six credit hours must be upper division.

Track 5: Environmental Planning and Management: Track electives must be courses from the following list: ECON 1123, ECON 3213, P SC 3233, ENST 3213, GEOG 3233, PHIL 3293, RCPL 4003, COMM 1113, COMM 3483, COMM 3513, COMM 4513, and ENGR 4513. (Course titles, prerequisites, and semesters offered are shown in Table 2.) Other courses may be chosen from these or related departments, if approved by the student's advisor and recorded in degree navigator. At least six credit hours must be upper division. Track 5 electives must be chosen from at least two different departments.

Table 2

Course	Title	Prerequisites beyond courses already required for the ES curriculum)
ECON 1123	Principles of Economics-Micro	None
ECON 3213	Environmental Economics	ECON 1123
PSC 3233	Environmental Policy and Administration	None
ENST 3213	Law and the Environment	None
GEOG 3233	Principles of Sustainability	None
PHIL 3293	Environmental Ethics	None
RCPL 4003	Global City and Planning Issues	None
COMM 1113	Principles of Communication	None
COMM 3483	Communication and Argumentation	COMM 1113
COMM 3513	Intercultural Communication	COMM 1113
COMM 4513	International Communication	COMM 1113
ENGR 4513	Introduction to Sustainable Engineering	None

Track 6: Mathematics and Computer Science: Track electives must be courses from the following list: MATH 2934, MATH 3113, MATH 3333, MATH 3413, MATH 3401, CS 1313, and ENGR 3411. (Course titles, prerequisites, and semesters offered are shown in Table 3.) Other courses may be chosen from these or related departments, if approved by the student's advisor and recorded in degree navigator. At least one course must be upper division.

Table 3

Course	Title	Prerequisites beyond courses already required for the ES curriculum)
MATH 2934	Differential & Integral Calculus III	None
MATH 3113	Intro. to Ordinary Differential Equations	None
MATH 3333	Linear Algebra I	MATH 2934
MATH 3413	Physical Mathematics I	MATH 2934
MATH 3401	Numerical Methods with Matlab	MATH 2934, MATH 3413 (or concurrent enrollment in MATH 3413)
CS 1313	Programming for Non-Majors	None
ENGR 3411	Numerical Methods	CS 1313 or CS 1323 and MATH 3113
ENGR 3723	Numerical Methods for Engineering Computation	CS 1313 or 1323 and MATH 3113

Track 7: Premedical: Track electives must include at least three chemical, physical, or life science courses that are required or recommended for medical school admission, and that are not already required for the ES major. Written documentation that these three courses are part of a plan for medical school application must be obtained from the Premedical Professions Advising Office and must be recorded in degree navigator.