

McCormick

Northwestern Engineering

Civil and Environmental Engineering

**Master of Science
Civil and Environmental Engineering
Student Handbook**

2015-2016

September 2015

Also available online

<http://www.mccormick.northwestern.edu/civil-environmental/current-students/forms-documents.html>

Name: _____

Program: M.S. in _____

Campus Address: _____

Phone: _____

E-mail: _____

Faculty Advisor: _____ Office/Email: _____

*******Important Notice to All Advisees*******

Please bring the following information with you when you meet with your advisor:

- *your career goal*
- *your academic plan - 3 or 4 quarters M.S. program*
- *your interest in thesis or non-thesis (some program does not have this option)*
- *questions you want to ask - academic or professional*

Academic Time Table

based on 3-quarter program

What	When	How
Academic advisor assignment	CEE Orientation	Assigned by area coordinators
Plan for fall quarter courses	CEE Orientation break out sessions	Meet with your advisor, discuss course selection, advisor approve plan
Learn GSTS and CAESAR	CEE Orientation lunch session	Dr. Alan Wolff introduces GSTS (Graduate Student Tracking System)
Fall Registration	NU Orientation week till the end of first week of class	Fall course selection must be inputted to GSTS and approved by advisor in GSTS before registration hold is removed. Once registration hold is removed, students are ready to register via CAESAR
Job/internship search	As soon as you can	Register with McCormick Office of Career Development (MCD) advisor, register with McCormick Connect (http://www.mccormick.northwestern.edu/career-development/mccormickconnect.html). Networking with profession, alumni, etc.
	Fall quarter	Attend professional seminar available in the department. See announcements on presentation on job search resources, resume writing, etc. in CEE. Prepare resume and practice interview Start looking for jobs or internships
	January	Participate in CEE Career Fair
Curriculum Plan	By October 31	Submit curriculum plan for the entire degree program to GSTS (upload your plan in pdf). Plan must be signed by academic advisor.
Winter quarter advising	Start at about the 5 th week of fall quarter	Make an appointment to meet your advisor to discuss courses you plan to take in the winter quarter.
Winter quarter registration	Start at about 9 th week of fall quarter	Have your course selection approved by your advisor.
Spring quarter advising	Start at about the 5 th week of winter quarter	make an appointment to meet your advisor to discuss courses you plan to take in the spring quarter.
Spring quarter advising	Start at about 8 th week of winter quarter	Have your course selection approved by your advisor.
Spring graduation		
AFD	early spring quarter	Submit Application for a Degree form via CAESAR
Degree completion	late spring quarter	Form signed by at least two faculty advisor due at TGS. Check with Academic Coordinator

Important Dates

Academic Year 2015-2016

Event	Date
CEE Orientation	9/15/2015
Fall Registration	9/16/2015 – 9/25/2015
TGS Graduate Student Orientation	9/18/2015
Fall quarter classes begin	9/21/2015
Last day to drop a class for Fall	10/30/2015
Winter Registration begins	11/16/2015
Thanksgiving vacation	6 pm 11/25/2015 – 11/28/2015
Fall quarter classes end	12/5/2015
Fall quarter final exam	12/7 – 12/11/2015
Winter quarter break	12/12/2015 – 1/3/2016
Winter quarter classes begin	1/4/2016
Last day to add or change a course	1/8/2016
Martin Luther King Day observance	1/18/2016
CEE Career Fair	1/23/2016
Last day to drop a class for Winter	2/12/2016
Spring registration begins	2/22/2016
Winter classes end	3/12/2016
Winter quarter final exam	3/14 – 3/18/2016
Spring break	3/19 – 3/27/2016
Spring quarter classes begin	3/29/2016
Last Day to add or change a course	4/4/2016
Summer registration begins	4/11/2016
Application for a Degree via CAESAR for spring graduation	4/15/2016
Last day to drop a class for Spring	5/6/2016
M.S. completion form due to TGS for spring graduation	5/13/2016
Fall registration begins	5/16/2016
Memorial Day observance	5/30/2016
Spring classes end	6/4/2016
Spring quarter final exam	6/6 – 6/10/2016
CEE Graduation Reception for graduates and families – by invitation	6/16/2016
Commencement	6/17/2016
McCormick M.S. Convocation	6/17/2016
Summer classes begin	6/20/2016
Independence Day observance	7/4/2016
Application for a Degree via CAESAR for summer graduation	7/15/2016
M.S. completion form due to TGS for summer graduation	8/12/2016

Preface

This handbook is intended to provide you with a comprehensive guide to the Master of Science degree in Civil and Environmental Engineering (CEE) programs, The Graduate School (TGS) at Northwestern University. We hope this handbook will enhance your experience at Northwestern.

This handbook is prepared as a handy reference guide to the degree requirements, programs, policies, and procedures of the Department and The Graduate School. An Academic Time Table on page 3 is provided to guide you through various milestones during 3-quarter (9 – 12 months) program. We hope that you will find the information you need for both planning and understanding your M.S. education.

The Department would also like to emphasize the importance of social and ethical implications of an engineer's work in the betterment of the society. Through student professional organizations, departmental seminars, and many ethnics groups, you can interact with world renown researchers and engineers, and experience diverse cultures. You can also interact with professionals in the Greater Chicago area through meetings hosted by various professional groups. We hope you will take full advantage of the opportunities presented to you during your stay with us.

We hope you find this handbook a useful resource for your M.S. study. We wish you much success and welcome your suggestions for improvement of the handbook.

Kimberly Gray, Ph.D.

Professor and Chair

Civil and Environmental Engineering

Responsibility for Meeting Degree Requirements

Ultimately, students are responsible for understanding the degree requirements for their specialty area and for planning their courses of study accordingly. The Department, Assistant Dean of Graduate Study of McCormick School of Engineering and Applied Sciences, The Graduate School, and the International Office are valuable resources for academic and visa information. Faculty advisors assigned to you will assist you in course selection. However, they are not responsible for ensuring that you meet all the degree requirements including grade point average (GPA) requirement. That is the responsibility of the student.

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Introduction

Welcome to the Department of Civil and Environmental Engineering (CEE), McCormick School of Engineering and Applied Science at Northwestern University. The faculty, staff, and students at CEE look forward to interact with you so that you can enjoy the maximum learning, social, and cultural experience Northwestern University can offer you. This handbook is part of our effort to help you achieve this goal from the academic aspect. In addition to academic requirements, this handbook includes an academic time table (base on a 3-quarter to 12-month program) of some milestones such as completion of curriculum plan, advising and registration, internship or permanent position, Application for a Degree, and degree completion. We hope you will thoroughly read this handbook at least once to see the types of information included here. We also hope that you will refer to it whenever you have an academic related question. Of course, our faculty and your peers are available to address any issue you may have. Please feel free to contact them.

A new edition of the handbook is published annually to coincide with each academic year. Revisions will be made as needed each quarter. The modification will be denoted by vertical lines at the left hand margins for easy referencing. First revision is denoted by single vertical line. Second revision is denoted by double vertical lines. Third revision is denoted by double vertical lines with one being a heavy thickness line. Revision number and dates are shown on the cover page. The handbook and all the forms listed in this handbook are also available online <http://www.mccormick.northwestern.edu/civil-environmental/current-students/forms-documents.html>.

To assist us in the continuing effort to improve this document, please send your suggestions and comments to Professor Karen Chou, Assistant Chair & Clinical Professor at karen-chou@northwestern.edu.

Missions

Northwestern University

Northwestern is committed to excellent teaching, innovative research, and the personal and intellectual growth of its students in a diverse academic community.

The Graduate School

The mission of The Graduate School (TGS) of Northwestern University is to be a trusted, responsive, visionary leader and partner in order to maintain and promote the highest quality master's and doctoral education. TGS collaborates with a number of schools to guide and sustain an institutional culture that facilitates excellence in teaching, innovation and rigor in research, and the personal and intellectual growth of its diverse student population.

Department of Civil and Environmental Engineering

We empower our students to gain technical, design, and management skills needed for leadership. We emphasize fundamental principles and design methods that apply to many career paths. We conduct research that advances our ability to:

- 1. Plan, design, construct, and operate society's infrastructure*
- 2. Design and control behavior of materials*
- 3. Sustain natural and engineered environmental systems*

We achieve this through basic and applied projects in which students and faculty work together in cutting-edge facilities.

The above mission statements can be found on the websites:

University – <http://www.northwestern.edu/provost/about/index.html>

The Graduate School – <http://www.tgs.northwestern.edu/about/index.html>

Department – <http://www.mccormick.northwestern.edu/civil-environmental/about/mission-vision-statement.html>

Student and Professional Organizations

Student and professional organizations provide networking opportunity and seminars on the state of the art research and design in the civil and environmental engineering profession. The Department of Civil and Environmental Engineering is home to the Student Chapter of American Society of Civil Engineers (NU ASCE). Professional organizations of all branches of civil and environmental engineering have local section in Chicago area which hosts monthly meetings. You are encouraged to attend some of these meetings to interact and network with the engineering profession. Following is a list of organizations you may consider participating.



Northwestern University American Society of Civil Engineers Founded in 1852, the American Society of Civil Engineers represents more than 140,000 members of the civil engineering profession worldwide and is America's oldest national engineering society. ASCE's mission is to provide essential value to our members and partners, advance civil engineering, and serve the public good.

The Mission of NUASCE is *to create a more informed and involved Civil Engineering community by providing opportunities to apply and further refine technical skills, increasing student and faculty interactions, and preparing students to enter the professional engineering industry.* Through NUASCE you will have the opportunity to meet other students with similar interests, network with professionals, and participate in exciting design competitions such as concrete canoe and steel bridge. Most importantly, the student chapter prides itself on creating a strong community of engineers, and they would love for you to join!!! For more information, visit their website: <http://asce.mccormick.northwestern.edu>.

Other student organizations:

Civil and Environmental Engineering Graduate Association (CEEGA) – see Prof. David Corr, faculty advisor.

McCormick Graduate Leadership Council (MGLC) Founded in 2006, the MGLC fosters community among all McCormick graduate students. <http://mglc.mccormick.northwestern.edu/>

Graduate Student Association (NUGSA) at Northwestern enhances graduate students' experiences in and out of the classroom and strives to create resources and programs to improve the quality of students' lives. <https://nugsa.wordpress.com/>

Graduate Leadership and Advocacy Council (GLAC) is the voice of graduate students in academic and administrative matters at Northwestern University and a forum for graduate student leaders. <http://groups.northwestern.edu/glc/#GLC>

Chicago Area Professional Organizations



Illinois Section American Society of Civil Engineers represents Civil Engineers in Northern Illinois. The Section has five technical groups and the Younger Member Group (YMG). The technical groups are Environmental and Water Resources Institute (EWRI), Geo Institute (GEO), Structural Engineering Institute (SEI), Transportation and Development Institute (T&DI), and Urban Planning and Development (UBD). All groups hold monthly lunch or dinner meeting. YMG usually hosts social event for younger engineers of all disciplines to network and they also sponsor a number of outreach events to pre-college students. For more information, visit <http://www.isasce.org/>.

American Academy of Environmental Engineers and Scientists <http://www.aees.org/>
American Chemical Society: <http://www.acs.org>
American Concrete Institute (ACI) <https://www.concrete.org/>
American Geophysical Union: <http://sites.agu.org>
American Institute of Steel Construction (AISC) <http://www.aisc.org/>
American Society for Microbiology: <http://www.asm.org>
Association of Environmental Engineering and Science Professors: <http://www.aeesp.org>
Institute of Transportation Engineers (ITE) <http://www.ite.org/>
Structural Engineers Association of Illinois (SEAOI) advances and advocates excellence in structural engineering and to aid in safeguarding the public. <http://www.seaoi.org/index.html>
Transportation Research Board (TRB) <http://www.trb.org/AboutTRB/AboutTRB.aspx>
Water Environment Federation <http://www.wef.org>

Internship and Career Development

Civil and Environmental Engineering Career Fair

Through the joint effort of NUASCE and EnvEUS, the inaugural **CEE Career Fair** was held in 2013. Starting in 2015, the CEEGA (CEE Graduate Association) joined the Career Fair as a new sponsor. CEE Career Fair focus on interaction between firms that hire civil and environmental engineering graduates for full time engineering positions and for internships. Watch for the announcement of this annual event in November and December. The event is held annually in January. The Department also maintains a web page <http://www.mccormick.northwestern.edu/civil-environmental/current-students/index.html> where internships and graduate engineer positions are posted when the information is sent to the Department. We suggest you check on the site periodically to see what is being posted.

McCormick Office of Career Development (MCD)

MCD <http://www.mccormick.northwestern.edu/career-development/index.html> provides career preparation and employment assistance through a variety of work-integrated learning programs including co-op engineering education, internships, research experience, and service learning. Register with **McCormickConnect** (<http://www.mccormick.northwestern.edu/career-development/mccormickconnect.html>) to receive information on job postings, resume submissions, interview schedules, career events, or meet with a MCD advisor. MCD is located in Room 2.350 in Ford Building.

Northwestern Career Advancement (NCA)

The mission of Northwestern Career Advancement is to foster excellence in career development, preparation, and professional opportunities for undergraduate and graduate students and alumni by providing comprehensive services and programming and by promoting strong partnerships with employers, academic departments, and the university community.

<http://www.northwestern.edu/careers/>

Academic Integrity

Northwestern University and the CEE Department expect their students to hold high standard of academic honesty. Behaviors such as cheating on exam, plagiarism, using unauthorized materials for your work are not tolerated. Northwestern Provost Office issues a document *Academic Integrity: A Basic Guide* (<http://www.northwestern.edu/provost/docs/academic-integrity-basic-guide.pdf>) which is a central resource of policies governing academic integrity for all students and faculty at Northwestern. There are four main sections of the Guide:

- Principles regarding academic integrity
- Eight Cardinal Rules of academic Integrity
- Counseling and contacts
- How to avoid plagiarism

The Northwestern University *Student Handbook and Code of Conduct*

(<http://www.northwestern.edu/student-conduct/shared-assets/studenthandbook.pdf>) describes the expectations for behavior and conduct in the Northwestern community and outlines the procedures to be followed when these expectations are not met. Additional resources on academic integrity can be found in The Graduate School web site <http://www.tgs.northwestern.edu/about/policies/academic-integrity.html>.

Downloading Computer Software & File Sharing

It is incumbent on any person who uses Northwestern University resources, such as computers and associated networks, to ensure that they are not using illegal software. Downloading and using software that was obtained illegally is against University policy. Obtaining software legally means that either you personally, or your advisor through NU, has paid for the correct number of copies of the software for the number of computers you have installed the software on.

It is also against University policy to illegally download copyrighted material, such as movies, videos, mp3's, scientific papers, magazine articles, etc. **Any person who has violated this policy is subject to the disciplinary action determined by the University.**

There are many alternatives to using illegally obtained software. The University provides a limited number of software titles available for students on the IT website at <http://www.it.northwestern.edu>, located under the "Students" tab. Also, many software titles are available either free, or at a reduced cost, for educational purposes. In addition, there are many free alternatives to standard software titles, such as Open Office, that can be used freely and are very robust.

Any questions or concerns about this matter should be directed to your advisor or Department of Civil and Environmental Engineering technical support staff.

Safety Training – Laboratory

Northwestern University and the Department of Civil and Environmental Engineering take the safety of every member in the community very seriously. In that spirit, Northwestern University and CEE require students to take special care while working in the university laboratories. Everyone who works in any laboratories under the supervision of CEE **MUST** follow the Lab Safety Requirements outlined below.

- a. If you plan to use any lab for course project or research, you must contact the lab coordinator: Dave Ventre if you plan to use any of the civil engineering lab; or contact Richard Warta if you plan to use any of the environmental engineering lab. The lab coordinator will also explain the lab rules of etiquette and cleanup. Then, the LC will add you to the lab roster.
- b. All lab workers must be on the official Office for Research Safety (ORS) lab roster in order to conduct any experiments or project in the lab.
- c. Lab Safety Training and preparation are required by ORS and CEE **before he or she can begin any lab work**. The required training can be taken on-line.
- d. Once you are on the roster, you will receive email notification from Northwestern Safety Information System (NSIS), the automated training web site. The email will provide links to take the on-line ORS training. They can be taken from any NU computer, or off campus (requires VPN).
- e. The lab coordinator will be notified when you have successfully completed the ORS training.
- f. In addition, you **MUST** take the CEE on-line training, <http://www.mccormick.northwestern.edu/civil-environmental/research/lab-safety.html>. Read the Safety Guide, then take the Safety Quiz. Submit the quiz as an attached file (pdf, doc, txt, etc) to Dave Ventre at d-ventre@northwestern.edu.
- g. You may be required to have addition training, such as welding safety, depending on the specific machinery or equipment you will use.
- h. Once you have successfully complete the CEE safety quiz, ORS training, and any additional safety training, the lab coordinator will give you your lab access code and you can begin lab work.
- i. Please note that our labs and workshops contain certain specialty machines and tools that require individual, hands-on training to operate safely. This includes MTS machines, the Hobart mixers, saws, grinders, drills, hand tools, welding equipment and others. Most are kept locked. **Using any such machines without proper training and lab coordinator approval is strictly forbidden.**
- j. Anyone working in a lab without the required training, failing to follow lab safety and hygiene rules, or operating equipment without proper training and authorization, will have their lab access and privileges suspended.
- k. Under no circumstances should there be only one person is the lab during weekends, holidays, and non-normal operating hours: 8:30 am to 5:00 pm Monday through Friday

Academic Advising

You are among the elite groups of students in the Northwestern community. It is our goal for you to have an enjoyable and productive learning experience during your time with us. To achieve this goal, the Department has developed an Advising Policy for the M.S. programs described below to assist you with curriculum planning and progress towards your M.S. degree.

The Department is using the GSTS (Graduate Students Tracking System) to monitor all the M.S. students, academic plan, academic progress, and advising. You will have a 24/7 access to your unofficial academic record (the only official academic record is the transcript issued by the Registrar Office), study plan, curriculum plan. The url of GSTS is <https://gsts.northwestern.edu/site/login>. You can login with your netid and password.

While all the advising communication can be done online through GSTS, **it is not the intent of GSTS**. You are **STRONGLY** recommended to meet with your advisor as often as you wish and certainly no less than once a quarter. Your advisor is your primary resource for academic and professional advices. As experts in their fields, you should take the opportunity to interact with your advisors.

1. Academic Advisor

Each M.S. student is assigned a faculty advisor in the student's area of study during the new student orientation in the fall quarter. The four major areas of M.S. program are: Environmental Engineering and Science (EES), Geotechnical (GEO), Structural Engineering (STR), and Transportation Systems Analysis and Planning (TRN). Each B.S. student interested in the BS/MS program must include the signature of his/her M.S. faculty-advisor-to-be in the application to BS/MS program. This faculty will become the BS/MS student's faculty advisor upon acceptance to the program.

A student may change his/her faculty advisor at any time. However, the new faculty advisor must be a full time faculty member of the Department of Civil and Environmental Engineering in the area of the student's study. A change of advisor form, signed by the current advisor and advisor-to-be, must be submitted to the M.S. coordinator.

2. Curriculum Plan

Each M.S. student must complete a curriculum plan by the end of October in the academic year that the student begins his/her M.S. program. The curriculum plan must follow the guidelines for one of the four M.S. programs that are described on the CEE website (<http://www.mccormick.northwestern.edu/civil-environmental/graduate/index.html>). One copy of the curriculum plan along with the advisor's original signature must be uploaded to GSTS (<https://gsts.northwestern.edu/document/index>; click the **upload document** tab, from the **type** pull down menu, click **plan of study: courses planned**, choose your signed curriculum plan and upload it) by the end of October to prevent an academic hold on registration for the winter quarter. Students with an academic hold will not be allowed to register for any courses until the hold is removed.

Students may revise their curriculum plan at any time prior to the student's graduation with the M.S. degree. The revised curriculum plan form must be signed by the student's faculty advisor and uploaded to the **GSTS document** page under **plan of study: courses planned**. The most current curriculum plan in the student's file will be used for M.S. degree audit when the student submits the AFD (Application for a Degree) form to The Graduate School.

3. Monitoring of Progress

All M.S. and BS/MS students **must meet** with their faculty advisors at least once per quarter for academic advising and career planning. During each advising session, the student is encouraged to discuss current course performance, course selection for the subsequent quarter, and career planning such as internship, co-op, or post graduate job searching with the faculty advisor. Course selection should follow the most current curriculum plan that is in the student's academic file at the time (via GSTS>documents>plan of study). Deviation from the curriculum plan is permissible if a completed revised curriculum plan form is uploaded GSTS while submitting the plan of study (via GSTS>Plan of Study) for your advisor's approval.

Every M.S. and BS/MS student is required to complete the plan of study via the GSTS and approved by his/her advisor in order to receive permission to register for the following quarter. The mandatory advising session should be held no later than a week before the registration begins for each quarter. Registration holds will be in place until your advisor approved your plan of study each quarter. Failure to meet with the academic advisor will delay the student's ability to register.

Registration hold is usually removed within 1 business day after your advisor approves your plan. E-mail will be sent when the registration hold is removed. A new registration hold is placed on each student in each quarter until the student completes all the degree requirements.

4. Satisfactory Progress

According to The Graduate School (TGS) requirements <http://www.tgs.northwestern.edu/about/policies/satisfactory-academic-progress.html>, a GPA of 3.0 is required for graduation. A GPA below 3.0 in any quarter will place a student on probation. Probation is intended as a notice of unsatisfactory academic performance and constitutes a warning that improvement must be made in subsequent work to demonstrate progress toward M.S. degree. TGS allows a student up to two (2) consecutive quarters to return to satisfactory progress (quarter and cumulative GPA ≥ 3.0). Lack of improvement or evidence of inability to complete the work successfully in a given curriculum may provide reason for dismissal. Each student's academic performance is reviewed by the M.S. coordinator to ensure students are progressing satisfactorily.

If a quarter GPA(QGPA) or cumulative GPA (CGPA) falls below a 3.0, the M.S. coordinator will send an e-mail via GSTS before the beginning of a new quarter informing the student of his/her unsatisfactory progress. A letter from TGS will arrive in about the second week of the new quarter.

If a student's QGPA or CGPA is between 3.0 and 3.2, an e-mail from M.S. coordinator will be sent via GSTS to the student. Although this range of GPA is still considered satisfactory, however, a course below 3.0 could easily put the student's GPA in jeopardy. Unlike undergraduate, the M.S. program is only one year long, it is critical to recognize the importance of time and performance.

Degree Requirements

The Department of Civil and Environmental Engineering (CEE) offers The Graduate School (TGS) Master of Science degree in four (4) specialty areas. The requirement for M.S. in CEE is 12 units of courses. A minimum of 9 units must be taken for grades. Each specialty area requires minimum of 2 to 3 quarters of seminar course. This is a zero unit, no tuition course.

In addition to the above requirements, each program has its own core and elective courses requirements; thesis, course-only, design project, research paper, requirement; and possibility for minor; etc. Please refer to the area degree requirements in subsequent pages and discuss the requirements with your advisor.

Full Time Enrollment

While the M.S. degree is designed for full time enrollment, this is not an absolute requirement. For international students (F1 or similar visa holders), full time enrollment is required during the academic year (fall, winter, and spring quarter; excluding summer session).

Full time enrollment is defined as 3 to 4 units of courses in a quarter. If a student wishes to enroll more than 4 units of courses in any one quarter, additional tuition would be assessed.

For students who have registered for 12 units of courses but have not completed the degree requirements, for example, completing research paper (zero unit) in TRN; completing a CivEnv 499 project; or completing CivEnv 590 thesis, registration of TGS 512 is required for international students if the work is to be completed in U.S. during the following academic year. Registration of TGS 512 is recognized by Northwestern as full time enrollment. The cost of this course is about \$100 and is only allowed after a student has registered for 12 units of courses. For U.S. residents or U.S. citizen, registration of TGS 512 is not required if the student is not completing the work on campus. More information can be found on TGS General Registration Policy

<http://www.tgs.northwestern.edu/about/policies/general-registration-policies.html>

Part Time Enrollment

Part time enrollment is permitted and is usually occurred when a student needs one or two courses to complete the degree. For international students (F1 or similar visa holders), part time enrollment is permitted during the quarter when the student only needs those courses to complete the degree. In this case, the student must submit a **Reduced Course Load Form**

http://www.northwestern.edu/international/docs/current-students/Reduced_Course_Load_Form.pdf.

Independent Study (CivEnv 499)

Independent Study is a self-structured study that is agreed upon between the student and the faculty supervisor. For area that has a thesis option, CivEnv 499 is a good way for both the student and the faculty to see if research or thesis is right for each other. Independent work done during CivEnv 499 can be expanded to become a M.S. thesis. At that time the student should register for CivEnv 590. Hence, maximum of one CivEnv 499 is permitted among the 12 units of courses registered. A petition form signed by the student and the faculty supervisor must be submitted to the M.S. Coordinator in order to receive a permission number for registration. The petition form will be uploaded to the GSTS and becomes part of the student's academic record.

Application for a Degree (AFD)

In any quarter if you **anticipate** to complete ALL your degree requirements (12 units of courses and necessary paper, project, or thesis depending on the program), you **must** submit an Application for a Degree (AFD) via CAESAR. Submission of this form does not bind you to complete all your work by the end of the quarter. It is a notice to TGS that you plan to graduate at the end of that quarter. There is a deadline for submitting AFD each quarter and in the summer session. You may consult the Academic Calendar on the Registrar Office web site or refer to the Important Dates (page 6) for the current academic year. You may submit AFD more than once until you graduate.

Degree Completion Form

Once TGS receives your AFD, it will initiate a series of paperwork, called the Degree Completion Form. This form must be signed by your M.S. committee which usually include your (project, research, etc) advisor and a graduate faculty member. Hence, you should inform the CEE Academic Coordinator the faculty members' name in your M.S. Committee within a few weeks after you submit your AFD.

NORTHWESTERN - MASTERS OF SCIENCE: PROGRAM IN ENVIRONMENTAL ENGINEERING & SCIENCE 2015-2016

The MS in EES requires 12 course units in addition to the Environmental Seminar Series – CIV ENV 516. For the BS/MS option, students use 3 of their undergraduate courses, denoted by *, that count towards the MS and need to follow an additional 9 courses.

		1 st Quarter/Fall	2 nd Quarter/Winter	3 rd Quarter/Spring	Optional 4 th Quarter/Summer
Recommended: CIV ENV # 4 Courses/Quarter and the EES seminar series		Environmental Microbiology (361-1)^{†*}	Environmental Laboratory (365)*	Bio-Chemical-Physical Processes (448)	
		Aquatic Chemistry (367)*	Physical-Chemical Process in Water Treatment (444)	Environmental Biotechnology (442)	
		Environmental Transport Processes (440)	1st Technical Elective[§]	2nd Technical Elective[§]	
		4 th Course from Tracks below or as unrestricted elective	4 th Course from Tracks below or as unrestricted elective	4 th Course from Tracks below or as unrestricted elective	4 th Course from Tracks below or as unrestricted elective
		Environmental Engineering Science Seminar Series (516) – no tuition zero credit seminar			
Tracks & Tech Electives Choose additional Courses/Quarter	Environmental Chemistry		Chemical Microbial Interactions (441) and Biogeochemistry (317)	Metals in the Env. (468) and Environmental Organic Chemistry (370)	
	Environmental Microbiology		Chemical Microbial Interactions (441) and Microbial Ecology (443)		
	Global Ecological Health Engineering	Sustainability (368)	Global and Ecological Health Challenges (GBL HLTH BME 395)		Global Health: Achieving Global Impact Through Local Engagement
	Electives within CEE	Environmental Law (303)	Community Based Design (398-1)	Community Based Design (398-2)	
Additional Options	MS Thesis		Research Project (499)	Research Project (590)	Research Project (590)
	Design		Community Based Design (398-1)	Community Based Design (398-2)	

Note: required core courses are in **bold** face

[†] numbers in parentheses are CIV ENV course numbers unless otherwise stated

* For the BS/MS option, students use 3 of their undergraduate courses, denoted by *, that count towards the MS and need to follow an additional 9 courses.

[§] Technical electives must be CIV ENV courses within the EES program

NORTHWESTERN UNIVERSITY MASTERS OF SCIENCE PROGRAM IN GEOTECHNICAL ENGINEERING

Note: The recommended program includes 12 courses, in addition to the Geotechnical Engineering Seminar.
The minimum number of courses for an MS is 12 (9 required + 3 electives).

Track		1 st Quarter/Fall	2 nd Quarter/Winter	3 rd Quarter/Spring
Recommended: 4 Courses/Quarter plus Geotechnical Engineering Seminar		Advanced Soil Mechanics I (450-1)¹	Advanced Soil Mechanics II (450-2)²	Advanced Soil Mechanics III (450-3)
		Underground Construction (495-21)	Soil Dynamics (458)	Constitutive Modeling (495)
		Ground Improvement (495-22)	Unsaturated Soil Mechanics (495)	Geotechnical Earthquake Engineering (495) ² or LRFD in Geotechnical Engineering (495) ³
		4 th Course from Tracks below	4 th Course from Tracks below	
			MS Design Project – pre-requisite course (504) – zero unit, zero cost	MS Design Project (495)
			Seminar in Geotechnical Engineering Civ-Env 515 in winter (515-1) and spring (515-2) quarters	
Tracks Choose 1 Course/Quarter	Design	Uncertainty analysis (306) Advanced Steel Design (495-20) Finite Elements Methods (327)	MS Design Project (495) with a required zero unit pre-requisite course (504) in Winter quarter	
	Earth Science	Introductory (Aqueous) Geochemistry (Earth 310)	Seismology and Earth Structure (Earth 323-0)	
	Structures	Finite Elements Methods (327)	Reinforced Concrete (325)	Steel Design (323)
	Simulation-Driven Geotechnical Engrg.	Finite Elements Methods (327)	Advanced Finite Elements Methods (426-1)	Computational Forensics and Failure Analysis (395)
<p>Note: required courses/projects are in bold face</p> <p>¹ number in parenthesis are Civ-Env courses unless noted otherwise</p> <p>² courses offered in even years</p> <p>³ courses offered in odd years</p>				

NORTHWESTERN UNIVERSITY MASTERS OF SCIENCE PROGRAM IN STRUCTURAL ENGINEERING

The MS in STR requires 12 course units (6 core courses + 6 electives) in addition to the STR Seminar.

Track	1 st Quarter/Fall	2 nd Quarter/Winter	3 rd Quarter/Spring
Recommended:	Dynamics of Structures (320)¹	Theory of Structures II (319)	Pre-stressed Concrete Structures (421)
4 Courses/Quarter plus STR Seminar	Finite Elements Methods (327)	Theory of Plates and shells structures (495)	2 nd Course from approved list [†]
	Mechanics of Continua I (417)² or course from approved list[†]	Theory of Elasticity (415)² or course from approved list[†]	3 rd Course from approved list [†]
	4 th Course from approved list [†]	4 th Course from approved list [†]	4 th Course from approved list [†]
	STR Seminar (512)³ – no tuition zero credit seminar		
[†]Approved list of electives	Architecture Engineering & Design I (385-1), F Experimental Solid Mechanics (413), F Inelastic Analysis of Structures (422), F Method of Applied Math (ES311) ⁷ Advanced Soil Mechanics 1 (450-1), F Forensic Engineering (395), V Advanced Steel Design (495-20), V Uncertainty Analysis (306), F Differential Geometry (MATH 342) Independent Project/Study (499) ⁵	Architecture Engineering & Design II (385-2), W Concrete Design (325) ⁴ , W Cohesive Fracture and Scaling (430), W Mechanics of Composite Materials I (414-1), W Advanced Finite Elements Method (426-1), W Advanced Soil Mechanics II (450-2), W Foundation Design (352), W(O) Independent Project/Study (499) ⁵	Architecture Engineering & Design III (385-3), S Steel Design (323) ⁴ , S Computational Forensics and Failure Analysis (395), S Structural System and Optimization, V Behavior of RC Structure (425), V Mechanics of Composite Materials II (414-2), S Advanced Soil Mechanics III (450-3), S Independent Project/Study (499) ⁵
Design Practice option		MS Design Project (495) with a required zero unit pre-requisite course (504) in Winter quarter	
Thesis option	Research (590) ⁶ or Independ Study (499) ⁵	Research (590) ⁶	Research (590) ⁶
Simulation Driven Structural Engrg.	Finite Elements Methods (327)	Advanced Finite Elements Method (426-1), W	Computational Forensics and Failure Analysis (395), S

Note: required courses shown in **bold** face and/or shaded cells and are **required** for students who choose post MS plan of Engineering Practice. Failure to satisfactorily meet the required course may delay your graduation. If you want to waive the required course requirement, the instructor of the course must approve the waiver and report the decision in GSTS. For students who choose the thesis option, your curriculum plan may deviate from above and must be approved by your thesis advisor and a change of advisor may be necessary. For students interested in **architecture engineering and design (AED)**, they may want to take the sequence of 385 courses highlighted in the **Approved List of Electives**.

¹ numbers in parentheses are Civ_Env course numbers unless otherwise stated

² either 417 or 415 is required

³ additional professional development seminars at 5 pm on Wednesday are **required** for students who choose post MS plan of Engineering Practice.

⁴ must take these courses in the appropriate quarters if not taken as an undergraduate

⁵ **maximum of 1 unit** of Civ_Env 499 may be used in M.S. program; must submit petition form to CEE

⁶ A thesis is required for Civ_Env 590, **min 1 unit and max 3 units**. Grading is P/N.

⁷ To prepare for 424 and 422

NORTHWESTERN UNIVERSITY MASTERS OF SCIENCE PROGRAM IN TRANSPORTATION SYSTEMS ANALYSIS AND PLANNING

The MS in TRN requires 12 course units (**6** core courses + **6** electives)

Track		1 st Quarter/Fall	2 nd Quarter/Winter	3 rd Quarter/Spring
Recommended: 4 Courses/Quarter plus Transportation Engineering Seminar		Introduction to Transportation Engineering (376, *)	Infrastructure Systems Analysis (483)* select a course from tracks below	Transportation Systems Operations I: Urban Network (472-2, +, #) or Advances in Travel Demand Analysis and Forecast (472-2, +, #)
		Transportation Systems Planning and Management (479)	Transportation Systems Analysis I (471-1, *)	Evaluation and Decision Making for Infrastructure Systems (482)
		Transportation Economics and Public Policy (Econ 355)	Advanced Theories of Traffic Flow (472-1, +, #) or Transportation Systems Operations II: Scheduled Modes and Real Time Systems (472-1, +, #)	Transportation Systems Analysis II (471-2, *)
		4 th Course from Tracks below	4 th Course from Tracks below	4 th Course from Tracks below
	Seminar in Transportation Engineering (517) – no tuition zero credit seminar			
Tracks Choose 1 Course/Quarter	Transportation Science and Logistics	Mathematical Programming (450-1); <i>or</i> Transportation network design and operations (IEMS 489)	Production and logistics-I (480-1) <i>or</i> Supply chain modeling and analysis (IEMS 381)	Supply Chain Management (IEMS 480);
	Operations research	Uncertainty analysis (306) <i>or</i> Stochastic models and simulation (IEMS 315) <i>or</i> Mathematical Programming (450-1)	Mathematical Programming (450-2)	Civil and Environmental Engineering Systems Analysis (304)
	Travel demand analysis	Microeconomics (Econ 310) <i>or</i> Intermediate statistics (IEMS 401)	Travel Demand Analysis & Forecasting I (480-1)	Travel Demand Analysis & Forecasting I (480-2)
	Urban planning and policy	Elements of Public Finance (Econ 309)		Public Policy and Management Strategy: Energy and Environment (KGMS 466)
Writing requirement	Students are required to write a research or analysis paper on some aspect of transportation that demonstrates the student's knowledge, investigative and/or analytic ability, and writing skills.			
<p>Note: required courses/projects are in bold face; all courses are Civ_Env courses unless otherwise stated</p> <p># is offered in alternating years</p> <p>* must choose two of three course denoted by *, third * slot will be used for electives</p> <p>+ must choose one of four courses denoted by +; two are highly recommended</p> <p>† for MS admitted in Fall 2015 only: replace CEE 483 with an elective course from the tracks above. This change yields 6 core courses + 6 electives.</p>				

Northwestern University
 Department of Civil & Environmental Engineering
 Master of Science Curriculum Plan for Advising

Name: _____ Specialty Area: _____
 Starting Quarter: _____ Projected Graduation Date: _____
 Faculty Advisor _____
 (F.A.): _____ F.A. signature & date: _____

Date	Course Number	Course Title	credit
Quarter 1 (mm/yyyy)			
Quarter 2 (mm/yyyy)			
Quarter 3 (mm/yyyy)			
Quarter 4 (mm/yyyy)			
Quarter 5 (mm/yyyy)			

Notes: (use additional sheets if needed)

Northwestern University
 Department of Civil & Environmental Engineering
 Master of Science **REVISED** Curriculum Plan for Advising

Name: _____ Specialty Area: _____
 Starting Quarter: _____ Projected Graduation Date: _____
 Faculty Advisor _____
 (F.A.): _____ F.A. signature & date: _____
 Date of most current curriculum plan _____

Date	Most current curriculum plan		Revised curriculum plan		credit
	Course No.	Course Title	Course No.	Course Title	
Quarter 1					
Quarter 2					
Quarter 3					
Quarter 4					
Quarter 5					

Notes: *(use additional sheets if needed)*

Department of Civil and Environmental Engineering

Northwestern University • McCormick School of Engineering and Applied Science

CHANGE OF ADVISOR FORM

Name of student: _____

NU ID: _____

E-mail address: _____

Mobile phone number: _____

Name of current
faculty advisor: _____

Signature/Date: _____

Procedures for Changing Academic Advisor:

1. This Change of Advisor form must be signed by both your current advisor and your advisor-to-be.
2. Bring a copy of your M.S. Advising Form and your most current M.S. Curriculum Plan along with this form to your advisor-to-be. You may request a copy from the Academic Coordinator. If you wish to modify your curriculum plan, you must also bring the M.S. Revised Curriculum Plan form to your advisor-to-be.
3. Return the completed Change of Advisor Form to the M.S. Coordinator.

To the Advisor-to-be:

Have you reviewed the student's advising record and the most recent curriculum plan (M.S. Curriculum Plan and/or M.S. Revised Curriculum Plan form)? Will you approve the most recent curriculum plan, and agree to serve as the student's faculty advisor?

_____ YES

_____ NO

Comments:

Name of faculty
advisor-to-be: _____

Signature/Date: _____

CIV_ENV 499 Project Application for an Independent Study

1) Your Topic

- a. Scope/project objectives

- b. List of project tasks/goals and a tentative weekly schedule

- c. References

- d. Deliverables (all projects must include a written report and an oral presentation; if this is for lab work, it must involve a significant lab report at the end of the quarter.)

2) How this independent study supports your curriculum

- a. Courses that led to this one

- b. How this enhances your learning in your master degree?

3) Interaction with professor

- a. How often will you meet

- b. Basis of evaluation (preference: itemized evaluation, example – weekly reports 15%, scholarly/technical component 50%, written report 20%, oral presentation 15%)

4) Signatures by sponsoring independent study Professor,

Sponsoring Project Advisor _____
(print name)

(signature) Date _____

Student _____
(print name)

(signature) Date _____

Please return completed form to CEE Academic Coordinator (Tech A236) to be placed in the student's academic folder and to receive a permission number to register CivEnv 499.

Department of Civil and Environmental Faculty

Jan Achenbach (Emeritus Professor)
Mechanics, Materials, and Structures

Zdeněk Bažant
Mechanics, Materials, and Structures

Larry Booth
Architectural Engineering & Design

Karen Chou (Assistant Chair, DGS M.S., M.S. in
STR Coordinator)
Mechanics, Materials, and Structures

David Corr (Director of Graduate Study)
Mechanics, Materials, and Structures

Isaac Daniel
Mechanics, Materials, and Structures

Pablo Durango-Cohen (TRN Coordinator)
Transportation Systems Analysis & Planning

Jean-François Gaillard (EES Coordinator)
Environmental Engineering & Science

Ahmad Hadavi
Project Management

Leon Keer (Emeritus Professor)
Mechanics, Materials, and Structures

Raymond Krizek (MPM Director)
Geotechnical Engineering; Project Management

Hani Mahmassani (Transportation Center
Director)
Transportation Systems Analysis & Planning

Harish Rao (Adjunct Professor)
Environmental Engineering & Science

Oluwaseyi Balogun
Mechanics of Materials & Solids

Neil Blair
Environmental Engineering & Science

Giuseppe Buscarnera
Geotechnical Engineering

Mark Clark
Environmental Engineering & Science

Gianluca Cusatis (Ph.D. in MMS Coordinator)
Mechanics, Materials, and Structures

Charles Dowding (Associate Chair)
Geotechnical Engineering

Richard Finno (GEO Coordinator)
Geotechnical Engineering

Kimberly Gray (Department Chair)
Environmental Engineering & Science

Yonggang Huang
Mechanics, Materials, and Structures

Sinan Keten
Mechanics, Materials, and Structures

Luisa Marcelino (Research Professor)
Environmental Engineering & Science

Yu (Marco) Nie
Transportation Systems Analysis & Planning

Aaron Packman
Environmental Engineering & Science

Department of Civil and Environmental Faculty

John Rudnicki
Mechanics, Materials, and Structures

Surendra Shah (Emeritus Professor)
Mechanics, Materials, and Structures

George Wells
Environmental Engineering & Science

Joseph Schofer
Transportation Systems Analysis & Planning

Amanda Stathopoulos
Transportation System Analysis & Planning

Yun Wang
Environmental Engineering & Science

Contacts for Frequently Asked Questions

Questions

Students should consult with their academic advisors regarding academic and professional issues such as course selections and career guidance. The MS coordinator will assist the academic coordinator when procedural issues arise. The list below is intended to help you identify resources that could address your questions.

Staff Contact Information

Academic Coordinator	Hyein Kim
CEE IT	Craig Neumann
Laboratory (dry) coordinator & Lab safety coordinator	Dave Ventre
Environmental laboratory & safety coordinator	Richard Warta
Finance	George Homsy
Access to AG 51 and locker key (deposit required)	CEE staff (Tech A236)

University Contact Information

If you have question related to:	Who should you see or where should you go:
Academic – satisfaction progress	Professor Karen Chou Antoaneta Condurat or Kate Veraldi, TGS
Academic Calendar	http://planitpurple.northwestern.edu/calendar/academic_calendar
CAESAR – reference materials, how to register	http://www.northwestern.edu/caesar/
Counseling and Psychological Services (CAPS)	Student Affairs http://www.northwestern.edu/counseling/
Course schedule/listings – current academic year	http://www.mccormick.northwestern.edu/civil-environmental/courses/index.html
General M.S. degree requirements	Dr. Bruce Lindvall, Assistant Dean for Graduate Study, McCormick
GSTS	Professor Karen Chou
Health Service	http://www.northwestern.edu/health/
Internship, Co-op	http://www.mccormick.northwestern.edu/career-development/index.html
M.S. in CEE degree requirements	academic advisors, area coordinators
Parking – walking zone, rates, FAQ, campus shuttle, U-Pass CTA	http://www.northwestern.edu/up/parking/
Reduced Course form Optional Practical Training form Curricular Practical Training form	http://www.northwestern.edu/international/forms/form-library/student-forms.html
Registration hold	Hyein Kim or Professor Karen Chou
Transportation Center & Library	http://www.transportation.northwestern.edu/ http://www.library.northwestern.edu/libraries-collections/evanston-campus/transportation-library
Visa	International Office
WildCard	http://www.northwestern.edu/userservices/wildcard/