PROGRESSIVE DEGREE PROGRAM
COURSE PLAN TEMPLATE

USC SCHOOL	Viterbi School of Engineering
ACADEMIC DEPARTMENT	Sonny Astani Civil and Environmental Engineering
GRADUATE PROGRAM	Master of Science in Sustainable Engineering
POST CODE	1994
TERM EFFECTIVE DATE	Fall 2024

PROGRAM DESCRIPTION
A brief description of the graduate program.

The Sustainable Engineering Program is a highly interdisciplinary degree program that emphasizes green systems and the environment, energy technology and efficiency, and sustainability and society. The discipline seeks opportunities for alternative sourcing, conservation, efficiency and repurposing through an understanding of product life cycles from origins to recycling or inevitable disposal. Green technologists will design products, processes and complex infrastructure systems to promote sustainable attributes of importance to the environment and the global community.

COMMON BACHELOR DEGREE PROGRAM PATHWAYS
A list of common bachelor's degrees that undergraduate students pursue in advance of pursuing a progressive degree option with this graduate program. Some programs are restricted to certain majors while others are open to all students.

Any BS degree offered by the Viterbi School.	

PREPARATORY UNDERGRADUATE COURSES
A list of courses at the undergraduate level that prepare students for the graduate program. Required coursework is listed first, followed by recommended courses. If not applicable, this section will be blank.

Dept. Prefix - Course #	Course Title	Required or Recommended	Units
PHYS 151L	Fundamental of Physics I: Mechanics and Thermodynamics	Required	4
	Additional physics course. PHYS 152L, CHE 330, or AME 310	Required	4
MATH 126	Calculus II	Required	4

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UNDERGRADUATE COURSES USED TO REDUCE GRADUATE LEVEL UNITS

A list of undergraduate level courses that may be used to reduce the number of graduate level units required for the graduate program. If there are none, that is specified instead.

Dept. Prefix - Course #	Course Title	Units

CORE GRADUATE PROGRAM REQUIREMENTS (12 units required)

A list of all required graduate courses for the graduate program. None of these courses may be used toward satisfying undergraduate degree requirements.

If special exceptions for any of these courses are made by the academic department, the course # is marked with an asterisk (*) and the exception is explained in the "Department Notes" section at the end of this course plan template.

Dept. Prefix - Course #	Course Title	Units
ENE 505*	Energy and the Environment ENE 527 Climate Change and Atmospheric Aerosols (4 units) ISE 576 Industrial Ecology (4 units)	4
ENE 527	Climate Change and Atmospheric Aerosols	4
ISE 576	Industrial Ecology	4

PRE-APPROVED ELECTIVE COURSEWORK

Elective coursework is approved at the discretion of the academic department. Note the following details about the total number and units required of elective coursework.

16	**TOTAL ELECTIVE UNITS REQUIRED FOR THE TRADITIONAL GRADUATE DEGREE**
7	**TOTAL ELECTIVE UNITS REQUIRED FOR THE PROGRESSIVE GRADUATE DEGREE**

TOTAL UNIT COUNTS AND REQUIRED GRADUATE UNITS

28	**TOTAL UNITS REQUIRED FOR THE TRADITIONAL GRADUATE DEGREE**
9	**TOTAL GRADUATE UNITS THAT MAY BE WAIVED (IF ANY)**
19	**MINIMUM NUMBER OF GRADUATE UNITS THAT MUST BE AT THE 500 LEVEL OR ABOVE**

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NOTES FROM THE DEPARTMENT
This section highlights any unique considerations, exceptions, or requirements for the graduate program. If a program has specific restrictions (courses, majors, etc.), they are detailed below.

*If ENE 215 was completed, then ENE 505 can be replaced with a 500-level approved elective.

Must take a minimum of 7 units in a selected emphasis.

Energy and Power Systems Emphasis
AME 513a: Fundamentals and Applications of Combustion (4 units)
AME 513b: Fundamentals and Applications of Combustion (4 units)
AME 577: Survey of Energy and Power for a Sustainable Future (4 units)
CHE 510: Energy and Process Efficiency (3 units)
EE 513: Solid State Energy Devices (4 units)
EE 521: Power Systems Analysis and Design (4 units)
EE 526: Renewable Energy in Power Systems (4 units)
MASC 570: Introduction to Photovoltaic Solar Energy Conversion (4 units)

Buildings and Infrastructure Emphasis
ARCH 519: Sustainability in the Environment: Infrastructures, Urban Landscapes, and Buildings (3 units)
CE 521: Transportation Systems Analysis (4 units)
CE 576: Invention and Technology Development (3 units)
CE 584: Intelligent Transportation Systems (4 units)
SAE 515: Sustainable Infrastructure Systems (4 units)

Fate of Pollutions Emphasis
ENE 512: Environmental Fluid Mechanics (4 units)
ENE 535: Applied Air Quality Management (4 units)
ENE 553: Biological Processes in Environmental Engineering (4 units)
GEOL 515: Introduction to Atmospheric Science (3 units)

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Authorizing Dean's Name

Date Approved

Kelly Goulis

Senior Associate Dean

Authorizing Dean's Title

Last Revised 9/23/2024

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