

# CIVIL AND ENVIRONMENTAL ENGINEERING: PROFESSIONAL, M.S.

## REQUIREMENTS

### MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (<http://guide.wisc.edu/graduate/#policiesandrequirements>), in addition to the program requirements listed below.

### NAMED OPTION REQUIREMENTS

#### MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	Yes

### CURRICULAR REQUIREMENTS

Requirements	Detail
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	At least 50% of credits (15/30) applied toward the graduate degree credit requirement must be completed in graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide.
Overall Graduate GPA Requirement	3.00 GPA required.
Other Grade Requirements	The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.
Assessments and Examinations	There are no degree-specific assessments and examinations outside of those given in individual courses.
Language Requirements	n/a

### REQUIRED COURSES

This is a face to face, accelerated program:

- Complete the program in one academic year (fall, spring, summer)
- Courses may begin in the fall or spring semester

### CORE COURSES:

- At least 15 of the 30 credit hours must be taken within one curriculum path.<sup>1</sup> Please see curriculum paths below
- 21 of the 30 credit hours must be taken in CIV ENGR ([https://guide.wisc.edu/courses/civ\\_engr/](https://guide.wisc.edu/courses/civ_engr/)) or G L E ([https://guide.wisc.edu/courses/g\\_l\\_e/](https://guide.wisc.edu/courses/g_l_e/)).
- 15 of the 30 credit hours must be at the graduate level (50% attribute).

### PROFESSIONAL DEVELOPMENT:

- May enroll in up to 5 credits of CIV ENGR 999 Advanced Independent Study or G L E 999 Independent Work.

### ELECTIVE COURSES:

- Up to 2 credit hours of seminar. Please see seminar options listed below.
- Additional electives beyond CIV ENGR 999, G L E 999, and/or seminar(s) may be taken based on your career interests and advisor approval.

#### Seminars

Code	Title	Credits
CIV ENGR 579	Seminar-Transportation Engineering	1
CIV ENGR 669	Special Topics in Construction Engineering and Management	1-4
G L E 900	Seminar	1
CIV ENGR 909	Graduate Seminar - Environmental Chemistry & Technology	1
CIV ENGR 919	Seminar-Hydraulic Engineering and Fluid Mechanics	1
CIV ENGR 929	Seminar-Environmental Engineering	1
CIV ENGR 939	Geotechnical Engineering Seminar	1
CIV ENGR 949	Seminar-Structural Engineering	1

### CURRICULUM PATHS:

#### Construction Engineering and Management<sup>1</sup>

Code	Title	Credits
CIV ENGR 392	Building Information Modeling (BIM)	3
CIV ENGR/G L E 430	Introduction to Slope Stability and Earth Retention	1
CIV ENGR/G L E 432	Introduction to Shallow and Deep Foundation Systems	1
CIV ENGR/G L E 434	Introduction to Underground Openings Engineering	1
CIV ENGR 445	Steel Structures I	3
CIV ENGR 447	Concrete Structures I	3
CIV ENGR 451	Architectural Design	3
CIV ENGR 491	Legal Aspects of Engineering	3
CIV ENGR 492	Integrated Project Estimating and Scheduling	3
CIV ENGR 494	Civil and Environmental Engineering Decision Making	3
CIV ENGR 496	Electrical Systems for Construction	3
CIV ENGR 497	Mechanical Systems for Construction	3
CIV ENGR 498	Construction Project Management	3

CIV ENGR/G L E 532	Foundations	3
CIV ENGR 545	Steel Structures II	3
CIV ENGR 547	Concrete Structures II	3
CIV ENGR 575	Advanced Highway Materials and Construction	3
CIV ENGR 576	Advanced Pavement Design	3
CIV ENGR 649	Special Topics in Structural Engineering	1-3
CIV ENGR 669	Special Topics in Construction Engineering and Management	1-4

<sup>1</sup> These tracks are internal to the program and represent different pathways a student can follow to earn this degree. Track names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

### Environmental Science and Engineering <sup>1</sup>

Code	Title	Credits
CIV ENGR 410	Hydraulic Engineering	3
CIV ENGR 411	Open Channel Hydraulics	3
CIV ENGR 412	Groundwater Hydraulics	3
CIV ENGR 414	Hydrologic Design	3
CIV ENGR 415	Hydrology	3
CIV ENGR 416	Water Resources Systems Analysis	3
CIV ENGR/G L E 421	Environmental Sustainability Engineering	3
CIV ENGR 423	Air Pollution Effects, Measurement and Control	3
CIV ENGR 426	Design of Wastewater Treatment Plants	3
CIV ENGR 427	Solid and Hazardous Wastes Engineering	3
CIV ENGR 428	Water Treatment Plant Design	3
CIV ENGR 429	Environmental Systems Optimization	3
CIV ENGR 494	Civil and Environmental Engineering Decision Making	3
CIV ENGR 500	Water Chemistry	3
CIV ENGR 501	Water Analysis-Intermediate	3
CIV ENGR/G L E 511	Mixing and Transport in the Environment	3
CIV ENGR 514	Coastal Engineering	2-3
CIV ENGR 515	Hydroclimatology for Water Resources Management	3
CIV ENGR 522	Hazardous Waste Management	3
CIV ENGR/G L E 530	Seepage and Slopes	3
CIV ENGR 609	Special Topics in Water Chemistry	1-3
CIV ENGR/G L E 612	Ecohydrology	3
CIV ENGR 618	Special Topics in Hydraulics and Fluid Mechanics	1-3
CIV ENGR 619	Special Topics in Hydrology	1-3
CIV ENGR 629	Special Topics in Environmental Engineering	1-3
CIV ENGR/M&ENVTOX/SOIL SCI 631	Toxicants in the Environment: Sources, Distribution, Fate, & Effects	3

CIV ENGR 700	Chemistry of Natural Waters	3
CIV ENGR/ATM OCN 701	The Chemistry of Air Pollution	2
CIV ENGR 703	Environmental Geochemistry	3
CIV ENGR 704	Environmental Chemical Kinetics	3
CIV ENGR 716	Statistical Modelling of Hydrologic Systems	3
CIV ENGR 721	Biological Principles of Environmental Engineering	3
CIV ENGR 722	Chemical Principles of Environmental Engineering	3
CIV ENGR 723	Energy Principles of Environmental Engineering	3
CIV ENGR 729	Environmental Sustainability Tools	3
CIV ENGR/G L E 732	Unsaturated Soil Geoengineering	3
CIV ENGR 820	Hydraulics and Applied Fluid Mechanics for Environmental Engineers	3
CIV ENGR 821	Environmental Engineering: Biological Treatment Processes	3-4
CIV ENGR 822	Environmental Engineering: Physical/Chemical Treatment Process	3-4
CIV ENGR 823	Environmental Engineering Design Project	3

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### Geological/Geotechnical Engineering <sup>1</sup>

Code	Title	Credits
G L E 401	Special Topics in Geological Engineering	1-3
CIV ENGR 411	Open Channel Hydraulics	3
CIV ENGR 414	Hydrologic Design	3
CIV ENGR 427	Solid and Hazardous Wastes Engineering	3
CIV ENGR/G L E 430	Introduction to Slope Stability and Earth Retention	1
CIV ENGR/G L E 432	Introduction to Shallow and Deep Foundation Systems	1
CIV ENGR/G L E 434	Introduction to Underground Openings Engineering	1
G L E/CIV ENGR/GEOSCI/M S & E 474	Rock Mechanics	3
CIV ENGR 514	Coastal Engineering	2-3
CIV ENGR/G L E 530	Seepage and Slopes	3
G L E/CIV ENGR 532	Foundations	3
G L E/GEOSCI 537	Quantitative Methods for Geoscience	3
CIV ENGR 575	Advanced Highway Materials and Construction	3
CIV ENGR 576	Advanced Pavement Design	3
G L E/GEOSCI 594	Introduction to Applied Geophysics	3

G L E/GEOSCI 595	Field Methods in Applied and Engineering Geophysics	1
G L E/GEOSCI 627	Hydrogeology	3-4
G L E/GEOSCI 629	Contaminant Hydrogeology	3
G L E/CIV ENGR 635	Remediation Geotechnics	3
GEOSCI 720	Glaciology	3
G L E/GEOSCI 724	Groundwater Flow Modeling	3
G L E/CIV ENGR 730	Engineering Properties of Soils	3
G L E/CIV ENGR 732	Unsaturated Soil Geoengineering	3
G L E/CIV ENGR 733	Physicochemical Basis of Soil Behavior	3
G L E/CIV ENGR 735	Soil Dynamics	3
CIV ENGR 744	Structural Dynamics and Earthquake Engineering	4
G L E/GEOSCI 747	Tectonophysics	3
GEOSCI 755	Advanced Structural Geology	3
G L E/GEOSCI 757	Advanced Rock Mechanics	3
GEOSCI 758	Mechanics of Earthquakes and Faulting	3
G L E 801	Special Topics in Geological Engineering	1-3

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### Structural Engineering <sup>1</sup>

Code	Title	Credits
E M A 405	Practicum in Finite Elements	3
CIV ENGR/G L E 430	Introduction to Slope Stability and Earth Retention	1
CIV ENGR/G L E 432	Introduction to Shallow and Deep Foundation Systems	1
CIV ENGR/G L E 434	Introduction to Underground Openings Engineering	1
CIV ENGR 440	Structural Analysis II <sup>2</sup>	3
CIV ENGR 491	Legal Aspects of Engineering	3
CIV ENGR 498	Construction Project Management	3
E M A 506	Advanced Mechanics of Materials I	3
CIV ENGR/E M A/ M E 508	Composite Materials	3
CIV ENGR/G L E 532	Foundations	3
CIV ENGR 545	Steel Structures II <sup>2</sup>	3
CIV ENGR 547	Concrete Structures II <sup>2</sup>	3
E M A 605	Introduction to Finite Elements	3
CIV ENGR 649	Special Topics in Structural Engineering	1-3
CIV ENGR/G L E 730	Engineering Properties of Soils	3
CIV ENGR/G L E 735	Soil Dynamics	3
CIV ENGR 744	Structural Dynamics and Earthquake Engineering	4
CIV ENGR 749	Special Topics in Structural Engineering	1-4

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<sup>2</sup> NOTE: CIV ENGR 440 Structural Analysis II, CIV ENGR 545 Steel Structures II, and CIV ENGR 547 Concrete Structures II are required for students in the Structural Engineering Path unless approved by their advisor.

### Transportation Engineering <sup>1</sup>

Code	Title	Credits
PSYCH/I SY E 349	Introduction to Human Factors	3
CIV ENGR 370	Transportation Engineering	3
CIV ENGR/G L E 421	Environmental Sustainability Engineering	3
CIV ENGR 491	Legal Aspects of Engineering	3
CIV ENGR 494	Civil and Environmental Engineering Decision Making	3
CIV ENGR 571	Urban Transportation Planning	3
CIV ENGR 572	Transportation Operations	3
CIV ENGR 573	Geometric Design of Transport Facilities	3
CIV ENGR 574	Traffic Control	3
CIV ENGR 575	Advanced Highway Materials and Construction	3
CIV ENGR 576	Advanced Pavement Design	3
CIV ENGR 577	Traffic Flow Theory	3
CIV ENGR 678	Advanced Traffic Modeling and Computer Simulation	3
CIV ENGR 679	Special Topics in Transportation and City Planning	3
CIV ENGR/ PUB AFFR 694	Management of Civil Infrastructure Systems	3

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### Water Resources <sup>1</sup>

Code	Title	Credits
CIV ENGR 410	Hydraulic Engineering	3
CIV ENGR 411	Open Channel Hydraulics	3
CIV ENGR 412	Groundwater Hydraulics	3
CIV ENGR 414	Hydrologic Design	3
CIV ENGR 415	Hydrology	3
CIV ENGR 416	Water Resources Systems Analysis	3
CIV ENGR/G L E 421	Environmental Sustainability Engineering	3
CIV ENGR 423	Air Pollution Effects, Measurement and Control	3
CIV ENGR 426	Design of Wastewater Treatment Plants	3
CIV ENGR 427	Solid and Hazardous Wastes Engineering	3
CIV ENGR 428	Water Treatment Plant Design	3

CIV ENGR 429	Environmental Systems Optimization	3
CIV ENGR 494	Civil and Environmental Engineering Decision Making	3
CIV ENGR 500	Water Chemistry	3
CIV ENGR 501	Water Analysis-Intermediate	3
CIV ENGR/G L E 511	Mixing and Transport in the Environment	3
CIV ENGR 514	Coastal Engineering	2-3
CIV ENGR 515	Hydroclimatology for Water Resources Management	3
CIV ENGR 522	Hazardous Waste Management	3
CIV ENGR/G L E 530	Seepage and Slopes	3
CIV ENGR 609	Special Topics in Water Chemistry	1-3
CIV ENGR/G L E 612	Ecohydrology	3
CIV ENGR 618	Special Topics in Hydraulics and Fluid Mechanics	1-3
CIV ENGR 619	Special Topics in Hydrology	1-3
CIV ENGR 629	Special Topics in Environmental Engineering	1-3
CIV ENGR/ M&ENVTOX/ SOIL SCI 631	Toxicants in the Environment: Sources, Distribution, Fate, & Effects	3
CIV ENGR 700	Chemistry of Natural Waters	3
CIV ENGR/ ATM OCN 701	The Chemistry of Air Pollution	2
CIV ENGR 703	Environmental Geochemistry	3
CIV ENGR 704	Environmental Chemical Kinetics	3
CIV ENGR 716	Statistical Modelling of Hydrologic Systems	3
CIV ENGR 721	Biological Principles of Environmental Engineering	3
CIV ENGR 722	Chemical Principles of Environmental Engineering	3
CIV ENGR 723	Energy Principles of Environmental Engineering	3
CIV ENGR 729	Environmental Sustainability Tools	3
CIV ENGR/G L E 732	Unsaturated Soil Geoengineering	3
CIV ENGR 820	Hydraulics and Applied Fluid Mechanics for Environmental Engineers	3
CIV ENGR 821	Environmental Engineering: Biological Treatment Processes	3-4
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