

Combined Degree Program

BS in Environmental Engineering and

MS in Environmental Engineering and Science

DEPARTMENT OF ENVIRONMENTAL ENGINEERING AND EARTH SCIENCES

Environmental Engineering undergraduates at Clemson University may begin a Master of Science (MS) degree program while completing their Bachelor of Science (BS) degree and use a limited number of courses to satisfy the requirements of both their undergraduate and graduate degrees. The following specific requirements apply:

A. Undergraduate/graduate transition

1. Undergraduate students having a minimum overall GPA of 3.4 and a minimum of 90 credit hours may apply for acceptance by the Graduate School and to this joint program. If accepted, students must maintain an overall GPA of 3.4 in Environmental Engineering and a 3.0 average in the EES graduate courses to continue enrollment in this combined program.
2. Up to 9 semester hours of 6000- or 8000- level EES courses may be used to satisfy the requirements of the BS degree. The 9 credit hours earned at the undergraduate level will be combined with 21 hours earned at the Master's level, for a total of 30 hours needed for a Master's degree. If fewer than 9 hours are taken at the BS level, these must be made up at the graduate level in order to reach the 30 hours for a Master's degree. The 9 hours taken at the undergraduate level towards the MS degree fulfills the 9 hours of courses needed for the BS "Engineering or Science Requirement" category.
3. Students in the combined degree program are conditionally accepted to the graduate program until completion of the BS degree requirements.
4. Graduate assistantships cannot be accepted until full graduate status is attained and contingent on availability of funds in alignment with departmental policy. Non-thesis students are not eligible for graduate assistantships.

B. Graduate program

1. Thesis and non-thesis options are available for the MS degree in EES. The EES program has six focus areas: process engineering, sustainable systems and environmental assessment, fate and transport, environmental health physics {ABET-accredited}, environmental radiochemistry, and environmental chemistry. See the EES program descriptions in the [EEES Graduate Handbook](#) for details.
 - a. For the thesis option, a student must complete 24 credit hours of course work plus at least 6 hours of thesis research. At least one additional semester may be needed to complete a thesis.
 - b. For the non-thesis option, a student must complete 27 credit hours of course work plus 3 hours of a special project (EES 8810). Non-thesis students are not eligible for research or teaching assistantship appointments, but are eligible for graduate internships.
 - c. All EES MS students are required to take three core courses: EES 8020 (Environmental Engineering Principles), EES 8430 (Environmental Chemistry), and EES 8510

(Biological Principles of Environmental Engineering). One or more may be taken while the student is an undergraduate.

2. Complete information about the MS degree in EES may be found in the [EEES Graduate Handbook](#). Students interested in the combined BS/MS program should consult with their Environmental Engineering undergraduate advisor as early as possible. They may begin the program by taking their first graduate course when they have completed their bachelor's curriculum through their junior year (minimum 90 credits). Most students enroll in their first graduate course during the penultimate semester of their bachelor's program, then take two more graduate courses during their final bachelor's semester. When ready to enroll in their first graduate course, the student should fill out the [Form GS6-Bachelor-to-Graduate](#), collect signatures, and submit according to the instructions on the form and on the graduate school's [Forms and Requests](#) web page. The Form GS6-Bachelor-to-Graduate is the mechanism by which students are approved for the program and are enrolled in the course(s) they list on the form; graduate school staff will complete the registration and enrollment after the signed form is received. Students fill out and submit the form before each semester they take graduate courses.

C. Example course map

An example course map is provided on the next page so that students can see a path forward for obtaining the BS and MS degrees in five years. The three courses (3 hours each) that count towards both degrees are shown in italics during the senior year (one in the first semester, two in the second). This example is for students who select the process engineering focus area for the MS degree. Students who select other focus areas should consult with the EES Graduate Program Coordinator for advice on course selection. Regardless of the focus area selected, all graduate students in the EES MS degree program are required to take EES 8020, EES 8430, and EES 8510. Furthermore, all MS degree candidates are required to enroll in EES 8610 (Environmental Engineering and Science Seminar, 1 credit hour) each semester, but it does not count towards the 30 credit hours needed to fulfill the MS degree requirements.

EXAMPLE COURSE MAP FOR BS/MS IN ENVIRONMENTAL ENGINEERING

| FRESHMAN YEAR | | | |
|---------------------------------------|--|-----------|--|
| Cr | Course | Cr | Course |
| 4 | CH 1010 & 1011 General Chemistry | 4 | CH 1020 & 1021 General Chemistry |
| 3 | ENGL 1030 & 1031 Composition and Rhetoric | 3 | ENGR 1410 & 1411 Programming and Problem Solving ⁴ |
| 3 | ENGR 1020 & 1021 Engineering Disciplines and Skills ¹ | 4 | MATH 1080 Calculus of One Variable II |
| 4 | MATH 1060 Calculus of One Variable I ² | 3 | PHYS 1220 Physics with Calculus I |
| 3 | General Education Requirement ³ | 3 | General Education Requirement ³ |
| 17 | | 17 | |
| SOPHOMORE YEAR | | | |
| 3 | BIOL 1030 General Biology I ⁵ | 2 | CE 2080 Dynamics |
| 1 | BIOL 1050 General Biology Lab I ⁵ | 3 | CE 2010 Survey of Organic Chemistry ⁶ |
| 3 | CE 2010 Statics | 4 | EES 2020 & 2021 Environmental Engr Fundamentals II ⁵ |
| 3 | EES 2010 Environmental Eng Fundamentals I ^F | 2 | ENGR 2100 and 2101 CAD and Engineering Applications ⁷ |
| 4 | MATH 2060 Calculus of Several Variables | 4 | MATH 2080 Int. to Ordinary Differential Eqn. |
| 3 | PHYS 2210 Physics with Calculus II | | |
| 17 | | 15 | |
| JUNIOR YEAR | | | |
| 2 | EES 3030 Water Treatment Systems ^F | 3 | CE 3410 Intro to Fluid Mechanics |
| 2 | EES 3040 Wastewater Treatment Systems ^F | 1 | CE 3430 Intro to Fluid Mechanics Lab |
| 1 | EES 3050 Water and Wastewater Treatment Lab ^F | 3 | EES 4300 Air Pollution Engineering ⁵ |
| 3 | MATH 3020 Statistics for Science and Engineering | 3 | EES 4860 Environmental Sustainability |
| 4 | MICR 3050 & 3051 General Microbiology | 3 | GEOL 1010 Physical Geology ⁸ |
| 3 | General Education Requirement ³ | 1 | GEOL 1030 Physical Geology Lab ⁸ |
| | | 3 | ME 3100 Thermodynamics and Heat Transfer ⁵ |
| 15 | | 17 | |
| SENIOR YEAR | | | |
| 3 | EES 4850 Hazardous Waste Management ^F | 3 | EES 4750 & 4751 Capstone Design Project ⁵ |
| 1 | EES 4500 Professional Seminar ^F | 3 | EES 8030 Physicochemical Operations ⁵ |
| 3 | EES 4800 Environmental Risk Assessment ^F | 3 | EES 8040 Biochemical Operations ⁵ |
| 3 | EES 4840 Municipal Solid Waste Management ^F | 3 | General Education Req ³ |
| 2 | Engineering Economics Req ⁹ | 3 | Humanities OR Social Science Req ¹¹ |
| 3 | EES 8020 Environmental Engineering Principles ^F | 3 | Oral Communication Req ³ |
| 15 | | 18 | |
| FIFTH YEAR, to complete the MS degree | | | |
| 3 | EES 8430 Environmental Chemistry ^F | 3 | Elective (6000 or 8000 level) |
| 3 | EES 8510 Biological Principles Env Engr ^F | 3 | Elective (6000 or 8000 level) |
| 3 | EES 8060 Design of Env Engr Systems ^F | 3 | EES 8810 Special Project |
| 3 | Elective (6000 or 8000 level) | 1 | EES 8610 Graduate Seminar |
| 1 | EES 8610 Graduate Seminar | | |
| 13 | | 10 | |

Students should always refer to the [Academic Catalog](#) for course descriptions and for course pre-requisites, corequisites, and concurrent enrollment requirements. Advisors will assist students in scheduling courses to fulfill the requirements of the degree program; nevertheless, it is the responsibility of the student to fulfill the relevant requirements of the degree.

Footnotes

^F Fall only

^S Spring only

¹ The combination of ENGR 1050 and ENGR 1060 or the combination of ENGR 1510 and ENGR 1520 may be substituted for ENGR 1020.

² Depending on a student's Clemson Mathematics Placement Test score, MATH 1040 and MATH 1070 may be substituted for MATH 1060; or the student may be required to take MATH 1050 before enrolling in MATH 1060.

³ See General Education Requirements. Three General Education credits must also satisfy the South Carolina REACH Act Requirement. See the South Carolina REACH Act Requirement in the Academic Regulations section.

⁴ ENGR 1640 or the combination of ENGR 1070, ENGR 1080 and ENGR 1090 may be substituted for ENGR 1410.

⁵ BIOL 1100 may be substituted for BIOL 1030 and BIOL 1050.

⁶ CH 2230 may be substituted.

⁷ ENGR 2080 may be substituted.

⁸ PES 2020 may be substituted for GEOL 1010 and GEOL 1030.

⁹ Select CE 3520 or IE 3840.

¹⁰ Select from BCHM 3050, BE 3220, BE 4150, BE 4220, BE 4240, BE 4400, BE 4640, BIOL 4100, BIOL 4430, BIOL 4440, CE 2060, CE 2550, CE 3210, CE 3310, CE 3420, CE 4430, CE 4470, CE 4820, CH 3300, CH 3310, CH 4130, ECE 2070, ECE 2080, EES 3000, EES 3010, EES 4000, EES 4100, EES 4110, EES 4120, EES 4140, EES 4270, EES 4370, EES 4910, EES 4950, ENSP 4000, GEOL 2700, GEOL 3000, GEOL 3180, GEOL 4210, GEOL 4820, MATH 3110, MATH 3650, MATH 4340, ME 4260, MICR 4100, MSE 4150, MSE 4160, MSE 4280, MSE 4530, MSE 4580, MSE 4610, PES 4850, PHYS 2400, PHYS 2450, PHYS 4200.

¹¹ See the Policy on Humanities and Social Sciences for Engineering Curricula.

Other Notes

- The following courses must be completed with a grade of C or better: CE 2010, CE 2080, CE 3410, CH 1010, ENGL 1030, ENGR 1020 (or ENGR 1050 and ENGR 1060 or ENGR 1510 and ENGR 1520 if substituted for ENGR 1020), MATH 1060, MATH 1080, MATH 2060, MATH 2080, PHYS 1220, and PHYS 2210.
- Depending on a student's math placement, they may be invited to take part in the General Engineering Learning Community where they complete the following courses: ENGR 1000, ENGR 1010, ENGR 1100, ENGR 1110, ENGR 1510, ENGR 1520, and ENGR 1640. The combination of ENGR 1510 and ENGR 1520 may be substituted for ENGR 1020. ENGR 1640 may be substituted for ENGR 1410.
- A transfer course may not be used to satisfy the General Education Global Challenges Requirement. While a transfer course may fulfill other degree requirements, students must enroll in a Clemson course(s) on the Global Challenges list to fulfill the Global Challenges Requirement.