



University at Buffalo

Department of Civil, Structural  
and Environmental Engineering

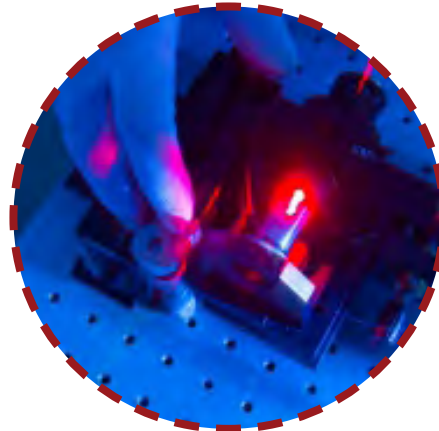
School of Engineering and Applied Sciences

# Graduate Studies Manual

## Academic Year 2020-2021



Bridge Engineering



Computational  
Engineering Mechanics



Environmental & Water  
Resources Engineering



Geomechanics, Geotechnical  
& Geoenvironmental  
Engineering



Structural & Earthquake  
Engineering



Transportation Systems  
Engineering

# University at Buffalo

## Department of Civil, Structural, and Environmental Engineering (CSEE)

### Graduate Studies Manual

### Policies and Procedures for Graduate Students and Advisors

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## Preface

The policies and procedures summarized in this manual are applicable to all graduate students in the Department of Civil, Structural, and Environmental Engineering (CSEE), effective August 31, 2020. Exceptions to these policies and procedures must be approved by the CSEE Department Chair or Director of Graduate Studies. The Department reserves the right to modify the procedures and requirements described herein. Unless otherwise noted, policy changes will not apply retroactively to students who matriculated in a CSEE graduate degree program prior to the effective date of the GSM.

In accordance with federal and state laws, no person in whatever relationship with the State University of New York at Buffalo shall be subject to discrimination on the basis of age, religion or creed, color, disability, national origin, race, ethnicity, sex or sexual orientation, marital, or veteran status.

# TABLE OF CONTENTS

<b>1.0</b>	<b>GENERAL INFORMATION .....</b>	<b>4</b>
1.1	INTRODUCTION.....	4
1.2	INITIAL ADVISEMENT AND COURSE REGISTRATION .....	4
<b>2.0</b>	<b>GRADUATE PROGRAMS AND DEGREE REQUIREMENTS .....</b>	<b>5</b>
2.1	AREAS OF STUDY AND DEGREE OPTIONS .....	5
2.2	MASTER OF SCIENCE PROGRAM .....	6
2.2.1	<i>Coursework</i> .....	6
2.2.2	<i>Culminating Experience Requirements</i> .....	14
2.2.3	<i>Faculty Advisors for M.S. Project and Thesis</i> .....	15
2.2.4	<i>M.S. Graduation and Degree Conferral</i> .....	16
2.3	DOCTOR OF PHILOSOPHY PROGRAM .....	17
2.3.1	<i>Ph.D. Program Coursework</i> .....	17
2.3.2	<i>Ph.D. Advisory Committee</i> .....	18
2.3.3	<i>Ph.D. Qualifying Examination</i> .....	18
2.3.4	<i>Application to Candidacy</i> .....	20
2.3.5	<i>Dissertation Proposal</i> .....	20
2.3.6	<i>Dissertation and Defense</i> .....	21
2.3.7	<i>Mid-program PhD evaluations</i> .....	21
2.3.8	<i>Ph.D. Degree conferral</i> .....	22
<b>3.0</b>	<b>ADDITIONAL GRADUATE POLICIES AND PROCEDURES (ALL STUDENTS) .....</b>	<b>22</b>
3.1	CONTINUOUS REGISTRATION, FULL-TIME STATUS, AND RESIDENCY.....	22
3.2	TRANSFER OF CREDITS TAKEN AT OTHER UNIVERSITIES.....	23
3.3	MINIMUM GRADES IN REQUIRED COURSES.....	23
3.4	INFORMAL COURSEWORK: INTERNSHIPS.....	24
3.5	INFORMAL COURSEWORK: INDIVIDUAL PROBLEMS .....	25
3.6	UNDERGRADUATE COURSES FOR GRADUATE CREDIT .....	26
3.7	INAPPLICABLE CREDITS .....	26
3.8	GRADING POLICY .....	26
3.9	REPEATING COURSES .....	27
3.10	NON-MATRICULATED STUDENTS.....	27
3.11	DISTANCE LEARNING.....	27
3.12	GPA REQUIREMENT FOR GOOD ACADEMIC STANDING.....	27
3.13	ACADEMIC PROBATION.....	28
3.14	ACADEMIC DISMISSAL .....	28
3.15	TIME LIMITS FOR DEGREE.....	29
3.16	LEAVE OF ABSENCE .....	29
3.17	ACADEMIC INTEGRITY .....	29
3.18	COMPUTING LABS .....	30
3.19	PUBLICATION POLICY .....	31
3.20	CHANGING PROGRAM AREA OR DEGREE.....	31

## 1.0 General Information

### 1.1 Introduction

This manual is designed as a general reference for students pursuing graduate degrees in the Department of Civil, Structural, and Environmental Engineering (CSEE) and for their faculty advisors. Policies and procedures of CSEE, the School of Engineering and Applied Sciences (SEAS), and the Graduate School of the University at Buffalo (UB) are listed. Different degree programs are described in Chapter 2, and policies that apply to all graduate students are in Chapter 3.

Some CSEE requirements for graduate studies may be more rigorous than those included in other UB and SEAS documents. If there is a conflict between these requirements and others at the University, the most rigorous must be satisfied. Generally the department policies will be most rigorous.

A student who wishes to petition for waiver from any of the policies and procedures presented in this manual should consult with his or her advisor first and gain approval for the waiver from the Director of Graduate Studies (DGS).

Additional information on UB, SEAS and CSEE can be found in various electronic resources, as listed in Table 1.1.

**Table 1.1 – Useful UB, SEAS and CSEE Electronic Resources.**

Title	Publisher	URL Address
Student Code of Conduct	Student Conduct and Advocacy	<a href="https://www.buffalo.edu/studentlife/life-on-campus/community/rules.html#studentcode">https://www.buffalo.edu/studentlife/life-on-campus/community/rules.html#studentcode</a>
Policy Library	The Graduate School	<a href="http://grad.buffalo.edu/succeed/current-students/policy-library.html">http://grad.buffalo.edu/succeed/current-students/policy-library.html</a>
Student Life Gateway	Student Life	<a href="https://www.buffalo.edu/studentlife.html">https://www.buffalo.edu/studentlife.html</a>
Fellowships & Scholarships	The Graduate School	<a href="http://grad.buffalo.edu/explore/funding/fellowships.html">http://grad.buffalo.edu/explore/funding/fellowships.html</a>
SEAS Graduate Education	SEAS	<a href="http://engineering.buffalo.edu/home/academics/grad.html">http://engineering.buffalo.edu/home/academics/grad.html</a>
The Graduate School	The Graduate School	<a href="http://www.grad.buffalo.edu">http://www.grad.buffalo.edu</a>
UB	The University at Buffalo	<a href="http://www.buffalo.edu">http://www.buffalo.edu</a>
International Student Services	ISS	<a href="http://www.buffalo.edu/international-student-services.html">http://www.buffalo.edu/international-student-services.html</a>
CSEE	CSEE	<a href="http://engineering.buffalo.edu/civil-structural-environmental.html">http://engineering.buffalo.edu/civil-structural-environmental.html</a>

### 1.2 Initial Advisement and Course Registration

Graduate study requires frequent interaction between a student, his/her academic advisor (hereafter referred to as “advisor”), and other faculty members. To initiate this important process, each student is assigned a preliminary advisor upon admission. The preliminary

advisor will: (1) work with the student to decide coursework that should be taken during the first semester of graduate study (or until the student finds a different advisor), (2) assist with general questions a student may have about the program, including research opportunities, and (3) help the student find a different advisor, if necessary, for those students wishing to prepare a project, thesis, or dissertation. For students choosing the all-course M.S. option (Section 2.2), the preliminary advisor will normally be the advisor for the duration of the student's graduate program. Students wishing to do a project, thesis, or dissertation must work out a mutual agreement with a research advisor (usually not the same person as the preliminary advisor), who will supervise that work. Any advisor also may be of assistance to counsel in non-curricular matters, such as health; housing; deficiencies in English comprehension, speaking, or writing.

Students enrolling in graduate study for the first time should report to the CSEE Office of Graduate Studies at least one week prior to the first day of classes. The CSEE Office of Graduate Studies, located in 212 Ketter Hall, is the central resource for all administrative issues related to graduate studies. International students registering for the first time also should report to the International Student Services office in Talbert Hall for assistance on housing, visa status, and orientation before coming to the department. All incoming students must attend the CSEE Department graduate orientation, which provides a general overview of the Departmental policies and procedures, as well as the School-wide SEAS graduate orientation. Both orientations typically are held the week before the beginning of Fall classes. If they have not already done so, students should also meet with their preliminary advisor during the week before classes.

## **2.0 Graduate Programs and Degree Requirements**

### **2.1 Areas of Study and Degree Options**

CSEE currently offers Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in Civil Engineering, and an M.S. degree in Environmental and Water Resources Engineering (EWRE). The civil engineering degrees are intended for students who already have a background in civil or a closely related field in engineering. The EWRE M.S. degree is designed for students with a baccalaureate degree in civil engineering, environmental engineering, chemical engineering, or another closely related field of study, including natural sciences with a strong mathematical component.

The M.S. and Ph.D. degrees in Civil Engineering require students to identify one of the following program concentrations: Bridge Engineering (M.S. only); Computational Engineering Mechanics; Environmental and Water Resources Engineering (Ph.D. only); Geomechanics, Geotechnical, and Geoenvironmental Engineering; Structural and Earthquake Engineering; and Transportation Systems Engineering. Selection of a program concentration is designated at the time of application and admission. Once admitted, a formal request must be submitted to the Director of Graduate Studies if a student wishes to change program concentrations.

For the civil engineering degrees, selection of a program concentration has two implications: (1) course requirements are different for each concentration (see Section 2.2.1), and (2) the title of the program concentration will appear on the student's transcript.

## **2.2 Master of Science Program**

For the MS-Civil and MS-EWRE, the program consists of required courses, elective courses, and a culminating experience. These requirements can be organized according to the three options for the culminating experience: (1) Comprehensive exam, (2) Project, and (3) Thesis. Graduate students preparing for careers in engineering practice often follow the all-course or project option, while those planning on further graduate education would normally choose the thesis option. All three options require a minimum of 30 credit hours, as further detailed in Section 2.2.2

### **2.2.1 Coursework**

Required and approved elective courses for each concentration are given in Tables 2.1 to 2.6. In addition to the two required courses, elective courses should be selected from the list corresponding to the student's program concentration. Elective courses that are not listed may also be considered, but prior approval by the student's advisor and DGS are required if the course is to be used to satisfy degree requirements. In addition, although some program lists include multiple classes from outside the CSEE Department, no more than two listed non-CSEE classes can be included in the MS coursework. A *required* course can be replaced only if the student can demonstrate that he/she has already taken an equivalent course before entering UB. Students wishing to take more than two non-CSEE classes, or any classes that are not listed in the relevant Table, should submit a formal request to their advisor and DGS, including the CSEE Graduate Advisement form that is provided by the GSC. In some cases, the advisor/DGS may request to review the student's plan for the entire 30-credit M.S. before approving individual exceptions to the class lists. Listed courses may not be taught every semester/year; *it is the student's responsibility, with help and approval of the advisor, to develop a plan of study that considers class scheduling.*

A maximum of 6 credit hours of previous graduate level coursework can be transferred towards the MS (also see Section 3.2). All transfer credits are subject to approval by the student's advisor, the DGS, and the Graduate School.

In addition to the listed elective courses, students may include up to six credits of Individual Problems (IP: CIE 501, 502) and/or Internship as part of the 30 MS credits. Prior to registration for IP, the student must complete an Informal Course Form (available from the GAC) that summarizes the scope, objectives, deliverables, and meeting schedule for the class. Signature of the faculty instructor and approval of the DGS are required before the student is registered for the IP. Although any number of credits can be assigned to IP (up to a total of 6 for the MS), the most common arrangement is a 3-credit IP that that requires a time commitment similar to a standard graduate course.

With the noted exceptions, all courses counted toward the MS degree, including Individual Problems must be evaluated with a letter grade. Exceptions include project, thesis, and internship credits, which are graded with an S (satisfactory) or U (unsatisfactory). Students must maintain at least 3.0 GPA throughout their degree program.

Descriptions of all required and elective courses listed in these tables can be found on the department website or (if a non-CSEE class) on the website of the corresponding Department. The current and most recent class schedules can be found online via the student's HUB account or through the website for the UB registrar.



**Table 2.1. M.S. Civil Engineering with a concentration in Bridge Engineering. Prior approval by CSEE advisor is required for any elective course that is not listed in the Table.**

<b>REQUIRED COURSES</b>	CIE 579 Bridge and Highway Infrastructure Management and Public Policy <i>or</i> CIE 580 Emerging Technologies in Bridge Engineering
	CIE 584 Bridge Engineering 1: Design of Steel Highway Bridges <i>or</i> CIE 585 Bridge Engineering 2: Design of Prestressed Concrete Highway Bridges
<b>ELECTIVE COURSES</b>	<p>CIE 500 Special Topics – Industrial Ecology  CIE 500 Machine Learning in Structural and Earthquake Engineering  CIE 511 Advanced Mechanics of Solids  CIE 512 Structural Reliability and Safety  CIE 514 Introduction to Advanced Mechanics and Mathematics  CIE 515 Advanced Structural Analysis  CIE 516 Advanced Mathematics for Civil Engineers  CIE 519 Structural Dynamics and Earthquake Engineering I  CIE 521 Plastic Analysis and Design  CIE 522 Design of Structures for Fire  CIE 524 Steel Structures  CIE 525 Concrete Structures  CIE 526 Finite Element Structural Analysis  CIE 530 Mech Behavior of Materials  CIE 533 Advanced Foundation Design  CIE 534 Earthquake Engineering and Foundation Dynamics  CIE 540 Geomechanics: Applications to Tunneling &amp; Reservoir Engineering  CIE 561 Wind Engineering and Turbulent Flow  CIE 572 Advanced Concrete Materials  CIE 617 Advanced Finite Element Analysis  CIE 619 Structural Dynamics and Earthquake Engineering II  CIE 625 Aseismic Base Isolation  EAS 521 Principles of Engineering Management</p>

**Table 2.2. M.S. and Ph.D. in Civil Engineering with a concentration in Computational Engineering Mechanics. Prior approval by CSEE advisor is required for: (i) any elective course that is not listed in the Table, and (2) a total (over all semesters of study) of more than three elective classes from outside CSEE (including MAE and MTH prefixes).**

<b>REQUIRED COURSES</b>	CIE 511 Advanced Mechanics of Solids <i>or</i> CIE 546 Environmental Fluid Mechanics
	CIE 516 Advanced Mathematics for Civil Engineers
<b>ELECTIVE COURSES</b>	CIE 512 Structural Reliability and Safety CIE 515 Advanced Structural Analysis CIE 520 Random Vibrations and Stochastic Structural Dynamics CIE 526 Finite Element Structural Analysis CIE 528 Composite Structures CIE 530 Mechanical Behavior of Materials CIE 617 Advanced Finite Elements CIE 618 Blast Engineering CIE 623 Plastic Behavior of Materials MAE 550 Optimization in Engineering Design MAE 555 Continuum Mechanics MAE 562 Analytical Dynamics MAE 567 Vibration and Shock 1 MAE 568 Vibration and Shock 2 MAE 609 High Performance Computing 1 MAE 610 High Performance Computing 2 MTH 537 Intro to Numerical Analysis 1 MTH 538 Intro to Numerical Analysis 2

**Table 2.3. M.S. and Ph.D. in Environmental and Water Resources and PhD in Civil Engineering with a concentration in Environmental and Water Resources Engineering. Prior approval by CSEE advisor is required for: (i) any elective course that is not listed in the Table, and (ii) a total (over all semesters of study) of more than three elective classes from outside CSEE (any course without CIE prefix).**

<b>REQUIRED COURSES</b>	CIE 532 Statistical Methods in Environmental and Water Resources Engineering
	CIE 546 Environmental Fluid Mechanics or CIE 562 Environmental Fate and Transport of Pollutants or CIE 556 Physical and Chemical Processes for Water Reuse
<b>ELECTIVE COURSES</b>	CIE 500 Ethics of Engineering Sustainability CIE 500 Industrial Ecology CIE 541 Groundwater Engineering CIE 543 Water Quality Modeling CIE 550 Hydrologic Engineering CIE 556 Physical and Chemical Processes for Water Reuse CIE 563 Air Pollution CIE 564 Chemical Principles in Environmental Engineering CIE 565 Biological Principles in Environmental Engineering CIE 569 Brownfield Restoration CSE 503 Computer Science for Nonmajors EAS 521 Principles of Engineering Management EE 571 Sustainable Energy GEO 506 GIS GEO 515 Conservation Biogeography GEO 548 Stream Restoration GEO 553 Remote Sensing GEO 549 Fluvial Geomorphology GEO 559 GIS for Environmental Modeling GEO 561 Ecohydrology GEO 575 Landscape Modeling with GIS GEO 570 Integrated Environmental Management GLY 514 Hydrogeology GLY 530 Groundwater Modeling GLY 560 GIS for Earth Scientists GLY 562 Aqueous Geochemistry GLY 565 Environmental Remote Sensing IE 507 Design and Analysis of Experiments MAE 519 Turbulent Flow MAE 550 Optimization in Engineering Design MTH 537 Intro to Numerical Analysis MTH 538 Intro to Numerical Analysis 2 SPM 534 Global Health SPM 549 Environmental Health SPM 551 Epidemiology Applied to Environmental Health PD 505 Urban Planning and Environmental Change PD 578 Environmental Planning GEO 642 Law, Land, and the Environment PMY 626 Toxicology Principles and Practice

**Table 2.4. M.S. and Ph. D. Civil Engineering with a concentration in Geomechanics, Geoenvironmental, and Geotechnical Engineering. Prior approval by CSEE advisor is required for: (i) any elective course that is not listed in the Table, and (2) a total (over all semesters of study) of more than three (ii) elective classes from outside CSEE (GEO prefix).**

**Requirements for MS students**

<b>REQUIRED COURSES</b>	CIE 514 Introduction to Advanced Mechanics and Mathematics
	CIE 530 Mechanical Behavior of Materials <i>or</i> CIE 533 Advanced Foundation Design
<b>ELECTIVE COURSES</b>	CIE 512 Structural Reliability and Safety CIE 519 Structural Dynamics and Earthquake Engineering I CIE 526 Finite Element Structural Analysis CIE 529 Pavement Materials and Design CIE 531 Design and Construction of Earth Structures CIE 534 Earthquake Engineering and Foundation Dynamics CIE 535 Introduction to Geoenvironmental Engineering CIE 540 Geomechanics: Tunneling & Reservoir Engineering CIE 541 Groundwater Engineering CIE 623 Plastic Behavior of Materials CIE 630 Geotechnical Instit and Lab Testing GEO 506 GIS GEO 519 Transportation GEO 520 Transportation and Spatial Information

**Requirements for PhD students**

<b>REQUIRED COURSES</b>	CIE 511 Advanced Mechanics of Solids <i>or</i> CIE 530 Mechanical Behavior of Materials
	CIE 516 Advanced Mathematics for Civil Engineers
	CIE 512 Structural Reliability and Safety CIE 519 Structural Dynamics and Earthquake Engineering I CIE 526 Finite Element Structural Analysis CIE 529 Pavement Materials and Design CIE 531 Design and Construction of Earth Structures CIE 533 Advanced Foundation Design CIE 534 Earthquake Engineering and Foundation Dynamics CIE 535 Introduction to Geoenvironmental Engineering CIE 540 Geomechanics: Tunneling & Reservoir Engineering CIE 541 Groundwater Engineering CIE 623 Plastic Behavior of Materials CIE 630 Geotechnical Instit and Lab Testing GEO 506 GIS GEO 519 Transportation GEO 520 Transportation and Spatial Information

**Table 2.5. M.S. and Ph. D. in Civil Engineering with a concentration in Structural and Earthquake Engineering. Prior approval by CSEE advisor is required for any elective course that is not listed in the Table.**

**For MS students admitted Fall 2019 and after**

<b>REQUIRED COURSES</b>	CIE 514 Introduction to Advanced Mechanics and Mathematics
	CIE 515 Advanced Structural Analysis <i>or</i>
	CIE 519 Structural Dynamics and Earthquake Engineering I
<b>ELECTIVE COURSES</b>	<b>Please see elective course list below.</b>

**For MS students admitted prior to Fall 2019 and all PhD students**

<b>REQUIRED COURSES</b>	CIE 511 Advanced Mechanics of Solids <i>or</i>
	CIE 530 Mechanical Behavior of Materials
	CIE 516 Advanced Mathematics for Civil Engineers
<b>ELECTIVE COURSES</b>	CIE 512 Structural Reliability and Safety
	CIE 515 Advanced Structural Analysis
	CIE 518 Masonry Design
	CIE 519 Structural Dynamics and Earthquake Engineering I
	CIE 520 Random Vibration and Stochastic Structural Analysis
	CIE 521 Plastic Analysis
	CIE 522 Design of Structures for Fire
	CIE 524 Steel Structures
	CIE 525 Concrete Structures
	CIE 526 Finite Element Structural Analysis
	CIE 530 Mechanical Behavior of Materials
	CIE 533 Advanced Foundation Design
	CIE 534 Earthquake Engineering and Foundation Dynamics
	CIE 540 Geomechanics: Tunneling & Reservoir Engineering
	CIE 561 Wind Engineering and Turbulent Flow
	CIE 572 Advanced Concrete Materials
	CIE 580 Emerging Technologies in Bridge Engineering
	CIE 584 Bridge Engineering 1: Design of Steel Highway Bridges
	CIE 585 Bridge Engineering 2: Prestressed Concrete Design for Highway Bridges
	CIE 616 Experimental Mechanics in Structural Engineering
	CIE 617 Advanced Finite Elements
	CIE 618 Blast Engineering
	CIE 619 Structural Dynamics and Earthquake Engineering II
	CIE 623 Plastic Behavior of Materials
	CIE 625 Aseismic Base Isolation
	CIE 626 Structural Control
	EAS 521 Principles of Engineering Management

**Table 2.6. M.S. and Ph.D. in Civil Engineering with a concentration in Transportation Systems Engineering. Prior approval by CSEE advisor is required for: (i) any elective course that is not listed in the Table, and (2) a total (over all semesters of study) of more than three elective classes from outside CSEE (non-CIE prefix).**

<b>REQUIRED COURSES</b>	CIE 536 Traffic Operations and Design <b>or</b> CIE 539 Travel Demand Forecasting <b>or</b> CIE 576 Geometric Design of Highways
	CIE 573 Transportation Analytics <b>or</b> CIE 574 Traffic Safety <b>or</b> CIE 633 Statistical and Econometric Methods
<b>ELECTIVE COURSES</b>	CIE 507 GIS Applications in Civil Engineering CIE 508 Probabilistic Analysis and Design CIE 529 Pavement Materials and Design CIE 537 Traffic Flow Theory CIE 555 Discrete Choice Analysis CIE 631 Transportation Network Analysis CIE 632 Transportation Systems Management and Control CSE 515 Introduction to Parallel Computing CSE 555 Introduction to Pattern Recognition CSE 574 Introduction to Machine Learning ECO 521 Urban Economics ECO 580 Econometrics 1 GEO 506 GIS GEO 519 Transportation GEO 520 Transportation and Spatial Information GEO 605 Spatial Statistics IE 511 Social Network Behavior Models IE 512 Decision Analysis IE 551 Simulation and Stochastic Models IE 572 Linear Programming IE 573 Discrete Optimization IE 575 Stochastic Methods IE 576 Applied Stochastic Processes IE 662 Queuing Theory IE 675 Game Theory IE 677 Network Optimization IE 678 Urban Operations Research MGO 636 Supply Chain Design, Modeling and Optimization MGO 638 Logistics and Distribution Management PD 562 Transportation, Land Use & Urban Form PD 571 3D Visualization & Urban Simulation STA 545 Statistical Data Mining I STA 546 Statistical Data Mining II

## 2.2.2 Culminating Experience Requirements

Each M.S. program of study includes a culminating experience that can be in the form of a comprehensive examination, a 3-credit project, or a 6-credit thesis (Table 2.7). The all-course option, which requires 30 credit hours of coursework and a comprehensive exam, is the default option for all entering M.S. students. A student may, however, with the approval of his/her advisor, choose a project or thesis as the culminating experience. In these cases, it is the responsibility of the student to identify a project or thesis supervisor and to work out a suitable project or thesis topic. The coursework, culminating experience, and projected time for each M.S. option are summarized in Table 2.7. Requirements for the comprehensive examination, thesis and project are outlined below.

**Table 2.7. Master's Degree Culminating Experience Options**

Option	Minimum Credits of Approved Coursework	Culminating Experience	Estimated Time to Completion*
All-course	30	Comprehensive examination	9 – 16 months
Project	27	3 credit project and presentation	12 – 16 months
Thesis	24	6 credit M.S. thesis and defense	18 – 24 months

\* Times are approximate, based on previous experience.

**Comprehensive Examination (CE).** The CE option is most common for students who wish to develop an advanced understanding of material in their subdiscipline but are not interested in completing an engineering project or thesis; this option is normally the shortest path to the M.S. degree. The CE is delivered in a take-home format, typically involving a critical review of a journal paper in the student's area of concentration. This exercise is an opportunity to bring together material and information gained through graduate coursework. Students register for the CE with the GAC. Near the end of their final semester, students are given a short list of papers selected by faculty members in each of the CSEE concentration areas. Students are required to read the paper and develop a critical review by an assigned deadline, following length and format guidelines provided by the DGS. The reviews are graded pass/fail by the faculty member who selected the paper, based on criteria that include technical merit and quality of the written presentation. If a student does not pass this exercise, the faculty member will provide feedback on what needs to be done to improve to a passing mark, typically within one week from the date of submission. The student will then be assigned an additional period (typically one week) to submit a revised report. If the resubmission is not assigned a passing grade, the exercise will be repeated the following semester. If a passing grade is not achieved after two attempts, the student may be dismissed without degree.

**M.S. Project.** The M.S. Project provides an opportunity for students to work on an applied problem in their field of study without an extensive research component. The 3-credit

project, typically completed during the final semester, emphasizes a written project report that demonstrates the student's technical and communication skills. An oral presentation also may be included, at the discretion of the faculty advisor. The M.S. project report is submitted to the student's advisor, who has sole responsibility for its review, revision, and acceptance. A second reader of the M.S. project report may also be assigned, at the discretion of the advisor. Details regarding faculty readers and oral presentation should be worked out at the beginning of the semester the project is completed. The M.S. Project is graded Satisfactory/Unsatisfactory (S/U) and is not included in the student's GPA calculation. Registration for Engineering Project credits is accomplished by students submitting a Graduate Advisement form to the GAC. The form requires a signature from the CSEE faculty member that has agreed to advise the project.

**M.S. Thesis.** The M.S. thesis provides a substantial (6-credit) research experience for students wishing to engage in original data collection and/or analysis. Registration for thesis credits is accomplished by students submitting a Graduate Advisement form to the GAC. The form requires a signature from the CSEE faculty member that has agreed to advise the thesis.

The formal thesis defense also provides an evaluation of student skills in written and oral communication. Most thesis-based programs require four semesters for completion. The M.S. thesis must be successfully defended before an open audience and the student's M.S. thesis committee, which consists of the student's advisor and at least one other CSEE faculty member. Once the thesis is ready for defense, a departmental announcement must be circulated one week prior to the defense. The defense consists of an oral presentation and open to the public, including questions, followed by a closed session with more in-depth questions by the student's faculty thesis committee. After the defense, the committee will determine whether the student has successfully defended the thesis or if additional work is required. After successfully completing a thesis defense, the candidate must: (1) submit to the Graduate School an electronic copy of the thesis and a completed copyright and billing form, and (2) submit to the CSEE GAC an "M-form" that documents the completion of all degree requirements. The M.S. Thesis is graded Satisfactory/Unsatisfactory (S/U) and is not included the student's GPA calculation.

Final thesis formatting should be determined in consultation with the student's advisor and committee. The Graduate School will accept any self-consistent thesis format that follows the conventions of a recognized discipline, subject to the *Required Format for Electronic Thesis & Dissertation* available from the Graduate School website (<http://grad.buffalo.edu/succeed/graduate/electronic-submission.html>).

### **2.2.3. Faculty Advisors for M.S. Project and Thesis**

M.S. students opting for a project or thesis as the culminating experience must select a research advisor who has agreed to supervise the project/thesis research work. Typically, this arrangement is finalized no later than the end of the second semester of full-time study. The research advisor must be a member of the [UB Graduate Faculty](#), as determined by the Graduate School (all CSEE Assistant, Associate, and Full Professors are members of the Graduate Faculty). Once a research advisor is agreed upon, the student is required to consult with him/her to select courses and conduct research for



each remaining semester. The student must also consult with the advisor to form the thesis committee, which is chaired by the student's advisor, and must include at least one other CSEE faculty member. A formal committee is not needed for M.S. projects, although the student and advisor may elect to designate additional faculty member(s) to review and comment on the project report. Students pursuing the all-course option do not require a research advisor; logistics for the Comprehensive Exam are coordinated through the Director of Graduate Studies and faculty from the program concentration.

#### 2.2.4 M.S. Graduation and Degree Conferral

Prior to each degree conferral deadline, students will receive instructions for initiating the conferral process. Per the instructions and deadlines provided (typically 3 months in advance of degree conferral), MS students should submit a memo by email to the GAC, copied to the advisor, with the following information:

1. Expected conferral date (February 1, June 1, or August 31)
2. Person number
3. Degree program (Civil or EWRE) and Concentration (Civil only)
4. List of all courses to be applied to the degree (30 credits total)
5. Culminating experience (comprehensive exam, project, or thesis)
6. Faculty advisor
7. Additional thesis committee member(s), if applicable

Advisors should review the information and respond to the GAC with their approval of the student's plan. The student should then apply to graduate through their HUB Student Center. Any subsequent changes to the above information must to be communicated via email to the GAC and the faculty advisor at the earliest possible moment; changes submitted after the deadline could result in a delay in degree conferral. Prior to CSEE approval for graduation, each student must also submit a *Departing Student Form* that documents cleanup of any lab and office space (including desk) used by the student.

In addition to the above requirements, each student and/or faculty advisor must document completion of the culminating experience as follows:

- Successful completion of the **comprehensive exam** is documented by the supervising faculty member by email to the GAC and DGS no later than three weeks prior to degree conferral.
- Successful completion of the **engineering project** is documented by the faculty advisor by email to the GAC and DGS no later than three weeks prior to degree conferral.
- Successful completion of the **thesis** is documented by submission of the M-form, which indicates a successful defense and approval of the final thesis document by the faculty advisor and (applicable) committee. Concurrent completion of the M-form, an electronic copy of the M.S. thesis must be uploaded by the student to the UB Graduate School website; students should review the current Graduate School thesis requirements, including issues related to copyright and inclusion of proprietary information.

## **2.3 Doctor of Philosophy Program**

The Doctor of Philosophy (Ph.D.) program emphasizes original research in a specialized area and includes a dissertation that expresses a high level of independent scholarship. The procedures for satisfying the requirements of the Ph.D. degree in CSEE are based on successful completion of the following:

- An approved program of graduate coursework;
- All the components of the Ph.D. qualifying examination, as described below; and
- Defense and approval of the Ph.D. dissertation.

Each student's doctoral program is guided by a faculty member who serves as the student's academic advisor and works with the student in developing the dissertation research. This relationship could begin from the time the student starts the Ph.D. program, but a potential research advisor must be identified before the student takes the written Qualifying Exam (see below). As noted above, the preliminary advisor assigned at Admission to a CSEE degree is not necessarily the same as the advisor who supervises research.

### **2.3.1 Ph.D. Program Coursework**

Course work for the Ph.D. degree should reflect a well-defined area of study and must be approved by the student's advisor and research advisory committee (see following section), as documented in the student's Application to Candidacy (ATC). The full program of coursework should be formulated by the student and his/her advisor in the first or second semester beyond completion of the master's degree, or equivalent. The required and elective courses for each program concentration are similar to the corresponding M.S. programs as listed in Tables 2.1 through 2.6. However, in some cases, the student's advisor may require specific courses that support the planned research.

As a research-oriented degree, the number of course credits is very flexible and may differ substantially according to the student's background, research topic, and career goals. In determining the balance of coursework and research credits, the following constraints apply:

- The Ph.D. program consists of a minimum of 72 credit hours beyond the bachelor's degree.
- A maximum of 36 credit hours of previous graduate level coursework can be transferred towards the Ph.D. (also see Section 3.2). All transfer credits are subject to approval by the student's advisor, the DGS, and the Graduate School.
- Ph.D. programs must include a minimum of 12 to a maximum of 30 credit hours of dissertation research.
- Ph.D. students will not receive credit for repeating courses taken earlier for the M.S. degree at UB or at other institutions.
- Depending on the number of available coursework credits, students may enroll in up to six credits of Individual Problems, which typically consists of an independent study or research project not included in the scope of the dissertation (see Section 3 for requirements).

- Regardless of the number of transfer and dissertation credits, students must take at least two regular classes (not Individual Problems) taught by a CSEE faculty member.

Three examples are provided to illustrate the variety of pathways toward satisfying the Ph.D. coursework requirements:

- A student begins the Ph.D. directly after completing a B.S. degree and wishes to take the maximum number of classes. The resulting program consists of 60 credits of coursework (typically 20 classes) and 12 credits of dissertation.
- A student begins the Ph.D. program after completing a 36-credit M.S. degree and wishes to take the maximum number of research credits. The resulting program consists of 36 transfer credits (assuming all are approved), 30 dissertation credits (the maximum permitted), and 6 credits of coursework (typically 2 classes; must be taught by CSEE faculty and cannot be Individual Problems).
- A student begins the Ph.D. program after completing a 30-credit M.S. and chooses to take classes during the first year of doctoral study (e.g., 3 classes/semester). The resulting program consists of 30 transfer credits (assuming all are approved), 18 credits of coursework, and 24 dissertation credits.

The above examples are provided only to illustrate program flexibility. In all cases, the final configuration of transfer, coursework, and dissertation credits must be approved by the student's advisor and the CSEE DGS. Students should consult their advisor prior to registering for classes.

### **2.3.2 Ph.D. Advisory Committee**

Students pursuing a Ph.D. are guided primarily by their advisor and research advisory committee, who evaluate and approve the student's program of coursework and supervise the Ph.D. research and dissertation. Typically, the Ph.D. advisory committee is formed, in consultation with the advisor, after the student completes the written Qualifying Exam. This committee must include the dissertation advisor, who is a CSEE faculty member, and at least two additional UB faculty members, one with a primary appointment in CSEE. Each of the three core committee members must also be a full (not Associate) member of the UB Graduate Faculty (<http://grad.buffalo.edu/succeed/current-students/grad-faculty.html>). If a student has two primary dissertation advisors (co-advisors), the committee must include a total of four core committee members.

Additional faculty participation on the dissertation committee is encouraged; many CSEE Ph.D. committees include 5 or 6 members. The additional committee members should have expertise in the research topic and can include CSEE faculty members, UB faculty members from other Departments, faculty members from other Universities, and/or representatives from industry.

### **2.3.3 Ph.D. Qualifying Examination**

One component to formal candidacy for the Ph.D. degree requires successful completion of the CSEE Ph.D. written Qualifying Examination (QE). This examination consists of up to three parts, as described below. Different program concentrations utilize different

formats for the exam; prior to requesting to take the QE, students should consult with their advisor about specific procedures and requirements. All students also must have a GPA of at least 3.0 in order to be eligible to take the exam.

All students wishing to take the QE must first identify a faculty member who agrees to serve as the student's research advisor. For some program concentrations, the advisor will help form an examination committee that is specific to the student. In other cases, all students from a program concentration will take a common exam. At the time of this writing, the QEs for three program concentrations follow a common format (Computational Engineering Mechanics, Structural and Earthquake Engineering, Geotechnical and Geomechanics). The QEs for Environmental and Water Resources Engineering and Transportation and Systems Engineering follow modified formats.

Although the QE content and format differ across program concentrations, each version of the exam is organized as summarized below.

**Part I.** The first component of the QE consists of written problems designed to test underlying scientific, mathematical, and engineering concepts that define the foundation of the program concentration, including but not limited to material taught in the applicable core courses. For most program concentrations, the exam is typically delivered in closed-book fixed-time format; at the time of this writing, the exception is the Transportation Systems Engineering program, which utilizes a take-home format.

The Part I exam is administered twice yearly, usually on the first or second Saturday in January and June. Several months prior to the next offering, eligible PhD students will be invited via email to register to take the exam by emailing the CSEE GAC. Students should have completed the majority of their graduate coursework with a cumulative GPA of at least 3.0 and received approval from their research advisor. In some cases, subject to DGS approval, a student may designate a temporary advisor for the purpose of taking the written QE. Students who are approved by the DGS to take the exam will receive instructions that summarize the scope, format, and grading procedure.

After taking the QE, students will be notified of their scores and/or pass/fail status within a specified period, typically two weeks. In some cases, depending on program-specific guidelines, a student with a borderline score may be asked to participate in an oral follow-up session that will be considered in determining the overall grade of pass/fail; details regarding the scope and format of the oral follow-up will be provided to the student in advance. Students who do not receive a passing grade on the first attempt at the QE may, at the discretion of the faculty advisor and DGS, be invited to retake the exam at the next offering. Students who fail the exam twice are subject to dismissal from the PhD program.

**Part II.** After passing the initial written QE, the student's research advisor may conduct an additional examination to evaluate mastery of content and skills needed to perform the dissertation research. The format of the Part 2 exam is flexible, including but not limited to written questions in a closed-book or take-home format, and/or open-ended oral questioning. While the format of the Part 2 exam is flexible, the exam will typically take place within several weeks of the written exam. Pass/fail grading will be determined by

the Ph.D. advisory committee (Section 2.3.2). Students who do not earn a passing grade in the Part 2 exam may be dismissed from the PhD program or, at the discretion of the committee, be invited to take the exam a second and final time.

#### **2.3.4 Application to Candidacy**

A student who passes the written QE (Part 1 and, if applicable, Part 2) is considered a “candidate” for the Ph.D. degree and should submit the Application to Candidacy paperwork. Students who have successfully completed the QE and filed the ATC form are eligible for certification of full-time status, which allows the student to register for less than the normal full-time load (12 credit hours, 9 credit hours with Research/Teaching Assistantship).

In conjunction with the ATC, all Ph.D. students are required to document successful completion of “Responsible Conduct of Research” (RCR) training. This training requirement may be fulfilled by completing the Collaborative Institutional Training Initiative (CITI) Online Program in Responsible Conduct of Research with a score of 80% or higher. Current details regarding this requirement, as well as alternative ways of satisfying it, are summarized in the online Graduate School Policies and Procedures.

PhD students will utilize the Application to Candidacy (ATC) form, available at <http://www.grad.buffalo.edu/succeed/graduate/application-to-candidacy.html>, to submit their plan for graduation. This form serves as a useful planning document for the student and the student’s dissertation committee, and indicates to the Graduate School the student’s intended degree conferral date.

Once admitted to candidacy, a student may not need to enroll for 12 credits (9 credits for graduate, teaching and research assistants) to be certified as a full-time student. As such, it is important for the student to prepare and submit their ATC as soon as possible. The timing for submission of the ATC is generally immediately following the successful completion of the qualifying examination for Ph.D. students. The ATC must be submitted at least three months prior to the expected degree conferral date. Specific dates will be distributed by the GAC. An approved ATC must be filed with a Certification of Full-Time Status Form to maintain full-time student status.

Amendments to an ATC may be made with the approval of the advisor and DGS using an Amend ATC form available from the Graduate School. Amendments may include a change of expected conferral date, adding a committee member, a change in course credits planned, etc.

#### **2.3.5 Dissertation Proposal**

After passing the qualifying exam, the student should work with the advisor to develop a dissertation advisory committee. In collaboration with the advisor and committee, the student should develop her/his research topic and prepare a dissertation proposal. The dissertation proposal must then be formally defended, typically within 6-12 months after completing the written QE. The scope and format of the dissertation proposal are flexible and determined by the advisor and committee. A typical process would include preparation of a written document by the student, an oral presentation of the planned

dissertation research, and an open-ended question/answer session. The student's advisor will notify the DGS by memo or email when a student has successfully completed the dissertation proposal and defense.

### **2.3.6 Dissertation and Defense**

Upon satisfactory completion of the qualifying examination and acceptance of a Ph.D. dissertation proposal, the student should have a clear idea of the direction and expected end point for completing the dissertation research. The research is documented in a written dissertation that represents a relevant, original, and substantial contribution to the state of knowledge in the candidate's area of concentration. Following completion of the draft document, the dissertation must be defended, which includes a public presentation by the candidate, an open session for questioning by the audience and committee members, and a closed session for additional questions by the committee members. Students are required to provide their completed dissertation to their Ph.D. committee at least two weeks before their scheduled defense. Passage of the defense indicates the Ph.D. committee is satisfied with the dissertation document and the student's understanding of the material related to and contained in the dissertation.

General announcements for Ph.D. dissertation defenses must be posted in Ketter/Jarvis Hall(s) at least one week prior to the defense, and should also be distributed electronically to all CSEE faculty and graduate students (the GAC will assist with this). All CSEE faculty members, graduate students, and interested guests are invited to attend the public portion of the defense.

After successfully completing the dissertation defense, the candidate must submit to the Graduate School a digital copy of the dissertation, a copyright and billing form, the Ph.D. exit survey, and a "Departing Student" form. The Graduate School will accept any self-consistent dissertation format that follows the conventions of a recognized academic discipline, with some general formatting standards as outlined in the "Electronic Thesis and Dissertation (ETD) Guidelines" available from the Graduate School website. After the final dissertation has been uploaded to the Graduate School, a completed and signed (by advisor and committee) M-Form must be submitted to the CSEE-GAC.

### **2.3.7 Mid-program PhD evaluations**

In addition to the academic components of the Ph.D. requirements, which include the ATC (Section 2.3.4) and M forms (Section 2.3.6), CSEE doctoral students are required to complete the following additional procedures and documentation:

- TA evaluation forms (for teaching assistants) must be filled out every semester that a student serves as a TA. Normally, the process is initiated by the course instructor, but it is the student's responsibility to ensure that the form is submitted to the CSEE-GAC.
- Beginning in Fall 2018, all Ph.D. students are required to submit an annual progress report, which requires faculty input. Normally, the process is initiated by the faculty advisor, but it is the student's responsibility to ensure that the form is submitted to the CSEE-GAC. The PhD Annual Review is due in May. Submission of the progress report is not required if the student graduates during the same year. The form will be emailed to students and faculty during the Spring semester.

### 2.3.8 Ph.D. Degree conferral

Prior to each degree conferral deadline, students will receive instructions for initiating the graduation process. Per the instructions and deadlines provided, Ph.D. students should submit a memo by email to the GAC, copied to the advisor, with the expected conferral date (February 1, June 1, or August 31). Other relevant information is contained in the previously approved Application to Candidacy (Section 2.3.4), including documentation the student has completed the *Responsible Conduct of Research* training.

The following steps are required for final degree conferral:

- Submission of the M-form that indicates successful completion of the dissertation defense and faculty approval of the final dissertation document.
- Submission of the final dissertation in electronic format by upload to the Graduate School website; students should review the current Graduate School dissertation requirements, including issues related to copyright and inclusion of proprietary information.
- Completion of the SEAS *Exit Survey*. Data collected in this survey are used to evaluate program strengths and areas needing improvement, employment benchmarking, and student evaluation of their graduate experiences at UB.
- Completion the CSEE *Departing Student form*, which documents that the student has cleaned up her/his lab and office space.
- Completion of any additional student surveys required by the UB Graduate School (currently, two *doctoral degree recipient* surveys).

## 3.0 Additional Graduate Policies and Procedures (all students)

In addition to the academic requirements outlined in previous sections, CSEE graduate students are required to follow additional policies and procedures established by CSEE, SEAS, and the Graduate School. In addition to reviewing the requirements in this Section of the CSEE Manual, students are encouraged to review the relevant portions of the SEAS and Graduate School websites. In general, policies established at the Department level (CSEE in this case) can be more restrictive than the more general policies of the Graduate School. Students should consult the GAC with questions regarding applicability or interpretation of these CSEE policies.

### 3.1 Continuous Registration, Full-time Status, and Residency

- a) All CSEE graduate students must maintain continuous registration for a minimum of one credit hour in Fall and Spring semesters until degree conferral. If such registration should be impossible, a student may request a formal leave of absence, which must be approved by the CSEE-DGS and the Graduate School.
- b) Under certain circumstances, including immigration requirements (for international students) and financial aid or scholarship regulations, students need to maintain **full-time** status. Full-time status is defined as registration for a minimum of 12 credit hours during each fall and spring semester, or a minimum of 9 credit hours if the student holds a graduate, teaching, or research assistantship. These definitions are used by agencies/organizations such as lending institutions, health insurance carriers, and the U.S. Citizenship and Immigration Service. Per

immigration regulations, international students must maintain full time status during their entire period of graduate study at UB, subject to two exceptions noted below.

1. For students in their first semester of study it is possible to petition the International Student Services office for a reduced course load (typically 9 credits instead of 12). This reduction allows students to better address cultural, language, or other transition issues, and is available one time.
  2. Students who have completed or will complete all of their credits in the current semester may request designation of “full-time status” by completing a Full-Time Status Form when registering for fewer than 12 credits (or fewer than 9 credits with assistantship). This scenario is primarily applicable to students working on a thesis or dissertation. Typically, full-time status will be granted for one semester only. For example, students in an all-course M.S. program with 6 credits remaining to fulfill degree requirements cannot distribute those credits into two semesters.
  3. The Certification of Full-Time Status form requires the signature of the student’s advisor and the department DGS. For Ph.D. students an Application to Candidacy (Section 3.3.4) must be submitted before full-time status will be approved.
- c) Ph.D. degree programs require a minimum residency requirement of the equivalent of two complete academic years of full-time study at UB. This includes two semesters of continuous full-time study not already applied to the master’s degree.

### **3.2 Transfer of Credits Taken at Other Universities**

- a) A maximum of 6 transfer credits of graduate course work may be applied toward the 30-credit requirement for a Master’s degree.
- b) A maximum of 36 transfer credits of graduate course work may be applied toward the 72-credit requirement for the Ph.D. degree.
- c) Only courses applicable to the relevant engineering degree are acceptable as transfer credit. Students should fill out the appropriate petition for acceptance of graduate credits taken outside of UB (available from the Graduate School website). After obtaining the signature of the faculty advisor, the student should submit the form to the GAC for subsequent review and approval by the CSEE-DGS and the Graduate School.
- d) Only those graduate courses completed with grades of “B” or better are eligible for consideration as transfer credit. However, the grade of the transferred course will not be counted towards the student’s UB grade point average.

### **3.3 Minimum Grades in Required Courses**

Students must earn a grade of “B” or better in any course designated as “required” in the program concentration. For requirements that can be satisfied by choosing from multiple courses, the student must earn the minimum grade in only one of the alternatives for that requirement. Students who fail to obtain a grade of “B” in a required course have the following options:



- a) The student may retake the course in a subsequent semester; this is the most common resolution.
- b) If multiple courses can be used to satisfy a specific requirement, the student can earn the minimum grade in one of the other designated courses.
- c) In some cases, subject to the discretion of the instructor, the student can demonstrate mastery of the course material through an alternative means. For example, a student might be invited to audit part or all of a subsequent version of the required course, including specified exams and/or assignments, without formally registering for the course. Such arrangements are available only if the instructor agrees and provides specific requirements for documenting content mastery. At the conclusion of the process, the instructor will communicate the results to the DGS, who may then agree to waive the “B or better” requirement.
- d) A student may petition to complete an alternative course (with a grade of “B” or better) to satisfy the requirement. Typically, such petitions are approved only when scheduling or financial constraints prevent a retake of the required class.

### 3.4 Informal Coursework: Internships

Students enrolled in any of the CSEE graduate degree programs are eligible to complete an *Internship* as part of their program of study. CSEE internships normally take place in the summer; an academic year internship would be considered only under the specific “continuation” scenario outlined below. During the internship period, the student would perform work in their area of specialization under the supervision of an external engineering professional. The scope, location, and timing of the internship are flexible, and both paid and unpaid internships are eligible for academic credit.

Prior to commencing an internship, approvals by the student’s advisor and the DGS are required. At the end of the grading period, written documentation by the internship sponsor must be submitted to the CSEE-DGS. Additional requirements are summarized below:

- The student is responsible for securing arrangements with the internship sponsor. The scope and duration of an internship can vary, but the level of effort must be equivalent to a typical academic course that provides a comparable number of credit hours, and the work must primarily involve engineering tasks. Internships can be paid or unpaid. For international students, speak with an International Student Advisor from the International Student Services office to discuss authorization appropriate for your situation.
- Students receive academic credit for summer internships by obtaining Department approval and enrolling for 1-3 credits in the summer session.
  - The most common scenario is a 3-credit internship, which would contribute the equivalent of one course toward meeting the student’s degree requirements. Note that CSEE policy limits the number of “informal” credits that can be counted toward the degree to six credits, including any combination of Individual Problems and Internship; project and thesis credits are not included in the “informal” limit.
  - Students may also enroll in a one-credit summer internship, which reduces the cost of summer tuition and fees. However, depending on other course

selections, the one-credit internship may result in a program of study that exceeds the minimum credit requirements for the degree.

- Internship credits are graded pass/fail (S/U) and thus do not contribute to the student's Grade Point Average.
- Registration for Internship is accomplished by submitting the relevant form to the CSEE Graduate Academic Coordinator GAC. The form includes the following information: Internship sponsor with contact information, brief description (1-2 paragraphs) of the scope of work, salary status (paid/unpaid), start/end dates, and expected level of effort (hours/week). Duration/effort can vary, but for a three credit-hour internship, the duration would typically conform to the standard UB 12-week summer session. The completed internship request form must be submitted to the GAC no later than May 1 of the semester preceding the internship.
- Registration for academic credit is required for international students who engage in a professional internship, regardless of salary status. In addition to Departmental approval, international students must secure approval for *Curricular Practical Training* (CPT) through International Student Services. As part of the CSEE approval process, the DGS or faculty advisor will complete the Academic Advisor's Recommendation form as required by ISS. Please check the ISS deadlines for applying for CPT.
- Domestic students may engage in an internship without registering for academic credit, but prior approval and registration are required if the internship will be applied to satisfy degree requirements.
- At the completion of the internship, the internship sponsor must provide a letter to the DGS indicating that the specified scope of work (submitted at registration time) was completed at a satisfactory level. After review of the sponsor letter, the DGS will submit the appropriate S/U grade.
- The most common internship will involve a single summer experience. However, in some situations the internship sponsor may request that the student continue working during the Fall semester (e.g., to complete an in-process project). After completing the summer internship and receiving Departmental approval, the student would enroll in one internship credit for the Fall semester, which would be graded pass/fail (S/U) and subject to the overall limit of 6 informal credits to be applied to the degree. To avoid generating "extra" credits beyond the minimum degree requirement, the student might consider limiting the summer internship to 2 credits (yield a total of 3 internship credits) or combining the Fall 1-credit internship with a 2-credit Individual Problems (IP). The IP would follow the usual requirements (detailed scope of work, advisor/DGS approval), involve work that is related to but independent of the internship activity, and fall within the 6-credit limit.

### **3.5 Informal Coursework: Individual Problems**

- a) Individual Problem (IP) courses do not have formal catalog descriptions and are taught by a special arrangement with an instructor. IP courses can be taken by M.S. and Ph.D. students, subject to the constraints outlined below and approval of the CSEE-DGS. At the time of course registration, the student must complete a form that includes a short narrative description of the content covered, means of evaluation, and signatures of the student and instructor. All informal courses are graded with a letter grade.

- b) A maximum of 6 credit hours of informal course work (internship or IP) may be applied toward the 30-credit hour requirement for the M.S. degree.
- c) Excluding those credits applied towards the M.S. degree, a maximum of 6 additional credit hours of IP course work may be applied towards the minimum 72 credit hour requirement for the Ph.D. degree.
- d) Regardless of IP credits, all PhD students must complete a minimum of two CIE classes from the list of approved courses for each program concentration (see Tables 2.1 to 2.6).

### **3.6 Undergraduate Courses for Graduate Credit**

Under certain circumstances, a student may take an undergraduate course for graduate credit, subject to the following conditions:

- a) Prior approval must first be obtained by submitting a petition to the Office of the Registrar ([Petition for Course Credit Outside Primary Academic Career](#)), which includes signatures by the student's advisor, the CSEE-DGS, and the course instructor. The petition must also include a clear statement from the instructor of the course regarding additional work that will be required to qualify for graduate credit. Retroactive approval will not be granted. Remedial courses, taken to make up deficiencies in a student's undergraduate background, will not be considered for graduate credit.
- b) Undergraduate courses must be at the 400 level to be considered for graduate credit.
- c) Undergraduate courses that carry 4 or more semester hours of credit will receive a maximum of 3 semester hours of graduate credit. A maximum of two approved undergraduate courses (up to 6 credit hours) may be applied toward the M.S. or Ph.D. degrees.

### **3.7 Inapplicable Credits**

Credits for the following courses are not applicable towards the coursework requirements for M.S. and Ph.D. degree programs:

- a) English Language Courses.
- b) Any course not included in Tables 2.1 to 2.6 or not approved by the student's advisor.
- c) Remedial courses taken to fulfill department admission requirements.

### **3.8 Grading Policy**

- a) Beginning in Fall 2018, Pass/Fail (S/U) grading is applied to Internship, Thesis, Project, and Dissertation credits.
- b) All other grades in courses applicable to the degree must be letter grades: A, A-, B+, B, B-, C+, C, D, F, and FX (never attended), carrying quality points of 4.0, 3.67, 3.33, 3.0, 2.67, 2.33, 2.0, 1.0, 0, and 0, respectively. This requirement includes Individual Problems and Special Topics courses.
- c) For all graduate courses, an interim grade of Incomplete (IU) may be assigned if the student has not completed all requirements for the course. An interim grade of Incomplete (IU) shall not be assigned to a student who did not attend the course. The default Unsatisfactory (U) grade shall become the permanent course grade of

record if the 'IU' is not changed through formal notice by the instructor upon the student's completion of the course within twelve (12) months after the close of the term for which the 'IU' is assigned. A shorter time frame for removal of the IU grade may be specified by the instructor.

### **3.9 Repeating Courses**

The current UB Graduate School policy on repeating courses states "If a graduate student repeats a course that is normally not "repeatable" ("repeatable" courses include dissertation, research, thesis, project; independent study; directed readings, etc.), only the highest grade earned in the course will be counted toward the degree and used to calculate the grade point average associated with the graduate degree program requirements. However, the student's official transcript will record all courses and accompanying grades attempted (including repeated courses). All resulting grades earned are calculated in the GPA reported on the student's final official transcript.

### **3.10 Non-Matriculated Students**

Students who hold a bachelor's degree in engineering or applied sciences are permitted to register for graduate coursework as a non-matriculated (non-degree student), up to a maximum of 12 credit hours. Applications for non-degree status are processed using the UB graduate admissions website (Application Management System) and subject to a similar review process as the degree programs. In some cases, students may petition for an expedited review process that does not include the GRE exam and/or the full set of reference letters. The expedited process, if approved by the CSEE-DGS, does not necessarily apply to subsequent applications to a degree program.

Students admitted to non-degree status may enroll for up to 12 credit hours of CSEE coursework. Once registration reaches twelve hours, further registration is prohibited until the student is admitted into a graduate degree program. Students already enrolled via non-degree status follow the standard application process for admission to a degree program. Classes completed as a non-degree student may count toward satisfying degree requirements if they are a required course or approved elective for the program concentration to which the student is admitted.

### **3.11 Distance Learning**

Each semester, a subset of CSEE courses are offered by distance learning, typically taken by part-time and non-degree students. Full-time students enrolled in a degree program must take the classroom version of the class (if available). Students may also take distance learning courses from other UB Departments, if the course is approved as an elective for the program concentration. In general, classes taken by distance learning may not contribute more than 49% of a student's total credit hours in a degree program. Non-degree students are also subject to the 12-credit limit described above, regardless of the mode of instruction.

### **3.12 GPA requirement for good academic standing**

For all CSEE degree programs, a cumulative grade point average of 3.0 is required for all courses counted toward satisfying degree requirements. Courses graded on an S/U basis are excluded from the GPA calculation, including Thesis, Project, Internship, and

Dissertation credits. In addition, a minimum grade of 'B' in all required courses must be achieved (see Section 3.4). If a student completed additional coursework beyond the minimum degree requirements, the minimum GPA requirement is evaluated only for courses that are applied to the degree.

### **3.13 Academic Probation**

At the end of each semester, an academic review is performed for each student enrolled in a degree program. Students who do not maintain good academic standing will be placed on Academic Probation. In addition to failure to maintain a cumulative GPA of 3.0, a student may be placed on Probation for any of the following conditions:

- a) the student receives a grade of 'U', 'F', or 'D' in any course that could be applied to the degree program. In some cases, a grade of 'U' or "F" also could result in dismissal (see below);
- b) the student indicates a lack of ability as determined by the student's advisor and/or the Director of Graduate Studies.

Students placed on academic probation will be issued a probationary letter by the Department Chair or the DGS, with a copy to the Graduate School and the student's advisor, including any conditions that must be met and the appropriate time frame to regain good academic standing. In most cases, students are expected to regain good standing within one additional semester. In addition, a service indicator will be placed on the student's account by the Graduate School to restrict future registration without departmental consultation.

### **3.14 Academic Dismissal**

A graduate student may be dismissed from the CSEE degree program if any of the following conditions apply:

- a) a grade of "F" is earned in any course that could be applied towards the degree;
- b) more than two courses are assigned a grade of "U" or a latter grade below "B-" (i.e., C+, C, C-, D);
- c) the conditions of provisional admission have not been satisfied within one semester after admission;
- d) probationary status has not been removed after one semester, or within a timeframe determined by the DGS (as noted in a probationary letter);
- e) the cumulative grade point average for courses which could be applied to the degree falls below 2.5 at the end of any grading period;
- f) the student is found guilty of a violation of UB academic integrity policy; or
- g) more than four resigned "R" grades are obtained in courses which could be applied to the degree.

Students who are dismissed from the CSEE department will be issued a letter by the Chair of the Department or the DGS, with a copy to the Graduate School and the student's advisor. A service indicator will be placed on the student's account by the Graduate School to restrict future registration.

A student who has been officially dismissed may submit a formal request for reinstatement, along with a supporting statement of explanation, to the CSEE Department Chair. The request shall be reviewed according to the Policies and Procedures of the UB Graduate School.

### **3.15 Time Limits for Degree**

- a) M.S. degree – Four years from the first registration date in the graduate program, excluding approved leaves of absence. (For part-time students, the time limit is six years from the first registration date in the graduate program, excluding approved leaves of absence).
- b) Ph.D. degree – Seven years from the first registration date in the program, excluding approved leaves of absence.

Requests for extensions of time limits must be petitioned using the [Petition for an Extension of the Time Limit to Complete a Graduate Degree Program](#) with departmental approval through the advisor and DGS. The student must be currently making active progress towards the degree. The petition will be presented to the SEAS divisional committee for approval before being submitted to the Graduate School. The petition must clearly explain reasons for requesting the extension, present a schedule for progress, and set a deadline for completion of the program. If approved, the extension is typically granted for a maximum period of one year.

### **3.16 Leave of Absence**

Requests for a leave of absence must be approved by the DGS using a [Graduate Student Petition for a Leave of Absence Form](#). The form must then be forwarded to the Office of the Registrar by the last day of classes of the semester in which the leave is to begin. Leaves of absence will normally be granted for a maximum of one year, but may be extended for up to one additional year if circumstances warrant. All leave requests must be supported by adequate documentation. Examples of valid justification include documented cases of financial hardship, illness, family situations, or compulsory military service. A student who leaves the program after completion of some graduate work but has not been given an approved leave of absence must reapply and be readmitted as a new student, according to university regulations. If the break is for less than 5 years the student can file a semester record activation request and does not need to reapply to the program. There is a \$350 fee for reactivation. The form needs to be approved by the department and by the Vice Provost for Graduate Education. Further information may be found on the Graduate School website, <https://grad.buffalo.edu/succeed/current-students/policy-library.html#returning-student-fee>. Continued leaves of absence beyond two years will normally not be granted. International students are advised to consult with International Student Services prior to applying for a leave of absence.

### **3.17 Academic Integrity**

The University at Buffalo takes its commitment to principles of academic integrity very seriously. All students are encouraged to carefully review the UB policies regarding academic integrity on a regular basis. Policies can be found at: <https://grad.buffalo.edu/succeed/current-students/policy-library.html#academic->

[integrity](#)). If there are any questions or uncertainty about what constitutes academic dishonesty, the student is encouraged to discuss the matter with her/his advisor.

As engineers, CSEE graduate students have special ethical obligations. From the National Society of Professional Engineers (NSPE) Code of Ethics, “*engineers shall avoid deceptive acts*” and “*shall conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.*”

### 3.18 Computing Labs

The CSEE Department computing labs for graduate students are located in 133A Ketter Hall. Access to these labs is a privilege provided to graduate students in CSEE. Lab facilities are to be used for academic work only; nonacademic or personal use is prohibited and could result in loss of access.

All students are required to follow UB's IT policy for computing and network use, which are maintained at: <https://www.buffalo.edu/ubit/policies/it-policies-a-to-z.html>

In addition to the UB-IT policies, the following rules apply to the CSEE labs:

- a) The CSEE computers are for academic and research use only. Downloading of files for personal use is strictly prohibited.
- b) Access to the 133A Ketter lab requires a registered UB card (CSEE majors are automatically registered). The door to the lab must be closed at all times; propping open the door is prohibited.
- c) Food and/or drinks are not allowed in the labs at any time.
- d) Each user must log in to a single computer using his/her assigned UBIT login and logoff when the session is completed. Accessing an account belonging to a different student (with or without permission) is prohibited.
- e) Users are permitted to access one computer at a time, and must remain with the computer while in use (except for short bathroom break). Unattended processes are subject to termination by the system administrator. Students can request special permission from SENS (email: [senshelp@buffalo.edu](mailto:senshelp@buffalo.edu)) to access multiple computers for research purposes for a limited duration. Normally, such request would be considered only for off-peak hours when classes are not in session.
- f) During times of peak activity (i.e., when other students are waiting), students should limit their session to a reasonable duration and essential academic usage.
- g) Students may not install software or save files to local hard drives. All work should be saved to a portable storage device. Any temporary files left after logging off will be deleted by the system administrator.
- h) Computers are to be left on at all times and should not be physically moved. Shutting down or restarting computers is prohibited. After logging off, any hardware problems should be reported to by sending email to [senshelp@buffalo.edu](mailto:senshelp@buffalo.edu).
- i) Students may not move or otherwise interfere with supporting hardware, including but not limited to teaching station(s), networking cables/switches, and/or or security cameras.

Conformance with the above policies will be monitored through a variety of means, including but not limited to unannounced inspections by CSEE faculty, remotely monitored security cameras, and network monitoring. Violation will result in temporary or permanent loss of lab privileges at the discretion of the CSEE Department Chair, in conjunction with other possible penalties as defined in the UB-IT policy. CSEE and SENS reserves the right, upon reasonable cause for suspicion, to access all aspects of its computing systems and networks, including individual login sessions to determine if a user is violating this policy or state or federal laws. Remote access to the computer lab will be granted during department closures. Students can reserve computer access by completing the [Ketter 133A Graduate Student Computer Lab Reservation form](#).

### **3.19 Publication Policy**

All publications of scholarly work by CSEE graduate students are subject to the following policy.

- a) Any student submitting work for publication conducted while they are or were a student in the department must have that work reviewed by her/his advisor prior to submittal.
- b) Faculty review of papers submitted under this policy should acknowledge faculty review in the Acknowledgment section of the paper (unless the faculty is a co-author).
- c) The department will pursue withdrawal of papers submitted without research/academic advisor review.

This policy is in no way intended to limit student desire for publishing independent work; rather, it is meant to help guide and protect the interests of the student, the faculty, the department, and the university.

### **3.20 Changing Program Area or Degree**

Students are admitted into specific program areas as indicated in their letter of acceptance from the department. It is possible to change areas once in the program, but only with the permission of the faculty and the DGS. Students who wish to change specialty area should submit a formal request to the DGS, who then will poll the relevant faculty involved to determine whether the change is reasonable.

Students in the M.S. program who are interested in continuing on to a Ph.D. must submit a formal application through the Application Management System. The GAC should be notified and will work with the student to determine information from the student's prior application that could be copied to the new application. The GAC also will initiate a petition to waive the application fee (the application fee is usually waived when a student is moving from one degree to another in the same program). The student should insure all information is correct, upload a current UB transcript to the new application, and obtain at least two letters of recommendation from UB faculty. One of the faculty referees should indicate he/she is willing to serve as the student's advisor. These applications will be reviewed along with all new applications. Students in this situation should be aware that



the GRE is required for Ph.D. applications, and would need to be taken if not already done so for the M.S. application.

## **APPENDIX: GRADUATE STUDENT FORMS**

Graduate students form to initiate various processes are available on the Graduate School Website or the GAC in 212 Ketter Hall.

### **CSEE Department Forms** (available from 212 Ketter Hall):

- Graduate Advisement Form
- Individual Problems Form
- Internship Form

### **Graduate School Forms** (available from the Graduate School Website):

- Application to Candidacy (ATC) Form
- Certification of Full-time Status Form
- Amend ATC Form
- Leave of Absence
- Transfer Credits Petition
- M-Form

Forms regarding Curricular Practical Training (CPT) or Reduced Course Load are available through the International Student Services website.