Doctor of Philosophy - Civil and Environmental Engineering

Plan Description

The Department of Civil and Environmental Engineering & Construction (CEEC) at UNLV offers a number of program degree options leading to the Doctor of Philosophy (Ph.D.) - Civil and Environmental Engineering. Specific areas of engineering that are currently available include Construction, Geotechnical, Structural, Transportation, and Water Resources/Environmental. Two tracks are available (1) Post-Master's Track and (2) Post-Bachelor's Track.

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

Plan Admission Requirements

Application deadlinesApplications available on the UNLV Graduate College website. Admission to the program leading to the Ph. D. in Engineering in the field of Civil and Environmental Engineering is open to those students completing the following requirements: Applications should be submitted in the Grad Rebel Gateway System. 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 Ph. D. degree. In addition, three 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)**. ~~The LOR~~ **Also, applicants must** ~~be submitted using~~ **enter official email** ~~addresses address~~ **addresses of those sending an LOR. A** ~~recent~~ **short** ~~resume of one to two page resum e~~ **resume (no more than 2 pages) must be submitted.** International applicants must meet English ~~Proficiency Pro ficiency Profi ciency~~ **Proficiency** requirements established in UNLV Graduate ~~Catalog Catalo g Cat alog~~ **Catalog**. All applicants are required to take GRE General Test and submit the scores to the University of Las Vegas, Nevada (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. Post-Master's TrackThe applicant to this track must have a Master of Science in Engineering degree or equivalent with a major in civil engineering or a closely allied field. Students with non-engineering backgrounds will be required to complete a set of coursework requirements that will ensure successful completion of the Ph. D. specialization. The CEEC Graduate Program Committee (GPC) and Graduate Coordinator make all the final decisions after the review of each applicants records and admissions information. A minimum post-baccalaureate GPA of 3. 20 on a 4. 00 scale (4. 00=A) or ~~equivalent e quivalent~~ **equ ivalent** is required for admission. The CEEC GPC and Graduate Coordinator make all ~~the th e final~~ **the** ~~fi nal fina l~~ **final** decisions after the review of each applicants ~~records reco rds~~ **records** and admissions information. Post-Bachelor's TrackThe ~~applicant a pplicant~~ **applicant** to ~~thi s~~ **this** track must have earned a Bachelor of Science in Engineering degree or equivalent with a major in civil engineering or a closely allied field. The CEEC GPC and Graduate Coordinator make all the final decisions after the review of each applicants records and admissions information. A minimum baccalaureate overall GPA of 3. 20 on a 4. 00 scale (4. 00=A) and GPA of 3. 5 for the last 60 ~~credit hours~~ **credits** is required for admission. The CEEC GPC and Graduate Coordinator make all the final decisions after the review of each applicants records and admissions information. All domestic and international applicants must review and follow the Graduate College Admission and Registration Requirements. Students are

accepted into a degree program as described in the Graduate Catalog. The faculty ~~and an d~~ and ~~corresponding~~ corre sponding sub-disciplines and sub-plans within the described programs are ~~subject subje ct to~~ subject ~~t o~~ to change at any time.

Plan Requirements

See Subplan Requirements below.

Subplan 1: Post-Master's Track
Subplan 2: Post-Bachelor's Track

Subplan 1 Requirements: Post-Master's Track

Total Credits Required: 42

Course Requirements

Elective Courses - Credits: 24

~~Students must successfully complete a minimum~~ Complete 24 credits of ~~3 courses from~~ advisor approved electives, including ~~CEE 700 and~~ 9 credits in one of the ~~five categories mentioned in the discipline-based list~~ following 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]~~	~~3~~
~~[Before]~~ CEE 730 Introduction to ~~Bid~~ Big Data [After] Analytics for Infrastructure Applications	3
[After] CEE 672-Construction Estimating of Infrastructure Projects	4
[After] CEE 673-Construction Scheduling for Infrastructure Projects	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 Bid Data Analytics for Infrastructure Applications	**3**

Transportation

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 760 Transportation Planning	**3**
CEE 764 Air Transportation	**3**
[After] CEE 727- Transportation Safety	**3**
[After] CEE 730-Introduction to ~~Bid~~ 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-Credits: Maximum up to 3

Students engaged in Curricular Practical Training (CPT) must take CEE 793. The course can be taken maximum three times during their study. However, these credits will not be counted towards the degree.

CEE 793 Graduate Internship for PhD Civil & Environmental Engineering	1

Dissertation – Credits: 18

CEE 799 Dissertation Research	1 – 9

Degree Requirements

Complete 24 credits of advisor-approved elective graduate-level coursework. Doctoral students who have not completed CEE 700, or its 3-credit equivalent, or did not write a thesis as part of their Master of Science studies, will be required to complete CEE 700. CEE 700 course will be counted towards elective ~~**credit hours**~~ **credits**. In addition to CEE 700, all students must successfully complete a minimum of 21 ~~**credit hours**~~ **credits** of approved graduate-level coursework beyond the degree of Master of Science in Engineering. For students who have completed CEE 700, or equivalent, during their Master of Science studies, a minimum of 24 ~~**credit hours**~~ **credits** of approved graduate-level coursework is required. A Doctoral Advisory Committee composed of at least five members of the UNLV graduate faculty is to be formed for the student. At least three of the committee members must be from tenured or tenure-track faculty of the CEEC Department and the fourth member from a related field. The fifth faculty member, the Graduate College ~~**Representative R epresentative**~~ **Repres entative**, is recommended by advisor/advisee and appointed by the Graduate College. It is strongly recommended that the Doctoral Advisory Committee collective expertise reflects the dissertation topic. The committee chair must be a **tenured or tenure-track** faculty from the area of expertise chosen for dissertation topic. In addition to the coursework requirements, a dissertation consisting of at least 18 credits of CEE 799 is required with the outcome being manuscripts written for a specific indexed conference or journal. At least 50% of the courses (600 and 700 level) within the total coursework must be from the College of Engineering. At least 50% of the

courses within the total coursework must be 700 level. 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. Students must take doctoral qualifying exam including a written component prepared by the student's ~~graduate gradua te committee~~ **graduate committ ee committee**. ~~The gradua te~~ **T he graduate** committee shall provide the examination to the CEEC Department Graduate Coordinator who will administer the written qualifying exam for the CEEC Department on scheduled dates. Students who have not passed the qualifying exam by their second attempt will be terminated from the Ph. D. program. After passing the qualifying exam in one area of specialty, the student moves to other area of specialty by changing the advisor; ~~he/she~~ **they** must retake the qualifying exam in the new area of specialty chosen by the student. After passing the qualifying exam, the doctoral student must pass a preliminary exam consisting of the preparation of a written proposal for the dissertation research followed by an oral defense of the proposal. The proposal must be approved by the student's Doctoral Advisory Committee.

Graduation Requirements

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. The student must submit and successfully defend ~~his/her~~ **their** dissertation by the posted deadline. The defense must be advertised and is open to the public. After the ~~thesis~~ **dissertation** 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~~ **dissertation** defenses, format check submissions, and the final ProQuest submission can be found here.

Subplan 2 Requirements: Post-Bachelor's Track

Total Credits Required: 60

Course Requirements

Elective Courses - Credits: 42

~~Students must successfully complete a minimum~~ **Complete 42 credits** of ~~3 courses from~~ **advisor approved electives, including** ~~CEE 700 and~~ **9 credits in** one of the ~~five categories mentioned in the discipline-based list~~ **following 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 730 - Introduction to Big Data Analytics for Infrastructure Applications	**3**
[After] CEE 672-Construction Estimating of Infrastructure Projects	**4**
[After] CEE 673-Construction Scheduling of Infrastructure Projects	**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

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 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**

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CEE 758 Air Quality Modeling	3
CEE 759 Mass Transfer in Environmental Systems	3
CEE 768 Applied Geographic Information Systems	4

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CEE 793 Graduate Internship for PhD Civil & Environmental Engineering	1

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Degree Requirements

Complete 42 credits of advisor-approved elective graduate-level coursework. Students will be required to complete CEE 700. CEE 700 course will be counted towards elective ~~**credit hours**~~ **credits**. In addition to CEE 700, all students must successfully complete a minimum of 39 ~~**credit hours**~~ **credits** of approved graduate-level coursework beyond the BS degree. A Doctoral

Advisory Committee composed of at least five members of the UNLV graduate faculty is to be formed for the student. At least three of the committee members must be from tenured or tenure-track faculty of the CEEC Department and the fourth member from a related field. The fifth faculty member, the Graduate College Representative, is recommended by advisor/advisee and appointed by the Graduate College. It is strongly recommended that the Doctoral Advisory Committee collective expertise reflects the dissertation topic. The committee chair must be a **tenured or tenure-track** faculty from the area of expertise chosen for dissertation topic. In addition ~~**to t o**~~ **to** the ~~**coursework require ments**~~ **cour sework requirements**, a dissertation consisting of at least 18 credits of CEE 799 is required with the outcome being manuscripts written for a specific indexed conference or journal. At least 50% of the courses (600 and 700 level) within the total coursework must be from the College of Engineering. At least 50% of the courses within the total coursework must be 700 level. 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. Students must take doctoral qualifying exam including a written component prepared by the student's graduate committee. The graduate committee shall provide the examination to the CEEC Department Graduate Coordinator who will administer the written qualifying exam for the CEEC Department on scheduled dates. Students who have not passed the qualifying exam by their second attempt will be terminated from the Ph. D. program. After passing the qualifying ~~**exam ex am**~~ **exam** in one area of ~~**specia lty**~~ **specialty**, the student moves to other area of specialty by changing the advisor; ~~**he/she**~~ **they** must retake the qualifying exam in the new area of specialty chosen by the student. After passing the qualifying exam, the doctoral student must pass a preliminary exam consisting of the preparation of a written proposal for the dissertation research followed by an oral defense of the proposal. The proposal must be approved by the student's Doctoral Advisory Committee.

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Plan Graduation Requirements

Refer to your subplan for Graduation Requirements.

Subplan 1: Post-Master's Track
Subplan 2: Post-Bachelor's Track