

DEPARTMENT OF CIVIL ENGINEERING

2021 - 2026 Graduate Program Study Planning Guide

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Students are held individually responsible for complying with all requirements of the rules and regulations of the Department, the University and the Board of Regents of The University of Texas System. Failure to read and comply with policies, regulations and procedures will not exempt a student from whatever penalties he or she may incur.

August 2021

DEPARTMENT OF CIVIL ENGINEERING

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DEPARTMENT OF CIVIL ENGINEERING

The purpose of this guide is to assist graduate students in planning their program of study. It is the intent of the Department to follow the schedule as shown; however, students should recognize that changes might occur due to unforeseen circumstances. Normally, the class schedule for each semester is available six months prior to the beginning of the semester. Students are advised to check the departmental bulletin board to see if there has been a change in scheduling and/or times that a course will be offered.

Students should recognize the importance of registering early. If students do not register at the proper time, it is virtually impossible to forecast which courses will make. Continuing students who do not register during the early registration period are not permitted to register until much later. If you delay registering for courses in an attempt to see if a course makes, you and others doing the same will likely be forcing class cancellation due to an insufficient number of students showing on the rolls for the early registration period. The decision to cancel a course due to insufficient enrollment is made approximately two weeks prior to the first day of class, i.e. enrollment of record at that time controls the cancellation of scheduled courses. Advising in the College of Engineering is generally held in March and October during the week immediately preceding the beginning of registration. Registration for continuing students normally begins in late March for the fall and summer semesters and in late October for the spring semester. Students should refer to the current Class Schedule to determine the exact time registration is scheduled.

The Department faculty is listed on page 4 of this booklet. If you have questions concerning your area of interest, please contact an appropriate faculty member (civil@uta.edu). If you have questions concerning admission to the Graduate School or rules of the Graduate School and/or Department, you should contact the Civil Engineering Student Records and Advising Office (records@uta.edu)

DEGREE PROGRAMS AND AREAS OF SPECIALIZATION

The Department of Civil Engineering offers an undergraduate B.S. degree in Civil Engineering, and graduate degrees of Master of Engineering in Civil Engineering, Master of Science in Civil Engineering, and Doctor of Philosophy in Civil Engineering. **At the graduate level, specialization in the areas of construction engineering and management, environmental engineering, geotechnical engineering, infrastructure engineering and management, structures and applied mechanics, transportation engineering and water resources (hydraulics-hydrology) engineering is available.**

The **Master of Science** degree is a **research-oriented** program in which completion of a thesis is mandatory. The degree consists of a minimum of **twenty-four (24)** credit hours of course work and an acceptable thesis (**six (6)** credit hours). Six (6) hours of thesis must be taken in the last semester (semester of graduation) but the research is expected to be conducted over a period starting earlier than the last semester.

The **Master of Engineering** degree is an engineering **practice-oriented non-thesis** program. The degree requires a minimum of **thirty (30)** credit hours. **Twenty-four (24)** credit hours must be taken in major area.

The **Ph.D. degree** is a research degree and, as such, requires the candidate to successfully carry out original, independent research in an area acceptable to the civil engineering faculty. In addition to research, this will require a minimum of five advanced courses beyond the master's degree core courses. Two of these five courses may be from outside the department if approved by the student's Ph.D. committee. A total of nine (9) hours of dissertation courses (CE 6399, 6699, or 6999) must be taken; at least three (3) of those hours must be in the semester of graduation.

COURSE OFFERINGS UNDER VARIABLE SUBJECT TITLES

Opportunities to take a formal course on a topic at the forefront of technology are provided through courses carrying numbers CE 5300 and CE 6300. These courses are provided as formal offerings in subjects of special interest to the student. These are formal courses and, as such, grades received will be consistent with formal course offerings. Any course taken under one of these numbers will appear on the student's transcript by subject title.

DISTANCE LEARNING

Selected classes are offered via the Internet during the semester that they are scheduled to be taught on campus. All courses delivered by Internet may be taken for full credit only, audit is not available. Distance Learning courses are indicated in the enclosed "Schedule of Class Offerings for Graduate Courses. "Check the CEE homepage (<https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/civil>) for individual course requirements over the Internet.

TENTATIVE PROGRAM OF WORK AND MAJOR PROFESSOR

A "Tentative Program of Work" must be **filed during the first semester** of full-time work on a master's degree, but **no later than the first twelve (12) hours** of graduate work. Approval of transfer credit requires the filing of a "Tentative Program of Work" during the first semester. A **student must select a Major Professor before the end of the first semester.**

GRADUATE SCHOOL AND DEGREE DEADLINES

Calendars listing dates of particular importance to graduate students can be found on the UT Arlington website <https://www.uta.edu/academics/academic-calendar>. **GRADUATING STUDENTS should refer to this calendar and the final semester checklist in the Regulations/Information section of the Catalog DURING THE FIRST WEEK of their final semester.** All Graduate School deadlines, unless otherwise specified, are final at 5:00 p.m. on the date specified in the Catalog, by which time all documents must be delivered to the Graduate School Office. Items requiring approval by graduate advisors, committees, instructors, department chairs, academic deans, etc. prior to delivery to the Graduate School should be initiated sufficiently in advance of the deadline for the required actions to be taken and approvals made before the deadline.

Master of Science (thesis) candidates are required to successfully defend and pass their thesis work through an oral examination to receive **six (6) credit hours** for the thesis (CE 5698) course.

The "Guide for Some Master's degree Form Deadlines" and "Guide for Some Doctoral Degree Form Deadlines" enclosed list pertinent actions required by the student to assist the student in meeting appropriate application deadlines.

COURSE CREDIT

With the approval of the student's Supervising Committee, the Committee on Graduate Studies, the Graduate Advisor and the Dean of the Graduate School, a maximum of **nine (9) hours of graduate course work** may be **transferred** from another US institution of recognized standing to a master's degree program.

With the approval of the student's Supervising Committee, the Committee on Graduate Studies, the Graduate Advisor and the Dean of the Graduate School, a maximum of **nine (9) hours of advanced undergraduate course work** may be **used toward a graduate degree provided they are not previously used to fulfill requirements for an undergraduate degree.**

Unless specifically allowed by concentration areas, no course(s) required in the undergraduate Civil Engineering Degree Program at UT-Arlington can be used for graduate credit. Since a number of departments in the University double-list a single course with an undergraduate and graduate course number, the student should be aware that an undergraduate course double-listed as (or taught with) a required graduate course cannot be applied toward a graduate degree. In addition, courses with substantially the same content as required undergraduate courses, regardless of listing, cannot be applied toward a graduate degree.

DEFICIENCY CREDIT

Students with ABET Accredited Civil Engineering Degrees: Students who have earned a civil engineering degree from a program accredited by the Accreditation Board for Engineering and Technology (ABET) are expected to have met all course requirements for pursuing a graduate degree. If any of the courses listed below as deficiency courses were not included in a student's undergraduate program, they must be taken as deficiency courses.

Students with ABET Accredited Engineering Degrees (Other than Civil), Non-ABET Accredited Engineering Degrees, and Non- Engineering Degrees: All students in this category must complete, as a minimum, course requirements listed below and those applicable to the area of specialization in which they wish to earn a graduate degree.

Minimum Undergraduate Course ⁽¹⁾

GRE: V: _____ Q: _____ TOEFL: _____ GPA: _____/4.0 SOP: Yes No REF LETTER: 0 1 2 3 MORE	DEFICIENCY STATUS	Required Leveling Courses for Areas of Study (CM Leveling)	ENVIRONMENTAL	GEOTECHNICAL	STRUCTURES AND APPLIED	WATER	TRANSPORTATION	INFRASTRUCTURE	CONSTRUCTION ENGINEERING	MCM	SSWEM	
COMMENT / COURSE NUMBER		(Check Area of Study)										
		BS in Engineering or Science					X					
		MATH 1308								X		
		MATH 2326	X	X	X	X	X	X	X		X	
		MATH 3319	X	X	X	X	X	X	X		X	
		CE 2311	X	X	X	X	X	X	X			
		CE 2313		X	X	X	X	X	X			
		CHEM 1465	X									
		CE 1252 Computer Tools-					X					
		CE 2331 Engineering Measurement and Computer					X					
		CE 3301 (IE 3301)	X			X	X	X	X		X	
		CE 3302 Transportation					X					
		CE 3305 Basic Fluid Mech.	X			X						
		CE 3342 Intro. to Water	X			X						
		CE 3310 Construction and Value Engr.						X				
		CE 3131 Environmental	X									
		CE 3142 Applied Fluid	X			X						
		CE 3143 Prop. & Beh. of		X								
		CE 3261 Prop. & Beh. of		X	X			X	X			
		CE 3334 Prin. Of Env. Engr.	X									
		CE 3341 Structural Analysis			X			X	X			
		CE 3343 Soil Mechs		X					X			
		CE 4347 Reinforced Conc.			X							

* Equivalent courses for Construction Engineering and Management Students

- (1) Prerequisites for deficiency courses are not listed. Consult the Undergraduate Catalog for prerequisite requirements.
- (2) For Infrastructure - Student must have a Civil Engineering Bachelor's Degree or equivalent degree.

CIVIL ENGINEERING FACULTY

FACULTY	AREA	OFFICE	TELEPHONE	E-MAIL ADDRESS
Dr. ALI ABOLMAALI, P.E., Professor and Department Chair	Structures and Materials	NH 423	817-272-5055	abolmaali@uta.edu
Dr. MELANIE L. SATTLER, P.E., Professor, Associate Chair	Environmental Engineering	NH 406	817-272-5410	msattler@uta.edu
Dr. HABIB AHMARI, P.E., Assistant Professor	Water Resources Engineering	NH 248C	817-272-6588	habib.ahmari@uta.edu
Dr. WARDA ASHRAF, Assistant Professor	Structures and Materials	NH 405	817-272-3408	warda.ashraf@uta.edu
Dr. RAAD AZZAWI, P.E., Associate Professor of Instruction	Structures and Materials	NH 337	817-272-1770	azzawi@uta.edu
Dr. JUAN BALDERRAMA, Assistant Professor of Instruction	Structures and Materials	NH 333	817-272-3761	juan.balderrama@uta.edu
Dr. ARPITA BHATT, Assistant Professor of Instruction	Construction Management	NH 336	817-272-6259	arpita.bhatt@uta.edu
Dr. SHIH-HO CHAO, P.E., Professor.	Structures and Materials	NH 407	817-272-2550	shchao@uta.edu
Dr. HYEOK CHOI, Associate Professor and Area Coordinator	Environmental Engineering	NH 437	817-272-5116	hchoi@uta.edu
Dr. ERNEST CROSBY, Graduate Advising	Graduate Advisor Master of Construction Management	NH 420	817-272-3500	ecrosby@uta.edu
Dr. GAUTAM EAPI, P.E., Assoc. Professor of Instruction	Graduate Advisor	NH 417	817-272-3760	gautam.eapi@uta.edu
Dr. JESSICA EISMA Assistant Professor	Water Resources Engineering	NH 401	817-272-5055	jessica.eisma@uta.edu
Dr. KARTHIKEYAN LOGANATHAN Asst. Prof of Instruction	Construction Engineering and Management	NH 417	817-272-7124	karthikeyan.loganathan@uta.edu
Prof. MICHAEL FAIRCHILD, Professor of Practice	Construction Management	NH 340	817-272-0650	michaelf@uta.edu
Dr. NICK Z. FANG, P.E., Associate Professor	Water Resources Engineering	NH 431	817-272-5334	nickfang@uta.edu
Dr. SUYUN HAM, Assistant Professor	Structures and Materials	NH 433	817-272-5217	suyun.ham@uta.edu
Dr. SAHADAT HOSSAIN, P.E., Professor and Area Coordinator	Geotechnical Engineering, Infrastructure System Engineering and Management	NH 404	817-272-3577	hossain@uta.edu
Dr. LAUREANO HOYOS, P.E., Professor	Geotechnical Engineering	NH 441	817-272-3879	lhoyos@uta.edu
Dr. MICHELLE HUMMEL, Assistant Professor	Water Infrastructure	NH 430	817-272-6485	michelle.hummel@uta.edu
Dr. KYUNG KATE HYUN, Assistant Professor	Transportation Engineering, Smart Cities	NH 432	817-272-9748	kate.hyun@uta.edu
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Dr. VINAYAK KAUSHAL, Assistant Professor of Instruction.	Construction Engineering and Management	NH 335	817-272-5055	vinayak.kaushal@uta.edu
Dr. SHARAREH KERMANSHACHI, Associate Professor	Construction Engineering and Management	NH 438	817-272-6704	sharareh.kermanshachi@uta.edu
Dr. MARIA S. KONSTA- GDOUTOS, Professor	Structures and Materials	ELB 334	817-272-2704	maria.konsta@uta.edu

Dr. ANDREW KRUZIC, P.E., Associate Professor	Environmental Engineering	NH 403	817-272-3822	kruzic@uta.edu
Dr. PENGFEI (TAYLOR) LI, Assistant Professor	Transportation Engineering	NH 402	817-272-3416	pengfei.li@uta.edu
Dr. STEPHEN P. MATTINGLY, Professor and Area Coordinator	Transportation Engineering, Infrastructure System Engineering and Management	NH 434	817-272-2859	mattingly@uta.edu
Dr. MOHAMMAD NAJAFI, P.E., Associate Professor	Coordinator of Construction Engineering and Management Graduate Program	NH 428	817-272-0507	najafi@uta.edu
Dr. JUNE YOUNG PARK Assistant Professor	Smart Buildings and Cities	NH 332	817-272-5055	june.park@uta.edu
Dr. NILOOFAR PARSAEIFARD Asst. Professor of Instruction.	Construction Management	NH 339	817-272-5055	niloofar.parsaeifard@uta.edu
Dr. SRINIVAS PRABAKAR, Associate Professor of Instruction	Environmental Engineering	NH 401	817-272-7590	prabakar@uta.edu
Dr. STEFAN A. ROMANOSCHI, P.E., Professor and Area Coordinator	Infrastructure System Engineering and Management	NH 408	817-272-0340	romanoschi@uta.edu
Dr. KYEONG ROK RYU, Assistant Professor	Construction Engineering and Management	NH 334	817-272-9378	kyeongrok.ryu@uta.edu
Dr. DONG-JUN (DJ) SEO, Professor and Area Coordinator	Water Resources Engineering	NH 248B	817-272-5063	djseo@uta.edu
Dr. SURENDRA SHAH, Presidential Distinguished Professor of Civil Engineering	Structures and Materials	ELB 335	817-272-5055	surendra.shah@uta.edu
Dr. MOHSEN SHAHANDASHTI, P.E., Associate Professor	Construction Engineering and Management, Infrastructure System Engineering and Management	NH 436	817-272-0440	mohsen@uta.edu
Dr. KATHLEEN SMITS, Associate Professor	Water Research Engineering	ERB 329	817-272-6486	kathleen.smits@uta.edu
Dr. NILO TSUNG, P.E., Associate Professor of Instruction	Construction Engineering and Management	NH 340	817-272-6899	nilo.tsung@uta.edu
Dr. JAMES C. WILLIAMS P.E., Professor	Transportation Engineering	NH 435	817-272-2894	jimwilliams@uta.edu
Dr. NUR YAZDANI, P.E., Professor	Structures and Materials	NH 439	817-272-0676	yazdani@uta.edu
Dr. XINBAO YU, P.E., Associate Professor	Geotechnical Engineering	NH 429	817-272-1243	xinbao@uta.edu
Prof. MICHAEL ZARETSKY, Associate Professor	Director of Architectural Engineering Program		817-272-6487	michael.zaretsky@uta.edu
Dr. YU ZHANG, Associate Professor	Hydrology and Water Resources	NH 339	817-272-1874	yu.zhang@uta.edu

MASTER OF CONSTRUCTION MANGEMENT (MCM)

Advances in construction technologies, financing, and methods underscore the need for a sound and systematic management of construction projects. Organizational structures, business models, and the capability of implementing new technologies into practice necessitate advanced study in Construction Management. The Master of Construction Management at The University of Texas at Arlington (UT Arlington) provides students interdisciplinary studies in Commercial and Residential, Infrastructure and Heavy/Highway, and General Construction applications to address a broad range of challenges facing the construction management field.

Core Courses: Twelve (12) semesters hours are required from the Core Course list.

Elective Courses: Eighteen (18) semester hours of elective course work must be taken from one of the areas listed below. One course from the Construction Electives or approved by MCM Director must be taken.

With approval of MCM Director, CE 5395, Master's Project, can be taken in lieu of one the elective courses.

Course selection must result in a cohesive program that supports the Master's Project and must receive the approval of the MCM Director.

Final Degree Requirements vary depending upon a student's background and experience. Director of Construction Management Program will establish individual degree requirements.

Construction Core Courses

CM 5344 Construction Methods – Field Operations
CM 5378 Construction Contracts, Specifications and Administration
CM 5379 Construction Cost Estimating
CM 5386 Construction Planning and Scheduling

CM 5381 Public Private Partnerships (P3) for Infrastructure
CM 5387 Construction Productivity
CM 5388 Pipeline Construction and Trenchless Technology
CM 5389 Pipeline Asset Management and Sustainability
General Elective with Approval of Program Director
CM 5395 Masters Project

Commercial and Residential Option

CM 5300 Topics in Civil Engineering (Best Construction Practices)
CM 5342 Construction Management
CM 5343 Building Information Modeling (BIM)
CM 5355 Construction Materials
CM 5377 Construction Finance
CM 5381 Public Private Partnerships (P3) for Infrastructure Projects
General Elective with Approval of Program Director
CM 5382 Construction Sustainability
CM 5387 Construction Productivity
CM 5395 Masters Project

General Construction Management Option

With prior approval of the Construction Management Program Director, students may choose to take courses from the following departments under a specific focus area:

- Architecture
- Business
- City and Regional Planning
- Management

Infrastructure and Heavy/Highway Option

CM 5342 Construction Management
CM 5345. Infrastructure Evaluation, Maintenance and Rehabilitation
CM 5350 Risk Management
CM 5377 Construction Finance

Construction Electives

CM 5300 Topics in Civil Engineering
CM 5339 Statistics for Construction
CM 5340 Construction Project Acquisition
CM 5342 Construction Management
CM 5350 Risk Management
CM 5377 Construction Finance
CM 5387 Construction Productivity
CM 5395 Masters Project

Planned Schedule of Class Offerings <i>Summer class offerings subject to change due to budget constraints</i>	2021-2022			2022-2023			2023-2024			2024-2025			2025-2026		
	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
CM 5300 Topics in Construction Management															
CM 5301 Topics in Construction Management with Lab															
CM 5339 Statistics for Construction	D	D			D			D			D			D	
CM 5340 Construction Project Acquisition	D	D		D	D		D	D		D	D		D	D	
CM 5342 Construction Management	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
CM 5343 Building Information Modeling (BIM)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
CM 5344 Const Methods – Field Operations*(CM4332)	D	D	D	D	D		D	D		D	D		D	D	
CM 5345 Infrastructure Evaluation, Maintenance & Rehabilitation	D			D			D			D			D		
CM 5350 Risk Management	D	D		D	D	D	D	D	D	D	D	D	D	D	D
CM 5355 Construction Materials	D			D			D			D			D		
CM 5377 Construction Finance	D	D			D			D			D			D	
CM 5378 Const. Contracts, Specs. & Adm.	D	D	D		D			D			D			D	
CM 5379 Construction Cost Estimating	D	D		D	D		D	D		D	D		D	D	
CM 5381 Public Private Partnerships (P3) for Infrastructure Projects		D			D			D			D			D	
CM 5382 Construction Sustainability	D	D	D	D	D		D	D		D	D		D	D	
CM 5386 Construction Planning and Scheduling	D	D		D	D		D	D		D	D		D	D	
CM 5387 Construction Productivity	D	D	D	D	D		D	D		D	D		D	D	
CM 5388 Pipeline Const. & Trenchless Tech.*(CE 4305)			D			D			D			D			D
CM 5389 Pipeline Asset Mgt & Sustainability*(CE4306)			D			D			D			D			D

The Department may change the courses offered without notice. Summer Schedule, usually available by April 1, lists available summer courses. D-Campus & Distance Learning Courses. *Course number in () indicates dual course offered composite with this course.

CONSTRUCTION ENGINEERING AND MANAGEMENT (CEM)

Construction Engineering and Management is a broad-based program specifically oriented towards an individual's interest and should emphasize the research and development in the Construction Engineering and Management area.

Each student's Tentative Program of Work must be developed before completing twelve (12) graduate credit hours. Students pursuing a M.S. or M.E. degree must meet with their supervising committee to fully establish their program of study. Course requirement for this master's degree are listed below.

Master of Science Degree

Core Courses: Twelve (12) semesters hours are required from the Core Course list. Three (3) Core courses are from the Required Construction Core list, and one (1) Core Course is taken from the Elective Construction Core list.

Elective Courses: Twelve (12) semester hours are required from Elective Course list work shown below. Course selections must result in a cohesive program that supports the degree plan.

Thesis: Six (6) hours of thesis must be enrolled in during the semester the student graduates, in which the thesis is successfully defended. The thesis must be defended in a final oral examination open to all members of the faculty. Once enrolled in thesis courses, continuous enrollment is required.

Master of Engineering Degree

Core Courses: Twelve (12) semesters hours are required from the Core Course list.

Elective Courses: Eighteen (18) semester hours of elective course work must be taken from one of the following options. Course selection must result in a cohesive program that supports the degree plan and must receive the approval of the student's supervising committee.

Final Degree Requirements vary depending upon a student's background and experience. Student's supervising committee establishes individual degree requirements.

Core Courses (All required)

Construction Core Courses:

CE 5320 Temporary Structures
CE 5344 Construction Methods –
Field Operations
CE 5350 Risk Management

Core Course (One required):

CE 5327 Construction Estimating &
Scheduling
CE 5343 Building Information
Modeling
CE 5377 Construction Finance

CE 5698 Thesis (Only for MS
students)

Electives

CE 5339 Statistics for Construction
CE 5340 Construction Project
Acquisition
CE 5342 Construction Management
CE 5343 Building Information
Modeling (BIM)
CE 5345 Infrastructure Evaluation,
Maintenance and Renewal
CE 5355 Construction Materials
CE 5377 Construction Finance
CE 5378 Construction Contracts,
Specifications and Administration
CE 5382 Construction
Sustainability
CE 5387 Construction Productivity
CE 5388 Pipeline Construction and
Trenchless Technology
CE 5389 Infrastructure Asset
Management and Sustainability

Other CE electives

CE 5300 Topics in Civil
Engineering
CE 5306 Structural Steel Design
CE 5307 Structural Timber Design
CE 5308 Structural Masonry Design
CE 5309 Prestressed Concrete
CE 5336 Pavement Design
CE 5338 System Evaluation
CE 5361 Design & Construction of
Asphalt Concrete
CE 5362 Rigid pavements
CE 5364 Foundation Analysis and
Design

Planned Schedule of Class Offerings <i>Summer class offerings subject to change due to budget constraints</i>	2021-2022			2022-2023			2023-2024			2024-2025			2025-2026		
	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
	CE 5306 Structural Steel Design (CE 4348)	D	D		D	D		D	D		D	D		D	D
CE 5307 Structural Timber Design (CE 4365)	D	D		D	D		D	D		D	D		D	D	
CE 5308 Structural Masonry Design (CE 4360)	D	D		D	D		D	D		D	D		D	D	
CE 5309 Prestressed Concrete (CE 4363)		D			D			D			D			D	
CE 5320 Temporary Structures	D	D		D	D		D	D		D	D		D	D	
CE 5327 Construction Estimating and Scheduling	D	D		D	D		D	D		D	D		D	D	
CE 5336 Pavement Design		D			D			D			D			D	
CE 5338 System Evaluation		D			D			D			D			D	
CE 5339 Statistics for Construction	D	D		D	D		D	D		D	D		D	D	
CE 5340 Construction Project Acquisition	D	D		D	D		D	D		D	D		D	D	
CE 5342 Construction Management	D	D		D	D		D	D		D	D		D	D	
CE 5343 Building Information Modeling (BIM)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
CE 5344 Const Methods – Field Operations*(CE4332)	D	D	D	D	D		D	D		D	D		D	D	
CE 5345 Infrastructure Evaluation, Maintenance & Rehabilitation	D			D			D			D			D		
CE 5350 Risk Management	D	D		D	D		D	D		D	D		D	D	
CE 5355 Construction Materials	D	D		D	D		D	D		D	D		D	D	
CE 5361 Design and Construction of Asphalt Concrete (CE 4336)		D			D			D			D			D	
CE 5362 Rigid Pavements															
CE 5364 Foundation Analysis and Design (SH) (CE 4321)	D	D		D	D		D	D		D	D		D	D	
CE 5377 Construction Finance	D	D		D	D		D	D		D	D		D	D	
CE 5378 Const. Contracts, Specs. & Adm.	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
CE 5379 Construction Cost Estimating	D	D		D	D		D	D		D	D		D	D	
CE 5381 Public Private Partnerships (P3) for Infrastructure Projects		D			D			D			D			D	
CE 5382 Construction Sustainability	D			D			D			D			D		
CE 5386 Construction Planning and Scheduling	D	D		D	D		D	D		D	D		D	D	
CE 5387 Construction Productivity	D	D		D	D		D	D		D	D		D	D	
CE 5388 Pipeline Const. & Trenchless Tech.* (CE 4305)			D ¹			D ¹			D ¹			D ¹			D ¹
CE 5389 Pipeline Asset Mgt & Sustainability* (CE 4306)			D ¹			D ¹			D ¹			D ¹			D ¹

The Department may change the courses offered without notice. Summer Schedule, usually available by April 1, lists available summer courses. D-Campus & Distance Learning Courses, *Course number in () indicates dual course offered composite with this course. D¹ Long Summer Session (11-week course).

ENVIRONMENTAL ENGINEERING

The environmental engineering curriculum covers water quality modeling and control, water supply and wastewater treatment, air pollution modeling and control, and solid waste management. Each student's program of work must be developed before completing twelve (12) graduate credit hours. Students pursuing a M.S. or Ph.D. degree must meet with their supervising committee to fully establish their program of work. Core and elective course requirements for a master's degree in the environmental engineering area are given below.

MASTER OF SCIENCE DEGREE

Core Courses: Twelve (12) semester hours are required from the Core Courses list.

Elective Courses: Six (6) semester hours of elective course work must be taken from Elective Course Group A. Additional six (6) semester hours can be taken from Elective Course Group A or Elective Course Group B. CE 5317 Environmental Engineering Processes and Analysis – Laboratory is highly recommended. Course selection must result in a cohesive program that supports the thesis and must receive the approval of the student's supervising committee.

Thesis: Once the student is enrolled in the thesis course(s), continuous enrollment is required. The student must be enrolled in six (6) hours of thesis during the semester the student finishes the thesis requirements and files for graduation (CE 5698 or CE 5398).

MASTER OF ENGINEERING DEGREE

Core Courses: Twelve (12) semester hours are required from the Core Courses list.

Elective Courses: Twelve (12) semester hours of elective course work must be taken from Elective Course Group A. Additional six (6) semester hours must be taken from Elective Course Group B. Course selection must result in a cohesive program that supports the major area and must receive the approval of the student's supervising committee.

FINAL DEGREE REQUIREMENTS vary depending upon a student's background and experience. Student's supervising committee establishes individual's final degree requirements.

CORE COURSES

CE 5318	Physical-Chemical Processes I	CE 5325	Biological Processes
CE 5319	Physical-Chemical Processes II	CE 5326	Water and Wastewater Treatment Facilities Design

ELECTIVE COURSE GROUP "A"

CE 5317	Environ. Eng. Process & Analysis-Laboratory	CE 5358	Solid & Hazardous Waste Management
CE 5322	Advanced Physical-Chemical Processes	CE 5392	Special Topics in Air Pollution
CE 5328	Fundamentals of Air Pollution	CE 5393	Environmental Organic Chemistry
CE 5329	Environmental Risk Based Corrective Action		

ELECTIVE COURSE GROUP "B"

CE 4328	Water Systems Design	CE 5357	Hydrologic Techniques
CE 5346	Open Channel Flow	CE 5359	Groundwater Contaminant Modeling
CE 5347	Advanced Hydrology	CE 5373	Environmental Geotechnology
CE 5348	Groundwater Hydrology	CE 5375	Geotechnical Aspects of Landfills
CE 5349	Adv. GIS & Hydrologic/Hydraulic Modeling	EVSE 5320	Toxicology
CE 5353	Advanced Hydraulics	EVSE 5455	Mathematical Modeling of Env. Quality Systems
CE 5354	Water Resources Planning	IE 5318	Applied Regression Analysis
CE 5356	Surface Water Quality Modeling	CE 5396	Site Remediation Engineering

PLANNED SCHEDULE OF CLASS OFFERINGS* <i>(summer class offerings subject to change due to budget constraints)</i>	2021-2022			2022-2023			2023-2024			2024-2025			2025-2026		
	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
CE 5317 Environmental Engineering Processes and Analysis -Lab	C			C			C			C			C		
CE 5318 Physical Chemical Processes I (CE 4351)	D			D			D			D			D		
CE 5319 Physical Chemical Processes II (CE 4353)		D			D			D			D			D	
CE 5325 Biological Processes (CE 4357)		D			D			D			D			D	
CE 5326 Water & Wastewater Treatment Facilities Design (CE 4355)	D			D			D			D			D		
CE 5328 Fundamentals of Air Pollution (CE 4350)	D			D			D			D			D		
CE 5329 Environmental Risk Based Corrective Action (RBCA)			D			D			D			D			D
CE 5358 Solid and Hazardous Waste Management (CE 4354)		D			D			D			D			D	
CE 5392 Special Topics in Air Pollution		D			D			D			D			D	
CE 5322 Advanced Physical Chemical Processes		D			D			D			D			D	
CE 5393 Environmental Organic Chemistry	D			D			D			D			D		

The Department may change the courses offered without notice. Summer Schedule, usually available by April 1, lists available summer courses. C – On Campus Only, D – Campus & Distance Learning Course, *Course number in parenthesis () indicates dual course offered composite with this course.

GEOTECHNICAL ENGINEERING

Geotechnical engineering is a broad-based program. Each program is specifically oriented toward an individual's interest and should emphasize the research and development of geotechnical engineering, or the design and application aspect of geotechnical engineering. Each student's program of study must be developed before completing twelve (12) graduate credit hours. Students pursuing a M.S., M.E. or Ph.D. degree must meet with their supervising committee to fully establish their program of study. Course requirements for the master's degree are listed below.

MASTER OF SCIENCE DEGREE

Core Courses: Nine (9) semester hours are required from the Core Courses list.

Elective Courses: A minimum of nine (9) semester hours of elective course work is required from the Elective Courses list below. Six (6) additional hours of elective course work must be taken as a research tool or supporting courses to the program of work. Course selection must result in a cohesive program that supports the thesis and must receive the approval of the student's supervising committee.

Thesis: Once the student is enrolled in the thesis course(s), continuous enrollment is required. The student must be enrolled in six (6) hours of thesis during the semester the student finishes the thesis requirements and files for graduation.

MASTER OF ENGINEERING DEGREE: Twenty-four (24) hours of course work must be in the major area of study.

Core Courses: Nine (9) semester hours of course work is required from the Core Courses list.

Electives Courses: A minimum of fifteen (15) semester credit hours of course work is required from the Elective Courses list below. Three (3) additional hours of elective course work must be taken as a research tool and three (3) credit hours are required from supporting courses to the program of work. Course selection must result in a cohesive program that supports the major area and must receive the approval of the student's supervising committee. Research tool courses can be in Statistics, Computer Science, Geology, GIS area or courses approved by the student's supervising committee

FINAL DEGREE REQUIREMENTS vary depending upon a student's background and experience. Student's supervising committee establishes individual's final degree requirements.

CORE COURSES

CE 5364 Foundation Analysis and Design
CE 5365 Theoretical Soil Mechanics
CE 5370 Experimental Soil Mechanics

ELECTIVE COURSES

CE 5336 Pavement Design
CE 5341 Pavement Management
CE 5361 Design/Construction of Asphalt Concrete
CE 5362 Rigid Pavements
CE 5363 Constitutive Modeling of Soils
CE 5366 Soil Dynamics
CE 5367 Design of Earth Structures
CE 5368 Unsaturated Soil Mechanics
CE 5369 Computational Geotechnics
CE 5371 Soil Behavior
CE 5372 Geosynthetics
CE 5374 Ground Improvement
CE 5375 Geotechnical Aspects of Landfills
CE 5360 Unsaturated Soils II
CE 6000 Advanced Geotechnical Modeling
CE 6311 Advanced Foundation Design
CE 6312 In Situ Testing
CE 6313 Design of Earth Dams

Planned Schedule of Class Offerings	2021-2022			2022-2023			2023-2024			2024-2025			2025-2026		
	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
<i>Summer class offerings subject to change due to budget constraints</i>															
CE 5363 Constitutive Modeling of Soils (LH)	D			D			D			D			D		
CE 5364 Foundation Analysis and Design (SH) (CE 4321)	D	D		D	D		D	D		D	D		D	D	
CE 5365 Theoretical Soil Mechanics (AP/SH)	D			D			D			D			D		
CE 5366 Soil Dynamics (LH/XY)	D						D			D			D		
CE 5367 Design of Earth Structures (LH) (CE 4320)		D	D		D	D		D	D		D	D		D	D
CE 5368 Unsaturated Soil Mechanics (LH)		D			D			D			D			D	
CE 5369 Computational Geotechnics (SH)		C			C			C			C			C	
CE 5370 Experimental Soil Mechanics (LH)	D			D			D			D			D		
CE 5371 Soil Behavior (AP)															
CE 5372 Geosynthetics (AP/XY) (CE 4322)	D			D			D			D			D		
CE 5374 Ground Improvement (AP)			D			D			D			D			D
CE 5375 Geotechnical Aspects of Landfills (SH) (CE 4323)	D			D			D			D			D		
CE 5390 Unsaturated Soils II (LH)			D			D			D			D			D
CE 6315 Advanced Geotechnical Modeling (XY)					D						D				
CE 6311 Advanced Foundation Design (XY)			D			D			D			D			D
CE 6312 In Situ Testing (AP)		D			D			D			D			D	
CE 6313 Design of Earth Dams (SH)		D			D			D			D			D	

The Department may change the courses offered without notice. Summer Schedule, usually available by April 1, lists available summer courses. C—On Campus Only, D—Campus & Distance Learning Course, *Course number in parenthesis () indicates dual course offered composite with this course.

INFRASTRUCTURE SYSTEM ENGINEERING AND MANAGEMENT

The Infrastructure Systems Engineering and Management curriculum provides holistic training in engineering and management of civil infrastructure systems. This multi-disciplinary, broad-based program is specifically delineated for covering conceptual and physical planning, design, and operational aspects of infrastructure systems. The program focuses on deterioration, assessment, renewal, maintenance, effectiveness, resilience, and sustainability elements as related to civil infrastructure systems. Each student's program of study must be developed before completing twelve (12) graduate credit hours. Students pursuing a M.S. or M.E. degree must meet with their supervising committee to fully establish their program of study. Core and elective course requirements for a master's degree in the infrastructure engineering and management area are given below.

Master of Science Degree

Core Courses: Nine (9) semester hours are required from the Core Courses list.

Elective Courses At least fifteen (15) additional semester hours must be taken from the Elective Courses listed below or from the remaining core courses. The elective courses listed below are highly recommended but are not all-inclusive. No more than nine (9) hours can be taken outside of Civil Engineering. Course selection must result in a cohesive program that supports the degree plan and must be approved by the student's supervising committee.

Thesis: Once the student is enrolled in the thesis course(s), continuous enrollment is required. The student must be enrolled in six (6) hours of thesis during the semester the student finishes the thesis requirements and files for graduation.

Master of Engineering Degree

Core Courses: Nine (9) semester hours are required from the Core Courses list.

Elective Courses: At least twenty-one (21) additional semester hours must be taken from the Elective Courses listed below or from the remaining core courses. They are highly recommended but are not all-inclusive. No more than nine (9) hours can be taken outside of Civil Engineering. Course selection must result in a cohesive program that supports the degree plan and must be approved by the student's supervising committee.

CORE COURSES

CE 5345 Infrastructure Evaluation
Maintenance & Renewal
CE 5380 Management of
Infrastructure Assets
IE 5317 Intro to Statistics and
Operations Research

CE ELECTIVE COURSES - INFRASTRUCTURE

CE 5336 Pavement Design
CE 5341 Pavement Evaluation
Rehabilitation & Management
CE 5361 Design and Construction of
Asphalt Concrete
CE 5362 Rigid Pavements

CE ELECTIVE COURSES - STRUCTURES & APPLIED MECHANICS

CE 5311 Advanced Steel Design I
CE 5312 Advanced Concrete Design I

CE ELECTIVE COURSES - CONSTRUCTION

CE 5344 Construction Methods
Field Operations
CE 5377 Construction Project
Management & Job Costing
CE 5388 Pipeline Construction &
Trenchless Technology
CE 5389 Pipeline Infrastructure Asset
Management. & Sustainability

CE ELECTIVE COURSES - WATER RESOURCES

CE 5354 Water Resources Planning
CE 5356 Surface Water Quality
Modeling

CE ELECTIVE COURSES - GEOTECHNICAL

CE 5364 Foundation Analysis and
Design
CE 5367 Design of Earth Structures
CE 5375 Geotechnical Aspects of
Landfills
CE 5372 Geosynthetics

CE ELECTIVE COURSES - ENVIRONMENTAL

CE 5326 Water & Wastewater
Treatment Facilities Design
CE 5328 Fundamentals of Air
Pollution

CE ELECTIVE COURSES - TRANSPORTATION

CE 5332 Highway Design
CE 5331 Traffic Operations
CE 5335 Airport Engineering
CE 5338 System Evaluation
CE 6306 Public Transit Planning and
Operation

ELECTIVE COURSES - OUTSIDE CE

CIRP 5356 Intro to GIS Systems
IE 5301 Advanced Operations
Research
IE 5304 Advanced Engineering
Economy
IE 5318 Advanced Engineering
Statistics
IE 5351 Intro to Systems Engineering
IE 5311 Decision Analysis

Planned Schedule of Class Offerings <i>Summer class offerings subject to change due to budget constraints</i>	2021-2022			2022-2023			2023-2024			2024-2025			2025-2026		
	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
CE 5345 Infrastructure Evaluation, Maintenance & Renewal	D			D			D			D			D		D
CE 5380 Management of Infrastructure Assets		D			D			D			D			D	
IE 5317 Introduction to Statistics and Operation Research	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
CE 5341 Pavement Evaluation, Rehabilitation and Management Systems				D						D					
CE 5338 System Evaluation (4316)		D			D			D			D			D	
IE 5311 Decision Analysis	D			D			D			D			D		
CE 5336 Pavement Design		D						D						D	
CE 5361 Design and Construction of Asphalt Concrete (4336)					D						D				
CE 5362 Rigid Pavements (4337)	D						D						D		

The Department may change the courses offered without notice. Summer Schedule, usually available by April 1, lists available summer courses **D** – Campus & Distance Learning Course.

STRUCTURES AND APPLIED MECHANICS ENGINEERING

The Structures and Applied Mechanics engineering program is broad-based. Each student's final program is specifically oriented toward an individual's interest and should emphasize the research and development of structures or applied mechanics, or the design and application aspect of structures. Each student's program of study must be developed before completing twelve (12) graduate credit hours. Students pursuing a M.S., M.E. or Ph.D. degree must meet with their supervising committee to fully establish their program of study. Course requirements for the master's degree and PhD degree are listed below.

MASTER OF SCIENCE DEGREE (24 Semester hours of course work plus thesis hours)

Core Courses: Twelve (12) semester hours of core coursework are required including CE 5303 Introduction to Finite Element, CE 5311 Advanced Steel Design I, CE 5312 Advanced Concrete Design I, and CE 5315 Advanced Mechanics of Materials.

Elective Courses: A minimum of twelve (12) semester hours of course work including at least one course from Group A and one course from Group B are required from the list below.

Thesis: Once the student is enrolled in the thesis course(s), continuous enrollment is required. The student must be enrolled in six (6) hours of thesis during the semester the student finishes the thesis requirements and files for graduation.

MASTER OF ENGINEERING DEGREE (30 hours of course work)

Core Courses: Twelve (12) semester hours of core coursework are required including CE 5303 Introduction to Finite Element, CE 5311 Advanced Steel Design I, CE 5312 Advanced Concrete Design I, and CE 5315 Advanced Mechanics of Materials

Electives Courses: A minimum of eighteen (18) semester hours of course work including at least one course from Group A and one course from Group B are required from the list below.

PHD STUDENTS

Core Courses for the Diagnostic Exam: The exam will cover four subjects; two from the Analysis Courses: CE 5303 Introduction to Finite Element, CE 5315 Advanced Mechanics of Materials, CE 5385 Structural Dynamics, and/or CE 5351 Advanced Theory of Structures and two from the Design Courses: CE 5311 Advanced Steel Design I, CE 5312 Advanced Concrete Design I, and/or CE 5309 Prestressed Concrete. With the consent of their supervising committee, the students can substitute one from the Design Courses with one from the Analysis Courses listed above, and vice versa. The students should declare prior to the exam which four subjects they wish to be examined on.

Final Degree Requirements: These vary depending upon each student's background and experience. The student's supervising committee establishes individual final degree requirements.

Planned Schedule of Class Offerings <i>Summer class offerings subject to change due to budget constraints</i>		2021-2022			2022-2023			2023-2024			2024-2025			2025-2026		
		F	Sp	S	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
		CORE COURSES	CE 5303 Introduction to Finite Element (CE 4325)		D			D			D			D		
CE 5311 Advanced Steel Design I			D			D			D			D			D	
CE 5312 Advanced Concrete Design I (CE 4361)	D				D			D			D			D		
CE 5315 Advanced Mechanics of Materials (CE 4324)	D				D			D			D			D		
GROUP A DESIGN COURSES	CE 5300 Building Information Modeling TBA		D			D			D			D			D	
	CE 5305 Fiber Reinforced Composite Design (CE 4366) TBA															
	CE 5306 Structural Steel Design (CE 4348)	D			D			D			D			D		
	CE 5307 Structural Timber Design (CE 4365) TBA															
	CE 5308 Structural Masonry Design (CE 4360)				D						D					
	CE 5309 Prestressed Concrete (CE 4363)		D			D			D			D			D	
	CE 5310 Plastic Analysis and Design of Structures						D						D			*
	CE 5314 Advanced Steel Design II TBA															
	CE 5364 Foundation Analysis and Design (CE 4321)	D	D		D	D		D	D		D	D		D	D	
	CE 5384 Concrete Bridge Design				D						D					
	CE 5394 Earthquake Design of Reinforced Concrete			D			D			D			D			D
CE 6350 Advanced Concrete Design II TBA																
GROUP B ANALYSIS COURSES	CE 5351 Advanced Theory of Structures (CE 4368)		D			D			D			D			D	
	CE 5383 Experimental Stress Analysis		D			D			D			D			D	
	CE 5385 Structural Dynamics						D						D			
	CE 6352 Advanced Finite Element Method					D						D				
	CE 6355 Earthquake Engineering			D						D	D					D
	CE 6357 Structural Stability		D							D					D	
	CE 6358 Advanced Analysis in Mechanics						D						D			
	CE 6359 Plates and Shells															
CE 6360 Theory of Elasticity			D							D					D	

The Department may change the courses offered without notice. Summer Schedule, usually available by April 1, lists available summer courses.
C–On Campus Only, D – Campus & Distance Learning Course, *Course number in parenthesis () indicates dual course offered composite with this course.

TRANSPORTATION ENGINEERING

Transportation engineering is a broad-based program. Each program is specifically oriented toward an individual's interest, and should emphasize the research and development of transportation, or the design and application of transportation engineering. Each student's program of study must be developed before completing twelve graduate credit hours. Students pursuing a M.S., M.E. or Ph.D. degree must meet with their supervising committee to fully establish their program of study. Course requirements for the master's degree are listed below.

MASTER OF SCIENCE DEGREE (24 semester hours of course work plus six thesis hours)

Core Courses: Four core courses are required; the core courses are listed below

Elective Courses: A minimum of four elective courses are required. At least two courses must be selected from the civil engineering transportation classes (in the schedule grid on the next page) or other transportation classes (also listed on the next page). Up to two courses may be selected from the Non-Transportation electives (listed on the next page) or from supportive areas. Courses not listed on the next page must be approved by an advisor in the transportation group. Course selection must result in a cohesive program that supports the thesis and must receive the approval of the student's supervising committee.

Thesis: Once the student is enrolled in the thesis course(s), continuous enrollment is required. The student must be enrolled in six hours of thesis (CE 5698) during the semester the student finishes the thesis requirements and files for graduation.

MASTER OF ENGINEERING DEGREE (30 hours of course work): Eight of the 10 courses must be in the major area of study.

Core Courses: Four core courses are required; the core courses are listed below.

Elective Courses: A minimum of six elective courses are required. At least four courses must be selected from the civil engineering transportation classes (in the schedule grid on the next page) or other transportation classes (also listed on the next page). Up to two courses may be selected from the other Non-Transportation electives (listed on the next page) or from supportive areas. Courses not listed on the next page must be approved by an advisor in the transportation group. Course selection must result in a cohesive program that supports the major area and must receive the approval of the student's supervising committee.

SUPPORTIVE AREAS: City and Regional Planning, Mathematics. Additional areas may be approved by petition to supervising committee.

FINAL DEGREE REQUIREMENTS vary depending upon a student's background and experience. Student's supervising committee establishes individual's final degree requirements. Those who have a GPA less than 3.0 in the core course classes must take the Masters Comprehensive Exam, which covers material in the core classes.

CORE COURSES

CE 5330 Characteristics of Traffic
CE 5332 Highway Design
CE 5337 Urban Transportation Planning

One of the following:

IE 5318 Applied Regression Analysis
ECON 5336 Econometrics I

Other Transportation Electives

Elective courses in schedule grid on the next page
CE 5336 Pavement Design
CE 5341 Pavement Evaluation, Rehabilitation and Maintenance Systems
CE 5361 Design and Construction of Asphalt Concrete
CE 5362 Rigid Pavements
Industrial Eng. Courses (consent of advisor)

Other Non-Transportation Electives

Elective courses in schedule grid on the next page
CE 5328 Air Pollution
CE 5346 Open Channel Flow
CE 5347 Advanced Hydrology
CE 5364 Foundation Analysis and Design
CE 5367 Design of Earth Structures
ECON 5336 Econometrics I
ECON 5339 Econometrics II

***Additional Courses may be approved by petition to supervising Committee.**

Planned Schedule of Class Offerings <i>Summer class offerings subject to change due to budget constraints</i>	2021-2022			2022-2023			2023-2024			2024-2025			2025-2026		
	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
	CE 5300 Hypermobility		D			D			D			D			D
CE 5300 Airport Operations				D						D					
CE 5330 Characteristics of Traffic		D			D			D			D			D	
CE 5331 Traffic Engineering Operations (CE 4313)	D			D			D			D			D		
CE 5332 Highway Design (CE 4312)		D			D			D			D			D	
CE 5333 Traffic Control Systems					C						C				
CE 5335 Airport Engineering		D						D						D	
CE 5337 Urban Transportation Planning (CE 4311)	D			D			D			D			D		
CE 5338 System Evaluation (CE 4310)		D			D			D			D			D	
CE 6308 Analytical Models in Transportation				D						D					
CE 6309 Traffic Flow Theory	D						D						D		
CE 5334 Introduction to Railroad Engg. (CE 4314)						D						D			

The Department may change the courses offered without notice. Summer Schedule, usually available by April 1, lists available summer courses.
C – On Campus Only, D – Campus & Distance Learning Course, **Course number in parenthesis ()** indicates dual course offered composite with this course.

WATER RESOURCES ENGINEERING

The water resources engineering curriculum covers hydraulics and hydrology as it pertains to engineering design, planning, modeling and quantification of natural water quality, availability, conveyance, control and development related to civil and environmental engineering issues. Each student's program of study must be developed before completing twelve (12) graduate credit hours. Students pursuing a M.S., M.E. or Ph.D. degree must meet with their supervising committee to fully establish their program of study. Course requirements for the master's degree are listed below.

MASTER OF SCIENCE DEGREE

Core Courses: Twelve (12) semester hours are required from the Core Courses list. With the approval in advance by the student's supervising committee, an additional course of comparable credit hours from the Elective Course Group A may serve as a core course in place of one of the core courses listed.

Elective Courses: Nine (9) semester hours of elective course work must be taken from Elective Course Group A below. Three (3) additional semester hours of elective course work must be taken from Group B. Course selection must result in a cohesive program that supports the thesis and must receive the approval of the student's supervising committee.

Thesis: Once the student is enrolled in the thesis course(s), continuous enrollment is required. The student must be enrolled in six (6) hours of thesis during the semester the student finishes the thesis requirements and files for graduation.

MASTER OF ENGINEERING DEGREE: Twenty-four (24) hours of course work must be in the major area of study.

Core Courses: Twelve (12) semester hours are required from the Core Courses list. With the approval in advance by the student's supervising committee, an additional course of comparable credit hours from the Elective Course Group A may serve as a core course in place of one of the core courses listed.

Elective Courses: Twelve (12) semester hours of elective course work must be taken from the Elective Course Group A below. Six (6) semester hours of elective course work must be taken from Elective Course Group B below. Course selection must result in a cohesive program that supports the degree plan and must receive the approval of the student's supervising committee.

Final degree requirements will vary depending upon a student's background and experience. Student's supervising committee establishes individual degree requirements.

Core Courses	Elective Course Group A	Elective Course Group B
CE 5346 Open Channel Flow	CE 5300 Hydroinformatics	CE 5396 Site Remediation Engineering
CE 5347 Advanced Hydrology	CE 5348 Groundwater Hydrology	CE 5319 Physical-Chemical Processes II
CE 5353 Advanced Hydraulics	CE 5349 Advanced GIS and Hydrologic and Hydraulic Modeling	CE 5326 Water and Wastewater Treatment Facilities Design
CE 5354 Water Resources Planning	CE 5352 Hydrometeorology and Remote Sensing	ME 5313 Fluid Dynamics
	CE 5356 Surface Water Quality Modeling	CIRP 5357 Intermediate GIS***
	CE 5357 Hydrologic Techniques	GEOL 5321 Analysis of Spatial
	CE 5359 Groundwater Contaminant Modeling	Data*** GEOL 5323 Remote Sensing Fundamentals (*** One or the other, but not both.)
	CE 5360 Probability, Statistics and Decisions for Civil Engineers	
	CE 6314 Stormwater Modeling	
	CE 6316 Sediment Transport	

Planned Schedule of Class Offerings <i>Summer class offerings subject to change due to budget constraints</i>	2021-2022			2022-2023			2023-2024			2024-2025			2025-2026			2025-2026		
	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
CE 5300 Hydroinformatics					D						D							
CE 5346 Open Channel Flow (CE 4358)	D			D			D			D			D			D		
CE 5347 Advanced Hydrology		D				D				D				D			D	
CE 5348 Groundwater Hydrology				D				D					D					D
CE 5349 Adv. GIS & H & H Modeling (CE 4326)	D			D			D			D			D			D		
CE 5352 Hydrometeorology and Remote Sensing	D			D			D			D			D			D		
CE 5353 Advanced Hydraulics (CE 4330)		D			D			D			D			D			D	
CE 5354 Water Resources Planning			D				D				D				D			
CE 5356 Surface Water Quality Modeling					D				D					D				D
CE 5357 Hydrologic Techniques	D				D				D				D				D	
CE 5359 Groundwater Contaminant Modeling	D					D					D				D			
CE 5360 Probability, Statistics and Decisions for Civil Engineers				D														
CE 5396 Site Remediation Engineering	D			D			D			D			D			D		
CE 6314 Stormwater Modeling				D				D								D		
CE 6316 Sediment Transport			D				D					D				D		

The Department may change the courses offered without notice. Summer Schedule, usually available by April 1, lists available summer courses. C – On Campus Only, D – Campus & Distance Learning Course, *Course number in parenthesis () indicates dual course offered composite with this course.

GUIDELINES FOR THE CIVIL ENGINEERING PHD PROGRAM

- The PhD program of work must consist of at least 5 courses beyond the core courses for the master's program.
- The Tentative Program of Work should be submitted during the same semester that a student completes the Diagnostic Examination and must be approved by the entire committee.
- The Final Program of Work should be submitted after passing the Comprehensive Examination but no later than the semester prior to Graduation and must be signed by the entire committee.
- PhD committees should be composed by the following:
 1. the students Major Professor.
 2. A minimum of 2 other CE Faculty members.
 3. A minimum of 1 member outside of CE, in the student's minor area.
 4. the student will have a committee with a minimum of 4 members.

GUIDE FOR SOME MASTER DEGREE FORM DEADLINES

Applications must be submitted to Civil Engineering Department at least one week prior to Graduate School deadline to insure reaching Graduate School in a timely manner. See catalog for additional details and deadlines.

	Description and Submission Requirements	SUBMITTED		APPROVED BY
		BY	TO	
Degree Time Limit: Programs for the master's degree must be completed within 6 years (time in military service excluded) from initial registration in graduate school.	MSCE - 24 hours approved course work - 6 hours thesis MECE - 30 hours approved course work (24 hours must be in major study area) <i>(May use up to 9 hrs. advanced Baccalaureate courses.)</i> <i>(May reserve up to 12 hrs. credit as undergraduate)</i> <i>(May transfer up to 9 hrs. of equivalent courses.)</i> <i>(May use up to 12 hrs. earned as a Special Student)</i>			
Time Limit	Within 6 years of initial Graduate School registration			
Appointment of Major (Supervising) Professor and Supervising Committee (CEE form)	Upon admission student assigned temporary advisor. Prior to completion of 1st semester student must select a Major Professor and at that time suggested committee members can also be determined and assigned. The committee consists of at least 3 members of CE Graduate Faculty (two of which should be from the student's area of concentration), any external members are additional. (DGS must approve all external members.) (DGS approves after recommendation by CECGS and GA.)	Student	CE	CECGS
Tentative Program of Work (GS form)	First semester of full work, but not later than first 12 hours graduate course work. First semester, if transfer credit (up to 9 hours) is applied to degree.	Student GA	CE GS	(SSC initials) GA CECGS DGS
Application for Candidacy and Final Program Of Work (GS form)	No later than 30 days after first day of - Class in graduating semester. - class in 11 week of summer session DGS Appoints (approves) Supervising Committee	Student GA	CE GS	SSC CECGS GA DGS
Application for Graduation (GS form)	All graduating students must file an Application for Graduation by deadline specified in the Graduate School calendar for semester of graduation. Pay Fees	Student	GS	DGS
Request for Scheduling of The Final Master Exam <i>Thesis Defense</i> (GS form)	At least two weeks before proposed examination date. <i>MSCE</i> - oral defense - conducted by all members of SSC - open to all faculty members - thesis copies to each SSC member at least two weeks prior to defense - enrolled in CE 5698 - Major Professor is chairman of SSC.	Student GA	CE GS	SSC GA
Final Masters Examination Report (GS form)	No later than 3 weeks before date degree is to be conferred	GA	GS	SSC GA
Application to Continue Studies Beyond the Master's Degree (GS form)	At time of Final Masters Examination or after completion of 30 hrs. Graduate level courses.	Student	CE	GA

Note: CE - Civil Engineering Department
CECGS - CE Committee on Graduate Studies
DGS - Dean of Graduate Studies
GA - Graduate Advisor
GS - Graduate School
SSC - Student's Supervising Committee
Bold Text indicates critical forms student is responsible for completing and submitting as well as the form(s) submission deadlines.

GUIDE FOR SOME DOCTORAL DEGREE FORM DEADLINES

Applications must be submitted to Civil Engineering Department at least one week prior to Graduate School deadline to insure reaching Graduate School in a timely manner. See catalog for additional details and deadlines.

	Description and Submission Requirements	SUBMITTED		APPROVED BY
		BY	TO	
Degree	Ph.D. is research degree requiring original, independent research. Normally minimum of 1 yr. advanced courses beyond the masters. Minor area complementary and supportive to specialization area. Research tool.			
Time Limit	Completed within 4 yrs. of passing Comprehensive Exam.			
Research Tool	Demonstrate proficiency in a research tool. Must be completed before Comprehensive Examination.			CECGS DGS
Appointment of Major (Supervising) Professor and Supervising Committee (CEE form)	Upon admission student assigned temporary advisor. Prior to completion of 1st semester student must select a Major Professor and after successful completion of Diagnostic Evaluation and recommendation of CECGS and GA suggested committee members can be determined and assigned. The committee consists of the major professor and at least 3 faculty members (the major professor and at least 2 other members of the Civil Engineering Graduate Faculty, and at least one external member). A minimum of one external member of all supervising and examining committees for doctoral students will be from outside the Department in each of the student's minor areas of study. GA approves comprehensive exam and dissertation defense chairman. Committee can be altered or expanded after comprehensive exam completed. (DGS must approve all external members.) (DGS approves after recommendation by CECGS and GA.)	Student	CE	CECGS
Tentative Program of Work (GS form)	First year of graduate work or 18 semester hours whichever comes first* (*Must be done before or at the same time as Diagnostic Examination.)	Student GA	CE GS	(SSC initials) GA, CECGS, DGS
Request for The Diagnostic Examination (CEE form)	To CEE at least 2 weeks prior to proposed exam date. Completed master's degree or 30 hours of graduate course work . Must take during first year of doctoral program work, but no later than 1st 18 hours of course work beyond masters.	Student	CE	SSC GA
Diagnostic Evaluation Report (GS form)	Method - oral, written, personal interview by SSC faculty members, successful completion of course(s) in first semester of residency, or any combination determined by CECGS. Major Professor is Chairman of committee conducting exam.	GA	GS	SSC GA
Request for The Comprehensive Examination (GS form) Time Limit: 4 years after the student passes the comprehensive exam	Submitted no later than 2 weeks before proposed examination date. SSC may require detailed proposal outline and detailed information about Research Tool. Chairman appointed by GA. Eligibility: completion of all or most course work, enrolled in GS semester of exam and meeting research requirement. Normally marks end of formal course work.	Student GA	CE GS	SSC GA
Comprehensive Examination Report (GS form)	Method - oral, written or both. Scope, content, and form is determined by SSC with approval of CECGS.	GA	GS	SSC CECGS GA
Application for Candidacy and Final Program of Work (GS form)	Upon passing comprehensive examination. At least one semester prior to awarding degree.	Student GA	CE GS	SSC, CECGS GA, DGS

To be continued

Request for Dissertation Defense (GS form) <u>Nine (9) hours of dissertation must be taken in the last semester (semester of graduation)</u>	Submitted no later than 3 weeks before final date for submission of approved dissertation and dissertation defense report to DGS, but no later than 2 weeks before scheduled defense examination date. DGS must approve in advance any changes in date, time, or place of the defense by filing new request form. Public oral exam, open to all members of University community. Questions directed by SSC (any person attending can participate). SSC may explore student's knowledge of areas interrelated with core of dissertation problem in addition to research and interpretation.	Student GA	CE GS	SSC GA
Dissertation Copies	To each SSC member no later than 2 weeks before defense date. Master copy must be received by GS 1 week before final deadline.	Student	SSC	
Dissertation Defense Report (GS form)	Must be unanimously approved by SSC and DGS. Must be submitted to DGS within 5 working days after exam, and no later than 3 weeks before date degree to be conferred.	GA	GS	SSC GA
Application for Graduation (GS form)	All graduating students must file an Application for Graduation by the deadline specified in the Graduate School calendar for the semester of graduation. Pay Fees	Student	GS	GS

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