

**Department of Civil and Environmental Engineering  
MSCE—Construction, Energy, and Sustainable Infrastructure Tracks  
Degree Requirements and Course Planning  
AY 2020-2021**

**1. On-campus degree requirements for Master’s degree options:**

	<b>Thesis Research Option (Credits)</b>	<b>Non-Thesis Research Option (Credits)</b>	<b>Coursework Only Option (Credits)</b>
Coursework	33	39	42
600 Research Paper	NA	3	NA
700 Thesis	9	NA	NA
<b>Total</b>	<b>42</b>	<b>42</b>	<b>42</b>

**Notes and General Requirements**

- There are two MSCE degree tracks: (1) construction and (2) energy and sustainable infrastructure. Cross-over between these two tracks is allowed. Further, there are three options within each of those tracks: (1) thesis option, (2) non-thesis research paper option and (3) coursework only. The course credit breakout for each is shown in the table.
- A degree program plan must be submitted to your faculty advisor for approval and to the CEE Graduate Advising Office before the end of your first academic quarter.
- Courses from the Department of Construction Management count the same as any CESI 5XX course (or other CEE graduate level courses) for degree purposes.
- At least ½ of coursework credits must be at the 500 level. Meeting this requirement is very straightforward.

**2. CEE 600 Research Paper Requirement (Optional)**

- You should provide a short summary describing the topic and an initial reference list to your faculty advisor by the end of the Autumn Quarter.
- You are not expected to complete the paper during the Winter Quarter but make substantial progress. By the end of the Winter Quarter, you are expected to complete a full outline for the paper, a completed literature review, begin your analysis of data (as appropriate), and preparation of a portion of the text. Discuss with your faculty advisor the required work to complete the paper during the Spring Quarter.
- Spring Quarter, sign up for 3 credits of CEE 600 with your faculty advisor. Complete the paper and receive at least a 3.0 grade to complete the research paper requirement.

**3. One credit graduate courses available for either track (construction or energy infrastructure)**

These one-credit courses are offered online. Students in either CESI track can take a maximum of 6 one-credit courses toward the 42 credit requirement. As of April 2020, the following courses are planned:

AUTUMN 2020		
CESI 510	Electric Grids	1 CR
CESI 520	Electricity Fundamentals	1 CR
CESI 524	Statistical Methods for Construction	1 CR
WINTER 2021		
CESI 511	Grid Integration of Variable Sources of Generation	1 CR
CESI 513	Operation and Maintenance of a Wind Farm	1 CR
CESI 526	Ropeway (Cable Car) Transportation	1 CR
CESI 527	Energy Infrastructure Fundamentals	1 CR
SPRING 2021		
CESI 512	Regulating Electric Utilities	1 CR
CESI 525	Wind Turbine Analysis	1 CR
CESI 534	Transmission Construction	1 CR
SUMMER 2021		
CESI 521	Introduction to AutoCAD and Bluebeam	1 CR
CESI 522	Introduction to AutoTURN	1 CR
CESI 528	Pavement Design for Project Roads	1 CR
CESI 529	Supplemental Pavement Topics	1 CR

**4. Typical Courses taken by Quarter—Construction Track**

The courses shown by academic quarter in the table below exceed the maximum needed for degree completion; however, this is an initial list to help you develop your degree plan. Additional course offerings that may be of interest to construction-oriented students are available in numerous other departments such as Construction Management (some of which are shown), Geological Sciences, Industrial Engineering, Architecture, Urban Planning, Environmental Health, etc.

You have significant latitude in selecting courses that directly or indirectly relate to construction.

**Consider the list below as a starting point in your selection.**

<b>AUTUMN 2020</b>		
CEE 424	GIS for Civil Engineers	3 CR
CEE 429	Sustainability in Building Infrastructure	3 CR
CEE 436	Foundation Design	3 CR
CEE 433 (498)	Design and Construction of Temporary Structures	3 CR
CESI 502	Geomatics in Energy Infrastructure <b>(online)</b>	3 CR
CESI 588	Energy Infrastructure and the Environment <b>(online)</b>	3 CR
CESI 599	Bridge Construction	3 CR
CM 500	Design and Construction Law	3 CR
CM 520	Construction Procurement Systems	3 CR
CM 560	Design Build	3 CR
<b>WINTER 2021</b>		
CEE 408	Sustainable Roadway Design and Construction	3 CR
CEE 454	Design of Timber Structures	3 CR
CEE 434 (498)	Project Estimating	3 CR
CEE 435 (498)	Project Scheduling	3 CR
CESI 505	Air Pollution Control and Occupational Safety and Health <b>(online)</b>	3 CR
CESI 595	Construction Materials <b>(online)</b>	3 CR
CESI 508	Accounting and Finance for Construction <b>(online)</b>	3 CR
CM 540	Sustainable Construction (LEED course)	3 CR
CM 518	Lean Construction	3 CR
CM 527	Risk and Scope Management	3 CR
<b>SPRING 2021</b>		
CEE 420	Engineering with Developing Communities	3 CR
CEE 490	Air Pollution Control	3 CR
CESI 552	Environmental Regulations <b>(online)</b>	3 CR
CESI 592	Statistics for Construction and Materials Applications <b>(online)</b>	3 CR
CM 515	Innovative Project Management Concepts	3 CR
CM 530	Project Economics and Risk Analysis	3 CR
CM 575	Leadership	3 CR
CESI 600	Research	3 CR
<b>SUMMER 2021</b>		
CESI 504	Buildings, LEED and Energy Use <b>(online)</b>	3 CR
CESI 594	Computer-Aided Construction <b>(online)</b>	3 CR
CESI 596	Pavement Construction <b>(online)</b>	3 CR
CM 582	Heavy Construction Estimating <b>(online)</b>	3 CR
CM 586	Utility System Design <b>(online)</b>	3 CR

**Notes:**

- 1) A wide variety of 400 and 500 level construction-oriented courses are available to CESI Construction graduate students through the Department of Construction Management in the College of the Built Environment.
- 2) Environmental Health graduate courses can be a good fit in your program. Consult the latest offering information via their website.
- 3) CEE 490 focuses on air quality. This course is taught in a manner that can be of interest to those in construction.
- 4) The courses shown in the table above are subject to change—so check the latest updates on the departmental website and/or UW Time Schedule page as it becomes available. Changes can occur from quarter to quarter. Course availability is a bit of a moving target, but the above list is a good start for your consideration.

### 5. Typical Courses taken by Quarter—Energy and Sustainable Infrastructure Track

As before, the courses shown by academic quarter in the table below are to help you develop an initial degree plan. Additional course offerings that may be of interest to energy and sustainable infrastructure-oriented students are available in numerous other departments such as Geological Sciences, Architecture, Urban Planning, Environmental Health, etc. You have significant latitude in selecting courses that directly or indirectly relate to energy and sustainable infrastructure. **Consider the list below as a starting point in your selection.**

<b>AUTUMN 2020</b>		
CEE 424	GIS for Civil Engineers	3 CR
CEE 429	Sustainability in Building Infrastructure	3 CR
CEE 480	Air Quality Modeling	3 CR
CEE 483	Drinking Water Treatment	3 CR
CESI 502	Geospatial Data for Energy Projects <b>(online)</b>	3 CR
CESI 588	Energy Infrastructure and the Environment <b>(online)</b>	3 CR
CEE 599	Sustainable and Healthy Buildings in a Global Context	3 CR
CM 500	Design and Construction Law	3 CR
<b>WINTER 2021</b>		
CEE 408	Sustainable Roadway Design and Construction	3 CR
CEE 477	Open-Channel Flow	3 CR
CEE 482	Wastewater Reuse and Resource Recovery	3 CR
CEE 454	Design of Timber Structures	3 CR
CEE 434 (498)	Project Estimating	3 CR
CEE 435 (498)	Project Scheduling	3 CR
CESI 505	Air Pollution and Occupational Safety and Health <b>(online)</b>	3 CR
CM 540	Sustainable Construction	3 CR
<b>SPRING 2021</b>		
CEE 420	Engineering with Developing Communities	3 CR
CEE 429	Sustainability in Building Infrastructure (this may be moved)	3 CR
CEE 490	Air Pollution Control	3 CR
CESI 501	Distributed Renewable Power Systems <b>(online)</b>	3 CR
CESI 503	Operation of a Power Plant <b>(online)</b>	3 CR
CM 515	Innovative Project Management Concepts	3 CR
CM 530	Project Economics and Risk Analysis	3 CR
CEE 600	Research	3 CR
<b>SUMMER 2021</b>		
CESI 504	Buildings, LEED and Energy Use <b>(online)</b>	3 CR
CM 586	Utility System Construction <b>(online)</b>	3 CR

**Notes:**

- 1) Environmental Health graduate courses can be a good fit in your program. Consult the latest offering information via their website.
- 2) If you take CESI 505, then it is best to not take CEE 480 or 490.
- 3) The courses shown in the table above are subject to change—so check the latest updates on the departmental website and/or UW Time Schedule page as it becomes available. Changes can occur from quarter to quarter. Course availability is a bit of a moving target, but the above list is a good start for your consideration.

## 5. Additional Information

- **MSCE thesis vs non-thesis degree options:** Students who do a thesis must take at a minimum 9 credits of CEE 700 which represents over 20% of the 42 credits to graduate. The work associated with a thesis is substantial and may be of special interest if you are considering a PhD. Further, a student that does a thesis should have financial assistance either from funded research studies or independent financial sources. Non-thesis students typically do coursework only and should not expect an offer of department-based financial assistance. All Additional details about CEE 600 are provided on p.1 of this document.
- **Online and on-campus courses and costs:** On both lists of recommended courses, some are designated online...all others are traditional on-campus delivered courses. As noted above, non-thesis students are generally self-funded while most thesis students are supported with research assistantships or fellowships. CEE Master's degrees course costs vary along with the registration process:
  - **In-state tuition:** Generally, this applies to military officers assigned to UW/CEE to pursue a MSCE degree and to some in-state students.
  - **Out-of-state tuition:** Can apply to out of state MS students but this occurs infrequently due to the PMP (see below).
  - **Professional Master's Program (PMP):** The cost per-credit is the same for Washington state residents and non-residents, including international students. The rate for AY 2020-2021 is approximately \$640 per credit.
  - **UW Continuum College/Professional Continuing Education:** This group is responsible for registration for online degrees at UW, the PMP in Civil Engineering and Summer Quarter. Online course credit fees vary.
  - **Graduate Fellowships:** Information about Graduate Fellowships can be found at <https://www.ce.washington.edu/future/grad/funding>
  - **Scholarships:** All CESI graduate students are eligible for a group of scholarships which range in total value from \$1000 up to \$4000. The total funds available are modest.