

CIVIL ENGINEERING
GRADUATE STUDENT HANDBOOK

December 16,2021

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Chapter 1

INTRODUCTION

This handbook sets forth the basic policies, requirements and procedures for graduate students pursuing Master of Science (MS) and Doctor of Philosophy (PhD) degrees in Civil Engineering. Note: your degrees are not called civil and environmental engineering. You should read this very carefully so that you are clear about your responsibilities as a student and the responsibilities of the program to you. If you have any questions about any of the information presented herein, please ask the Graduate Chair, Dr. Albert S. Kim and/or the Graduate Secretary. The earlier you clarify any matter of concern to you, the less likely it will create any problems for you later. We wish you great success in pursuing your educational goals and hope that this handbook provides you with a good tool in meeting those goals.

This handbook is intended to pull together information you will need. Additional information can be found in various university references including: the Civil & Environmental Engineering (CEE) Department (www.cee.hawaii.edu) and the UHM Office of Graduate Education (www.manoa.hawaii.edu/graduate). The latter website is a vast resource of official UHM information to further help you on your journey and it should be consulted for the most up-to-date policies/procedures and any questions that are not answered in this handbook.

The campus of the University of Hawaii at Manoa (UHM) is located on some 300 acres of land in green Manoa Valley close to Waikiki Beach and metropolitan Honolulu. The city's superb climate coupled with beautiful beaches and gorgeous mountains offers excellent outdoor recreational activities year round. The diverse ethnic background of the state's population provides rich cultural activities with colorful customs and traditions.

The University, founded in 1907, currently enrolls approximately 20,500 students including 6,030 graduate students at the Manoa campus. The University offers course work leading to bachelor's degree in 93 academic fields, masters in 84 fields, and doctorates in 51 fields. The University is one of only 12 Sea Grant, Land Grant and Space Grant Institutions in the United States of America.

The College of Engineering has three degree-granting departments: Civil & Environmental, Electrical & Computer, and Mechanical. The College presently enrolls approximately 900 undergraduates and 200 graduate students. Engineering degrees have been awarded since 1912 after the founding of the University in 1907. More than 10,000 practicing engineers and researchers have received engineering degrees from UHM. The College's academic strengths in providing a high-quality education are demonstrated by the number of alumni

who serve as presidents of regional engineering companies, as senior project managers in national and international high-tech corporations and research centers, and as senior managing engineers in government agencies.

The CEE Department has 20 Graduate Faculty plus 6 Cooperating Graduate Faculty, 2 Adjunct Faculty, 2 secretaries, and 3 technicians. There are 7 modern laboratories available for instructional and research activities. About 300 undergraduate students and 80 graduate students (60 MS and 20 PhD) enroll in its degree programs. The dedicated and dynamic faculty together with excellent laboratory facilities offers engineering education and research opportunities of the highest quality.

Chapter 2

PROGRAM OVERVIEW

The Civil & Environmental Engineering Department (CEE) of the University of Hawaii at Manoa (UHM) offers graduate programs leading to Master of Science (MS) and Doctor of Philosophy (PhD) degrees in Civil Engineering. The MS and PhD programs were approved by UHM in 1963 and 1992, respectively.

The overall Mission of CEE is to 1) educate civil engineers that meet the requirements of the profession, committed to life-long learning, and have the potential to be the future leaders of the profession; 2) create, develop, and disseminate new knowledge through high quality, innovative research; 3) provide service to various agencies of the State and Counties of Hawaii and the engineering community; and 4) provide leadership to the Civil Engineering profession in the Asia/Pacific Region.

The CEE mission is aligned with the CoE mission with respect to graduate programs: to provide research and graduate education opportunities to students worldwide, within the context of a faculty driven extramurally funded research program that leverages the resources of the University of Hawaii and its partners in Hawaii.

The Civil Engineering Bachelor of Science (BS) degree includes a broad-based general education component and coverage of six different CEE subdisciplines, including construction, environmental, geotechnical, hydraulics and hydrology, structures, and transportation with no opportunity for specialization in a subdiscipline. The BS degree is designed to prepare all graduates for entry-level positions in any CEE subdiscipline or general civil engineering work. The MS degree is designed to provide attainment of in depth technical knowledge in a single subdiscipline of the student's choice. The PhD degree is designed to produce high-level subdiscipline experts capable of self-directed independent research for professional leadership and/or university faculty positions.

Chapter 3

INITIAL STEPS AND PLAN OPTIONS

3.1 Application Information

3.1.1 Mailing Address

University of Hawai'i at Mānoa
Department of Civil and Environmental Engineering
2540 Dole Street Holmes 383 Honolulu, HI 96822
Tel: (808) 956-7449
Fax: (808) 956-5014
<http://www.cee.hawaii.edu>

3.1.2 Application Deadlines

	International		Mainland and Hawaii	
	Fall	Spring	Fall	Spring
MS	May 1	September 1	July 1	November 1
Ph.D.	March 1	September 1	July 1	November 1

Table 3.1: Official deadlines for applicants.

3.1.3 On-line applications

1. Applications are obtained at the Office of Graduate Education website:
<http://manoa.hawaii.edu/graduate/content/submitting-your-application>
2. There is a non-refundable application fee of \$100.
3. Applicants are admitted for a specific semester and are not allowed to “defer” admission to a later semester; instead they must re-apply and pay the application fee again.

3.1.4 Admission requirements

- BS degree in civil engineering or equivalent from an accredited U.S. college or university, or its equivalent from a recognized foreign institution of higher learning. Students who do not possess a BS degree in civil engineering must fulfill additional prerequisite coursework upon admission (see Initial Steps, below).
- Minimum GPA (Grade Point Average) of 3.0 or equivalent in the last two years of undergraduate study and in all post-baccalaureate and graduate-level course work. The GPA is calculated based on a scale of 4.0=A.
- GRE (Graduate Record Examination) General Test or evidence of passing the FE (Fundamentals of Engineering) exam. There are no absolute minimum GRE scores, however, applicants will be favorably viewed with GRE Quantitative score of 80% or better.
- TOEFL/IELTS/Duolingo scores for most non-native speakers of English. See a Graduate Division website: <https://manoa.hawaii.edu/graduate/english-proficiency/>
- Statement of objectives, including area(s) of graduate study interest. Download statement of objectives form at www.cee.hawaii.edu.
- Applicants wishing to be considered for a Teaching Assistantship (TA) or Research Assistantship (RA) submit Graduate Assistant Application Form, Graduate Assistant Evaluation Form, and three sealed letters of recommendation. Download forms at www.cee.hawaii.edu.

3.1.5 English Proficiency Minimum Requirements

Most applicants whose native language is not English are required to take either the TOEFL/IELTS/Duolingo.

- TOEFL:
 - MS applicants: Minimum score is 540/76 (paper/internet).
 - PhD applicants: Minimum score is 600/100.
 - For TA applicants: Minimum is 600/100, with subset scores of 25 for listening and speaking.
- IELTS:
 - Minimum score is 6.00 for the overall band scores.
 - For TA applicants the minimum is 7.00.
- Duolingo
 - Minimum score is 95 for the overall band test results.
 - For teaching assistantship applicants, the minimum score is 125.

Applicants may submit unofficial scores while applying for admission, but admitted students must submit official scores in order to enroll. Official scores are sent directly to Graduate Division Student Services. The Educational Testing Service (ETS) code for UHM is 4867. Test scores cannot be more than two (2) years old.

3.2 Initial Meeting of New Students with Graduate Chair

1. All new MS and PhD students must meet with the Graduate Program Chair.
2. The initial meeting should occur in person prior to the start of classes/registration but may occur via telephone or email if circumstances dictate (e.g. foreign students arriving just prior to the first day of classes).
3. The meeting establishes the student's area of study, discusses overall program requirements including choice of Plan A vs. Plan B for MS students, Qualifying Examination requirements for PhD students. Advise on the program of study for the first semester should be provide by a faculty in the student's area of interest and not by the graduate chair.
4. MS students must choose an area of concentration (subdiscipline) from the following:
 - (a) Construction
 - (b) Environmental
 - (c) Geotechnical
 - (d) Hydraulics/Hydrology
 - (e) Structures
 - (f) Transportation
5. For students being supported as a research assistant (RA), the student will be directed for further advising to the professor providing the research assistantship who will normally serve as the academic and thesis/dissertation advisor.
6. For students being supported as a teaching assistant (TA) and self-supported students, the Graduate Chair will suggest possible academic and thesis advisors based upon the student's area of concentration.

3.3 MS student choice of Plan A versus Plan B program

1. The CEE Department awards a Master of Science (MS) degree in Civil Engineering and there are two options from which the student must select: Plan A (thesis) or Plan B (non-thesis).
2. Selection of Plan A/B must occur during the first semester of study in consultation with the Graduate Chair and/or the student's permanent academic advisor. Students are able to change from Plan A to B or vice-versa during the program by petition to Graduate Division (contact Graduate Chair for assistance).

3. Plan A is known as the thesis option. A thesis is a scholarly contribution to knowledge. It presents research conducted by the student under the supervision of the thesis committee chair (mentor/advisor). The research is often but not always funded by a research grant obtained by a faculty member and may take many forms including campus-laboratory-based experimental or computer simulation studies, different types of off-campus experimental site research studies, or other studies that do not require being on UHM campus. The final thesis is a formal document that is approved by the thesis committee of three faculty (via signature) and becomes a permanent and official addition to the body of scholarship undertaken at UHM (a copy is cataloged in Hamilton Library). The thesis is presented orally and defended in front of the thesis committee which must approve of the defense. The thesis counts for 9 credits. The plan-A presentation is open to department faculty, students, and the public.
4. Plan B is known as the non-thesis option. This option requires a “major research report” which counts for 3 credits. The major research report is completed under the supervision of the student’s Plan B committee chair. The major report is often based upon a professional engineering project with novel features or planning-type studies of professional practice interest. Students must pass a Final Oral Exam in front of the Plan B committee of three faculty that includes a presentation/defense of the Plan B project and questioning on any other aspects of the student’s MS coursework. The plan-B presentation is open to department faculty, students, and the public.
5. The selection of Plan A or B occurs in consultation with the student’s academic advisor.
6. Actual time to degree completion (TTD) is variable and depends mostly on the student’s ability to complete the thesis/major report in a timely fashion. Sometimes research projects have un-foreseen delays in sponsor funding, or equipment purchase, or research site availability, and/or from experiments not going as expected and having to be repeated or changed. Students are encouraged to use good planning/management strategies such as establishing a scope, timeline and milestones as early as possible, meeting frequently with their advisor to update expectations/progress/milestones/timeline, starting writing of thesis/report at the very beginning of the project (make an outline and do the literature review), and constantly being aware of the schedule and committing to staying on track. Good communication with the advisor and committee members is key to a shorter TTD.
7. Students must complete all requirements within seven (7) years after admission to the program. Students failing to complete the degree within 5 full years will be automatically placed on probation by the Graduate Division at the start of the sixth year. The probation is rescinded if the degree is completed within 7 years. If all requirements except the Thesis or Major Report are completed by the end of 7 years, the Graduate Chair can, if appropriate, petition for an extension by providing reasons the extension is needed, and a reasonable timeline for completion. Extenuating circumstances are required in order to obtain such an extension.

3.4 MS Student Status

1. Classified status means a regular graduate student. Students with an undergraduate GPA of 3.0 or higher enter with a Classified status.
2. Conditional status means a graduate student on probation. Students with an undergraduate GPA of 2.7 to 2.9 generally enter with a Conditional status. Conditional students must complete 9 credits of graduate coursework with a GPA of 3.0 or higher at UHM before they are switched to Classified status. Students who do not meet the requirement with the first 9 credits completed are dismissed from the program.
3. Unclassified status means a graduate students with an undergraduate GPA lower than 2.7. Unclassified students are eligible to begin graduate studies at UHM (known as post-bachelor unclassified, PBU) are not admitted directly into CE.
 - (a) Unclassified (PBU) students can take all CEE classes.
 - (b) Unclassified (PBU) students who have completed 12 credits with a 3.0 or higher GPA can apply for admission into CE as a Classified student (complete the regular application to CE and pay the fee). Students who meet the grade requirements will be admitted.
 - (c) Credits earned as Unclassified status (PBU) are considered pre-program and must be transferred into the degree program following attainment of Classified status (this is completed by the Graduate Chair by petition to Graduate Division). A maximum of 15 pre-program credits can be transferred. Credits in excess of 15 taken as PBU will not be transferable to satisfy degree requirements.
 - (d) Residency requirements dictate that a student must be in Classified status for at least 2 semesters. Thus, Unclassified (PBU) students must apply for regular admission as soon as possible. For students that complete their first 12 (or more) credits in the Spring semester, this is not a problem, since there is plenty of time between the end of Spring semester in May and the July 1 application deadline for Fall semester. However, students that complete their first 12 credits in the Fall semester are not able to apply for admission in the Spring semester because their grades will not be available prior to the November 1 application deadline for Spring semester. These students have to wait for admission the following Fall semester, which could delay their program completion (necessitate two additional semesters to meet residency and loss of credits in excess of 15 as described above).

3.5 PhD Student Status

- PhD students can only enter as a Classified graduate student. It is not possible to start the PhD program as Unclassified status. Students must have completed an MSCE or equivalent and submit all other required application materials, including:
 1. Official Transcripts for all previous institutions and degrees

2. GRE general test scores or proof of passing the FE exam
3. Personal Statement of Objectives Form – describing area of specialization, objectives of graduate study, and long-range professional goals
4. Three Graduate Assistant Evaluation forms and three signed letters of reference (at least two from academic faculty) specifically commenting on the potential of the applicant to conduct research and be successful in a rigorous academic program.
5. TOEFL/IELTS/Duolingo scores for non-native English speakers.

3.6 Transfer Credits for Masters students

- Credits earned at UHM while Unclassified (PBU) at other UH campuses, at other universities, and excess credits earned as an undergrad, can be transferred into the CE degree program to satisfy degree requirements. Credits can only be transferred for courses completed for a letter grade (no CR/NC) and for which a grade of B or higher is earned (no B-).
- Credits earned while at UHM as PBU must be transferred into CE in order to count towards degree requirements. This is accomplished by the Graduate Chair petitioning the Graduate Division during the student's first semester as a Classified student. A maximum of 15 credits can be transferred. At least 16 credits must be completed while in Classified status.
- Credits for graduate coursework earned at other universities can be transferred to count toward degree requirements. Such coursework must be equivalent to courses offered in the UHM CEE program or clearly be applicable to the student's degree program. A maximum of 15 credits can be utilized from other universities. The student must provide transcripts and catalog course descriptions and a course syllabus to the Graduate Chair who will prepare a petition to the Graduate Division. Credits can only be transferred for courses completed for a letter grade (no CR/NC) and for which a grade of B or higher was earned (no B-).
- Excess credits earned from a BS program (at UHM or other universities) can also be transferred only if the credits were not used to satisfy BS requirements (no double-counting allowed), and a grade of B or higher is required. A maximum of 9 credits of excess undergrad-level courses are transferable. A maximum of 15 credits can be transferred.

3.7 Transfer Credits for Doctoral students

- PhD students must satisfactorily complete a minimum of 50 credits beyond the BS. With approval of the Graduate Chair, up to 30 credits earned as part of the student's MS program can be transferred to satisfy the credit requirements. MSCE credits will usually all transfer, however, credits obtained in "or equivalent" degree programs will be evaluated to determine whether they are relevant to a PhD and can therefore substitute for relevant CEE course that could otherwise be taken for credit during

the PhD program. It is required that 27 of the 50 credits beyond MSCE must be in graduate-level CEE coursework (excluding directed reading/research). Thus, generally, only courses offered in the UHM CE program and/or other courses typically offered in a CE program will be considered for transfer.

- The 30 credits may include up to 9 credits for MS thesis work but exclude graduate seminar credits taken as part of a MS program.
- The Graduate Chair completes the petition to Graduate Division to transfer up to 30 credits of appropriate MS coursework. This process is necessary regardless of whether the MSCE was earned at UHM or another institution. This is normally completed in the first semester of enrollment.
- Note: The typical PhD student possessing a prior MSCE will start the program with 30 transfer credits and will then need to complete only a minimum of 20 credits of additional coursework plus a one credit seminar course.

3.8 English Language Proficiency

1. Admitted students are required to submit official TOEFL, IELTS, or DuoLingo scores in order to enroll at UHM. Official scores should be sent directly to Graduate Division Student Services. The Educational Testing Service (ETS) code for UHM is 4867. Test scores cannot be more than two years old.
2. All non-exempted international students must report to the UHM English Language Institute (ELI) and take a placement test to evaluate the student's level of proficiency in English.
3. The following international students are exempted from the ELI placement test:
 - Native speakers of English.
 - International students who received a TOEFL score of 600/100 (paper/Internet) or IELTS score of 7.0 or above.
 - International students who received a GRE verbal score of 460 or above.
 - International students who have received within the last five years a bachelor's degree or an advanced degree from an accredited/recognized college in the United States, United Kingdom, Canada, New Zealand, Singapore, Australia, or Ireland.
4. ELI Placement Test
 - (a) Three hour test
 - (b) Tests are scheduled at the beginning of each semester and summer session.
 - (c) Seating is limited so students are advised to sign up immediately upon arrival on campus.
 - (d) Test measures: the ability to read academic texts with understanding and reasonable speed, vocabulary proficiency, ability to understand academic lectures in English, and facility in written self-expression.

- (e) Results are used for ELI clearance and course placement.
 - (f) Students may or may not be required to take ELI courses depending on the placement test score.
 - (g) Registration for ELI courses in the fall and spring semesters is limited to students who have been officially admitted to the university
 - (h) Except under unusual circumstances, students may not audit ELI courses. They must complete all ELI courses within the first year of study at the university.
 - (i) Students enrolled in ELI courses take a reduced regular academic course load, so that they may devote enough attention to gaining satisfactory competence in English. The amount of course load reduction is proportional to the number of assigned ELI course(s). Those required to take a relatively large number of ELI courses should expect to make proportionately slower progress in their regular academic program.
 - (j) Upon satisfactory completion of required ELI courses, the student is cleared to finish their degree
5. Required minimum scores for Graduate Assistants
- (a) Teaching Assistants: TOEFL – 600/100 (paper/internet), with subset scores of 25 for listening and speaking. IELTS – 7.00 for overall band test results. Duolingo – 125 for the overall band test results.
 - (b) Research Assistants: TOEFL – 600/100 (paper/internet), with subset scores of 25 for listening and speaking. IELTS – 7.00 for overall band test results. Duolingo – 125 for the overall band test results.

3.9 Requirements for Graduate Assistants

- In order to be hired as a Graduate Assistant (Teaching Assistant or Research Assistant), a student must meet minimum GPA and English proficiency requirements as follows:
 - GPA: Minimum: 3.00. Exceptions can be granted by Graduate Division upon petition by the Graduate Chair with justification (e.g. if GPA is close to 3.0).
 - TOEFL/IELTS/Duolingo: Exceptions are not granted.
 - Must be Classified
 - Must maintain at least 6 credits per semester
 - Must be employed for at least 12 weeks during the semester

Chapter 4

MASTER OF SCIENCE DEGREE REQUIREMENTS

4.1 MS Prerequisites for Admission

1. Students with a BS in CE from UHM or any other university are considered to have completed all pre-requisites.
2. The minimum pre-requisites for students without a BS in CE are completion of two courses in the following list with a grade of C or better prior to advancement to candidacy in the selected area of concentration.

General Courses

One from the following courses

- Course Requirement:
 - CEE 330 Environmental Engineering
 - CEE 355 Geotechnical Engineering I (Soil Mechanics)
 - CEE 361 Fundamentals of Transportation
 - CEE 375 Construction Materials
 - CEE 381 Structural Analysis

Additional course based on area of concentration

One of the following courses in each area

- Construction:
 - CEE 472 Construction Management
 - CEE 473 Construction Equipment and Methods
 - CEE 474 Construction Estimating and Bidding
- Environmental:

- CEE 431 Water and Wastewater Engineering
- Geotechnical:
 - CEE 455 Geotechnical Engineering II
- Hydraulics:
 - CEE 421 Engineering Hydraulics Structures:
 - CEE 482 Indeterminate
- Structures:
 - CEE 485 Reinforced Concrete Design
 - CEE 486 Structural Steel Design
- Transportation:
 - CEE 461 Pavement Engineering
 - CEE 462 Traffic Engineering
 - CEE 464 Urban & Regional Transportation Planning

4.2 MS Residency Requirements and Degree Completion Time Limits

- The minimum residency requirement is **two (2) semesters** of full-time work at UHM. For part-time students, each 8 units completed as a classified graduate student will be equivalent to a full-time semester.
- Candidates for the M.S. degree must complete all requirements within **seven (7) years** after admission to the program. Students failing to complete the degree within 5 full years will be automatically placed on probation by the Graduate Division at the start of the sixth year. The probation is rescinded if the degree is completed within 7 years. If all requirements except the Thesis or Major Report are completed by the end of 7 years, the Graduate Chair can, if appropriate, petition for an extension by providing reasons the extension is needed, and a reasonable timeline for completion. Extenuating circumstances are required in order to obtain such an extension.

4.3 MS Program Student Learning Outcomes (SLOs)

The student learning outcomes (SLOs) for the MS program describe a skill set that students are expected to have at the time of graduation. The SLOs are:

1. demonstrate in-depth technical knowledge in a subdiscipline of specialization;
2. evaluate critically and synthesize literature to inform engineering solutions;
3. present effectively technical work orally in a formal setting;

4. produce technical reports and/or publishable manuscripts; and
5. perform engineering research or conduct projects that address open-ended problems.

4.4 MS Coursework Requirements

There is no specific program of courses required for the MS degree. The program of study is custom tailored to the interests of the student and/or the technical needs of the student's research project. The plan of courses is determined in consultation with the student's advisor and Graduate Committee and will generally consist of all or most of the graduate courses available in the student's area of concentration possibly along with one, two, or three courses from another department.

Minimum Requirements	Plan A (Thesis)	Plan B (Non-Thesis)
CEE Graduate courses numbered higher than 600 (excluding CEE 699, CEE 700, CEE 691)	12 credits	18 credits
Graduate and/or 400-level courses (can be CEE or other; can include up to 3 credits of CEE 699 taken for a letter grade)	9 credits	9 credits
Thesis: CEE 700 (must have Graduate Committee formed and thesis title approved prior to enrollment. CEE 699 credits taken for CR/NC prior to committee/title approval are converted into CEE 700)	9 credits	NA
Major research report: CEE695	NA	3 credits
Seminar: CEE691	1 credit	1 credit
Minimum Total Credits	31	31
Final Examination	Oral thesis defense	Written and/or oral exam (at discretion of student's Graduate Committee)
Required course during semester degree is to be awarded	CEE 700	CEE 600 (only if all other courses are completed)

Table 4.1: The minimum course requirement.

Note: CEE 699 can either be taken for a letter grade or CR/NC. There are different

CRNs for each professor. Students must contact the CEE Department secretary (Janis Kusatsu) to obtain the CRN to register for CEE 699. You will fill out a form indicating the grading option. You must sign up for the correct grading option. Research-based 699 credits taken to satisfy Plan A thesis credits (later converted into CEE 700 once Advanced to Candidacy) must be taken CR/NC otherwise they cannot be converted into thesis credits. Directed Reading 699 credits taken to satisfy minimum credit requirements for either Plan A or Plan B (maximum of 3 credits) must be taken for a grade or they cannot be used to satisfy the minimum requirements. CEE 600 (1 cr, no grade option) is only ever taken by some Plan B students. It is only taken in the final semester if the student has completed all course requirements but has not completed the final oral examination.

4.5 Other MS Requirements

4.5.1 Pre-Candidacy Progress

UHM Form I - Plan A and CEE Form 1 – Plan B

- Form I (or 1) is completed and signed by the Graduate Chair only (view forms in Appendix).
- A preliminary degree plan that lists the student's intended courses should be developed in consultation with advisor and be submitted at the beginning of the first semester in the program. The list of courses may be modified at a later date.
- Previous graduate credits (from unclassified status or from another institution) must be transferred during the first semester after being accepted as a Classified or Conditional student. A maximum of three (3) graduate courses from another institution (9 credits) can be transferred into the M.S. program.
- Completion of Form I is at the discretion of the Department and authorized by the Graduate Chair. Generally, completion occurs after one semester and 12 credits of acceptable graduate degree coursework with a GPA of 3.0 or higher. All listed undergraduate deficiencies must be satisfied and Classified status achieved prior to completion of Form I. Note that Conditional students will be transferred to Classified status only after completing 9 credits of approved graduate degree coursework with a GPA of 3.0 or better.

4.5.2 Advance to Candidacy

UHM Form II - Plan A and CEE Form 2 – Plan B

- Form II (or 2) is signed by the student, the student's Graduate Committee, and the Graduate Chair (view forms in Appendix).
- Student fills in the Thesis or Research Report topic and signs the form
- Graduate Committee members then all must sign the form
- Finally the Graduate Chair signs the form and once processed, the student is Advanced to Candidacy and is eligible to enroll in CEE 700.

- The graduate student's committee consists of a minimum of three Graduate Faculty members. At least two of these must be from the CEE Department, one of which must be the committee chair. The chair becomes the student's academic advisor. Note that the interim advisor does not have to be a member of the committee. The student's academic program must be approved by the Graduate Committee.
- For Plan B a student must have the Graduate Committee formed and program of courses approved by the committee at least by the time that 18 credits of graduate degree courses have been completed. A student must have the major research report topic and title (CEE 695) approved by the student's Graduate Committee.
- Plan A: A student must have the thesis research topic and title approved by the Graduate Committee prior to registering for thesis credits (CEE 700). Any CEE 699 that is intended to be transferred later to thesis credit must be taken as credit/no credit.

4.5.3 Final Examination

UHM Form III - Plan A and CEE Form 3 – Plan B

- Plan A: This form is the Thesis Evaluation Form which is completed after the student's final defense. The student's thesis defense and oral examination are administered by the Graduate Committee. The student signs the form. The Committee members sign the form indicating pass/fail of defense and approval of thesis content (not final thesis document). A majority of committee members must vote to pass for the student to pass. Finally, the Graduate Chair signs the form.
- Plan B: Comprehensive written and/or oral examination is prepared and administered by the Graduate Committee. Committee members sign the form indicating pass/fail of final comprehensive written/oral exam and the major research report. The student and Graduate Chair also sign the form.

4.5.4 Thesis Submission

UHM Form IV - Plan A only

- This form is signed by the Graduate Committee and indicates approval of the final completed thesis document

4.5.5 Grade Point Average Requirements

- Students are required to maintain a GPA of at least 3.0 to remain in good standing
- GPA is computed from all courses completed during enrollment in the graduate program EXCLUDING the following: 100-level, 200-level, 399 and 499 courses; transfer courses; UHM undergraduate excess credits. (Note: both undergraduate excess courses and transfer courses are only accepted if a grade of B or higher is achieved.)

Chapter 5

DOCTOR OF PHILOSOPHY DEGREE REQUIREMENTS

5.1 Prerequisites for PhD

- PhD students must have completed a MS in CE at UHM or equivalent prior to beginning PhD studies. The typical applicant will have completed (or be in the final semester of) a CE Master of Science degree program with a GPA in excess of 3.0 and submitted all other requirement documents for admission. Other applicants may have completed “equivalent” degree programs in subjects such as Geotechnical Engineering, Transportation Engineering, Bridge Engineering, Biosystems Engineering or other similar engineering fields. Non-engineering MS degrees would generally not fall in this category. Students with MS degrees in Physics, Mathematics, Chemistry, Meteorology, Microbiology and other science fields would normally be required to enter the MS program en route to PhD and would obtain an MS first and then a PhD. Applicants should discuss this with the Graduate Chair.
- Students who complete their MSCE at UHM are able to petition for continuation in the PhD program in the semester following completion of MS degree requirements. If they wish to delay starting the PhD program, they are required to go through the conventional application process like all students.

5.2 PhD Program Student Learning Outcomes (SLOs)

The student learning outcomes (SLOs) for the PhD program describe a skill set that students are expected to have at the time of graduation. The SLOs are:

1. demonstrate foundational knowledge in civil engineering and comprehensive technical expertise in a subdiscipline of specialization;
2. evaluate critically and synthesize literature to inform engineering solutions;
3. present proficiently research plans and results orally in a formal setting;
4. perform original engineering research; and

5. produce publishable manuscripts.

Each subdiscipline establishes a sequence of courses to achieve SLOs 1 and 2. To achieve SLO 3, every student is required to take a seminar course, where they make an oral presentation, and every student must write a dissertation, which they defend orally during the final examination. To achieve SLO 4, each student is required to complete at least one semester as a teaching assistant or have demonstrated other teaching experience at the university level. To achieve SLO 5, each student must complete successfully a research-oriented dissertation

5.3 PhD Course Requirements

- Students must satisfactorily complete a minimum of 50 credit hours in course work beyond the B.S. and a minimum of 1 credit hour in civil and environmental engineering graduate seminars as a Ph.D. student. Based on a written recommendation of the student's dissertation committee, and with the approval of the Graduate Chair, students entering the Ph.D. program may be granted an equivalence of up to 30 credit hours earned as part of the student's M.S. program. The 30 credit hour equivalents may include up to 9 credit hours for the previous M.S. thesis work, but exclude graduate seminar credit hours taken as part of the M.S. program.
- The courses that a student undertakes to fulfill the Ph.D. credit hour requirements must be approved by the student's dissertation committee. At least 27 credit hours must be from graduate-level civil and environmental engineering courses (cannot include 699/700). The remaining courses may include graduate and 400-level courses offered by the Department of Civil and Environmental Engineering or other appropriate departments of the University as well as direct reading/research.

5.4 Qualifying Examination for PhD Students

- Purpose: to assess the student's potential for doctoral studies, including scholarly research, and to identify possible deficiencies in student preparation and, if necessary, to devise a program of remedial study to rectify any weaknesses.
- Offered every semester if more than one student signs up.
- Must be completed within first three semesters following admission to the program.
- Must register for the QE in the Department office no later than the second week of classes in the semester in which the QE will be taken.
- A five hours closed-book written portion and a 1-hr oral portion at least one week later.
- Written portion: Fall semester is usually the first Thursday of November, Spring semester is usually the Thursday of Spring Break.
- Written exam is closed-book consisting of three parts:

- The first portion of the written section is 1.5 hours long and involves questions on engineering mathematics, probability and statistics. These questions are restricted to material that would normally be expected to be part of a B.S. program in civil and environmental engineering.
 - The second written section is 2.5 hours long and is targeted at the student's particular subdiscipline of study. Questions involve material that would be familiar to students who have completed a M.S. program in their area of specialty.
 - The third written section is 1 hour long and involves preparing an essay on a generic engineering topic to assess the student's composition skills and writing ability.
 - All students will take the written examination at the same time.
- The oral exam is not conceived as an additional exam; rather, it is meant to complement the written part. Its purpose is to discuss the results of the written part with the student, clarify errors through further questioning, and, if necessary, more clearly identify weaknesses so that a plan of remedial study can be designed. Ordinarily, only the examination committee and the student are involved in the oral exam. However, if a student's solution to a written question is considered insufficient, and the faculty member who submitted the question is not a committee member, that faculty member may also attend the oral exam.
 - The written exam is scored by the members of the CEE graduate faculty on the QE Committee. There are no pre-set pass/fail score criteria for the written exam. The committee deliberates on whether the student passed or failed the exam after the oral portion when the student has had an opportunity to solve the problems in front of the committee. There is no partial pass, only pass or fail. Often with a pass determination, the committee will require specific coursework and a timeline to address identified weaknesses.
 - If a candidate fails the QE on the first attempt, he/she can attempt a second time in the following offering. If a student fails the second QE attempt the student is dismissed from the program.
 - The QE is administered by a committee of at least three graduate faculty in the Department. The committee members are appointed by the Graduate Program Chair and serve for the academic year. There will be a separate committee for each area of specialization. The examination committee develops the written exam, although questions may be submitted by faculty who are not members of the committee. However, selection of questions for the QE is the sole responsibility of the committee. Problems will be corrected by faculty members who submitted them. Corrected problems are not returned to the student. In addition, students are not allowed to ask committee members questions regarding the content of the examination, either before the written or oral parts. Only the Graduate Chair can provide general information and answer questions on the content of the written and oral exams. This policy is designed to provide the greatest fairness in the administration of the examination from year to year. All candidates are highly encouraged to meet with the Graduate Chair early in the process of preparing for the QE.

- Only committee members may vote on passing or failing a student. A simple majority of the committee is required for deciding the outcome of the examination. Students failing the QE may repeat it once during **the following offering**. A student failing the QE a second time will be dismissed from the Ph.D. program.
- Progress Form I (Pre-Candidacy Progress) is completed after the QE is successfully passed (see Appendix).

5.5 Comprehensive Examination for PhD Students

- A comprehensive dissertation is required of all students. It is to present results from innovative research that makes a significant contribution to the student's selected field of specialization. The findings should be publishable in refereed journals and other scientific and engineering forums. A dissertation proposal needs to be prepared and presented to perspective committee members by the end of the second year of study. The Proposal must receive the unanimous approval of the dissertation committee. After the PhD committee is formed and the PhD proposal is approved, the student must update the committee members at least once a year to report on the progress of his/her research.
- Every Ph.D. student must pass a comprehensive examination. The purpose of this examination is to ascertain the student's comprehension of the advances in the chosen specialty. Examinations are given when, in the judgment of the dissertation committee, the student has had sufficient preparation, but not sooner than six calendar months after the student has passed the qualifying examination.
- The examination committee consists of all members of the dissertation committee. The examination committee will select its own chair; however, the chair of the dissertation committee may not serve as chair of the examination committee. The role of the chair is to schedule the exam, coordinate the written questions from the members, administer the exam to the student, and chair the oral exam.
- The comprehensive examination consists of a written part and an oral part. The written part is a 'take-home, open-book', 5-day exam prepared by the examination committee. It is to be handed to the student on a Monday morning, no later than 9:00 AM, and it is to be returned by the student not earlier than noon, and no later than 5:00 PM, on the following Friday. A copy of the corrected exam will be returned to the student no later than the following Wednesday.
- The oral part will then take place no earlier than the Friday following the return of the corrected written exam to the student. It will be attended by all members of the committee, and may last a maximum of three hours. The oral examination provides an opportunity to discuss the written exam and to pose new questions to the student.
- A student passes the comprehensive examination if no more than one committee member opposes such an action. A student who fails the comprehensive examination may, at the discretion of the examination committee, repeat it once after a time period

of six calendar months. A student who fails the examination a second time will not be allowed to continue in the Ph.D, program.

- After successfully passing the Comprehensive Examination, the student is nearly ready to Advance to Candidacy. However, the student must also have their research topic approved by their Dissertation Committee. PhD progress Form II (Doctorate – Advance to Candidacy) requires signatures of all Committee members indicating their approval of the dissertation topic and passing of the Comprehensive Examination
- The dissertation proposal is normally presented at the oral exam portion of the Comprehensive Examination or at another meeting. Both must be completed prior to signing of Form II (Advance to Candidacy) of the student (forms in Appendix).

5.6 Dissertation Research

- A comprehensive dissertation is required of all students. It is to present results from innovative research that makes a significant contribution to the student's selected field of specialization. The findings should be publishable in refereed journals and other scientific and engineering forums.
- A dissertation proposal needs to be prepared and presented to perspective committee members by the end of the second year of study. The Proposal must receive the unanimous approval of the dissertation committee.
- After the PhD committee is formed and the PhD proposal is approved, the student must update the committee members at least once a year to report on the progress of his/her research.

5.7 Dissertation Defense and Final Examination

- Ph.D. candidates are required to take a final examination in defense of their dissertation. The candidate's dissertation committee conducts the examination. Students pass upon the favorable recommendation of the majority of the committee.
- PhD progress Form III (Doctorate – Dissertation Evaluation) is completed after the dissertation defense (forms in Appendix). It must be signed by all committee members who participate in the final defense and indicate pass or fail. It indicates approval or disapproval of both the content of the dissertation and the ability to defend it.
- PhD progress Form IV (Doctorate – Dissertation Submission) is the final signature page that must be signed by a majority of the dissertation committee including any members physically absent from the defense. It indicates that the committee has read and approve of the manuscript in its entirety. It is submitted by the student with the final digital copy of the manuscript to the Office of Graduate Education.

Chapter 6

WORK RELATED POLICIES

6.1 Graduate Teaching Assistants (TAs)

- Graduate Teaching Assistants (TAs) are hired by the Department to assist with undergraduate classes. Preference is given to unfunded new applicants and PhD students. TAs are provided to selected applicants who achieved a “B” or better for the course (or equivalent) and demonstrates English proficiency (first language or TOEFL > 600). TAs are typically provided for one year, awarded by semester, renewable upon review of adequate performance. Some extensions may be made available
- Teaching Assistants will adhere to the academic schedule (excepting mandatory activities) and will be allowed leave during scheduled vacations and leave to attend professional meetings.

6.2 Graduate Research Assistants (RAs)

- Graduate Research Assistants (RAs) are hired by individual faculty (through the Department) with RA funding. Work schedule should be arranged by the project PI.
- It is expected that the Graduate Assistants will not engage in outside employment while fully enrolled and receiving an Assistantship.

6.3 General Policies for Assistants

- You will have a shared mailbox in the CEE office and a UH e-mail address. Office supplies and copy/fax machines are for use Graduate Assistants for.
- Telephones are not to be used for long distance calls.
- Assistantships may be terminated after reasonable warning, at any time for reasonable cause or unsatisfactory performance.

Appendix A

APPENDICES

A.1 FREQUENTLY ASKED QUESTIONS

1. How do I find an advisor?
 - The Graduate Chair serves as the initial temporary advisor for all new students. All students should meet with the Graduate Chair prior to the start of the first semester for guidance with finding a permanent advisor.
2. Can I change from MS Plan A to Plan B (or visa versa)?
 - Yes, this change can be made by contacting/meeting the Graduate Chair who will write a petition to Graduate Division.

A.2 Graduate Study Forms

All graduate forms are available at <http://www.cee.hawaii.edu/resources-for-graduate-study/>.

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