

2021/2022 Program Requirements	Proposed 2022/2023 Program Requirements
M.S. Civil Engineering	M.S. Civil Engineering
Areas of Study	Areas of Study
Civil Engineering Materials; Environmental and Water Resources Engineering; Geotechnical Engineering; Structural Mechanics; Structural/Earthquake Engineering; Structures and Civil Engineering Materials; Transportation Engineering.	Civil Engineering Materials; Environmental Engineering ; Geotechnical Engineering; Hydrology and Water Resources Engineering ; Structural Mechanics; Structural/Earthquake Engineering; Structures and Civil Engineering Materials; Transportation Engineering.
Course Requirements	Course Requirements
<p>There are two plans of study that lead to the M.S. degree: the capstone plan (comprehensive examination) and thesis plans. For both plans, at least nine courses (36 units) are required, a majority of which must be in the Civil and Environmental Engineering Department. At least five of the courses must graduate level (200 series). In the thesis plan, seven of the nine must be upper division (100-series) or graduate level (200-series) courses. The remaining two may be 598 courses involving work on the thesis. In the capstone plan (comprehensive examination), 500-series courses may not be applied toward the nine-course requirement. Courses completed outside of the department must be equal in rigor and related to the Civil and Environmental Engineering program of study and recommended to be quantitative in nature. In addition, M.S. students must enroll in CEE 200 seminar each quarter. A minimum 3.0 grade-point average is required in all course work and in all 200-level course work applied toward the degree. All courses counting toward the 9 course requirement, except for 598, must be taken for letter grade.</p>	<p>There are two plans of study that lead to the M.S. degree: the capstone plan (comprehensive examination) and thesis plans. For both plans, at least nine courses (36 units) are required, a majority of which must be in the Civil and Environmental Engineering Department. At least five of the courses must graduate level (200 series). In the thesis plan, seven of the nine must be upper division (100-series) or graduate level (200-series) courses. The remaining two may be 598 courses involving work on the thesis. In the capstone plan (comprehensive examination), 500-series courses may not be applied toward the nine-course requirement. Courses completed outside of the department must be equal in rigor and related to the Civil and Environmental Engineering program of study and recommended to be quantitative in nature. In addition, M.S. students must enroll in CEE 200 seminar each quarter. A minimum 3.0 grade-point average is required in all course work and in all 200-level course work applied toward the degree. All courses counting toward the 9 course requirement, except for 598, must be taken for letter grade.</p>
<p>Each major field has a set of required preparatory courses that are normally completed during undergraduate studies. Equivalent courses taken at other institutions can satisfy the preparatory course requirements. Preparatory courses cannot be used to satisfy course requirements for the</p>	<p>Each major field has a set of required preparatory courses that are normally completed during undergraduate studies. Equivalent courses taken at other institutions can satisfy the preparatory course requirements. Preparatory courses cannot be used to satisfy course requirements for the</p>

master's degree. Courses for the master's degree must be selected in accordance with the lists of required graduate courses and elective courses for each major field listed below. Courses not listed below may be applied toward the course requirement if pre-approved by the faculty advisor and Student Affairs Officer.

Undergraduate Courses. No lower division (<100) courses may be applied toward graduate degrees.

Civil Engineering Materials

Required Preparatory Courses. General chemistry and physics with laboratory exercises, multivariate calculus, linear algebra and differential equations, introductory thermodynamics. Other preparation could include Civil and Environmental Engineering C104, 120, 121, 135A, 140L, 142 and Materials Science and Engineering 104.

Required Graduate Courses. Two courses must be selected from Civil and Environmental Engineering C204, C205, 226, 253, 258A, 261B, M262A, 263A, 266, 267.

Other Elective Courses. Remaining courses (at least two) must be selected from; Chemical Engineering 102A, 102B, 200, C219, 223, 230, 270; Chemistry and Biochemistry 103, 110A, 110B, 113A, C213B, C215A through C215D, C223A, C223B, 225, C226A, C275, 276B, 277; Civil and Environmental Engineering 110, M135C, 153, 154, 155, 157B, 157C, M166, C206, C211, 220, 224, 226, M230A/B/C, 235A/B/C, 243A/B, 254A, 258A, 261; Conservation of Archaeological and Ethnographic Materials M210, M215, M216, M250; Environmental Health Sciences 410A; Materials Science and Engineering 110, C111, 130, 131, 200, 201, 210, C211, 270; Mechanical and Aerospace Engineering 101, 105A, 131AL, 133A, 156A, C232A, 256F, 261A, 261B, 296A, 296B; Statistics: 201A.

master's degree. Courses for the master's degree must be selected in accordance with the lists of required graduate courses and elective courses for each major field listed below. Courses not listed below may be applied toward the course requirement if pre-approved by the faculty advisor and Student Affairs Officer.

Undergraduate Courses. No lower division (<100) courses may be applied toward graduate degrees.

Civil Engineering Materials

Required Preparatory Courses. General chemistry and physics with laboratory exercises, multivariate calculus, linear algebra and differential equations, introductory thermodynamics. Other preparation could include Civil and Environmental Engineering C104, 120, 121, 135A, 140L, 142 and Materials Science and Engineering 104.

Required Graduate Courses. Two courses must be selected from Civil and Environmental Engineering C204, C205, 226, 253, 258A, 261B, M262A, 263A, 266, 267.

Other Elective Courses. Remaining courses (at least two) must be selected from; Chemical Engineering 102A, 102B, 200, C219, 223, 230, 270; Chemistry and Biochemistry 103, 110A, 110B, 113A, C213B, C215A through C215D, C223A, C223B, 225, C226A, C275, 276B, 277; Civil and Environmental Engineering 110, M135C, 153, 154, 155, 157B, 157C, M166, C206, C211, 220, 224, 226, M230A/B/C, 235A/B/C, 243A/B, 254A, 258A, 261; Conservation of Archaeological and Ethnographic Materials M210, M215, M216, M250; Environmental Health Sciences 410A; Materials Science and Engineering 110, C111, 130, 131, 200, 201, 210, C211, 270; Mechanical and Aerospace Engineering 101, 105A, 131AL, 133A, 156A, C232A, 256F, 261A, 261B, 296A, 296B; Statistics: 201A.

Environmental and Water Resources

Engineering

Required Preparatory Courses. Chemistry and Biochemistry 20A, 20B, 20L; Mathematics 32A, 32B, 33B (or Mechanical and Aerospace Engineering 82); Mechanical and Aerospace Engineering 103; Physics 1A/4AL, 1B.

Environmental Engineering Option:

Required Graduate Courses (4). Civil and Environmental Engineering 254A, 255A, 255B, 266.

One (1) of the following: Civil and Environmental Engineering 250A, 250B, 250C, 250D. Select remainder of courses (9 total for the capstone plan option; 7 total for thesis option) from the approved elective list (or get approval for other electives).

Hydrology and Water Resources Engineering option:

Required Graduate Courses (4): Civil and Environmental Engineering 250A, 250B, 250C, 250D.

One (1) of the following: Civil and Environmental Engineering 254A, 255A, 255B, 266. Select remainder of courses (9 total for capstone plan option; 7 total for thesis option) from the approved elective list (or get approval for other electives).

Environmental and Water Resources

Engineering option:

Required Graduate Courses (4): Two of the following: Civil and Environmental Engineering 254A, 255A, 255B, 266 and two of the following: Civil and Environmental Engineering 250A, 250B, 250C, 250D. Select remainder of courses (9 total for the capstone plan option; 7 total for thesis option) from the approved elective list (or get approval for other electives).

Approved Electives: Civil and Environmental Engineering 110, 151, 152, 154, 155, 157A, 157B, 157C, 157L, M165, 226, 250A, 250B, 250C, 250D, 251C, 251D, 252, 253, 254A, 255A,

Environmental Engineering

Required Preparatory Courses. Chemistry and Biochemistry 20A, 20B, 20L; Mathematics 32A, 32B, 33B (or Mechanical and Aerospace Engineering 82); Mechanical and Aerospace Engineering 103; Physics 1A/4AL, 1B.

Required Graduate Courses (4). Civil and Environmental Engineering 254A, 255A, 255B, 266.

One (1) of the following: Civil and Environmental Engineering 250A, 250B, 250C, 250D. Select remainder of courses (9 total for the capstone plan option; 7 total for thesis option) from the approved elective list (or get approval for other electives).

Approved Electives: Civil and Environmental Engineering 110, 151, 152, 154, 155, 157A, 157B, 157C, 157L, M165, 226, 250A, 250B, 250C, 250D, 251C, 251D, 252, 253, 254A, 255A, 255B, 258A, C258, C259, 260, 261A, 261B, M262A, 263A, 263B, 266 or other elective courses approved by the student's academic adviser and the graduate adviser. Electives in the fields of Biostatistics/Statistics, Chemical Engineering, Chemistry and Biochemistry, Computer Science, Earth and Space Sciences, Electrical and Computer Engineering, and Environmental Health Sciences are commonly approved to satisfy course requirements. No more than two courses may be completed outside of Civil and Environmental Engineering unless pre-approved for exceptional circumstances. No more than two undergraduate courses may be applied towards the 9 course requirements unless pre-approved for exceptional circumstances.

Geotechnical Engineering

Required Preparatory Courses. Civil and Environmental Engineering 108, 120, 121.

Required Graduate Courses. Civil and Environmental Engineering 220, 221, 223.

255B, 258A, C258, C259, 260, 261A, 261B, M262A, 263A, 263B, 266 or other elective courses approved by the student's academic adviser and the graduate adviser. Electives in the fields of Biostatistics/Statistics, Chemical Engineering, Chemistry and Biochemistry, Computer Science, Earth and Space Sciences, Electrical and Computer Engineering, and Environmental Health Sciences are commonly approved to satisfy course requirements. No more than two courses may be completed outside of Civil and Environmental Engineering unless pre-approved for exceptional circumstances. No more than two undergraduate courses may be applied towards the 9 course requirements unless pre-approved for exceptional circumstances.

Geotechnical Engineering

Required Preparatory Courses. Civil and Environmental Engineering 108, 120, 121.

Required Graduate Courses. Civil and Environmental Engineering 220, 221, 223.

Major Elective Courses. Civil and Environmental Engineering 224, 225, 226, 227, 228, C239, 245. Other elective courses may be taken with prior approval from faculty advisor.

Structural Mechanics

Required Preparatory Courses. Civil and Environmental Engineering 130, 135A, 135B.

Required Graduate Courses. Civil and Environmental Engineering 232, 235A, 235B, M237A, 244.

Elective Courses. Undergraduate - maximum of two courses from Civil and Environmental Engineering M135C; Graduate: Civil and Environmental Engineering M230A, M230B, M230C, 233, 235C, C239, 246, 247, Mechanical and Aerospace Engineering 269B.

Structural/Earthquake Engineering

Required Preparatory Courses. Civil and Environmental Engineering 135A, 135B, and 141 (or 142).

Major Elective Courses. Civil and Environmental Engineering 224, 225, 226, 227, 228, C239, 245. Other elective courses may be taken with prior approval from faculty advisor.

Hydrology and Water Resources Engineering

Required Preparatory Courses. Chemistry and Biochemistry 20A, 20B, 20L; Mathematics 32A, 32B, 33B (or Mechanical and Aerospace Engineering 82); Mechanical and Aerospace Engineering 103; Physics 1A/4AL, 1B.

Required Graduate Courses (4): Civil and Environmental Engineering 250A, 250B, 250C, 250D.

One (1) of the following: Civil and Environmental Engineering 254A, 255A, 255B, 266. Select remainder of courses (9 total for capstone plan option; 7 total for thesis option) from the approved elective list (or get approval for other electives).

Approved Electives: Civil and Environmental Engineering 110, 151, 152, 154, 155, 157A, 157B, 157C, 157L, M165, 226, 250A, 250B, 250C, 250D, 251C, 251D, 252, 253, 254A, 255A, 255B, 258A, C258, C259, 260, 261A, 261B, M262A, 263A, 263B, 266 or other elective courses approved by the student's academic adviser and the graduate adviser. Electives in the fields of Biostatistics/Statistics, Chemical Engineering, Chemistry and Biochemistry, Computer Science, Earth and Space Sciences, Electrical and Computer Engineering, and Environmental Health Sciences are commonly approved to satisfy course requirements. No more than two courses may be completed outside of Civil and Environmental Engineering unless pre-approved for exceptional circumstances. No more than two undergraduate courses may be applied towards the 9 course requirements unless pre-approved for exceptional circumstances.

Required Graduate Courses. Civil and Environmental Engineering 235A, C239 and 246 and at least two courses from Civil and Environmental Engineering 235B, 241, 243A, 244, 245, 247.

Elective Courses. Undergraduate - no more than two courses from Civil and Environmental Engineering M135C, 143 and either 141 or 142 (whichever was not used as a requisite for graduate courses). Geotechnical Area: Civil and Environmental Engineering 220, 221, 222, 223, 225, 227. General Graduate: Civil and Environmental Engineering M230A, M230B, M230C, 232, 233, 235B, 235C, 236, M237A, C239, 241, 243A, 243B, 244, 245, 247, Mechanical and Aerospace Engineering 269B. *May not count 125 as an Elective.*

Structures and Civil Engineering Materials

Required Preparatory Courses. General chemistry and physics with laboratory exercises, multivariate calculus, linear algebra and differential equations, introductory thermodynamics, structural analysis (CEE 135A, 135B), steel or concrete design (CEE 141 or 142). Other preparation could include Civil and Environmental Engineering C104, 120, 121, 140L, and Materials Science and Engineering 104.

Required Graduate Courses. Civil and Environmental Engineering C204, 235A, M230A or 243A, and C282.

Elective Courses. At least one course from Civil Engineering Materials: 226, 253, 258A, 261B, M262A, 266, 267; and if M230A is selected, one course from Structural Mechanics: M230B, M230C, 232, 236, M237A; or if 243A is selected, one course from Structural/Earthquake Engineering: 241, 243B, 244, 245, 246, 247.

Other Elective Courses. Remaining courses selected from the following with no more than two undergraduate courses allowed. Chemical Engineering 102A, 102B, 200, C219, 223, 230, 270; Chemistry and Biochemistry 103, 110A, 110B, 113A, C213B, C215A through C215D,

Structural Mechanics

Required Preparatory Courses. Civil and Environmental Engineering 130, 135A, 135B.

Required Graduate Courses. Civil and Environmental Engineering 232, 235A, 235B, M237A, 244.

Elective Courses. Undergraduate - maximum of two courses from Civil and Environmental Engineering M135C; Graduate: Civil and Environmental Engineering M230A, M230B, M230C, 233, 235C, C239, 246, 247, Mechanical and Aerospace Engineering 269B.

Structural/Earthquake Engineering

Required Preparatory Courses. Civil and Environmental Engineering 135A, 135B, and 141 (or 142).

Required Graduate Courses. Civil and Environmental Engineering 235A, ~~C239 and~~ 246 and at least **three** courses from Civil and Environmental Engineering 235B, 241, 243A, 244, 245, **247**.

Elective Courses. Undergraduate - no more than two courses from Civil and Environmental Engineering M135C, 143 and either 141 or 142 (whichever was not used as a requisite for graduate courses). Geotechnical Area: Civil and Environmental Engineering 220, 221, 222, 223, 225, 227. General Graduate: Civil and Environmental Engineering M230A, M230B, M230C, 232, 233, 235B, 235C, 236, M237A, C239, 241, 243A, 243B, 244, 245, 247, Mechanical and Aerospace Engineering 269B. *May not count 125 as an Elective.*

Structures and Civil Engineering Materials

Required Preparatory Courses. General chemistry and physics with laboratory exercises, multivariate calculus, linear algebra and differential equations, introductory thermodynamics, structural analysis (CEE 135A, 135B), steel or concrete design (CEE 141 or 142). Other preparation could include Civil and

<p>C223A, C223B, 225, C226A, C275, 276B, 277; Civil and Environmental Engineering 110, M135C, 141 or 142 (whichever was not used as a requisite for graduate courses), 143, 153, 154, 155, 157B, 157C, M166, C206, C211, 220, 221, 222, 223, 224, 225, 226, 227, M230A/B/C, 232, 235A/B/C, 236, M237A, C239, 243A/B, 244, 245, 246, 247, 254A, 258A, 261; Conservation of Archaeological and Ethnographic Materials M210, M215, M216, M250; Environmental Health Sciences 410A; Materials Science and Engineering 110, C111, 130, 131, 200, 201, 210, C211, 270; Mechanical and Aerospace Engineering 101, 105A, 131AL, 133A, 156A, C232A, 256F, 261A, 261B, 296A, 296B; Statistics 201A.</p> <p>Students may petition the department for permission to pursue programs of study which differ from the above norms.</p> <p><u>Transportation Engineering</u> <i>Required Preparatory Courses.</i> Knowledge of calculus, linear algebra, and differential equations; C&EE 180 or equivalent courses or professional experiences; GEOG 7, URBN PL 206A or equivalent professional experiences. (Note: These preparatory courses may be taken while enrolled in the M.S. program, but none can count toward the required nine degree program courses.) <i>Required Graduate Courses.</i> Civil and Environmental Engineering C281, C286; Civil and Environmental Engineering C285 or Urban Planning 253; Urban Planning 206B; and choose 1 course from Urban Planning 251, 254, 255, 256, or 258. <i>Elective Courses.</i> Any 4 courses not counted as a required course from among: Civil and Environmental Engineering C185/285, C111/211, Urban Planning 251, 253, 254, 256, 258. Other elective courses may be taken with prior approval from the student's faculty advisor.</p>	<p>Environmental Engineering C104, 120, 121, 140L, and Materials Science and Engineering 104.</p> <p><i>Required Graduate Courses.</i> Civil and Environmental Engineering C204, 235A, M230A or 243A, and C282.</p> <p><i>Elective Courses.</i> At least one course from Civil Engineering Materials: 226, 253, 258A, 261B, M262A, 266, 267; and if M230A is selected, one course from Structural Mechanics: M230B, M230C, 232, 236, M237A; or if 243A is selected, one course from Structural/Earthquake Engineering: 241, 243B, 244, 245, 246, 247.</p> <p><i>Other Elective Courses.</i> Remaining courses selected from the following with no more than two undergraduate courses allowed. Chemical Engineering 102A, 102B, 200, C219, 223, 230, 270; Chemistry and Biochemistry 103, 110A, 110B, 113A, C213B, C215A through C215D, C223A, C223B, 225, C226A, C275, 276B, 277; Civil and Environmental Engineering 110, M135C, 141 or 142 (whichever was not used as a requisite for graduate courses), 143, 153, 154, 155, 157B, 157C, M166, C206, C211, 220, 221, 222, 223, 224, 225, 226, 227, M230A/B/C, 232, 235A/B/C, 236, M237A, C239, 243A/B, 244, 245, 246, 247, 254A, 258A, 261; Conservation of Archaeological and Ethnographic Materials M210, M215, M216, M250; Environmental Health Sciences 410A; Materials Science and Engineering 110, C111, 130, 131, 200, 201, 210, C211, 270; Mechanical and Aerospace Engineering 101, 105A, 131AL, 133A, 156A, C232A, 256F, 261A, 261B, 296A, 296B; Statistics 201A.</p> <p>Students may petition the department for permission to pursue programs of study which differ from the above norms.</p> <p><u>Transportation Engineering</u> <i>Required Preparatory Courses.</i> Knowledge of calculus, linear algebra, and differential equations; C&EE 180 or equivalent courses or professional experiences; GEOG 7,</p>
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	<p>URBN PL 206A or equivalent professional experiences. (Note: These preparatory courses may be taken while enrolled in the M.S. program, but none can count toward the required nine degree program courses.)</p> <p><i>Required Graduate Courses.</i> Civil and Environmental Engineering C281, C286; Civil and Environmental Engineering C285 or Urban Planning 253; Urban Planning 206B; and choose 1 course from Urban Planning 251, 254, 255, 256, or 258.</p> <p><i>Elective Courses.</i> Any 4 courses not counted as a required course from among: Civil and Environmental Engineering C185/285, C111/211, Urban Planning 251, 253, 254, 256, 258. Other elective courses may be taken with prior approval from the student's faculty advisor.</p>
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