The Master of Science degree in Civil and Environmental Engineering is primarily designed for students with an undergraduate degree in engineering, although students with other backgrounds can be accommodated with specially designed programs, often including pre-requisite undergraduate courses. An MS degree can be pursued by a full-time or part-time student in one of two ways:

1) Master of Science Thesis/Research Option: 24 semester course credits plus a 6-credit thesis.

2) Professional Master of Science (PMS) degree Option: 30 semester course credits.

The MS with thesis option has the following additional requirements:

a) Thesis Committee
   Students must form a masters committee of 3 or more persons, including the graduate advisor. The chair of the committee and at least one other committee member must be appointed to the University of Pittsburgh Graduate Faculty.

b) Thesis Defense
   Students must pass an oral presentation and defense of their completed thesis, administered by the student’s thesis committee.

NOTES:
- All full-time students are required to attend Departmental graduate student seminar (CEE 2085).
- All courses should only be selected after consultations with the faculty advisor.
- International students from universities where English is not the primary language of study are required to complete an English competency exam upon arrival at the University of Pittsburgh. If the results of this exam are not satisfactory, students may be required to take up to three additional English language courses that do not count towards the degree program coursework requirements.

The following provides coursework specifics for the MS and PMS programs and example 12-month PMS study plans for the possible concentration areas within the CEE Department:

- Structural Engineering and Mechanics
- Environmental Engineering
- Sustainability and Green Design
- Geotechnical Engineering
- Water Resources Engineering
- Transportation Engineering
- Pavement Engineering
- Construction Management and Green Construction
Structural Engineering and Mechanics (SEM)

MS Degree Requirements

30 Credits
a) 3 Credits – Advanced Mechanics of Materials (CEE 2320) or Elasticity, Plasticity and Fracture Mechanics (CEE 2321)
b) 3 Credits – Fundamentals of the Finite Element Method (CEE 2333 or Equivalent)
c) 3 Credits – SEM Graduate Design Elective (e.g., CEE 2340, 2341, 2343, 2347, and 2370)
d) 6 Credits – SEM Graduate Technical Electives (e.g., CEE 2330\(^1\), 2360, 2343, 2347, 2370, 3330, and 3333)
e) 9 Credits – Graduate Technical Electives\(^2\) (any advisor-approved program-related graduate course)
f) 6 Credits – MS Thesis (CEE 2999)

PMS Degree Requirements

30 Credits
a) 3 Credits – Advanced Mechanics of Materials (CEE 2320) or Elasticity, Plasticity and Fracture Mechanics (CEE 2321)
b) 3 Credits – Fundamentals of the Finite Element Method (CEE 2333 or Equivalent)
c) 3 Credits – SEM Graduate Design Elective (e.g., CEE 2340, 2341, 2343, 2347, and 2370)
d) 6 Credits – SEM Graduate Technical Electives (e.g., CEE 2330\(^1\), 2360, 2343, 2347, 2370, 3330, and 3333)
e) 15 Credits – Graduate Technical Electives\(^2\) (any advisor-approved program-related graduate course)

NOTES:
\(^1\) CEE 2330 Advanced Structural Analysis may not be taken for graduate credit if the student’s undergraduate program includes an equivalent course.

\(^2\) Graduate Technical Electives may include any advisor-approved program-related graduate course (i.e., course numbers 2XXX or 3XXX), including guided special investigations (CEE 2996).
Environmental Engineering

MS Degree Requirements

30 Credits

a) 3 Credits – Environmental Engineering Biology (CEE 2500 or Equivalent)
b) 3 Credits – Environmental Engineering Chemistry (CEE 2501 or Equivalent)
c) 3 Credits – Environmental Engineering Processes I (CEE 3501 or Equivalent)
d) 3 Credits – Environmental Engineering Processes II (CEE 3502 or Equivalent)
e) 12 Credits – Graduate Technical Electives¹
   (any advisor-approved program-related graduate course)
f) 6 Credits – MS Thesis (CEE 2999)

PMS Degree Requirements

30 Credits

a) 3 Credits – Environmental Engineering Biology (CEE 2500 or Equivalent)
b) 3 Credits – Environmental Engineering Chemistry (CEE 2501 or Equivalent)
c) 3 Credits – Environmental Engineering Processes I (CEE 3501 or Equivalent)
d) 3 Credits – Environmental Engineering Processes II (CEE 3502 or Equivalent)
e) 18 Credits – Graduate Technical Electives¹
   (any advisor-approved program-related graduate course)

NOTES:
¹ Graduate Technical Electives may include any advisor-approved program-related graduate course (i.e., course numbers 2XXX or 3XXX), including guided special investigations (CEE 2996).
Sustainability and Green Design

MS Degree Requirements

30 Credits

a) 3 Credits – *Life Cycle Assessment Methods and Tools* (CEE 2609 or Equivalent)
b) 3 Credits – *Engineering and Sustainable Development* (CEE 2610 or Equivalent)
c) 3 Credits – *Green Building Design and Construction* (CEE 2617 or Equivalent)
d) 3 Credits – *Design for the Environment*¹
   (CEE 2618 or Equivalent)
e) 12 Credits – *Graduate Technical Electives*²
   (any advisor-approved program-related graduate course)
f) 6 Credits – *MS Thesis* (CEE 2999)

PMS Degree Requirements

30 Credits

a) 3 Credits – *Life Cycle Assessment Methods and Tools* (CEE 2609 or Equivalent)
b) 3 Credits – *Engineering and Sustainable Development* (CEE 2610 or Equivalent)
c) 3 Credits – *Green Building Design and Construction* (CEE 2617 or Equivalent)
d) 3 Credits – *Design for the Environment*¹
   (CEE 2618 or Equivalent)
e) 18 Credits – *Graduate Technical Electives*²
   (any advisor-approved program-related graduate course)

NOTES:
¹ CEE 2618 may be substituted with another course approved by the SGD faculty.
² Graduate Technical Electives may include any advisor-approved program-related graduate course (i.e., course numbers 2XXX or 3XXX), including guided special investigations (CEE 2996 or CEE 3996).
Geotechnical Engineering

MS Degree Requirements

30 Credits

a) 3 Credits – Engineering Geology
   (CEE 2800 or Equivalent)
b) 3 Credits – Advanced Soil Mechanics
   (CEE 2801 or Equivalent)
c) 3 Credits – Geotechnical Analysis
   (CEE 2802 or Equivalent)
d) 3 Credits – Rock Mechanics
   (CEE 3805 or Equivalent)
e) 12 Credits – Graduate Technical Electives\(^1\)
   (any advisor-approved program-related graduate course)
f) 6 Credits – MS Thesis\(^2\) (CEE 2999)

PMS Degree Requirements

30 Credits

a) 3 Credits – Engineering Geology
   (CEE 2800 or Equivalent)
b) 3 Credits – Advanced Soil Mechanics
   (CEE 2801 or Equivalent)
c) 3 Credits – Geotechnical Analysis
   (CEE 2802 or Equivalent)
d) 3 Credits – Rock Mechanics
   (CEE 3805 or Equivalent)
e) 18 Credits – Graduate Technical Electives\(^1\)
   (any advisor-approved program-related graduate course)

NOTES:
\(^1\) Graduate Technical Electives may include any advisor-approved program-related graduate course (i.e., course numbers 2XXX or 3XXX), including guided special investigations (CEE 2996 or CEE 3996).
Water Resources Engineering

MS Degree Requirements

30 Credits

a) 3 Credits – Advanced Environmental Fluid Mechanics 
    (CEE 2408 or Equivalent)

b) 3 Credits – Advanced Hydrology 
    (CEE 3414 or Equivalent)

c) 3 Credits from one of the following courses: Hydrological Modeling (CEE 3420 or Equivalent), Sediment Transport (CEE 2416 or Equivalent), or River Mechanics and Morphodynamics (CEE 3416 or Equivalent)

d) 6 Credits – WR Graduate Technical Electives 
    (e.g., CEE 2401, 2410, and 2504)

e) 9 Credits – Graduate Technical Electives¹ 
    (any advisor-approved program-related graduate course)

f) 6 Credits – MS Thesis (CEE 2999)

PMS Degree Requirements

30 Credits

a) 3 Credits – Advanced Environmental Fluid Mechanics 
    (CEE 2408 or Equivalent)

b) 3 Credits – Advanced Hydrology 
    (CEE 3414 or Equivalent)

c) 3 Credits from one of the following courses: Hydrological Modeling (CEE 3420 or Equivalent), Sediment Transport (CEE 2416 or Equivalent), or River Mechanics and Morphodynamics (CEE 3416 or Equivalent)

d) 6 Credits – WR Graduate Technical Electives 
    (e.g., CEE 2401, 2410, and 2504)

e) 15 Credits – Graduate Technical Electives¹ 
    (any advisor-approved program-related graduate course)

NOTES:
¹ Graduate Technical Electives may include any advisor-approved program-related graduate course (i.e., course numbers 2XXX or 3XXX), including guided special investigations (CEE 2996 or CEE 3996).
Transportation Engineering
MS Degree Requirements

30 Credits

a) 3 Credits – Transportation Management Operations (CEE 2700 or Equivalent)

b) 3 Credits – Traffic Control Systems (CEE 2710 or Equivalent)

c) 3 Credits – Urban Transportation Planning (CEE 2720 or Equivalent)

d) 3 Credits – Pavement Design and Analysis OR Highway Engineering (CEE 2714 or Equivalent OR CEE 2730 or Equivalent)

e) 12-18 Credits – Graduate Technical Electives¹
(any advisor-approved program-related graduate course)

f) 6 Credits – MS Thesis (CEE 2999)

Transportation Engineering
PMS Degree Requirements

30 Credits

a) 3 Credits – Transportation Management Operations (CEE 2700 or Equivalent)

b) 3 Credits – Traffic Control Systems (CEE 2710 or Equivalent)

c) 3 Credits – Urban Transportation Planning (CEE 2720 or Equivalent)

d) 3 Credits – Pavement Design and Analysis OR Highway Engineering (CEE 2714 or Equivalent OR CEE 2730 or Equivalent)

e) 18 Credits – Graduate Technical Electives¹
(any advisor-approved program-related graduate course)

NOTES:

¹ Graduate Technical Electives may include any advisor-approved program-related graduate course (i.e., course numbers 2XXX or 3XXX), including guided special investigations (CEE 2996 or CEE 3996).
Pavement Engineering
MS Degree Requirements
30 Credits

a) 3 Credits – Pavement Design
   (CEE 2714 or Equivalent)
b) 3 Credits – Pavement Rehabilitation
   (CEE 2715 or Equivalent)
c) 3 Credits – Properties of Concrete OR Advanced Bituminous Materials
   (CEE 2717 or Equivalent OR CEE 2718 or Equivalent)
d) 3 Credits – Advanced Pavement Design
   (CEE 3714 or Equivalent)
e) 12 Credits – Graduate Technical Electives¹
   (any advisor-approved program-related graduate course)
f) 6 Credits – MS Thesis (CEE 2999)

Pavement Engineering
PMS Degree Requirements
30 Credits

a) 3 Credits – Pavement Design
   (CEE 2714 or Equivalent)
b) 3 Credits – Pavement Rehabilitation
   (CEE 2715 or Equivalent)
c) 3 Credits – Properties of Concrete OR Advanced Bituminous Materials
   (CEE 2717 or Equivalent OR CEE 2718 or Equivalent)
d) 3 Credits – Advanced Pavement Design
   (CEE 3714 or Equivalent)
e) 18 Credits – Graduate Technical Electives¹
   (any advisor-approved program-related graduate course)

NOTES:
¹ Graduate Technical Electives may include any advisor-approved program-related graduate course (i.e., course numbers 2XXX or 3XXX), including guided special investigations (CEE 2996 or CEE 3996)
Construction Management and Green Construction
MS Degree Requirements

30 Credits

a) 3 Credits – Construction Cost Estimating
   (CEE 2201 or Equivalent)

b) 3 Credits – Construction Cost Scheduling
   (CEE 2202 or Equivalent)

c) 3 Credits – Construction Methods and Equipment
   (CEE 2203 or Equivalent)

d) 3 Credits – Construction Law and Risk Management
   (CEE 2204 or Equivalent)

e) 3 Credits – Construction Finance and Cost Control
   (CEE 2205 or Equivalent)

f) 3 Credits – Construction and Cost of Electrical Supply OR Construction and Cost
   of Mechanical Systems
   (CEE 2206 or Equivalent OR CEE 2207 or Equivalent)

g) 6 Credits – Graduate Technical Electives
   (any advisor-approved program-related graduate course)

h) 6 Credits – MS Thesis (CEE 2999)

Construction Management and Green Construction
PMS Degree Requirements

30 Credits

a) 3 Credits – Construction Cost Estimating
   (CEE 2201 or Equivalent)

b) 3 Credits – Construction Cost Scheduling
   (CEE 2202 or Equivalent)

c) 3 Credits – Construction Methods and Equipment
   (CEE 2203 or Equivalent)

d) 3 Credits – Construction Law and Risk Management
   (CEE 2204 or Equivalent)

e) 3 Credits – Construction Finance and Cost Control
   (CEE 2205 or Equivalent)

f) 3 Credits – Construction and Cost of Electrical Supply OR Construction and Cost
   of Mechanical Systems
   (CEE 2206 or Equivalent OR CEE 2207 or Equivalent)

g) 12 Credits – Graduate Technical Electives
   (any advisor-approved program-related graduate course)

NOTES:

1 Graduate Technical Electives may include any advisor-approved program-related
   graduate course (i.e., course numbers 2XXX or 3XXX), including guided special
   investigations (CEE 2996 or CEE 3996).