

# ENVIRONMENTAL SCIENCE, M.S.

The Master of Science in Environmental Science program at Loyola Marymount University is a career-enhancing, evening master's program that exposes students to the most advanced, proven and sustainable approaches to protect, improve and manage environmental quality in urban and natural settings from the local to the global level. Our program provides a collaborative and student-focused environment for working professionals and full-time students to deepen their knowledge in environmental science and engineering required to investigate and solve real-world 21st century environmental problems.

Student in the program can benefit from:

- **Strong Industry Ties:** Our modern and professionally relevant courses are taught by faculty distinguished in industry and academia.
- **Focus on Sustainability:** With our Southern California backdrop, students are exposed to the most advanced, current and sustainable modern solutions to environmental problems.
- **Evening Program:** Courses are offered in the evening to accommodate both full-time students and working professionals.

## Program Educational Objectives

The Environmental Science graduate program has established the following program educational objectives that are consistent with the mission of the University and that describe the expected accomplishments of graduates during the first several years following graduation. Environmental Science program graduates will:

1. Apply critical thinking skills in their profession to identify, evaluate, and develop science-based solutions to 21st century environmental issues and challenges.
2. Demonstrate and apply ethical, socially equitable, and sustainable practices and principles to issues in their profession.
3. Advance in their careers by staying current in the field, working on interdisciplinary teams, and/or obtaining professional certifications.

To accomplish these program educational objectives, a variety of courses in the fields of environmental science and environmental engineering are offered with an emphasis on sustainability. Additional opportunities are available to broaden the educational experience through courses in other departments, independent study, and directed research resulting in a thesis. A broad base of theory and design is provided integrating current issues and professional practices.

## Program Learning Outcomes

The Environmental Science graduate program has established the following student outcomes:

1. Apply scientific, mathematical, and sustainability principles to identify problems and analyze solutions in environmental science.
2. Critically assess, evaluate, and understand sustainability, ethics, and social justice in environmental science.
3. Effectively communicate scientific principles related to the environment and sustainability.

## Admission Requirements

All applicants must hold an undergraduate or higher-level degree and have completed the following courses:

- Calculus, at least one semester of college-level
- General Chemistry, at least one college-level course
- Life and Physical Science, totaling at least four college-level courses, which could include Biology, Chemistry, Environmental Science, or Physics.

Applicants with a non-Bachelor of Science undergraduate or postgraduate degree may be considered if the applicant has completed the above coursework prior to applying.

The department may require applicants who lack an adequate background in mathematics, chemistry, and/or science to take additional courses prior to being admitted into the program or continuing in the program. Additional admission requirements may be set by the department upon review of the applicant's academic and professional preparation.

All applicants are required to submit:

- A completed application form (<https://graduatestudies.lmu.edu/apply/>) and \$50 application fee
- Official Transcripts of all colleges and universities attended
- A letter of intent (approximately 1.5 pages) describing the candidate's background, career goals, and interest in the program
- Two letters of recommendation attesting to the candidate's ability to succeed in the graduate program based on previous academic and/or professional performance

The GRE is not required for admission into the Environmental Science Master's Program. International applicants should submit the items listed above plus the additional items required by LMU Graduate Admission (<https://graduate.lmu.edu/apply/internationalstudents/>).

## Program Requirements

Students enrolled in this program must successfully complete the following:

- 30 semester hours with a cumulative grade point average of 3.0 ("B")
- Comprehensive Oral Examination (CIVL 690 Comprehensive Oral Exam or ENVS 690 Comprehensive Oral Exam) or Masters Thesis Defense (CIVL 696 Thesis Defense or ENVS 696 Thesis Defense)
- Completion of 500-level courses with grade of B (3.0) or higher
- All core and elective requirements for the Environmental Science program or one of the Civil Engineering program emphases (Water Resources Engineering or Environmental Engineering).

## Optional Thesis

Preparation of a master's thesis under the guidance of a faculty member is optional in both the Civil Engineering and Environmental Science Master's programs. Students electing to perform a master's thesis must pass ENVS 696 Thesis Defense or CIVL 696 Thesis Defense in the semester they expect to complete their thesis. The defense is in the form of a written thesis and an oral presentation. A thesis committee, selected by the student and primary research advisor, determine if the student has mastered the subject matter of the thesis, understands the work done by others, and can critically assess that work and his/her own work. No

later than two weeks prior to the thesis defense presentation, the student must provide their written thesis to their thesis committee for review. Students who elect to prepare a master's thesis are not required to take the ENVS 690 Comprehensive Oral Exam/CIVL 690 Comprehensive Oral Exam. Formal requirements may be obtained from the program director. Please see our research page for further information on research opportunities.

Thesis students also have the option to enroll in a 3-semester-hour master's thesis independent studies (ENVS 695 Master Thesis or CIVL 695 Master Thesis) in any term with director and thesis advisor consent. The master's thesis independent studies can satisfy an Elective requirement, may be taken a maximum of two times, and may be taken only once in a semester.

## Change of Program

Students with non-engineering undergraduate or postgraduate degree can change into the Civil Engineering Master's Program (Environmental Engineering or Water Resources Engineering) at any time provided that they 1) meet all Civil Engineering admissions requirements and 2) are in good academic standing (3.0 GPA or higher). Such students are also required to pass the National Council of Examiners for Engineering and Surveying Fundamentals of Engineering exam before their degree is awarded.

Code	Title	Semester Hours
<b>Core Requirements</b>		
CIVL 601	Sustainable Water Quality and Resources	3
CIVL 605	Aquatic Chemistry	3
ENVS 606	Applied Environmental Microbiology	3
Select one of the following:		0
<i>Non-Thesis Students</i>		
ENVS 690	Comprehensive Oral Exam	
or CIVL 690	Comprehensive Oral Exam	
<i>Thesis Students</i>		
ENVS 696	Thesis Defense	
or CIVL 696	Thesis Defense	
<b>Electives</b>		
ENVS 607	Environmental Engineering and Science Lab	3
ENVS 651	Remote Sensing with Civil Engineering and Environmental Science Applications	3
ENVS 652	Spatial Data Analysis and Geographical Information Systems	3
ENVS 680	Engineering Geology	3
ENVS 681	Ecosystem Services in Urban Landscapes	3
ENVS 682	Urban Coasts: Habitats, Stressors, and Resilience	3
ENVS 683	Environmental Toxicology and Health Risk	3
ENVS 684	Climate Change and Impacts	3
ENVS 686	Climate Change Mitigation	3
ENVS 687	Climate Change Adaptation and Resilience	3
ENVS 688	Environmental Health	3
ENVS 689	Sustainability, Health, and Equity	3
CIVL 608	Contaminant Fate, Transport, and Remediation	3
CIVL 617	Water Treatment Processes	3
CIVL 618	Water Reuse and Desalination	3

CIVL 619	Advanced Integrated Water Treatment Systems	3
CIVL 625	Applied Fluid Mechanics	3
CIVL 626	Surface Water Hydrology	3
CIVL 627	Urban Water Systems and Stormwater Management	3
CIVL 629	Groundwater Contaminant Transport and Remediation	3
CIVL 637	Building Information Modeling	3
CIVL 653	Modeling Environmental and Water Resources Systems	3
CIVL 671	Air Quality, Control, and Management	3
CIVL 672	Sustainable Waste Management	3
CIVL 673	Economics of Water and the Environment	3
CIVL 674	Sustainable Engineering	3
CIVL 690	Comprehensive Oral Exam	0
CIVL 695	Master Thesis (up to two)	3
CIVL/ENVS 699	Independent Studies (up to one with director consent)	1-3
Up to one 500- or 600-level course in another graduate program with director consent		3
CIVL 636	Nonlinear Structural Analysis	3
CIVL 639	Design of Masonry Structures	3
CIVL 655	Computational Fluid Dynamics	3
CIVL 657	Finite Element Methods	3
CIVL 675	Renewable Energy Systems	3
CIVL 676	Project Management	3
CIVL 678	Research in Civil Engineering & Environmental Science	3