

Master of Science in Engineering - Civil and Environmental Engineering

Plan Description

The Department of Civil and Environmental Engineering and Construction (CEEC) at UNLV offers a number of program degree options leading to the Master of Science in Engineering (M.S.E.) - Civil and Environmental Engineering. Specific areas of engineering that are currently available include Construction, Geotechnical, Structural, Transportation, and Water Resources/Environmental. Two tracks (thesis and project) are available in M.S.E. degree program along with an Integrated BS-MSE Thesis Track for currently enrolled CEEC undergraduate students.

For more information about your program, including your graduate program handbook and learning outcomes please visit the Degree Directory.

Plan Admission Requirements

Application deadlines Applications available on the UNLV Graduate College website. Admission to the program leading to the M. S. E. degree in thesis and project tracks is open to those students completing the following requirements: 1. Applications must include all documentation as required by the Graduate College. Applications should be submitted through the Grad Rebel Gateway system. 2. Applicant must have a bachelor's degree in engineering or a closely-related discipline with an overall GPA of 2.75 (4.00=A) and a GPA of 3.0 (4.00=A) for the last 60 ~~credit hours~~ **(semester credits(semester basis))** of undergraduate program. 3. Applicants desiring to specialize in environmental engineering who have baccalaureate degrees in the natural sciences may require at least an additional semester of **fulltime full time** study to complete engineering prerequisite undergraduate course work; this may include fluid mechanics, calculus through differential equations, engineering physics, chemistry and engineering economics. ~~Successful environmental~~ **Successful environmental environmental** engineering applicants are expected to complete a set of graduate courses in engineering hydrology, hydraulics, statistics, water and wastewater treatment, and wastewater treatment plant design during their graduate study. 4. The CEEC Graduate Program Committee (GPC) and Graduate Coordinator make all the final decisions after review of each applicant's records and admissions information. 5. The applicant must submit a Statement of Intent (SOI) with no more than two pages, indicating ~~his/her~~ **their** interests in the area of specialization (construction, geotechnical, structural, transportation, and water resources/environmental) and objectives in working toward a M. S. E. degree. 6. In addition, ~~two-three~~ **two** letters of recommendation (LOR) must be submitted from individuals familiar with the applicant's knowledge, skills and abilities. It is highly recommended that LOR ~~be written on documents are created using~~ **official letter head with signature letterheads (e. g. academic advisor, academic faculty, professional supervisor).** ~~LOR Also, applicants applic ants applica nts applicant s must be submitted using enter official email address addresses of those sending an LOR.~~ **7. A short resume (no more than 2 pages) must be submitted.** **8.** International ~~applicants appli cants applicants~~ **applicants applicants** must meet English proficiency requirements ~~established esta blished~~ **established** in the UNLV Graduate Catalog. ~~8~~ **9.** All applicants are required to take GRE General Test and submit the scores to the University of Nevada, Las Vegas (code 4861). Successful applicants generally have a combined verbal and quantitative GRE score of at least 300 and analytical writing score of at least 3. ~~9: A recent short resume of one to two page (no more than 2 pages) must be submitted.~~ All domestic and international applicants must review and follow the Graduate College Admission and Registration Requirements. Additional Requirements for the Integrated BS-MSE Thesis Track This

program is designed to provide high-achieving ~~CEEC~~ undergraduate students **in CEEC department** with the opportunity to be exposed to graduate courses and encourage them to continue with a graduate degree by reducing the time needed for degree completion. Up to six ~~credit hours credits~~ **credits** of approved ~~graduate-level graduate-level coursework graduate-level coursework coursework~~ **coursework** with grades of B or better can be taken as technical electives during the ~~senior senior~~ **senior** year. Those ~~credit hours credits~~ **credits** will be also counted ~~towards towards towards~~ **towards** the graduate degree coursework. **The students who are not in not enrolled in CEEC undergraduate undergraduate Civil Engineering degree cannot apply for this degree plan.** The following additional requirements must be ~~satisfied satisfied~~ **satisfied**: 1. A minimum of two semesters of ~~full-time full time~~ **full-time** enrollment in B. S. of Civil and Environmental Engineering program at UNLV is required. 2. A minimum of 90 ~~credit hours credits~~ **credits** of course work applicable to the B. S. of Civil and Environmental Engineering degree must be completed before beginning the joint degree program. 3. An overall cumulative GPA of 3.20 or higher is needed to begin the Integrated BS-MSE Thesis Track degree program. Once a student has been admitted into the Integrated BS-MSE Thesis Track program, they must then submit an application for an M. S. E. program in Civil Engineering. The student has to follow the normal application procedures found on ~~the the the~~ **the** UNLV ~~Graduate Graduate Gradu ate~~ **Graduate** College website. Additionally, Student must meet all departmental ~~and and and~~ **and** Graduate College application deadlines. Student ~~should should should~~ **should** indicate in their application materials that they are ~~participating pa rticipating~~ **participating** in the Integrated BS-MSE Thesis Track program. Student should request a letter of nomination from a CEEC faculty member. Submit this ~~letter letter~~ **letter** along with a short resume (no more than 2 pages). The materials will be evaluated by three faculty members in the student's technical area of interest or nearby areas. Student must choose the Integrated BS-M. S. E. Thesis Track Students are accepted into a degree program as described in the Graduate Catalog. The faculty, specific areas, and degree tracks within the described programs are subject to change at any time.

Plan Requirements

See Subplan Requirements below.

Subplan 1: Thesis Track

Subplan 2: Project Track

Subplan 3: The Integrated BS-MSE Thesis Track

Subplan 1 Requirements: Thesis Track

Total Credits Required: 30

Course Requirements

Required Course – Credits: 3

CEE 700 Research Methods in Civil and Environmental Engineering

3

Elective Courses – Credits: 18

~~Students must successfully complete a minimum~~ **Complete 18 credits of 3 courses from advisor approved electives, including CEE 700 and 9 credits in one of the five categories in the following discipline-based list: concentrations.**

Construction

CEM 651 Construction Estimating	4
CEM 653 Construction Scheduling and Resource Optimization	3
CEM 751 Construction Cost Analysis and Estimating	3
CEE 609 Engineering Project Management	3
CEE 710 Modular Construction	3
CEE 720 Information and Sensing Technology in Construction	3
CEE 785 Construction Engineering Management	3
[After] CEE 672-Construction Estimating of Infrastructure Projects	4
[After] CEE 673-Construction Estimating Scheduling for Infrastructure Projects	4 3
[After] CEE 730 - Introduction to Big Data Analytics for Infrastructure Applications	3

Geotechnical

CEE 710 Modular Construction	3
CEE 731 Pavement Materials and Design	3
CEE 732 Advanced Foundation Engineering	3
CEE 734 Advanced Soil Mechanics	3
CEE 736 Earth Slopes and Retaining Structures	3
CEE 737 Soil Dynamics and Earthquake Engineering	3
CEE 741 Design of Highway Bridge Structures	3
CEE 785 Construction Engineering Management	3
CEE 720 Information and Sensing Technology in Construction	3
[After] 730 - Introduction to Big Data Analytics for Infrastructure Applications	3

Transportation

Students must successfully complete a minimum of 2 courses at the 700 level from the following list

CEE 725 Freight Transportation	3
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CEE 726 Railroad Operations	3
CEE 735 Earth Dams and Embankments	3
CEE 761 Transportation Demand Analysis	3
CEE 762 Operations Research Applications in Civil Engineering	3
CEE 763 Advanced Traffic Engineering	3
CEE 661 Introduction to Railroad Transportation	3
CEE 662 Railroad Engineering	3
CEE 663 Traffic Engineering	3
CEE 664 Airport Design	3
CEE 666 Geometric Design of Highways	3
CEE 667 Computer Applications in Transportation Engineering	3
CEE 671 Public Transportation Systems	3
CEE 760 Transportation Planning	3
CEE 764 Air Transportation	3
[After] CEE 727 - Transportation Safety	3
[After] CEE 730 - Introduction to Big Data Analytics for Infrastructure Applications	3

Structure

CEE 741 Design of Highway Bridge Structures	3
CEE 744 Design of Prestressed/Post-Tensioned Concrete Structures	3
CEE 748 Advanced Design of Timber Structures	3
CEE 775 Seismic Response of Structures	3
CEE 780 Advanced Reinforced Concrete Structures	3

Water Resources/ Environmental

CEE 704 Environmental & Water Systems	3
CEE 709 Numerical Methods in Mechanics	3
CEE 750 Urban Runoff Quality and Control	3
CEE 751 Water Reuse Principles and Design	3
CEE 754 Biochemical Wastewater Treatment Fundamentals	3
CEE 755 Advanced Physicochemical Methods for Water Treatment	3
CEE 756 Advanced Waste Treatment Design	3
CEE 757 Engineering Modeling of Natural Systems	3
CEE 758 Air Quality Modeling	3
CEE 759 Mass Transfer in Environmental Systems	3
CEE 768 Applied Geographic Information Systems	4

(Optional) Graduate Internship Course - Credit: Maximum up to 1

Students engaged in Curricular Practical Training (CPT) must take CEE 792. The course can be taken maximum one time during their study. However, the credit will not be counted towards the degree.

CEE 792 Graduate Internship for Master in Civil Engineering and Transportation

1

Thesis – Credits: 9

CEE 797 Thesis in Civil Engineering

3 – 9

Degree Requirements

1. A Thesis Advisory Committee composed of at least four members of the UNLV graduate faculty is to be formed for the student. At least two of the committee members must be from tenured or tenure-track faculty of the CEEC Department and the third member from a related field. The fourth faculty member, the Graduate College Representative, is recommended by advisor/advisee and appointed by the Graduate College. It is recommended that the Thesis Advisory Committee collective expertise reflects the thesis topic. The committee chair must be a **tenured or tenure-track** faculty from the area of expertise chosen for thesis topic. 2. In addition to CEE 700, all students must successfully complete a minimum of 18 **credit hours credits** of approved graduate courses, out of which a minimum of 3 courses from one of the five categories in the discipline-based list provided above. 3. In addition to the coursework requirements, 9 credits of research work associated with the master's level thesis (CEE 797) with the **outcome outcome** being a **manuscript manuscript** written for a specific indexed conference or journal. 4. At least 50% of the courses (600 and 700 level) within the total coursework must be from the College of Engineering. 5. At least 50% of the courses within the total coursework must be 700 level. 6. Students must maintain a minimum grade point average of 3.00. A course in which a grade of less than C was earned will not be considered for use toward the degree. 7. All requirements for the M. S. E. are met upon the satisfactory completion of the proposed research, the submission of a satisfactory thesis, and the successful oral defense of the thesis before the Thesis Advisory Committee.

Graduation Requirements

1. The student must submit all required forms to the Graduate College **and then as well as** apply for graduation up to two semesters prior to completing **his/her their** degree requirements. 2. The student must submit and successfully defend **his/her their** thesis by the posted deadline. The defense must be advertised and is open to the public. 3. After the thesis defense, the student must electronically submit a properly formatted pdf copy of their thesis to the Graduate College for format check. Once the thesis format has been approved by the Graduate College, the student will submit the approved electronic version to ProQuest. Deadlines for thesis defenses, format check submissions, and the final ProQuest submission can be found here.

Subplan 2 Requirements: Project Track

Total Credits Required: 30

Course Requirements

Elective Courses - Credits: 27

~~Students must successfully complete a minimum~~ Complete 27 credits of ~~3 courses~~ from advisor approved electives, including ~~CEE 700 and~~ 9 credits in one of the ~~five categories in the~~ following ~~discipline-based list~~ concentrations.

Construction

CEM 651 Construction Estimating	4
CEM 653 Construction Scheduling and Resource Optimization	3
CEM 751 Construction Cost Analysis and Estimating	3
CEE 609 Engineering Project Management	3
CEE 710 Modular Construction	3
CEE 720 Information and Sensing Technology in Construction	3
CEM 705 Construction Engineering Management	3
[After] CEE 672-Construction Estimating of Infrastructure Projects	4
[After] CEE 673-Construction Scheduling for Infrastructure Projects	3
[After] CEE 730 - Introduction to Big Data Analytics for Infrastructure Applications	3

Geotechnical

CEE 710 Modular Construction	3
CEE 731 Pavement Materials and Design	3
CEE 732 Advanced Foundation Engineering	3
CEE 734 Advanced Soil Mechanics	3
CEE 736 Earth Slopes and Retaining Structures	3
CEE 737 Soil Dynamics and Earthquake Engineering	3
CEE 741 Design of Highway Bridge Structures	3
CEE 785 Construction Engineering Management	3

CEE 720 Information and Sensing Technology in Construction	3
[After] CEE 730 - Introduction to Big Data Analytics for Infrastructure Applications	3

Transportation

Students must successfully complete a minimum of 2 courses at the 700 level from the following list

CEE 725 Freight Transportation	3
CEE 726 Railroad Operations	3
CEE 735 Earth Dams and Embankments	3
CEE 761 Transportation Demand Analysis	3
CEE 762 Operations Research Applications in Civil Engineering	3
CEE 763 Advanced Traffic Engineering	3
CEE 661 Introduction to Railroad Transportation	3
CEE 662 Railroad Engineering	3
CEE 663 Traffic Engineering	3
CEE 664 Airport Design	3
CEE 666 Geometric Design of Highways	3
CEE 667 Computer Applications in Transportation Engineering	3
CEE 671 Public Transportation Systems	3
CEE 760 Transportation Planning	3
CEE 764 Air Transportation	3
[After] CEE 727 - Transportation Safety	3
[After] CEE 730 - Introduction to Big Data Analytics for Infrastructure Applications	3

Structure

CEE 741 Design of Highway Bridge Structures	3
CEE 744 Design of Prestressed/Post-Tensioned Concrete Structures	3
CEE 748 Advanced Design of Timber Structures	3
CEE 775 Seismic Response of Structures	3
CEE 780 Advanced Reinforced Concrete Structures	3

Water Resources/ Environmental

CEE 704 Environmental & Water Systems	3
CEE 709 Numerical Methods in Mechanics	3
CEE 750 Urban Runoff Quality and Control	3
CEE 751 Water Reuse Principles and Design	3

CEE 754 Biochemical Wastewater Treatment Fundamentals	3
CEE 755 Advanced Physicochemical Methods for Water Treatment	3
CEE 756 Advanced Waste Treatment Design	3
CEE 757 Engineering Modeling of Natural Systems	3
CEE 758 Air Quality Modeling	3
CEE 759 Mass Transfer in Environmental Systems	3
CEE 768 Applied Geographic Information Systems	4

(Optional) Graduate Internship Course - Credit: Maximum up to 1

Students engaged in Curricular Practical Training (CPT) must take CEE 792. The course can be taken maximum one time during their study. However, the credit will not be counted towards the degree.

CEE 792 Graduate Internship for Master in Civil Engineering and Transportation	1
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Project - Credits: 3

CEE 796 Design Project in Civil Engineering	1 – 3
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Degree Requirements

1. The student's Advisor should be tenured or a tenure-track faculty member of the CEEC Department. An advisory committee is not required. 2. Students must complete a minimum of 27 **credit-hours credits** of approved graduate-level courses, out of which a minimum of 3 courses from one of the five categories in the discipline-based list provided above, and 3 credits of project work associated with the master's level project (CEE 796) with the outcome being a paper written for a specific indexed conference or journal. 3. At least 50% of the courses (600 and 700 level) within the total coursework must be from the College of Engineering. 4. At least 50% of the courses within the total coursework must be 700 level. 5. Students must maintain a minimum grade point average of 3.00. A course in which a grade of less than C was earned will not be considered for use toward the degree. 6. All requirements for the M. S. E. are met upon the satisfactory completion of the project, and the submission of a satisfactory **-project project** report to the Advisor.

Graduation Requirements

1. The student must submit all required forms to the Graduate College **-and then as well as** apply for graduation up to two semesters prior to completing **-his/her their** degree requirements. 2. The student must successfully complete a project and submit a project report.

Subplan 3 Requirements: The Integrated BS-MSE Thesis Track

Total Credits Required: ~~30-24-27~~ **30**

Course Requirements

Required Courses - Credits: 3

CEE 700 Research Methods in Civil and Environmental Engineering	3
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Elective Courses-Credits: ~~18-12-15~~ **18**

~~Students must successfully complete a minimum Elective credits up to 6 credits completed during a student's undergraduate degree can be added. Complete the remaining 12 to 15 18 credits of 3 courses from advisor approved electives, including CEE 700 and 9 credits in one of the five categories in the following discipline-based list: concentrations. Elective credits vary according to the credits completed during student's undergraduate degree (up to 6 credits). Elective credits will vary according up to the 6 credits completed during a student's undergraduate degree; up to 6 credits can be used towards the MSE, and are accounted for during admissions to the BS-MSE track added.~~

Construction

CEM 651 Construction Estimating	4
CEM 653 Construction Scheduling and Resource Optimization	3
CEM 751 Construction Cost Analysis and Estimating	3
CEE 609 Engineering Project Management	3
CEE 710 Modular Construction	3
CEE 720 Information and Sensing Technology in Construction	3
CEE 785 Construction Engineering Management	3
CEM 705 Construction Engineering Management	3
[After] CEE 672-Construction Estimating of Infrastructure Projects	4
[After] CEE 673-Construction Scheduling for Infrastructure Projects	3
[After] CEE 730 - Introduction to Big Data Analytics for Infrastructure Applications	3

Geotechnical

CEE 710 Modular Construction	3
CEE 731 Pavement Materials and Design	3
CEE 732 Advanced Foundation Engineering	3
CEE 734 Advanced Soil Mechanics	3
CEE 736 Earth Slopes and Retaining Structures	3
CEE 737 Soil Dynamics and Earthquake Engineering	3
CEE 741 Design of Highway Bridge Structures	3
CEE 785 Construction Engineering Management	3
CEE 720 Information and Sensing Technology in Construction	3
[After] CEE - 730 Introduction to Big Data Analytics for Infrastructure Applications	3

Transportation

Students must successfully complete a minimum of 2 courses at the 700 level from the following list

CEE 725 Freight Transportation	3
CEE 726 Railroad Operations	3
CEE 735 Earth Dams and Embankments	3
CEE 761 Transportation Demand Analysis	3
CEE 762 Operations Research Applications in Civil Engineering	3
CEE 763 Advanced Traffic Engineering	3
CEE 661 Introduction to Railroad Transportation	3
CEE 662 Railroad Engineering	3
CEE 663 Traffic Engineering	3
CEE 664 Airport Design	3
CEE 666 Geometric Design of Highways	3
CEE 667 Computer Applications in Transportation Engineering	3
CEE 671 Public Transportation Systems	3
CEE 760 Transportation Planning	3
CEE 764 Air Transportation	3
[After] CEE 727 - Transportation Safety	3
[After] CEE 730 - Introduction to Big Data Analytics for Infrastructure Applications	3

Structure

CEE 741 Design of Highway Bridge Structures	3
CEE 744 Design of Prestressed/Post-Tensioned Concrete Structures	3
CEE 748 Advanced Design of Timber Structures	3
CEE 775 Seismic Response of Structures	3

CEE 780 Advanced Reinforced Concrete Structures	3
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Water Resources/ Environmental

CEE 704 Environmental & Water Systems	3
CEE 709 Numerical Methods in Mechanics	3
CEE 750 Urban Runoff Quality and Control	3
CEE 751 Water Reuse Principles and Design	3
CEE 754 Biochemical Wastewater Treatment Fundamentals	3
CEE 755 Advanced Physicochemical Methods for Water Treatment	3
CEE 756 Advanced Waste Treatment Design	3
CEE 757 Engineering Modeling of Natural Systems	3
CEE 758 Air Quality Modeling	3
CEE 759 Mass Transfer in Environmental Systems	3
CEE 768 Applied Geographic Information Systems	4

(Optional) Graduate Internship Course - Credit: Maximum up to 1

Students engaged in Curricular Practical Training (CPT) must take CEE 792. The course can be taken maximum one time during their study. However, the credit will not be counted towards the degree.

CEE 792 Graduate Internship for Master in Civil Engineering and Transportation	1
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Thesis – Credits: 9

CEE 797 Thesis in Civil Engineering	3 – 9
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Degree Requirements

1. A Thesis Advisory Committee composed of at least four members of the UNLV graduate faculty is to be formed for the student. At least two of the committee members must be from tenured or tenure-track faculty of the CEEC Department and the third member from a related field. The fourth faculty member, the Graduate College Representative, is recommended by advisor/advisee and appointed by the Graduate College. It is recommended that the Thesis Advisory Committee collective expertise reflects the thesis topic. The committee chair must be a **tenured or tenure-track** faculty from the area of expertise chosen for thesis topic. 2. **In addition to Including CEE 700, all students must successfully complete a minimum of 18-credit hours credits (12-15 for BS-MSE)** of approved graduate courses, out of which a minimum of 3 courses from one of the five categories in the discipline-based list provided above. 3. In addition to the coursework

requirements, 9 credits of research work associated with the master's level thesis (CEE 797) with the outcome ~~being be ing~~ a ~~manuscri-pt~~ ~~manuscript~~ written for a specific indexed conference or journal. 4. At least 50% of the courses (600 and 700 level) within the total coursework must be from the College of Engineering. 5. At least 50% of the courses within the total coursework must be 700 level. 6. Students must maintain a minimum grade point average of 3.00. A course in which a grade of less than C was earned will not be considered for use toward the degree. 6. All requirements for the M. S. E. are met upon the satisfactory completion of the proposed research, the submission of a satisfactory thesis, and the successful oral defense of the thesis before the Thesis Advisory Committee. In addition to this, the following are required. Additional Requirements for the Integrated BS-MSE: Students enrolled through Integrated BS-MSE Thesis Track option must meet requirements for both B. S. and M. S. E. degree as follows: B. S. Degree Requirements: 1. Students must successfully complete all of the existing B. S. ~~degree~~ ~~requirements-requi-rements-deg-ree~~ ~~degree~~ ~~requirements-for fo r~~ ~~Civil-Engine-ering~~ ~~Engineering~~ at UNLV. 2. Students may take up to 6 credits of approved graduate level courses in place of undergraduate courses. These classes would typically substitute for the undergraduate technical electives. 3. Undergraduates taking graduate courses must pay the graduate tuition and fees for these courses. 4. Students will graduate with the B. S. degree as soon as all B. S. degree requirements are completed. M. S. E. Degree Requirements: 1. Students must meet all of the other degree requirements for the M. S. E. Thesis Track degree. 2. The 6 graduate-level class credits taken as part of the undergraduate program may count for the M. S. E. degree as long as the course grades are B (3.00) or better and their average GPA for these classes is a 3.00 or above. 3. Students must pursue Thesis Track to receive the course release. Students who later elect to pursue a M. S. E. Project Track degree must apply to the M. S. E. degree and complete all the requirements listed for ~~that tha-t degree~~ ~~that-deg-ree~~ ~~degree~~.

Graduation Requirements

1. The student must submit all required forms to the Graduate College ~~and then as well as~~ apply for graduation up to two semesters prior to completing ~~his/her their~~ degree requirements. 2. The student must submit and successfully defend ~~his/her their~~ thesis by the posted deadline. The defense must be advertised and is open to the public. 3. After the thesis defense, the student must electronically submit a properly formatted pdf copy of their thesis to the Graduate College for format check. Once the thesis format has been approved by the Graduate College, the student will submit the approved electronic version to ProQuest. Deadlines for thesis defenses, format check submissions, and the final ProQuest submission can be found here.

Plan Graduation Requirements

Refer to your subplan for Graduation Requirements.

Subplan 1: Thesis Track

Subplan 2: Project Track

Subplan 3: The Integrated BS-MSE Thesis Track