

BS Civil Engineering Curriculum – ERE Concentration Catalog Year 2022-23

Freshman Year

First Semester	R	L	C	Second Semester	R	L	C
CEN 110 Civil Engineering Programming	0	2	2	CEN 161 Civil Eng. Design Graphics	1	3	2
CHM 153 Prin. Mod. Chem. for Engineers ¹	3	0	3	CHM 152 Principles Modern Chemistry II	3	0	3
CHM 161 Intro. to Applied Chemistry I	0	3	1	ENL 102 Critical Writing & Reading II	3	0	3
EGR 111 Intro. Engineering & Computing	2	3	3	MTH 154 Calc. Applied Sci. & Eng. II	4	0	4
ENL 101 Critical Writing & Reading I	3	0	3	PHY 111 Physics for Sci. & Eng. I	4	2	4
MTH 153 Calc. Applied Sci. & Eng. I	4	0	4				
			16				16

Sophomore Year

First Semester	R	L	C	Second Semester	R	L	C
EGR 241 Engineering Mechanics I: Statics ²	3	0	3	BIO/BNG BIO/BNG Requirement ⁴	3	0	3
ENL 266 Technical Communications	3	0	3	CEN 202 Mechanics of Materials ²	3	0	3
MTH 213 Calc. Applied Sci. & Eng. III	4	0	4	CEN 212 Civil Engineering Materials Lab	0	3	1
PHY 112 Physics for Sci. & Eng. II	4	2	4	EGR 242 Engineering Mechanics II: Dynamics ²	3	0	3
University Studies ³	3	0	3	MTH 212 Differential Equations	3	0	3
			17	University Studies ³	3	0	3
							16

Junior Year

First Semester	R	L	C	Second Semester	R	L	C
CEN 209 Intro to Transportation	3	0	3	CEN 304 Intro. Environmental Engineering ⁵	3	0	3
CEN 303 Fluid Mechanics ⁵	3	0	3	CEN 313 Fluid Mechanics Lab	0	3	1
CEN 305 Soil Mechanics	3	0	3	CEN 314 Environmental Eng. Lab	0	3	1
CEN 306 Structural Analysis	3	0	3	CEN 325 Water Resource Engineering	3	0	3
CEN 315 Soil Mechanics Lab	0	3	1	CEN ERE List A Elective ⁶	3	0	3
EGR 411 Intro to GIS	3	0	3	CEN ERE List A Elective ⁶	3	0	3
			16				14

Senior Year

First Semester	R	L	C	Second Semester	R	L	C
CEN 411 Water Quality Engineering	3	0	3	CEN 491 Civil Engineering Project ^{7,8}	2	0	2
CEN 491 Civil Engineering Project ^{7,8}	2	0	2	ERE List C Elective ⁶	3	0	3
EGR 303 Engineering Economics ⁹	3	0	3	ERE List C Elective ⁶	3	0	3
ERE List B Elective ⁶	3	0	3	ERE List C Elective ⁶	3	0	3
University Studies ³	3	0	3	University Studies ³	3	0	3
			14				14

TOTAL CREDITS = 123

R = Recitation (hours)

L = Laboratory (hours)

C = Number of Credits

¹ CHM 151 may be taken in place of CHM 153.

² Must be passed with a grade of C- or better.

³ See University Studies 3A, 3B, 4A, & 4B requirement (refer to www.umassd.edu/universitystudies/approvedcourses).

⁴ BIO/BNG course must be either BIO 143 or BNG 255. Satisfies University Studies 2B requirement.

⁵ The ERE Concentration requires these courses to be passed with a grade of C- or better.

⁶ Must be chosen from the approved list of courses and must be passed with a grade of C or better.

⁷ Course spans over two semesters. Also satisfies University Studies 5A/B requirements.

⁸ Project must have an Environmental Resources Engineering emphasis.

⁹ Course meets University Studies 4C requirement.

Environmental Resource Engineering (ERE) Concentration

The Environmental Resources Engineering (ERE) Concentration is offered to students who wish to expand their education with an emphasis on environmental concerns, assessment of the environmental impact of new or existing products or processes, methods for solving problems resulting from pollution in the air, water, or earth, and the management of energy and resources, in order to minimize pollution in the environment. Students should declare their intention no later than the junior year and must earn a grade of C- or better in both CEN 303 and CEN 304 in order to enroll in the List B and List C courses as well as to have the concentration appear on the transcript of record.

The concentration consists of completing both CEN 325 and CEN 411 as well as a combination of courses from three lists. Students are required to take two courses from List A, two courses from List B, and three courses from List C. Students will also complete a capstone design project having an environmental resources engineering emphasis. Students pursuing the concentration are required to earn at least a grade of C in each course in List B and List C.

List A: CEN Foundation Core: Two courses required.

Course	Title
CEN 307 or CEN 408	Analysis & Design of Reinforced Concrete Structures <u>OR</u> Analysis & Design of Steel Structures
CEN 323	Geotechnical Engineering
CEN 334	Traffic Engineering

List B: ERE Foundation Core: EGR 411 is required. Choose one additional course. Each course must be passed with a grade of C or better.

Course	Title
EGR 411	Intro to Geographic Info Systems
CEN 464	Environmental Water Chemistry
EGR 415	Environmental Fluid Mechanics

List C: ERE Technical Electives: Three courses required. Each course must be passed with a grade of C or better.

Course	Title
CEN 412	Pollution Control of Waste
CEN 414	Hazardous Waste Management
CEN 428	Probability and Statistics for Civil Engineers
CEN 430	Topics in Civil & Environmental Engineering (topic must be relevant to ERE Concentration – requires prior approval of the advisor)
CEN 433	Special Topics in Geotechnical Engineering
CEN 456	Waves and Tides
CEN 459	Dynamics of Stratified Flows
CEN 460	Climate Resiliency Engineering
CEN 464*	Environmental Water Chemistry
CEN 465	Pollutant Transport in the Environment
CEN 475	Introduction to Environmental Turbulence
CHM 356	Atmospheric/Terrestrial Environmental Chemistry
EGR 415*	Environmental Fluid Mechanics
EGR 490**	Engineering Internship
SUS 348	Ocean Policy and Law

*Course can't double count. Course not used for List B can meet List C requirement.

**Use of EGR 490 (up to 3 credits) as a Technical Elective requires prior approval of Advisor and Department Chairperson.