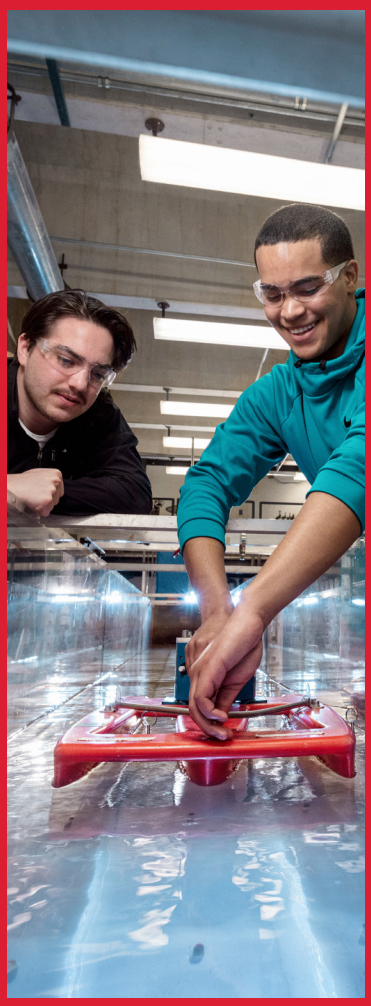
IOWA STATE UNIVERSITY

Department of Civil, Construction, and Environmental Engineering

CCEE Graduate Student Handbook



Town Engineering

www.ccee.iastate.edu

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1.0 INTRODUCTION

The Civil, Construction and Environmental Engineering Department (CCEE) Graduate Student Handbook is intended to provide academic guidance for students enrolled in the CCEE graduate programs. This document references key resources in the University, points to University requirements, identifies degree components, and highlights key components for students pursuing a graduate degree in civil engineering. The handbook does not contain all the resources and policies that may be relevant, but it will help direct the student to additional information.

Iowa State University is a global and culturally diverse university committed to providing an inclusive, equitable, and diverse environment for both learning and employment. We know that diversity in experience and perspective is vital to advancing innovation, thinking critically, solving complex problems, and building an inclusive academic community. At Iowa State, we translate these values into action by working with diverse students, colleagues, and ideas. The university expects that all students and employees will demonstrate a contribution to diversity and inclusion as embodied in Iowa State University's Principles of Community. The Civil, Construction and Environmental Engineering Department (CCEE) is committed to sustaining a collegial, positive, and productive environment for each individual and for the collective benefit of all.

The University's *Graduate College Handbook* identifies many more resources regarding University procedures, graduate forms, schedules for submission of forms, financial resources, and more. The Graduate College's web site, http://www.grad-college.iastate.edu, contains the Graduate College Handbook, as well as many deadlines, forms, and publications that are important to the graduate student. All students should acquaint themselves with these resources.

The CCEE Graduate Student Handbook is consistent with the policies and procedures formulated by the University and the Graduate College and, hence, supplements the materials contained there. This handbook is intended to emphasize departmental requirements and resources. Note that some specialization areas within the department may have additional requirements regarding core courses, graduate seminars, meetings, or other activities.

EACH STUDENT IS RESPONSIBLE FOR MEETING ALL POLICIES, DEADLINES AND REQUIREMENTS.

This handbook can be found on the CCEE website: CCEE Graduate Student Handbook

2.0 DEGREE PROGRAMS

2.1 Graduate Degree Major

A. The CCEE Department offers the following degree programs:
   - Master of Engineering (M.Eng.): coursework only
   - Master of Science (M.S.): thesis or non-thesis (creative component)
   - Doctor of Philosophy (Ph.D.)

B. The degree major is **Civil Engineering** with areas of specialization in:
   - Civil Engineering Materials
   - Construction Engineering and Management
   - Environmental Engineering
   - Geotechnical Engineering
   - Intelligent Infrastructure Engineering (M.S. (thesis) and Ph.D. only)
   - Structural Engineering
   - Transportation Engineering
   - General Civil Engineering (M.Eng. only)

C. For all degrees, the diploma will list the major **Civil Engineering**.

D. As noted above, a student can earn a degree in **Civil Engineering**, without a specialization. This option is only available for the M. Eng. It is a general degree that addresses three specialization areas selected by the student. Only students with an accredited bachelor's degree in civil engineering may select this general option.

2.2 Interdepartmental Degree Programs

A. The CCEE department participates in the following interdepartmental degree programs:
   - Environmental Science: MS and PhD
   - Biorenewable Resources & Technology (BRT): MS and PhD
     - Link: Bioeconomy Institute
   - Wind Energy Science, Engineering & Policy (WESEP): PhD only

B. Interdepartmental program requirements are established by the supervisory committee of each degree.

C. For additional information on policies regarding interdepartmental programs, refer to the Graduate College Handbook, Section 4.1.3.

2.3 CCEE BS/MS Concurrent Program

A. Eligible undergraduate civil or construction engineering students can become graduate students ***before*** they graduate with their BS degree.

B. CCEE juniors and seniors are encouraged to examine BS/MS concurrent program eligibility requirements and program structure, found on the CCEE website: Graduate Degree Prerequisites & Requirements page, click on ***Concurrent BS/MS Program***.

C. If accepted, student status changes to that of Graduate during the concurrent period, and all tuition and fees will be assessed as graduate.

D. Up to 6 graduate credits completed during the concurrent period can be counted for both the BS and MS degrees.
E. After the BS degree is completed, students continue on to finish the MS degree program.
F. For additional information on concurrent programs, refer to the Graduate College Handbook, Section 4.3.2

2.4 Graduate Courses Taken as an Undergraduate

A. If students choose to start an MS degree ***after*** BS graduation, they can also count up to 6 credits of graduate coursework completed during their undergraduate program. These credits can be counted regardless of if they counted for the BS degree.
B. For additional information, refer to the Graduate College Handbook, Section 6.3.2

2.5 Graduate Course Decisions

A. Undergraduate students interested in graduate degree programs and take graduate courses should take their focus area of interest into account, so that the courses completed will count for the graduate program.

3.0 GENERAL PROGRAM REQUIREMENTS

3.1 GRE Guidelines for Admission

A. Score Guidelines
   - Verbal = 146
   - Quantitative = 155 (Structures 160)
   - Analytical Writing = 3.0

B. GRE may be waived for the following applicants:
   - Graduates of CCEE undergraduate programs.
   - Graduates of US ABET-accredited undergraduate engineering programs.
   - Graduates of graduate programs from US ABET-accredited institutions.

3.2 Graduate English Requirements for Non-Native Speakers of English

A. Graduate students whose native language is not English must follow ISU Admissions and Graduate College policies for English proficiency.

B. Prior to Admission: English proficiency examination
   - This examination requirement measures an applicant's understanding of the English language.
   - Applicants are exempt from ISU English proficiency admission examinations if they have earned a bachelors or higher degree from a country where English is the ONLY OFFICIAL language, according to the International Graduate Application Instructions, page 2.

C. Applicants who do not meet the criteria in "A", must take one of the following exams:
   - TOEFL: Test of English as a Foreign Language
   - IELTS: International English Language Testing System
   - For 2020/2021: ISU Admissions will accept the DUOLINGO English Test in lieu of TOEFL or IELTS.
   - Admissions and CCEE minimum English requirements are listed as follows:

Exam	Admissions Minimum	CCEE Minimum
TOEFL iBT (internet-based)	79	82
TOEFL PBT (paper-based)	550	553
IELTS	6.5	6.5
DuoLingo	105	105

D. After Admission: English Placement Test (EPT)
   - The EPT is a measure of a student's ability to communicate using the English language.
   - Students are exempt from the EPT if they achieve or exceed scores on the following exams:

Exam	Score meets or exceeds
TOEFL iBT (internet-based)	100
TOEFL PBT (paper-based)	600
IELTS	7.5

- For additional information, refer to the English Placement Test website, click on ***Exemptions***.
- Graduate students should take the EPT as soon as they arrive, preferably before the start of classes their first semester, but no later than the end of the first semester.
- The EPT is pass/fail, and is scored by staff in the English Department:
- A student who passes the EPT fulfills all ISU English proficiency requirements.
- A student who does not pass the EPT is assigned to English 99 or 101 series, and must be completed during the first year of study.
- For additional information, refer to the English Placement Test website and the Graduate College Handbook, Section 4.4.3.

3.3 Civil Engineering Language Requirements

A. Civil Engineering does not require a foreign language for either the Master of Science, Master of Engineering or the Doctor of Philosophy degrees.

3.4 Program Requirements

A. The details of each student's program are developed in consultation with a major professor and a program of study (POS) committee.

B. Credit requirements
   - 30 credits = Master of Science, Master of Engineering
   - 72 credits = PhD

C. Master of Science options
   - Creative Component
   - Thesis
   - Students who have research assistant (RA) positions are expected to complete the thesis option.

3.5 Course Requirements

A. The courses listed in Table 1 are **minimum undergraduate course requirements** for students seeking a graduate degree in the areas of specialization in the CCEE Department.
   - Equivalent courses may be substituted for the listed courses.
   - Students who are missing prerequisite courses can be admitted with the requirement that they complete prerequisite courses on a graded basis before attempting graduate level courses.
   - Prerequisite courses do not count toward the graduate degree.

3.6 Professional Engineering Certification

A. Students without an accredited bachelor's degree in engineering should be aware that completion of the graduate degree **may not** qualify the student to attain registration as a professional engineer in some states.
   - The policies for registration are established by the Board of Engineering Examiners in each state.

B. The Board in the state you desire registration in should be contacted for complete information about current and developing policies regarding the qualifications for engineering registration.

3.7 Thesis, Creative Component and Dissertation Definition & Requirements

A. Master's Thesis, as defined by the Graduate College Handbook, Section 7.1.5

   "A scholarly composition that demonstrates the ability of the author to do independent and creative work. It explores in some depth a problem or issue related to the major field of study. Although considerable variations in format and style are acceptable, precise expression, logical construction, and meticulous attention to detail are essential. A thesis is required in all fields in which a master's degree is awarded, except where specific provision is made for a nonthesis degree program. A minimum of three research credits is required on every program of study for a thesis master's degree."

B. Dissertation, as defined by the Graduate College Handbook, Section 7.1.5

   "Must demonstrate conclusively the ability of the author to conceive, design, conduct, and interpret independent, original, and creative research. It must attempt to describe significant original contributions to the advancement of knowledge and must demonstrate the ability to organize, analyze, and interpret data. In most instances, a dissertation includes a statement of purpose, a review of pertinent literature, a presentation of methodology and results obtained, and a critical interpretation of conclusions in relation to the findings of others. When appropriate, it involves a defense of objectives, design, and analytical procedures. Dissertation research should be worthy of publication and should appear in appropriate professional journals or in book form."

C. For thesis and dissertations, the Graduate College Handbook, Section 7.1.5 states:

   "Since satisfactory completion of the dissertation or thesis can constitute one of the most gratifying experiences in graduate study, the document should reflect the highest standards of scholarship, serving as a measure of quality for the student, major professor, the program, and Iowa State University."

D. Master's Creative Component or Nonthesis, as defined by the Graduate College Handbook, Section 7.1.6

"Must present substantial evidence of individual accomplishment (e.g., a special report, capstone course, integrated field experience, annotated bibliography, research project, design, or other creative endeavor). A minimum of two credits of such independent work is required on those programs of study (POS)."

- CCEE expects the student to show mastery and understanding in the topic of the student's creative component through the final exam.

Table 1: Minimum Undergraduate Course Requirements for CCEE Department Graduate Degrees

Minimum Undergraduate Course Requirements	ConE*	G/M	Envir	Str	Tran**	IIE
Mathematics and Computer Science						
Calculus (12 semester credits, 3 of the 12 credits can be a numerical analysis course)……..	Calculus	Calculus	Calculus	Calculus	Calculus	Calculus
Math 266…Elementary Differential Equations……	Math 266	Math 266	Math 266	Math 266	Math 266	Math 266
Computer Language……..	Computer	Computer	Computer	Computer	Computer	Computer
Statistics……	Stat	Stat	Stat	Stat	Stat	Stat
Science						
Chem 167 or 177...General Chemistry……	Chem 167or177	Chem 167or177	Chem 167or177	…….	Chem 167or177	(select one) Chem 167 or 177
Geol 201…Geology for Engineers & Envir. Scientists……	…….	Geol 201	Geol 201	…….	Geol 201	Geol 201
Phys 221…Introduction to Classical Physics I……..	Phys 221	Phys 221	Phys 221	Phys 221	Phys 221	Phys 221
Engineering Mechanics						(select one)
CE 274…Statics of Engineering……	CE 274	CE 274	CE 274	CE 274	CE 274	CE 274
EM 324…Mechanics of Materials……..	EM 324	EM 324	…….	EM 324	EM 324	EM 324
EM 327…Mechanics of Materials Laboratory……..	EM 327	…….	…….	EM 327	…….	…….
ME 345…Dynamics……	…….	ME 345	…….	ME 345	…….	ME 345
ABE 378…Mechanics of Fluids……	…….	ABE 378	ABE 378	…….	ABE 378	ABE 378
Civil Engineering						(select two)
CE 306 …Project Management for Civil Engineers	CE 306	…….	…….	…….	…….	
CE 111…Fundamentals of Surveying I…….	…….	…….	…….	…….	…….	CE 111
CE 326…Principles of Environmental Engr……	…….	…….	CE 326	…….	…….	CE 326
CE 332…Structural Analysis I……	CE 332	…….	…….	CE 332	…….	CE 332
CE 333…Structural Steel Design I……	…….	…….	…….	CE 333	…….	CE 333
CE 334…Reinforced Concrete Design I……	CE 334	…….	…….	CE 334	…….	CE 334
CE 360…Geotechnical Engineering……	CE 360	CE 360	…….	CE 360	CE 360	CE 360
CE 372…Engineering Hydrology and Hydraulics……	…….	…….	CE 372	…….	CE 372	CE 372
CE 382…Design of Concretes ……	…….	CE 382	…….	…….	CE 382	CE 382
CE 383…Design of Portland Cement Concrete……	…….	…….	…….	…….	…….	CE 383
CE 453…Highway Design……	…….	…….	…….	…….	CE 453	CE 453
Construction Engineering – Demonstrated competencies in topic areas of current undergrad ConE courses (see below)***						
ConE 340…Concrete and Steel Construction……..	…….	…….	…….	…….	…….	ConE 340
ConE 422…Construction Estimating……	…….	…….	…….	…….	…….	ConE 422
ConE 441…Construction Planning, Scheduling, & Control.	…….	…….	…….	…….	…….	ConE 441

* Students with engineering degrees other than construction engineering who plan to emphasize in construction engineering & management should check with the program of study (POS) committee.

** Students with engineering degrees in other disciplines who plan to emphasize in planning and/or traffic operations should check with the program of study (POS) committee.

*** Competency will be evaluated by testing, course work, or experience.

4.0 GRADUATE DEGREE OPTIONS & CREDIT REQUIREMENTS

4.1 Guidelines That Apply to All Degree Programs

A. Students must complete a minimum of 9 credits of CCEE courses.
B. Students are limited to 3 credits of GR ST courses on the POS.

4.2 Master of Science

A. All guidelines in Section 4.1.
B. Minimum of 30 total credits, with the following conditions:
   - Maximum of 3 credits of CE 590.
   - 22 of the 30 total credits must be earned at ISU.
   - Transfer courses from other institutions must be graduate level with minimum grade of B (Refer to section 4.4).
   - Maximum of 9 credits earned as an ISU nondegree graduate student (refer to section 4.5).
   - Maximum of 6 graduate credits completed as an undergraduate, either as part of undergraduate requirements (refer to Section 2.4) or in a concurrent program (refer to section 2.3).
C. MS students must select an area of specialization.
D. Minimum of 20 credits of 500 level courses or above in the area of specialization.
E. Minimum of 6 credits of courses outside of the area of specialization (approved by POSC).
F. Maximum of one 3-credit course at 400 level within the Department (see Table 2).
G. Creative Component Option (Non-thesis)
   - Minimum of 27 credits of formal courses.
   - Minimum of 2 credits of CE 599: Creative Component.

3. Thesis Option
   - Minimum of 22 credits of formal courses.
   - Minimum of 6 credits of CE 699: Research.
4. For specialization area course lists- see Appendix.

4.3 Master of Engineering

A. All guidelines in Section 4.1.
B. Minimum of 30 total credits; with the following conditions
   - Maximum of credits of CE 590.
   - 22 of the 30 total credits must be earned at ISU.
   - Maximum of 6 graduate credits completed as an undergraduate, either as part of undergraduate requirements (refer to Section 2.4) or in a concurrent program (refer to Section 2.3).
   - Transfer courses from other institutions must be graduate level with a minimum grade of B (refer to Section 4.4)
C. Minimum of 20 credits of 500 level courses or above.
D. Maximum of one 3-credit course at 400 level within the department (see Table 2).
E. With Specialization

- Minimum of 18 credits of 500 level courses or above in area of specialization (excluding CE 590).
- Minimum of 6 credits of courses outside the area of specialization (approved by POSC).

F. Without Specialization
- Option 1: Minimum of 18 credits total in any of 3 CCEE specialization areas (6 credits each specialization).
- Option 2: Minimum of 18 credits total in any 2 CCEE specialization areas (9 credits in specialization 1 + 6 credits specialization 2).
- Minimum of 6 credits of courses outside the department (approved by POSC).

G. For specialization area courses lists- see Appendix.

4.4 Doctor of Philosophy

A. All guidelines in Section 4.1.
B. Minimum of 72 credits including dissertation research.
C. Minimum of 33 credits of formal course work, with the following conditions;
- 36 of the total 72 credits must be earned at ISU.
- Transfer credits from other institutions must be graduate level with a minimum grade of B (refer to Section 4.4).
- Maximum of 6 credits of CE 590.

D. Minimum of 36 credits of 500 level courses or above, including research credits.
E. Minimum of 16 credits of CE699: Research
- Research credits earned at another institution or for M.S. degree program earned at ISU are not transferable.

F. Minimum of 9 formal course credits outside of the department.
- Must be approved by the POS committee
- These credits are counted in the 33 credits above.

G. Maximum of 6 credits of 400 level formal course credits within the department, but outside the specialization area (see Table 2).
H. Applicable graduate credits received from Iowa State University for the Master of Science degree can be included as part of a Doctor of Philosophy program, subject to approval of the POSC.
I. Graduate credits received at another institution may be included in a doctor of philosophy program subject to the approval of the POSC and the Graduate College (refer to Section 4.4).
J. For specialization area courses lists- see Appendix.

Table 2: CCEE Courses Approved for Graduate Credit Outside Specialization Area and Minor Graduate Credit

Specialization Area	CCEE Courses Permitted
Civil Engineering Materials	417, 428, 446, 448
Construction Engineering &Management	417, 428, 446, 448, 460
Geotechnical Engineering	417, 428, 446, 448
Environmental Engineering	417, 446, 448, 460
Structural Engineering	417, 428, 460, 467
Transportation Engineering	417, 428, 446, 448, 460
Intelligent Infrastructure Engineering	417, 428, 446, 448, 460

4.5 Transfer Credits of formal course work

A. Graduate credits of formal course work received at another institution may be used towards the master's or PhD degree program, but are subjected to the approval of the POSC and the Graduate College, and the maximum credits set forth in 4.4.B.

B. Courses must have been completed as a graduate student, and the grade received must be equivalent to ISU grade of B or better.
   - For a Master's, of the 30 total required credits, a minimum of 22 graduate credits (coursework and research) must be earned at ISU, per the Graduate College Handbook, Section 4.4.1.
   - For a PhD, of the 72 total required credits:
     - A minimum of 36 graduate credits (coursework and research) must be earned at ISU, per the Graduate College Handbook, Section 4.4.1. However, this policy is general and departmental guidelines must be followed, see below.
     - CCEE will allow transfer of up to 12 credits of formal course work.

4.6 Nondegree credits

A. A maximum of 9 credits earned as an ISU non-degree graduate student may be applied towards an advanced degree after admission to a degree-seeking program, per the Graduate College Handbook, Section 1.1.3.

4.7 Co-Specialization Options (M.S. and Ph.D. in Civil Engineering)

A. The CCEE Department permits the pursuit of a co-specialization option if both specializations are approved by the student's POS committee.

B. The desire for such a program would result from a professional interest that does not clearly fall within a single specialization area but is within the scope of two areas.

C. The degree is to be granted when the student fulfills separately the requirements of each specialization.
   - For Master's degree, at least 9 graduate credit hours in the area of each specialization must be earned to satisfy the co-specialization

- For PhD, at least 15 graduate credit hours must be earned in the area of each specialization to satisfy the co-specialization.
- Examinations and research work associated with a co-specialization option should be related to both specializations.

4.8 Co-Major Degree Program

A. A co-major is a program of study for a single degree in which the requirements for two separate majors are met.
B. A master's degree student, outside the CCEE department who wishes to co-major in an area of specialization within Civil Engineering, is required to take at least 12 graduate credit hours of formal courses in that area of specialization or other CCEE formal graduate courses approved by the CCEE co-major professor.
C. A Ph.D. degree student, outside the CCEE department who wishes to co-major in an area of specialization in Civil Engineering, is required to take at least 18 graduate credit hours of formal courses in that area of specialization or other CCEE formal graduate courses approved by the CCEE co-major professor.
D. Students must show that all degree requirements in their department and in the CCEE area of specialization are met in their program of study.
E. The student's POS committee will have co-chairs, one from the CCEE Department and one from his/her department.
F. It is expected that the research component in the co-major will be related to both majors.
G. CCEE students who wish to co-major in another degree program should consult the DOGE of the degree program with regards to the co-major degree requirements.
H. For additional information, refer to the Graduate College Handbook, Section 4.3.1.

4.9 Minor for Other Master of Science Major Degrees

A. Minimum of 9 credits of 500 level courses in the specialization area.
B. One graduate faculty member from the specialization area must be the minor representative/committee member on the POS committee.
C. The minor committee member will guide the student in specific course requirements and administer written or oral questions during the final oral exam.

4.10 Minor for Other Doctor of Philosophy Major Degrees

A. Minimum of 15 credits of 500 level courses in the area of specialization.
B. One graduate faculty member from the specialization area must be the minor representative/committee member on the POS committee.
C. The minor committee member will guide the student in specific course requirements and administer written or oral questions during the preliminary and final oral exams.

4.11 Co-Majors for Students Without an Accredited Civil Engineering Degree

A. Students without an accredited engineering bachelor's degree may take a co-major in a civil engineering area of specialization if appropriate background courses are successfully completed.
B. The minimum undergraduate course requirements for each specialization are listed in Table 1.

5.0 NON-DEGREE PROGRAMS

5.1 Non-Degree Program – General

A. Qualified students may enroll in a non-degree graduate program with a declared area of specialization in Civil Engineering.
B. These programs are intended to provide advanced study opportunities to students who wish to increase their technical competence, but who are not interested in pursuing the entire advanced degree program.
C. A maximum of 9 credits earned under the non-degree option may be applied to an advanced degree if the student later chooses to undertake a degree option.
D. A major professor from the department will be appointed to advise the student.

5.2 Environmental Engineering Graduate Certificate

A. Students must have earned an undergraduate engineering degree or have met the prerequisite undergraduate courses shown in Table 1 for the Environmental Engineering specialization.
B. Students should check with the major professor or the Focus Area leader for current courses that have been approved for the certificate.
C. Environmental Engineering Graduate Certificate requirements:
   - Minimum of 12 approved graduate credits
   - Six of the 12 credits required must include:
   - CE 520 - Environmental Engineering Chemistry
   - CE 521 - Environmental Biotechnology
   - Remaining six credits are selected from a list of approved courses maintained by the Environmental Division (see http://www.elo.iastate.edu/graduate-certificates/environmental-engineering-graduate-certificate-online/).
   - CE 591: Environmental Engineering Seminar

5.3 Environmental Systems Graduate Certificate

A. Students should check with the major professor or the focus area leader or other departments for current courses that have been approved for the certificate.
B. Environmental Systems Graduate Certificate requirements:
   - Minimum of 12 approved graduate credits
   - Required: CE 591 (Environmental Engineering Seminar) from CCEE Department or course approved by the Agricultural and Biosystems Engineering graduate faculty.
   - At least 6 of credits must be from the list of the core courses.
   - Course listing: http://www.elo.iastate.edu/graduate-certificates/environmental-systems-graduate-certificate-online/.

5.4 Construction Engineering Graduate Certificate

B. Core course requirements can be found on the Construction Management Graduate Certificate webpage. The Director of Certificate Studies can provide additional guidance.

- Minimum of 12 approved graduate credits, 9 of which must include:
- CE 501 (3 credits): Preconstruction Project Engineering and Management,
- CE 502 (3 credits): Construction Project Engineering and Management
- CE 503 (3 credits): Construction Management Function and Processes.

6.0 DEVELOPING THE PROGRAM

6.1 Major Professor

A. New incoming graduate students are required to arrange to meet with their major professors within the first two weeks of their first semester.
B. Table 3 should cover most student situations.
C. If there are students without a major professor, the DOGE will work to ensure the students will have a major advisor.

Table 3. Major Professor Selection

Student	Major Professor
With research assistantship	Faculty providing the assistantship
With teaching assistantship	Professor who had indicated willingness to work with student during admission process or Focus Area graduate coordinator serving as temporary major advisor until student decides on a permanent major advisor
Self-funded students (M.S. or Ph.D.)	Professor who had indicated willingness to work with student during admission process or Focus Area graduate coordinator serving as temporary major advisor until student decides on a permanent major advisor
M.Eng. students	Focus Area graduate coordinators or assigned by the Focus Area graduate coordinator
Certificate Students	Certificate coordinators unless student selects a different faculty member

6.2 Responsibilities of the Major Professor

A. Directs a student's graduate program and serves as chair of the POS committee.
B. Guide the student in the selection of the POS committee.
C. Assist the student in defining educational and professional objectives and developing a program of study to meet the said objectives.
D. Supervise the student's research work, thesis or creative component, and professional development.
E. For additional information about the Major Professor, refer to the Graduate College Handbook, Section 6.4.1.

6.3 Program of Study Committee (POSC)

A. All prospective committee members should be contacted personally by the student and asked to serve in this capacity. A POS committee should be formed:
   - M.Eng. students do not need a POS committee
   - MS student: before the end of the first semester

- PHD student: before the end of the second semester

B. Table 4 outlines the minimum requirements for committee membership:

Table 4. POS Committee Membership

Degree	Committee Membership
Master of Science	No fewer than three members of the graduate faculty, at least two members must be from the area of specialization and at least one must be from outside area of specialization.
Doctor of Philosophy	• No fewer than five members of the graduate faculty, at least three members must be from the area of specialization and at least two members must be from outside the student's specialty area. • In situations where there are insufficient faculty in the area of specialization, one of the three members can be from a related area of specialization. • At least one member must be from outside the CCEE Department.
Master of Engineering	Focus Area graduate coordinator
Certificate	Certificate program administrator or a faculty of student's choice

C. It may be to the student's advantage to include additional committee members, especially from outside the department, in order to broaden the perspective for review of the student's program.

D. The student should select committee members who can contribute to the student's educational and research programs.
   - The POS committee is appointed to aid the student in the completion of quality research.

E. The student should seek guidance from his/her major professor and from members of his/her POS committee during the conduct of the research and not just at the time of the final oral examination.

F. Meetings of all members of the POSC should be held as frequently as necessary to guide the student's work and to evaluate progress.

G. As a minimum, formal meetings of the committee should be held:
   - To approve the program of study, including research or creative component topic.
   - To conduct the final oral examination, all committee members must participate.

H. For additional information about the POSC, refer to the Graduate College Handbook, Section 6.1.

6.4 Program of Study

A. The student and the major professor develop the program of study with the consultation and approval of the POS committee.

B. Each student's program of study should be:
   - Consistent with the CCEE degree and credit requirements (Section 5).

- Designed to correct deficiencies in academic preparation.
- Allow study of subject matter that most interests the student.
- Avoid repetition in areas where the student is well prepared.

C. The POSC assures that program requirements are met before approving the POSC form.

D. Students should enter on the POS only those courses that are necessary to meet degree requirements.

E. The POSC must be approved by the POS Committee, CCEE DOGE and Graduate College, according to the published deadline dates no later than the term (semester) before:
   - M.Eng. candidates: the last semester of coursework
   - MS candidates: final oral examination
   - PhD candidates: preliminary oral examination

F. For additional information, refer to the Graduate College Degree Deadline Summary webpage.

6.5 Credit Load

A. Full Time Student: Own Support
   - Minimum of 9 to a maximum of 15 credits per semester.
   - 10 credits for the summer session.
   - No employment responsibility to the department.
   - The student is responsible to his or her major professor for fulfilling program requirements and for participating in activities designed for his or her professional development.

B. Full-Time Student: Sponsored by Another University, Foundation, or Government Agency.
   - Minimum of 9 to a maximum of 15 credits per semester.
   - Maximum of 10 credits summer session.
   - When planning the POS, the student and the major professor are obligated to meet objectives as set forth in the sponsoring agency's program.

C. Full-Time Student: Research/Teaching Assistants
   - ¼ time appointment = 15 credit maximum fall/spring, 10 credits summer
   - ½ time appointment = 12 credit maximum fall/spring, 6 credits summer
   - For additional information about credit loads, refer to the Graduate College Handbook, Section 2.1.6.
   - Minimum credit load for any student with an appointment = 1 credit. Refer to the Graduate College Handbook, Section 3.2.
   - Graduate students on assistantships during the academic year are considered full time. Refer to the Graduate College Handbook, Section 2.1.7.

D. Graduate Assistants: PhD Registration Requirements
   - Doctoral students on assistantship who have 1) passed the preliminary oral examination, and 2) fulfilled POSC requirements of coursework and research, ***but have not*** yet completed the final oral examination, ***must register*** for a minimum of 1 credit of GRST681A: Doctoral Continuous Registration during spring and fall semesters.
   - For additional information, refer to the Graduate College Handbook, Section 2.1.4.

E. Examination Registration: refer to Graduate College Handbook, Section 2.1.5
   - Doctoral students must be registered the term of the preliminary oral examination.
   - All graduate students must be registered for a minimum of 1 credit the term of the final oral examination.
   - If there are no other course or research credits needed to fulfill the POSC, students can register for 1 credit of GRST681B: Examination Only.

7.0 ACADEMIC PROGRESS

7.1 Time-to-Degree Limit

A. The Graduate College allows all graduate students, both master's and PhD, 7 years to complete their degrees.
B. For more information, refer to the Graduate College Handbook, Section 4.4.5.

7.2 GPA Requirement

A. All graduate students are required to maintain a cumulative grade point average (GPA) of 3.0 to remain in good standing.
B. The grade point average is calculated using the standard point allocation for University grades.
C. Grades for creative component (CE 599) or research (CE 699) are not included in the grade point average calculation.
D. For additional information, refer to the Graduate College Handbook, Section 5.2.

7.3 Academic Probation

A. Students must maintain a minimum of a 3.0 grade point average for all courses on their program of study.
B. A minimum grade of C is required for all courses on the program of study.
   - Exceptions must be recommended in writing by the student's POS committee and DOGE and approved by the Dean of the Graduate College.
C. Students not maintaining a 3.0 grade point average will be placed on academic probation by the Dean of the Graduate College.
D. While on academic probation, a student;
   - Will not be able to register for classes in AccessPlus.
   - Doctoral students will not be admitted to candidacy for a degree.
   - If appointed to a graduate assistantship, will not receive a Graduate College tuition scholarship.
E. The Graduate College places a hold on a student's registration for as long as the GPA is below 3.0.
F. Students on probation must be reviewed before registration for each term.
   - The major professor must review the student's record and make a recommendation to the CCEE Director of Graduate Education (DOGE) regarding continued registration in the graduate program.
   - If the DOGE approves, the DOGE must send a written request to the Graduate College to permit registration for a particular term.
G. If a major professor has not been selected, a temporary advisor from the area of specialization will conduct the probation review.
H. For additional information, refer to the Graduate College Handbook, Section 5.2.6.

7.4 Dismissal Criteria

A. Failure to maintain academic standing
   - Inability to maintain the minimum 3.0 grade point average.
   - Failure to pass within the time frame designated by the relevant academic program any required examinations. This includes qualifying, preliminary, or final oral examinations.

- Failure to complete within the time frame designated by the relevant academic program any required coursework, or thesis or creative component credits.
- Failure to demonstrate scholarly and professional competence.
- Failure to comply with the ethical standards of the profession for students engaged in programs leading to professional licensure.
- Academic probationary status for two or more years.
- Failure to establish a major professor in the time frame specified by the major program.
- Failure to comply with graduate student responsibilities or requirements discussed in the CCEE or Graduate College Handbooks.

B. Academic/Research Misconduct
- A finding by the Research Misconduct Investigatory Committee constituted under the University's Research Misconduct Policy.
- Academic Conduct
- Academic Dishonesty

C. Personal Misconduct
- Conduct that violates Regents Uniform Rules of Personal Conduct and General University Regulations, as listed in the ISU Catalog and Policy Library:
- Student Code of Conduct
- Violence Free University

7.5 Dismissal Procedures

A. A student's POS committee or, if the student has no POS committee, the student's major professor or temporary advisor, can recommend dismissal of a student for any of the Dismissal Criteria reasons as listed above.

B. An informal conference will be held with the Director of Graduate Education (DOGE), the major professor (or temporary advisor) and the student to discuss the situation in an attempt to find a satisfactory resolution of the matter.

C. If the informal conference does not bring about satisfactory resolution, a dismissal review request will be submitted to the CCEE Administrative Council by the DOGE.

D. Before a dismissal is decided, the DOGE must give the student a written notice explaining why dismissal is being considered.

E. If a satisfactory resolution cannot be reached and the CCEE Administrative Council votes to dismiss the student, the DOGE must notify the student in writing of the dismissal.

F. Either party may bring the issue to the attention of the Dean of the Graduate College for the following reasons.
- If the informal conference does not bring about a satisfactory resolution.
- The student may appeal the dismissal if it is based on failure to demonstrate scholarly or professional competence.
- If the dismissal is for reasons other than scholarly or professional competence.

G. A student cannot appeal a dismissal if it is based on an institutional action, such as from the Student Conduct Administrator for academic misconduct, or Dean of Graduate College for research misconduct.

H. For additional information, refer to the Graduate College Handbook, Section 9.7.

7.6 Student Grievance Procedures

A. Grades and Instruction
- If a student feels their instructor has behaved unfairly or unprofessionally, a grievance must be invoked before a year passes that the course was completed.
- If a student feels that they have received an unfair grade in a course, an appeal must be initiated by the midterm of the semester following the course completion.
- In either case, the student is encouraged to contact their major professor, if the perceived violation does not involve the major professor.
- If at all possible, academic grievances should be resolved with the instructor involved.
- If it's not possible to determine a resolution with an instructor, the student should submit in writing the grievance to the instructor's academic department chair.
- If a resolution is not made with the department chair, the student can submit the grievance to the dean of the instructor's college.
- If there is no resolution with the dean of the instructor's college, the student may forward the grievance to the Provost.
- For additional information, refer to the Graduate Student Handbook, Section 9.5.1.
- Other sources of support outside the department include:
  - Graduate & Professional Student Senate (GPSS)
  - Student Assistance staff in the Dean of Student's Office
  - Dean of the Graduate College
  - Ombuds Office

B. Scholarly and professional competence
- If a student feels their scholarly or professional competence has been evaluated unfairly, they should present their complaint to those most directly involved in the matter: a faculty member, major professor, POS committee, DOGE, or department chair.
- If a resolution is not possible with the individuals involved, the student can submit the grievance with the program or departmental grievance committee. If such a committee does not exist, the DOGE must appoint a committee.
- If a student is unsatisfied with the findings of the departmental grievance committee, they may appeal the action in writing to the Dean of the Graduate College. The Graduate College grievance committee will then review the complaint.
- Students submitting a grievance must be willing to participate in all phases of the grievance process, at all levels if necessary.
- Students still unsatisfied with the disposition of the grievance – on matters of procedure only – may appeal in writing to the Provost, and, if necessary, to the President of the University.
- For additional information, refer to the Graduate Student Handbook, Section 9.5.2.

C. Discrimination, harassment and/or sexual misconduct
- These concerns fall outside of academic and scholarly grievances.
- Report any concerns/incidents to the Office of Equal Opportunity.

8.0 Graduate Student Resources

8.1 CCEE Office Space

A. Office space will be provided for teaching and research assistants. The department will try to accommodate the remaining students as space permits.
B. Requests for office space should be made through the major professor or Focus Area leader, who will contact the office administrator accordingly.
C. Graduate students located at the Institute for Transportation (InTrans) will have their desk assignments made by InTrans.

8.2 CCEE Computers

A. The department maintains and operates networked PC computer laboratories in Town Engineering Building for use by undergraduate and graduate students.
   - 210 Town: main computer lab for the building
   - 194 Town: undergraduate study center with a small computer lab
   - 134 Town: available any time classes are not being held in the room
B. Graduate students can obtain an account and receive an allocation for use of the laser printer in the computer laboratories.
C. Most, if not all, of the graduate students' office desks are equipped with a desktop computer.

8.3 CCEE Copy Machine

A. The department's copy machines are available for copying materials related to research and teaching responsibilities.
B. A copy code number must be obtained from the graduate student's major professor so the costs can be allocated to the correct projects.
C. Inappropriate use of this equipment (e.g. copying a textbook, developing a personal library of journal articles, or copying coursework) is not permitted. **It is a state policy that University equipment shall not be used for personal use.**
D. It is important that each person help maintain security by observing rules for locking equipment room doors.

8.4 CCEE Graduate Student Mailboxes

A. Located in the mail/copy machine room, 397 Town.
B. The grad student mailbox bin is on the countertop at the back of the room on the far left side.
C. Mail is sorted alphabetically by last name. Each letter of the alphabet has a mail slot.
D. Grad students should check for mail at least once a month.

8.5 CCEE Keys

A. Not all grad students will need keys.
B. Faculty/staff members who want you to have a key must contact Nancy Qvale, 302 Town.
C. Nancy will order the keys and let you know when they are available.
D. Key pickup will be at the Key Desk in the General Services Building.
E. Keys for InTrans will be arranged by InTrans.

8.6 CCEE Kitchen

A. Coffee is available in the faculty/staff kitchen, 385 Town.
B. Payment is by the cup, or you can join the coffee club by the month or semester.
C. There are times when tea or cocoa are available, depending on supply.

8.7 ISU Safety Training

A. Graduate students are responsible for compliance with established safety policies that ensure safety, protection of health and minimization of the institution's impact on the environment.
B. All graduate students involved with laboratory or field research are expected to complete Environmental Health & Safety (EH&S) Lab Safety training and any additional lab specific training needed to complete their research.
C. Registration information for safety training is available at the EH&S website.
D. Students should work closely with their supervisors to identify safety training needs and document completion of all training.
E. Graduate students are also expected to be familiar with the policies, and can download the Iowa State University Laboratory Safety Manual.

8.8 Graduate College Resources

F. Student & Major Professor Checklist
G. Graduate Student Orientation
H. Graduate College Handbook
I. Center for Communication Excellence
J. Career Services
K. Online & Paper Forms
L. Degree Deadlines
M. Thesis & Dissertations
N. Graduation Requirements

9.0 GET INVOLVED

9.1 CCEE Grad Student Council

A. Email address: cceegrads@iastate.edu
B. You are automatically a member
C. You will be informed of meetings and events by council leadership

9.2 ISU Graduate & Professional Student Senate

A. Join GPSS

9.3 ISU College of Engineering Organizations

9.4 ISU Multicultural Organizations

9.5 ISU Student Organization Website

10.0 EXAMINATIONS AND GENERAL LIST OF ACTION ITEMS

10.1 Graduate English Requirement

A. The Graduate English Requirements for Non-Native Speakers of English, which is to be completed during the first semester, is discussed under the section **Graduate English Requirements for Non-Native Speakers of English on page 3.**

10.2 Ph.D. Diagnostic Examinations

A. Under certain circumstances, and depending upon the area of specialization, an entering graduate student may be required to take a Ph.D. diagnostic examination. This examination, if required, normally will be taken during the first semester of residence at Iowa State University.
B. The purpose of a diagnostic examination is to ascertain deficiencies in academic preparation of critical importance to a specific program. Consequently, examinations will differ depending upon a student's specialization.
C. The major professor will advise the student as to the necessity for a diagnostic examination and arrangements for taking the examination.
D. Depending upon the outcome of the diagnostic examination, a student may be advised to remedy the deficiency by self-study or to undertake certain remedial undergraduate courses for which graduate credit may not be received. These remedial courses must be taken early in a graduate program.

10.3 Master of Science Final Examinations

A. The final examination for Master of Science candidates will be administered and evaluated by the student's POS committee.
B. The examination is comprehensive and usually oral, although a written component may be included. The majority of the final exam is directed towards the defense of the thesis or creative component. However, each area of specialization may have further requirements for the final exam.
C. The proportion of the examination devoted to the creative component for a non-thesis program will be less than that devoted to a thesis.
D. A complete copy of the thesis or creative component should be delivered to members of the POS committee at least two weeks prior to undertaking a final oral examination.
   - For more information regarding Final Oral Examinations, refer to the Graduate College Handbook, Section 7.1.2.

10.4 Doctor of Philosophy Program Examinations

A. A student undertaking a Ph.D. program must pass a preliminary examination prior to being admitted to candidacy for the degree.
   - The preliminary examination will include an oral component and a written component taken prior to the oral examination.
   - At a minimum, committee members in the student's area of specialization should provide a written exam. This examination is comprehensive and is not restricted to the content of graduate courses.
   - A graduate student who fails the preliminary examination may be afforded the opportunity to retake it, providing that six months elapse before a reexamination.

- A student is admitted as a candidate for the Ph.D. degree after successful completion of the preliminary examination.

B. A Ph.D. candidate must also pass a final examination to satisfy requirements for the degree.
   - The Ph.D. final examination is devoted primarily to a defense of the dissertation. It is normally an oral examination.
   - The POS committee may recommend reexamination if the student is unsuccessful in passing the examination. In this case, the requirements to be satisfied prior to reexamination will be stipulated and a time limitation specified.

C. Both preliminary and final examinations are administered and graded by the student's POS committee.
   - Six months or more must elapse between passing the preliminary oral examination and the date of the final oral examination.
   - For more information regarding Final Oral Examinations, refer to the Graduate College Handbook, Section 7.1.2.

10.5 Information and Timing of Required Actions

A. The CCEE department and Graduate College procedures, timelines and forms to be completed are provided in Table 5.

B. Exact dates for each academic year will be announced by Graduate College.

C. Students are responsible for meeting all degree policies, deadlines, and requirements. Failure to progress satisfactorily in his/her degree program is a criterion for dismissal.

Table 5: Information and Timing of Required Actions for CCEE Graduate Students

Requirements	Degree	Timeline	Forms	Action Source
Graduate English Requirement (non-native speakers of English)	M.S. M.Eng. Ph.D.	**Start of 1st semester**	**English Placement Test (EPT)**	*EPT Webpage*
POS Committee	M.S	**Before the end of 1st semester.**	**Program of Study Committee Form**	*AccessPlus:* *Grad Stdnt Status page* *Grad College Deadlines*
	Ph.D.	**Before the end of 2nd semester.**		
Program of Study	M.S.	**Before the end of the 2nd semester.*NO LATER than the semester prior to graduation***	**Program of Study Committee Form (POSC)**	*AccessPlus:* *Grad Stdnt Status page* *Grad College Deadlines*
	Ph.D	**Must be approved 3 months prior to preliminary oral exam**		
Preliminary Exam (After completion of majority of coursework)	Ph.D. only	**Schedule Preliminary Exam.** (Student arranges dates for written and oral exam committee/POSC)	**Request for Prelim Exam Online Form** (Must be submitted **2** weeks before Prelim Exam.)	*Graduate College Forms Webpage* *Grad College Deadlines*
		Take Preliminary Exam	**Report for Preliminary Examination Form**	*MP will receive email notification with link to online report form.*
Graduation Preparations	M.S. M.Eng. Ph.D.	**By third week of graduation semester** *Grad College Deadlines*	**Application for Graduation**	*AccessPlus:* *Grad Stdnt Status page*
Final Exam	M.S. Ph.D. (must take place at least 6 months **after** the prelim exam)	**Schedule Final Oral Exam** (upon completion of creative component/ thesis/dissertation) (Date for final exam arranged by student and major professor/POS committee)	**Request for Final Oral Exam Online Form** (Must be submitted at least **3** weeks before final oral exam date)	*Graduate College Forms Webpage* *Grad College Deadlines*
		Take Final Oral Exam	**Report of Final Oral Examination Form**	*MP will receive email notification with link to online report form.*
Graduation	M.S. (thesis)	**Submit Thesis**	**Proquest Account** **Graduate Student Approval Form**	*Grad College Deadlines* MP will receive GSAF by email
	MS (nonthesis)	**Submit Creative Component**	**ISU Digital Repository** **Graduate Student Approval Form**	*Grad College Deadlines*
	Ph.D.	**Submit Dissertation**	**Proquest Account** **Graduate Student Approval Form**	*Grad College Deadlines*
	M.Eng		**Coursework Only Final Check**	*Grad College Deadlines*

11.0 GRADUATE ASSISTANT INFORMATION

11.1 Letter of Intent (LOI)

A. A student's major professor initiates the LOI for a graduate assistantship appointment by providing specific information regarding:
   - Graduate Assistant tuition scholarship percentage
   - Appointment time (½, ¼, other)
   - Stipend amount

B. The department's financial team processes the LOI in Workday. When the LOI is ready, the student will be emailed a notification from the Workday system that they need to take action (sign the form).

C. The student should understand the terms of the agreement and ask any questions if needed. If the student agrees to the terms, they can sign the LOI electronically.

D. The signed copy of the LOI is saved in Workday and it's recommended that students download a copy for their personal records.

E. LOI initiation and approval actions are subject to specific payroll and tuition assistance deadlines.

11.2 Scope of Work

A. A graduate assistant is classified as a continuous graduate assistant or C-base employee, and work hours depend upon the time of appointment:
   - ½ time appointment = 20 hours/week
   - ¼ time appointment = 10 hours/week
   - ¾ time appointment = 30 hours/week, with these conditions:
     - Any time for US students or international students on CPT
     - Summer only for international students not on CPT
     - Approval for any appointment greater than ½ time is contingent upon proof of reasonable academic progress.
   - Appointments greater than ¾ are not allowed.

B. Coursework is considered part of a graduate assistant's training and the combination of assistantship and coursework equals full time. Course credit loads are as follows:
   - ½ time appointment = 12 credit maximum
   - ¼ time appointment = 15 credit maximum
   - Minimum # of credits = 1

C. International student teaching assistants must complete the Oral English Certification Test (OCET) before they are assigned any duties.
   - Students who do not reach Level 1 (full certification) are required to complete ENGL 180: Communication Skills for International Teaching Assistants.

11.3 Graduate Tuition Scholarship Eligibility

A. Generally, only students with a cumulative GPA of 3.0 or better are eligible to hold graduate assistantships and receive the Graduate College tuition scholarship.

- New students are hired based on their undergraduate GPA. Any student with a GPA below 3.0 in their first term will receive a warning letter from the Graduate College, and be allowed a grace period of 1 semester to bring the GPA up to 3.0 or better.

B. If a student is placed on academic probation (GPA below 3.0), the student will be assessed Iowa resident fees but will not receive a Graduate College tuition scholarship.

11.4 Final Examination Registration

A. All graduate students, regardless if on assistantship or not, must register during the term of the final oral examination.

B. If no coursework is needed, students can register for a minimum of 1 credit of GR ST 681B (Examination Only).

C. If students take the final oral examination during the interim between terms (including the first day of classes), registration can be either for the term before or the term after the examination is held.

11.5 Stipends

A. The university establishes a minimum and maximum monthly stipend for ½ time research, teaching and administrative assistantships. The stipend for a ½ time assistantship is sufficient to cover modest living expenses. Stipends for other fractional appointments are scaled proportionately.

B. The guidelines and procedures for setting stipends used by the graduate assistant's department are filed in the department office, where they are available to a graduate assistant upon request.

C. All assistantship monthly stipends are subject to income tax withholding.

11.6 Hourly work in addition to assistantship

A. U.S. citizens and permanent residents who are on graduate assistantships may also work on an hourly basis, provided that:

- The additional work is approved by the unit awarding the assistantship, and
- The hourly work is not related to the students' educational program.
- Total hours (assistantship and hourly work) cannot exceed 30 hours per week.

B. Non-immigrant international students must abide by the terms of their visa status and immigration guidelines according to total hours worked.

- For visa questions, contact the International Students and Scholars Office, 515-294-1120.

11.7 Graduate Assistant Employment Benefits

A. Descriptions below are brief. For full explanation of Employment Benefits, refer to the Student & Scholar Health Insurance Program website. Questions can be emailed to isusship@iastate.edu.

B. Health Insurance

- Self-only coverage
- No cost
- Eligibility: Students must be on a minimum of ¼ time for at least 3 months fall and spring semesters.

C. Dental Insurance

- Self only coverage
- Partially subsidized by the university and monthly premium will be deducted from the graduate assistant's paycheck.
- Eligibility: Students must be on a minimum of ¼ time for at least 3 months fall and spring semesters.

D. Dependents
- Who can be enrolled: lawful spouse or domestic partner, and unmarried dependent children under age 26.
  - Must be added within 30 days of start date or with a qualifying event.
  - Once added, will remain until the end of the policy year or the appointment ends.
- A portion of the monthly premium will be deducted from the graduate assistant's paycheck when adding coverage for dependents.

E. Leave of Absence
- A graduate assistant can request to be absent for illness or personal reasons.
- If at all possible, the graduate assistant should plan personal leave so it does not interfere with or cause neglect of their assistantship duties.
- Arrangements must be made to adhere to all grant or other funding source restrictions.
- Graduate assistant supervisors should be understanding and accommodating when the need for leave occurs, but also must ensure that their assistants to not exceed reasonable limits for leave.
- If a conflict arises between the graduate assistant and supervisor regarding leave of absence use, either party may contact the DOGE. If the conflict is not resolved in a timely manner, any of the parties may contact the Dean of the Graduate College.

F. Workers Compensation
- Injury sustained while performing duties directly related to the graduate assistantship appointment must be reported immediately to University Human Resources by the supervisor, instructor and/or department chair using the Incident Reporting System and following the Report of Injury instructions.
- Workers compensation may or may not apply to the injury, depending on the situation. Injuries sustained for educational purposes are generally not considered work-related and not usually covered by the worker's compensation system. ISU UHR will provide guidance on claims in consultation with a third-party claims administrator.

11.8 University-Approved Travel

A. Travel authorization is required by the CCEE Department and InTrans before any trip that will cause an official work day to be missed or that will use university funds.
- The form is required whether travel is hosted or on a grant.

B. The CCEE Department and InTrans require that the travel authorization form be completed and approved prior to any domestic or foreign travel, including in state travel.
- The only exceptions are local travel not requiring reimbursement, or local travel where no standard responsibilities will be missed.

C. Expenses for out-of-state travel can only be paid if a travel authorization has been approved by the major professor. Students should seek approval and agreement with their major professor on availability of funds before travelling.
D. A travel request should be submitted at least 15 days before the departure, unless there are extenuating circumstances.
E. The student should ask his or her major professor for procedural details when traveling for the first time.
F. It is best if a student uses an ISU Travel and Hospitality (T&H) card during travel. If a student does not have a T&H card, expenses might not be reimbursed. Students should speak to their major professor about getting a T&H card, and do so well in advance of any travel.
G. When traveling, student must keep receipts for everything.
H. When a personal car is used, a record of miles traveled must be included.
I. Graduate Students are eligible and are encouraged to apply for "Professional Advancement Grant (PAG)". These are mini-travel grants from the Graduate and Professional Student Senate (GPSS). These should be applied for at the earliest possible date and only once per fiscal year.
    - Certain rules and deadlines apply so read the guidelines carefully.

11.9 Graduate College Assistantship Policies

A. For additional information on Graduate Assistantships, refer to the Graduate College Handbook, Section 3.2.

12.0 APPENDICES A – G: REQUIRED AND ELECTIVE COURSE LISTS PER FOCUS AREA

12.1 Choosing Courses

A. It is in a student's best interest to discuss course choices with faculty in their focus area.
   - Major professor
   - Focus area leader (if no major professor)
   - DOGE

12.2 Course offerings

A. It is a student's responsibility to research course offerings in the ISU Course Catalog and ISU Schedule of Classes to build the program of study. Of most importance:
   - How often a course is offered
   - Number of credits
   - Whether the course is offered online.

12.3 Research credits

A. Research credits are not included in the Appendix lists.
B. Refer to degree requirements, pages 11 & 12, for research credit information.

12.4 Course list changes

A. Course lists are subject to change due to:
   - ISU catalog offering changes
   - Departmental course offering changes
   - Focus area requirement changes
   - Online course offering changes

12.5 Courses outside department

A. Courses highlighted in RED require instructor permission.

APPENDIX A: Civil Engineering Materials Course Requirements

Required for all students when offered	
CE 581	Geotechnical & Materials Engineering Seminar
Required courses (58X) – choose 4 (minimum)	
C E 583	Pavement Analysis and Design
C E 584	Advanced Design of Concretes
C E 586	Advanced Asphalt Materials
C E 587	Advanced Portland Cement Concretes
CE 589	Pavement Preservation and Rehabilitation
Required courses (56X) – choose 1 (minimum)	
C E 560	Fundamentals of Soil Mechanics
C E 561	Applied Foundation Engineering
C E 562	Site Evaluations for Civil Engineering Projects
C E 563	Experimental Methods in Geo-Engineering
C E 564	Application of Numerical Methods to Geotechnical Design
C E 565	Fundamentals of Geomaterials Behavior
C E 567	Geomaterials Stabilization
C E 568	Dynamics of Soils and Foundations
C E 569	Ground Improvement

APPENDIX B: Construction Engineering & Management Course Requirements

Required Courses	
CE 501	Preconstruction Project Engineering & Management
CE 502	Construction Project Engineering & Management
CE 503	Construction Management Functions & Processes
CE 594A*	Special Topics: Planning & Scheduling
CE 595A**	Graduate Research Methods Seminar: Qualitative Methods
CE 595B**	Graduate Research Methods Seminar: Quantitative Methods

*Required if undergraduate courses do not include content in planning and scheduling.
**Required for a doctoral program.

Remaining coursework will include:

- Minimum of 3 credit hours of Construction Engineering Technical Electives (see list below)
- Minimum of 3 credit hours Finance Electives (per Construction Engineering Graduate Handbook)
- Minimum of 3 credit hours Context Electives (per Construction Engineering Graduate Handbook)
- **All electives and research credits must be approved by the POSC.**

Technical Electives	
CE 505	Design of Construction Systems
CE 594L	Special Topics: LEED for New Construction
CE 594M	Special Topics: Design Build Construction
CE 594O	Special Topics: Highway & Heavy Construction

APPENDIX C: Environmental Engineering Course Requirements

Water Quality Required Courses	
CE 520	Environmental Engineering Chemistry
CE 521	Environmental Biotechnology
CE 522	Water Pollution Control Processes
CE 523	Physical-chemical Treatment Process
CE 591	Environmental Engineering Seminar

Water Quantity Required Courses	
CE 571	Surface Water Hydrology
CE 572	Analysis and Modeling of Aquatic Environments
CE 573	Groundwater Hydrology
CE 576	Environmental Flows
CE 591	Environmental Engineering Seminar

APPENDIX D: Geotechnical Engineering Course Requirements

Required for all students when offered	
CE 581	Geotechnical & Materials Engineering Seminar
Required courses (56X) – choose 4 (minimum)	
C E 560	Fundamentals of Soil Mechanics
C E 561	Applied Foundation Engineering
C E 562	Site Evaluations for Civil Engineering Projects
C E 563	Experimental Methods in Geo-Engineering
C E 564	Application of Numerical Methods to Geotechnical Design
C E 565	Fundamentals of Geomaterials Behavior
C E 567	Geomaterials Stabilization
C E 568	Dynamics of Soils and Foundations
C E 569	Ground Improvement
Required courses (58X) – choose 1 (minimum)	
C E 583	Pavement Analysis and Design
C E 584	Advanced Design of Concretes
C E 586	Advanced Asphalt Materials
C E 587	Advanced Portland Cement Concretes
CE 589	Pavement Preservation and Rehabilitation

APPENDIX E: Intelligent Infrastructure Engineering Course Requirements

Required Courses **MS Students = 9 credits minimum** **PhD Students = 12 credits minimum**	
CE 532	Structural Analysis II
CE 541 or CE 568	Dynamic Analysis of Structures Dynamics of Soils and Foundation
CE 549	Structural Health Monitoring
CE 557	Transportation Systems Analysis
CE 556	Transportation Data Analysis
CE 559	Asset Management
CE 583	Pavement Analysis and Design
CE 588	Sustainable Horizontal Infrastructure
CE 594P	Modeling and Evaluation of Energy Performance of Buildings and Communities
CE 519	Methods for Data-Driven Computations Engineering Research
CE 650C	Advanced Topics in Transportation Engineering: Data Analysis

IIE Preapproved Extended Core Courses	
COM S 535	Algorithms for Large Data Sets: Theory & Practice
COM S 573	Machine Learning
CE 594S	Special Topics in Construction Engineering & Management: Building Information Modeling
CE 594Y	Engineering for Disaster and Climate Resilience
CE 542	Structural Analysis by Finite Elements
COM S 311	Introduction to the Design & Analysis of Algorithms
COM S 511	Design & Analysis of Algorithms
COM S 573	Machine Learning
COM S 574	Introduction to Machine Learning
EE 424	Introduction to Digital Signal Processing
EE 524	Digital Signal Processing
EE 526	Deep Learning: Theory & Practice
EE 527	Detection & Estimation Theory
EE 570	Systems Engineering Analysis & Design
EE 571	Introduction to Convex Optimization
EE 574	Optimal Control
EE 577	Linear Systems
EE 578	Nonlinear Systems
EE 622	Information Theory
EE 653	Advanced Topics in Electric Power System Engineering
IE 510	Network Analysis
IE 513	Analysis of Stochastic Systems
IE 533	Reliability

IIE Preapproved Extended Core Courses	
IE 534	Linear Programming
IE 583	Knowledge Discovery and Data Mining
IE 631	Nonlinear Programming
IE 632	Integer Programming
IE 634	Computational Organization
MATH 565	Continuous Optimization
ME 591X	Probabilistic Engineering Analysis and Design

APPENDIX F: Structural Engineering Course Requirements

M.S. with thesis:
- Minimum of 6 credits of advanced structural analysis courses from approved list below.
- Minimum of 6 credits of advanced structural design courses from approved list below.

M.S. degree Non-thesis (Creative Component)
- Minimum of 6 credits of advanced structural analysis courses from approved list below.
- Minimum of 9 credits of advanced structural design courses from approved list below.

M. Eng.
- Minimum of 9 credits of advanced structural analysis courses from approved list below
- Minimum of 9 credits of advanced structural design courses from approved list below.

Advanced Structural Analysis Courses	
CE 519	Methods for Data-Driven Computational Engineering Research
CE 532	Structural Analysis II
CE 541	Dynamic Analysis of Structures
CE 542	Structural Analysis by Finite Elements
CE 547	Analysis and Design of Plate and Slab Structures
CE 549	Structural Health Monitoring

Advanced Structural Design Courses	
CE 533	Structural Steel Design II
CE 534	Reinforced Concrete Design II
CE 535	Pre-stressed Concrete Structures
CE 536	Masonry and Timber Design
CE 545	Seismic Design
CE 546	Bridge Design
CE 548	Building Design
ABE 578	Wood Frame Structural Design

Core Structural Engineering courses, cannot be considered non-structure courses	
EM 525	Finite Element Analysis
EM 570	Wind Engineering

Approved courses outside Structural Engineering:

1. All graduate students specializing in Structural Engineering are required to select courses from this pre-approved list below to fulfill the non-structure course credits; **courses with text in red** requires approval of the major professor(s).
2. Any course identified below as a core course will be considered towards structural engineering design or analysis requirement.

Geotechnical Engineering & Construction Materials	
Course No.	Course Title
CE 460	Foundation Engineering
CE 560	Fundamentals of Soil Mechanics
CE 561	Applied Foundation Engineering
CE 568	Dynamics of Soils and Foundations
CE 587	Advanced Portland Cement Concrete
Engineering Mechanics	
EM 417	Experimental Mechanics
EM 510	Continuum Mechanics
EM 514	Advanced Mechanics of Materials
EM 516	Applied Elasticity and Mechanics of Deformable Solids
EM 517	Experimental Mechanics
EM/ME/AER E/MSE 564	Fracture and Fatigue
EM 569	Mechanics of Composite and Combined Materials
Mathematics	
MATH 317	Theory of Linear Algebra
MATH 385	Introduction to Partial Differential Equations
MATH 481	Numerical Methods for Differential Equations
MATH 507	Applied Linear Algebra
MATH 565	Continuous Optimization
MATH 566	Discrete Optimization
Materials Science & Engineering	
MAT E 350	Polymers & Polymer Engineering
MAT E 351	Introduction to Polymeric Materials
MAT E 362	Principles of Nondestructive Testing
MAT E 362L	Nondestructive Testing Laboratory
MAT E 418	Mechanical Behavior of Materials
MAT E 443	Physical Metallurgy of Ferrous Alloys
MAT E 453	Physical & Mechanical Properties of Polymers
MAT E 454	Polymer Composites & Processing

Approved courses outside Structural Engineering:

Statistics	
STAT 474/574:	Introduction to Bayesian Data Analysis
STAT 501	Multivariate Statistical Methods
STAT 502	Applied Modern Multivariate Statistical Learning
STAT 512	Design of Experiments
STAT 533	Reliability
STAT 542	Theory of Probability & Statistics I
STAT 543	Theory of Probability & Statistics II
STAT 544	Bayesian Statistics
STAT 554	Stochastic Process Models
STAT 587	Statistical Methods for Research Workers
STAT 588	Statistical Theory for Research Workers
STAT 644	Advanced Bayesian Theory
Electrical Engineering	
EE 424	Introduction to Digital Signal Processing
EE 524	Digital Signal Processing
EE 527	Detection & Estimation Theory
EE 571	Introduction to Convex Optimization
EE 577	Linear Systems
EE 578	Nonlinear Systems

Approved courses outside Structural Engineering:

Computer Science	
COM S 311	Introduction to the Design and Analysis of Algorithms
COM S 425	High Performance Computing for Scientific & Engineering Applications
COM S 426	Introduction to Parallel Algorithms and Programming
COM S 474	Introduction to Machine Learning
COM S 511	Design and Analysis Algorithms
COM S 573	Machine Learning
Geological & Atmospheric Sciences	
GEOL/ENSCI 413/513	Applied & Environmental Geophysics
GEOL 439/539	Seismic Methods in Geology, Engineering, and Petroleum Exploration
Aerospace Engineering	
AER E 446	Computational Fluid Dynamics
AER E 463	Introduction to Multidisciplinary Design Optimization
AER E 541	Incompressible Flow Aerodynamics
AER E 647	Advanced Computational Fluid Dynamics
Industrial Engineering	
IE 534	Linear Programming
IE 631	Nonlinear programming
IE 632	Integer Programming
IE 510	Network Analysis
IE 513	Analysis of Stochastic Systems

APPENDIX G: Transportation Engineering Course Requirements

NOTE: due to the highly specialized nature of transportation research, students should work with major professor and POSC to select the majority of their coursework.

Required Courses	
CE 551	Urban Transportation Planning Models
CE 553	Traffic Engineering
TRANS 691	Seminar in Transportation Planning

Recommended Courses (PhD)	
CE 556	Transportation Data Analysis
STAT 587	Statistical Methods for Research Workers
Other statistics or data analysis courses with approval of POSC	

Approved Electives	
CE 552	Traffic Safety, Operations, and Maintenance
CE 557	Transportation Systems Analysis
CE 558	Transportation Systems Development & Management
CE 559	Transportation Infrastructure/Asset Management
CE 588	Sustainable Civil Infrastructure Systems
CE 650A	Advanced Topics in Transportation Engineering: Highway Design
CE 650B	Advanced Topics in Transportation Engineering: Traffic Operations
CE 650C	Advanced Topics in Transportation Engineering: Data Analysis
CE 650D	Advanced Topics in Transportation Engineering: Traffic Simulation
CRP 551	Introduction to GIS
CRP 552	Geographic Data Management and Planning Analysis
CRP 554	Fundamentals of Remote Sensing
CRP 555	Smart Cities
Other electives with approval of POSC	