Master of Science

Engineering with a Concentration in Environmental Engineering (MS)

Master's Degrees

In this rapidly changing technological world, graduate degrees are highly desirable and most often master's degrees are required to hold professional civil and environmental engineering positions in the industry, and in federal, state and municipal government agencies. The department's graduate programs are designed to educate the technological leaders of the future in civil and environmental engineering, and are structured to accommodate both full-time and part-time students. The specialty areas include coastal, geotechnical, structural, transportation, and water resources engineering in civil engineering, and sub-fields in environmental engineering including water quality, water and wastewater treatment, hydrologic processes, water resources, environmental engineering microbiology, air quality, hazardous and solid waste, biofuels, nutrient cycling, and pollution prevention. Online master's degree programs in Coastal Engineering and Environmental Engineering are available with/without allowed transfer credits. For additional information, please request a departmental handbook from the graduate program director (CEGPD@odu.edu).

Admission Information

Civil and Environmental master's degree applicants must have a bachelor's degree, preferably, in civil or environmental engineering with a strong background in mathematics and physical sciences. Each applicant must submit an essay of 500 words or less describing personal and academic goals, professional objectives, preparation for graduate study, and how the chosen program will help the applicant achieve these goals and objectives. Two letters of recommendation must be submitted from former or current professors, or employment supervisors. Regular admission to a master's program generally requires an undergraduate GPA of 3.0 or higher on a 4.0 scale. Applicants with a lower undergraduate GPA may be considered for regular or provisional admission on the basis of successful engineering work experience or other credentials demonstrating potential for success in the graduate program. The submission of Graduate Record Examination (GRE) is required unless the applicant holds an ABET accredited engineering degree from an institution in the USA. TOEFL (or IELTS) is required for all applicants whose native language is not English unless their BS degrees are from USA institutions. Provisional admission may also be possible for applicants with a bachelor's degree in a field other than the applicant's intended graduate program. In such cases there will be prerequisite course requirements. Provisional admission may be given to those applicants who do not hold a bachelor's degree in civil or environmental engineering; however, these students will be required to complete undergraduate course work in addition to the graduate program requirements. Potential prerequisite courses are listed below.

Curriculum Requirements

Potential Prerequisite Courses for M.S. Engineering - Environmental Engineering

MATH 211	Calculus I	4
MATH 212	Calculus II	4
MATH 307	Ordinary Differential Equations	3
MATH 312	Calculus III	4
PHYS 231N	University Physics I	4
PHYS 232N	University Physics II	4
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N	Foundations of Chemistry I Laboratory	1
CHEM 123N	Foundations of Chemistry II Lecture	3
CEE 204	Statics	3
CEE 305	Numerical Methods for Civil and Environmental Engineering	1
CEE 330	Hydromechanics	3
CEE 340	Hydraulics and Water Resources	3
CEE 350	Environmental Pollution and Control	3

Civil Engineering and Environmental Engineering Graduate Course Requirements (except Transportation Engineering Emphasis)

The graduate courses applicable towards a master's degree in the Department of Civil and Environmental Engineering are grouped into various categories listed below. The required number of the credit hours from these categories for the Master of Science (M.S.) degree in Civil Engineering (except for the transportation engineering concentration) and the Master of Science (M.S.) degree in Environmental Engineering are summarized in Table CEE-1 and CEE-2, respectively. Note that the M.S. Thesis option students must pass an oral thesis defense examination and submit a thesis, M.S. Project option students must pass an oral project defense examination, and M.S. Course option students must pass an oral (for civil engineering) or written (for environmental engineering) comprehensive examination at the end of all course work.

Category B – Upper level master degree courses in Environmental Engineering

CEE 715	Engineering Optimization I *	3
CEE 741	Open Channel Flow *	3
CEE 747	Groundwater Flow *	3
CEE 751	Physicochemical Treatment Processes (Env. Engr. Core Course)	3
CEE 752	Biological Wastewater Treatment (Env. Engr. Core Course)	3
CEE 753	Advanced Processes for Water and Wastewater Treatment	3
CEE 754	Environmental Engineering Microbiology	3
CEE 755	Water Quality Management (Env. Engr. Core Course)	3
CEE 756	Water Quality Modeling (Env. Engr. Core Course)	3
CEE 759	Carbon-Free Clean Energy	3
CEE 760	Managing Phosphorous in Circular Economy	3
CEE 761	Water Resources Processes and Analysis Methods *	3
CEE 762	Aquatic Chemistry in Environmental Engineering (Env. Engr. Core Course)	3
CEE 788	Coastal Hydrodynamics and Sediment Processes *	3

Category C – Lower level courses in Civil & Environmental Engineering

CEE 514	Masonry Structures Design	3
CEE 515	Steel Structures Design	3
CEE 516	Wood Structures Design	3
CEE 530	Foundation Engineering	3
CEE 531	Slope Stability and Earth Structures Design	3
CEE 532	Introduction to Earthquake Engineering	3
CEE 533	Geomaterials Stabilization	3
CEE 540	Hydraulic Engineering	3
CEE 546	Urban Stormwater Hydrology	3
CEE 547	Groundwater Hydraulics	3

CEE 550	Water Distribution and Wastewater Collection System Design	3
CEE 552	Air Quality	3
CEE 554	Hazardous Waste Treatment	3
CEE 555	Pollution Prevention and Green Engineering	3
CEE 558	Sustainable Development	3
CEE 571	Transportation Operations I	3
CEE 574	Transportation Data Analytics	3
CEE 575	Geometric Design of Highways	3
CEE 582	Introduction to Coastal Engineering	3

Category D – Other graduate courses

Graduate level courses offered from other departments. These courses must be related to the program of study and must be approved by the student's academic advisor.

MATH or STAT Category

CEE 700 Civil and Environmental Engineering Experimental Design

CEE 701 Applied Mathematics for Civil and Environmental Engineering

or a graduate level MATH or STAT course.

* Double listings in A and B categories.

Table CEE-2. Required Course Distributions for M.S. Engineering - Environmental Engineering

M.S. - Thesis Option

Category	Credit Hours
Env. Engr. Core Courses (choose 4 from 5 listed courses)	12
A,B,C, or D	9
MATH/STAT	3
Thesis	6
Total	30*

M.S. - Project Option

Category	Credit Hours
Env. Engr. Core Courses (choose 4 from 5 listed courses)	12
B	3
A,B, C, or D	9
MATH/STAT	3
Project	3
Total	30*

M.S. - Course Option

Category	Credit Hours
Env. Engr. Core Courses (choose 4 from 5 listed courses)	12
B	6
A,B, C, or D	9
MATH/STAT	3
Total	30**

* For Thesis & Project options, no more than 9 credit hours can be at the 500 level.

** For Course option, no more than 12 credit hours can be at the 500 level.