

Civil Engineering MS Profile

Master of Science in Civil Engineering

All Civil Engineering MS Students will follow one of three plans. Students completing a Civil Engineering MS must select one the following concentrations:

Construction Engineering and Management;

Geomechanics and Geotechnical Engineering; or

Structural and Materials Engineering.

Students who receive a Master's in Civil Engineering in one focus area cannot apply for and receive a second Master's in Civil Engineering in a different focus area.

Programs are planned by the students in consultation with their advisors. At least half of the coursework must be at or above the 600 level. Students who have taken the lower level of a double-numbered course (e.g., a course offered at the 400 and 600 levels) may not take the higher level of the same course for credit.

M.S. candidates may transfer a maximum of six credits from other institutions and are expected to complete their entire program within five calendar years of admission.

Thesis and non-thesis options are available. Students anticipating further graduate study at the doctoral level should pursue the thesis option.

We encourage you to become familiar with the [research areas](#) in the Department, to reach out to our [faculty](#) for support, and to become actively engaged in the Department community. One way we encourage our students to become involved is by attending the seminar series we hold throughout the academic year. This is an opportunity to learn about advances in the academic community and to network with faculty and students from across campus.

Academic Integrity

Syracuse University aspires to the highest standards of integrity and honesty in all endeavors. The Academic Integrity Policy is designed to make integrity and honesty central to the Syracuse University experience by:

- setting forth clear ethical expectations for students in their academic endeavors;
- promoting consistency of standards and practices across colleges, schools and programs;
- encouraging reporting of suspected violations; and
- facilitating the resolution of cases as promptly as possible while providing thorough and fair consideration for students and instructors.

Education is a central goal of the policy, including affording students an opportunity to discuss and learn from academic integrity violations.

Students must fully inform themselves of their responsibilities in the conduct of their academic work and should familiarize themselves with Syracuse University's policy on Academic Integrity.

Requirements with Thesis (30 credits)

1. Completion of 9 credits of core courses in any one of the following areas: construction engineering and management, geotechnical engineering, or structural engineering.
2. Completion of 15 credits of coursework satisfying the distributional requirements for each concentration.
3. Completion of 6 credits of CEE 997 – Master's Thesis
4. Defense of thesis
5. Participation in the zero credit faculty/student seminar program (CEE 660)

Requirements without Thesis (30 credits)

1. Completion of 9 credits of core courses in any one of the following areas: construction engineering and management, geotechnical engineering, or structural engineering.
2. Completion of 21 credits of coursework satisfying the distributional requirements for each concentration.
3. Completion of CEE 995 - Master's Exit Paper (zero credits)
4. Participation in the zero credit faculty/student seminar program (CEE 660)

Construction Engineering and Management – Program of Study

Construction Engineering and Management – 30 Total Credit Hours

Group 1 – Core Courses

All courses in Group 1 are required for a total of 9 Credit Hours. Courses include:

1. **CEE 601 Construction Engineering and Project Management;**
2. **CEE 639/ECS 636 Sustainable Development and Infrastructure Management;**
3. **CEE 605 Construction Estimating and Scheduling.**

Group 2 – Advanced Fundamentals

At least one course from Group 2 (3 credit hours) must be selected.

Course	Description
CEE 600	Geotechnical Earthquake Engineering
CEE 637	Advanced Soil Mechanics and Foundation Engineering I
CEE 678	Rehabilitation of Civil Infrastructure
CEE 663	Introduction to Sustainable Engineering
MAE 548	Engineering Economics and Technology Valuation
MFE 634	Productivity and Quality Control

Group 3 – Design

At least one course from Group 3 (3 credit hours) must be selected.

Course	Description
CEE 535	Structural Steel Design
CEE 536	Pre-Stressed Concrete Design
CEE 549	Designing with Geofabric
CEE 638	Advanced Soil Mechanics and Foundation Engineering II
CEE 641	Seepage and Earth Dam Design
CEE 643	Transportation Engineering
CEE 739	Soil Stabilization

Group 4 - Management and Advanced Tools

At least one course from Group 4 (3 credit hours) must be selected.

Course	Description
ECS 526	Statistics for Engineers
ECS 650	Managing Sustainability
GEO 683	Geographic Information Systems
MBC 616	Operations Management (1.5 credits). Must be taken with MBC 617
MBC 617	Supply Chain Management (1.5 credits). Must be taken with MBC 616
PAI 712	Public Organizations and Management
PAI 731	Financial Management in State and Local Governments. Cannot be taken with PAI 734.
PAI 734	Public Budgeting. Cannot be taken with PAI 731.
PAI 895	Mid-Career Training Group
SCM 656	Project Management
SCM 701	Introduction to Supply Chain Management

SCM 702	Principles of Management
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Group 5 – Electives

- Advisor approval is required before a student can take courses from this group.
- Some suggested elective courses can be selected from Engineering and Computer Science (ECS) and Public Administration and Management (PAI) courses not listed above, Architecture (ARC), and Construction Management at ESF (CME).
- For the MS with Thesis - Two additional course from Groups II through V, upon advisor's approval, one of which can be CEE 690 - Independent study, should be taken for a total of 6 credit hours. Students will also enroll in CEE 997 - Master's Thesis for 6 credit hours.
- For the MS without Thesis - Four additional courses from Groups II through V upon advisor's approval; one of which can be CEE 690 - Independent study for a total of 12 credit hours. Students will also enroll in CEE 995 - Master's Exit Paper (0 credit hour). The exit paper must address a topic relevant to construction engineering. The paper can be an original work or it can be a critical review of a published journal article.
- All Full-Time MS candidates must enroll and participate in CEE 660-CEE Seminar.

Geomechanics and Geotechnical Engineering – Program of Study

Geomechanics and Geotechnical Engineering – 30 Total Credit Hours

Group 1 – Core Courses

Three courses in Group 1 are required for a total of 9 Credit Hours. Courses include:

1. **CEE 637 Soil Mechanics and Foundation Engineering I;**
2. **CEE 638 Soil Mechanics and Foundation Engineering II;**
3. **Either CEE 549 Designing with Geofam, or CEE 584 Designing with Geosynthetics.**

Group 2 – Advanced Fundamentals

At least one course from Group 2 (3 credit hours) must be selected.

Course	Description
CEE 538	Dynamics of Structures
CEE 633	Finite Element Analysis
CEE 737	Applied Soil Mechanics
CEE 739	Soil Stabilization
CEE 740	Soil Dynamics

Group 3 – Design

At least two courses from Group 3 (6 credit hours) must be selected.

Course	Description
CEE 545	Pavement Design
CEE 549	Designing with Geofam
CEE 584	Designing with Geosynthetics
CEE 641	Seepage and Earth Dam Design

Group 4 - Advanced Tools

At least one course from Group 4 (3 credit hours) must be selected.

Course	Description
CEE 629	Reliability of Civil Systems

CEE 678	Rehabilitation of Civil Infrastructure
EAR 601	Hydrogeology
EAR 603	Geomorphology
ERE 527	Storm Water Management
ERE 551	GIS for Engineers
ERE 693	GIS Based Modeling

Group 5 – Electives

1. Advisor approval is required before a student can take courses from this group.
2. Some suggested elective courses can be selected from Earth Science (EAR), Computer Programming (CIS), Construction Engineering (CME), Information Technology (IST), and Other CEE graduate courses.
3. For the MS with Thesis - One additional course from Groups II through V, upon advisor's approval, or CEE 690 - Independent study should be taken for a total of 3 credit hours. Students will also enroll in CEE 997 - Master's Thesis for 6 credit hours.
4. For the MS without Thesis - Three additional courses from Groups II through V upon advisor's approval; one of which can be CEE 690 - Independent study for a total of 9 credit hours. Students will also enroll in CEE 995 - Master's Exit Paper (0 credit hour). The exit paper must address a topic relevant to geotechnical engineering. The paper can be an original work or it can be a critical review of a published journal article. The paper has a minimum length requirement of 2000 words and requires approval of the student's advisor.
5. All Full-Time MS candidates must enroll and participate in CEE 660-CEE Seminar.

Structural and Materials Engineering – Program of Study

Structural Engineering – 30 Total Credit Hours

Group 1 – Core Courses

All courses in Group 1 are required for a total of 9 Credit Hours. Courses include:

1. **CEE 633 Finite Element Analysis;**
2. **CEE 678 Rehabilitation of Civil Infrastructure;**
3. **MAE 635 Advanced Mechanics of Materials.**

Group 2 – Structural Analysis

At least one course from Group 2 (3 credit hours) must be selected.

Course	Description
CEE 629	Reliability of Civil Systems
CEE 631	Classical and Matrix Structural Analysis
CEE 634	Stability Analysis of Structural Systems
CEE 676	Multiscale Material Modeling and Simulations

Group 3 – Structural Design

Two courses from Group 3 (6 credit hours) must be selected. One course must be on Steel Design, and one course must be on either Concrete Design or Bridge Engineering.

Course	Description
CEE 535	Structural Steel Design

CEE 536	Pre-Stressed Concrete Design
CEE 635	Advanced Reinforced Concrete Design
CEE 636	Plastic Design of Steel Structures
CEE 666	Design of Concrete Bridges

Group 4 – Dynamics and Earthquake Engineering

At least one course from Group 4 (3 credit hours) must be selected.

Course	Description
CEE 538	Dynamics of Structures
CEE 600	Geotechnical Earthquake Engineering
CEE 632	Structural Dynamics and Earthquake Engineering
MAE 626	Vibration of Mechanical Systems

Group 5 – Electives

- Advisor approval is required before a student can take courses from this group.
- Some suggested elective courses can be selected from Architecture (ARC), Construction Management (CME), Political Science, Engineering and Computer Science (ECS), Information Studies Management (IST), Public Communications, and Other CEE graduate courses not listed above.
- Note that CEE 520 - Building Information Modeling and ARC 555 - Introduction to Building Information Modeling can only be counted once towards your program of study.
- For the MS with Thesis - One additional course from Groups II through V, upon advisor's approval, or CEE 690 - Independent study should be taken for a total of 3 credit hours. Students will also enroll in CEE 997 - Master's Thesis for 6 credit hours.
- For the MS without Thesis - Three additional courses from Groups II through V upon advisor's approval; one of which can be CEE 690 - Independent study for a total of 9 credit hours. Students will also enroll in CEE 995 - Master's Exit Paper (0 credit hour). The exit paper must address a topic relevant to structural engineering. The paper can be an original work or it can be a critical review of a published journal article. The paper has a minimum length requirement of 2000 words and requires approval of the student's advisor.
- All Full-Time MS candidates must enroll and participate in CEE 660-CEE Seminar.

Electives

Graduate students at Syracuse University are able to take courses at both SUNY ESF and SUNY Upstate Medical University.

Students may register for SUNY Upstate Medical University coursework using the Inter-Institutional Graduate Course Registration Form, which is available from the department's administrative assistant. All coursework taken at SUNY Upstate Medical University must be approved by petition.

Students may register for SUNY ESF coursework normally using MySlice.

Please contact the department if you are interested in an elective that is not included on one of the approved lists below.

Additional coursework at Syracuse University or SUNY ESF may be approved by petition. CEE Master's Degree Programs require at least 15 Credits of Coursework be CEE Prefixed.

Approved by Prefix and Level

Unless otherwise noted, all courses offered by either Syracuse University or SUNY ESF that are numbered 600:996 with one of the following prefixes are approved as electives for all MS & PhD programs of study.

Prefix	Department
APM	Applied Mathematics
ARC	Architecture
BCM	Biochemistry
BEN	Bioengineering

BIO	Biology
BPE	Bioprocess Engineering
BTC	Biotechnology
CEN	Chemical Engineering
CHE	Chemistry
CME	Construction Management Engineering
CIS	Computer and Information Science
CPS	Computational Science
CSE	Computer Engineering
EAR	Earth Sciences
ECS	Engineering and Computer Science
EGR	Engineering
FCH	Chemistry
IST	Information Studies
MAE	Mechanical and Aerospace Engineering
MAT	Mathematics
MEE	Mechanical Engineering
MFE	Manufacturing Engineering
MTS	Materials Science
PHY	Physics
SCM	Supply Chain Management

Approved by Course, Syracuse University

Additionally, the following specific courses offered by Syracuse University are approved as electives for all graduate-level programs of study.

Course	Description
ARC 555	Introduction to Building Information Modeling*
ARC 558	Advanced Building Information Modeling and 3D Design
COM 600	Multimedia Reporting: Climate Change
EAR 600	Water Energy Field Course
EAR 601	Hydrogeology
EAR 665	Groundwater Modeling
ECS 526	Statistics for Engineers
ECS 651	Strategic Management & The Natural Environment
ECS 759	Sustainability Driven Enterprise
GEO 683	Geographic Information Systems
IST 687	Introduction to Data Science
IST 719	Information Visualization
MAE 548	Engineering Economics and Technology Valuation
MAE 573	Application of Finite Element Analysis
MAE 587	Design of Solar Energy System

MAE 626	Vibration of Mechanical Systems
MAE 658	Built in Environmental Modeling
MBC 616	Operations Management
MBC 617	Supply Chain Management
PAI 734	Public Budgeting
PAI 895	Managerial Leadership
SCM 656	Project Management
SCM 701	Supply Chain and Logistics Management
SCM 702	Principles of Management Science

*Note that CEE 520 - Building Information Modeling and ARC 555 - Introduction to Building Information Modeling can only be counted once towards a program of study. If a student has taken either CEE 520 or ARC 555 and used it towards any program of study, they cannot take the other course for program credit.

Approved by Course, SUNY ESF

Additionally, the following specific courses offered by SUNY ESF are approved as electives for all graduate-level programs of study.

Course	Description
APM 595	Probability and Statistics for Engineers
APM 620	Experimental Design and ANOVA
CME 531	Construction Safety
CME 535	Cost Engineering
CME 543	Construction Estimating
ERE 527	Stormwater Management
ERE 551	GIS for Engineers
ERE 645	Hydrologic Modeling
ERE 693	GIS-Based Modeling
ENS 607	Wetland Practicum
EST 695	Environmental Journalism
EST 770	Ecological Economics & Policy

Exit Requirements

- No fewer than 30 total credits of graduate-level coursework;
- completion of all coursework group requirements in a selected concentration;
- minimum 3.000 GPA for all coursework used toward the completion of degree;
- minimum 2.800 GPA cumulative for all coursework taken at SU;
- no more than 15 credits of 500-level coursework;
- at least 15 credits must be CEE prefixed graduate level courses; and
- satisfactory completion of either a thesis or an exit paper.

Thesis

The Oral Thesis Defense and submission of the thesis document to the Syracuse University Graduate School are the final requirements for students in a thesis plan.

Defense paperwork must comply with the [Graduate School's guidelines](#), including formatting.

The candidate must complete 24 credit hours of coursework, which include a set of core courses in the student's chosen area of specialization and a cohesive program of elective coursework approved by the student's advisor, as outlined in the attached programs of study. All Full-Time M.S. candidates are expected to participate in faculty/student seminar series (CEE 660) each year. In addition, the student must register for six credits of CEE 997-Master's Thesis, culminating in the defense of the thesis administered by the student's thesis committee.

Deadlines

The official Request for Examination form must be signed and submitted to the Graduate School at least **three full weeks** prior to the oral defense date.

A copy of the thesis document must be delivered to all members of the defense committee at least **two full weeks** prior to the oral defense date.

Defense Committee

The thesis defense committee will consist of four members, including

- the thesis advisor;
- two faculty members from the department or other specialists in the subject area; and
- the Chair of the Oral Examination Committee

The Chair of the Oral Examination Committee must be a Syracuse University tenured or tenure-track faculty member.

Two of the four-committee members must be CEE faculty members.

A committee member from outside Syracuse University may be allowed by petition.

Exit Paper

Students not completing a Master's Thesis must instead complete a Master's Exit Paper. To complete the degree requirement, a student must also take CEE 995-Master's Exit Paper for zero credit. The exit paper must be an original work that address issues related to their specialty approved by the advisor and have a minimum length of 2,000 words. The academic advisor determines the formatting and requirements for the exit paper.