



University of Cincinnati

**Department of
Electrical Engineering and
Computer Science
(EECS)**

**GRADUATE STUDENT
HANDBOOK**

2020-21

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1 Graduate Program Administration

1.1 Graduate Handbook

The Department of Electrical Engineering and Computer Science (EECS) Graduate Handbook contains the detailed policies and rules pertaining to the departmental graduate programs and supplements the policies of the College of Engineering and Applied Sciences (CEAS) Graduate Office and the policies of the University of Cincinnati Graduate School. All students admitted to EECS can access a copy of this handbook from the EECS graduate program webpages. Students should familiarize themselves with and to conform to these rules and regulations in this handbook. It is recommended that the students retain a copy of this handbook for their personal use throughout their degree program.

The College of Engineering and Applied Sciences (CEAS) Graduate Office provides assistance with the admissions process and with administrative matters associated with academic programs in CEAS. Information regarding services available and CEAS specific policies is available at the CEAS Graduate Studies website (http://ceas.uc.edu/Graduate_Studies.html).

The University of Cincinnati Graduate School office provides academic leadership, administrative services and, in some cases, financial support to the faculty and students. It coordinates and implements common regulations pertaining to all graduate programs of the University and regulates the awarding of graduate degrees. Information regarding services provided by the University of Cincinnati Graduate School can be found on the UC Graduate School Website (<http://grad.uc.edu>). The UC Graduate School Student Handbook is also available from the Graduate School website under the Current Students dropdown http://grad.uc.edu/student-life/graduate_studenthandbook.html

Any student who wishes to petition for relief from any of the regulations and requirements contained in this handbook may do so by submitting a written request to the EECS Graduate Program Director who will review with the EECS Graduate Council and render a decision as soon as possible. The Department of Electrical Engineering and Computer Science reserves the right to make changes or corrections to this handbook and will announce any modifications via email to students.

1.2 The EECS Graduate Program Director

The Graduate Program Director (GPD) is selected by the Department Head to oversee all graduate programs in the EECS department. The GPD administers the graduate program's policies & procedures set by the Graduate Council and approved by the EECS faculty. As Chair of the Graduate Council, the GPD convenes meetings of the council at least once each academic term and liaisons with the CEAS Graduate Office and the UC Graduate School to ensure smooth administrative operations. The GPD assures that accurate records of the graduate programs are kept and are updated in a timely manner. Other duties include checking on the registration of graduate students & monitoring their progress in required courses, assigning of graduate teaching assistants and supervising their workload & performance, and advising the Department Chair on the needs of the graduate programs. The current EECS Graduate Program Director is:

Prof. Ali Minai
Office: 828 Rhodes Hall
Phone: (513) 556-4783
Email: ali.minai@uc.edu

1.3 The EECS MEng Program Director

The MEng Program Director (MPD) is selected by the Department Head to oversee the Master of Engineering program in the EECS department. The MEng Program Director, in collaboration with the CEAS MEng Coordinator, administers the MEng program's policies & procedures set by CEAS and the EECS Graduate Council. The MPD ensures that accurate records of the MEng programs are kept and are updated in a timely manner. Other duties include checking on the registration of MEng students, monitoring their progress, advising them on the selection of the capstone experience, and advising the Department Head on the needs of the graduate programs. The current EECS MEng Program Director is:

Prof. Xuefu Zhou
Office: 838 Rhodes Hall
Phone: (513) 556-6552
Email: xuefu.zhou@uc.edu

1.4 The EECS Graduate Admissions Director

The EECS Graduate Admissions Director is a faculty member appointed by the EECS Department Head to coordinate the admissions process, including review of applications, tracking offers and acceptances, and reporting data to the faculty. The current EECS Graduate Admissions Director is:

Prof. Ranga Vemuri
Office: 530 ERC
Phone: (513) 556-4784
Email: ranga.vemuri@uc.edu

1.5 The EECS Graduate Council

The Graduate Council consists of Graduate Program Director (GPD) and 4 faculty, one from each of the EECS graduate programs (CS, CompE, EE-Systems, EE-Devices). The EECS MEng Program Director and the EECS Graduate Admissions Director are ex-officio members of the Graduate Council, and also represent their appropriate programs. The EECS Graduate Program Coordinator (if designated) is an ex-officio non-voting member of the Graduate Council. The Graduate Council deliberates on any issues concerning the graduate programs, interprets graduate policy, and proposes new policy from time to time. The Graduate Council also serves as the EECS Grievance Committee for any and all issues pertaining to the graduate programs. Other duties of the Graduate Council include advising and assisting the GPD in their duties and being jointly responsible for admissions, core course curriculum in degree tracks available in EECS, and the generation and balanced allocation of Graduate Incentive Awards (GIA).

A quorum for a Graduate Council meeting consists of at least three voting members. All issues are decided by a simple majority vote of the voting members present. The GPD or a designated representative reports on the activities of the Graduate Council at every regularly scheduled faculty meeting and presents any issues that require a vote of the entire EECS faculty for resolution.

1.6 Degree Programs and Degree Tracks

The graduate program in the EECS is divided into 8 separate degree programs including EE-MEng, EE- MS, EE-PhD, CompE-MEng, CompE-MS, CS-MEng, CS-MS and CSE-PhD (see Section 2.1 for more details). The faculty are organized based on shared research and teaching interests that may span across one or more degree programs. Each faculty member is granted Graduate Faculty status by the graduate school for the degree programs that are appropriate to their research and teaching interests. A faculty member must have Graduate Faculty status with a degree program in order to serve as thesis/dissertation advisor for students in that degree program. A faculty member may have Graduate Faculty status with multiple degree programs and thus may advise students in one or more of the degree programs. Adjunct faculty members, professor educator faculty members, and other non-tenure track faculty members are not part of the Graduate Faculty.

Degree programs may be divided into multiple degree tracks. Each degree track is a specialization that focuses the coursework and research activities into specific sub-topics related to the broader degree discipline. Faculty members with research and teaching focus related to a degree track determine which courses are required for students in that track. By maintaining current course content and appropriate track course curriculum, the faculty members of a specific degree track ensure that students receiving a graduate degree in EECS have completed a program of sufficient depth and breadth. So long as they obtain/maintain appropriate graduate faculty status, a faculty member may supervise a thesis or dissertation of a student in any degree program in EECS provided that the research topic is appropriate for the degree and the student meets the requirements for their degree program.

1.7 The CEAS Graduate Director for MS/PhD Programs

The CEAS Graduate Director for MS/PhD Programs maintains all graduate records, processes all admission applications for faculty review, updates the student database, and interacts with EECS Graduate Program Director and students to ensure the smooth operation of the EECS graduate programs. The current CEAS Graduate Director for MS/PhD Programs is:

Ms. Julie Muenchen – Director Academics, CEAS Graduate Studies
Office: 665 Baldwin Hall
Phone Number: (513) 556-0635
Email: julie.muenchen@uc.edu

1.8 The CEAS Manager of MEng Programs

The CEAS Manager of MEng Programs has overall responsibility for all MEng programs in the College of Engineering and Applied Science, and interacts with EECS MEng Program Director, the EECS Graduate Program Director and students to ensure the smooth operation of the EECS MEng program. The current CEAS Manager of MEng Program is:

Mr. Eugene Rutz
Office: 665C Baldwin Hall
Phone Number: (513) 556-1096
Email: eugene.rutz@uc.edu

1.9 The CEAS Assistant Director for MEng and Certificates

The CEAS Assistant Director for MEng and Certificates maintains all MEng records, processes all admission applications for faculty review, updates the student database, and interacts with EECS MEng Program Director, the EECS Graduate Program Director and students to ensure the smooth operation of the EECS MEng program. The current CEAS Assistant Director for MEng and Certificates is:

Ms. Julie Steimle – Assistant Director, CEAS Graduate Studies

Office: 665 Baldwin Hall

Phone Number: (513) 556-1582

Email: julie.steimle@uc.edu

1.10 Whom to Contact?

The student's primary points-of-contact within EECS are:

For questions related to the MEng Program: ***EECS MEng Program Director***

For all other questions, including those involving coordination between the MEng Program and other programs: ***EECS Graduate Program Director***.

Questions involving CEAS policies, such as program of study, financial aid rules, registration status, graduation, etc., may need to be referred to the CEAS Graduate Director for MS/PhD Programs, the CEAS Manager of MEng Programs, or the CEAS Assistant Director for MEng and Certificates.

2 Application and Admission

2.1 Degree Programs and Certificate Programs

The Department of Electrical Engineering and Computer Science offers eight (8) graduate degrees:

- Masters of Engineering in Electrical Engineering (EE-MEng)
- Masters of Science in Electrical Engineering (EE-MS)
- Doctor of Philosophy in Electrical Engineering (EE-PhD)
- Masters of Engineering in Computer Engineering (CompE-MEng)
- Masters of Science in Computer Engineering (CompE-MS)
- Masters of Engineering in Computer Science (CS-MEng)
- Masters of Science in Computer Science (CS-MS)
- Doctor of Philosophy in Computer Science and Engineering (CSE-PhD)

The **Masters of Engineering (MEng)** program provides a graduate degree that focuses on the student's ability to contribute to the technical workforce. The MEng program is based on coursework and a capstone project; it does not require a thesis. Students completing a MEng degree will typically not matriculate into a PhD program. However, the difference between the MEng program and the MS program is not in the rigor of the coursework or a qualitative difference in competencies. Rather, the difference lies in the orientation of the MEng program towards participation in the industrial workforce rather than research. More information about the MEng program is available on the CEAS Graduate website at: http://ceas.uc.edu/programs_degrees/MasterOfEngineering.html

The Graduate Handbook for the MEng program is available at:

https://ceas.uc.edu/content/dam/ceas/documents/MEng/MEng_Handbook_2017.pdf

The **Masters of Science (MS)** degree program is a research-based program that provides development of research skills along with expansion of technical expertise associated with completion of advanced engineering coursework. In addition to coursework, students are required to complete a Master's Thesis based on a research project that is closely advised by a member of the EECS faculty. The thesis must be defended orally before a committee comprising the student's advisor and at least two other faculty members. The primary focus of the MS program is to develop technical and research skills necessary for a student to work independently on the development of state-of-the-art technology.

The **Doctor of Philosophy (PhD)** degree program trains graduate students to develop their skills as independent, creative researchers capable of making significant original contributions towards advancing their technical field. In addition to advanced technical coursework, PhD students are expected to work with a dissertation advisor to propose, develop and demonstrate innovative research on a specific topic that extends beyond the current state-of-the-art.

Every student admitted into the PhD program is required to develop a dissertation research proposal based on guidelines similar to those used by many federal funding agencies. To be admitted to candidacy for PhD, the student must successfully defend the proposal before a committee of no less than five faculty members (including the student's dissertation advisor). Upon completion of the dissertation research, PhD students are required to write and orally defend a PhD Dissertation in a public defense before a dissertation committee of no less than five faculty members (including the student's dissertation advisor). This dissertation becomes an archival record of the research completed by the student. Additionally, PhD students are expected to contribute to the body of technical

knowledge by disseminating their research results at technical meetings and through publication in technical journals. The members of the student's proposal and dissertation committees must be chosen appropriately with respect to the research topic, and must meet all other guidelines of the EECS Department, the CEAS Office of Graduate Studies, and the UC Graduate School.

The PhD degrees can be pursued in a direct route following a Bachelor's degree without first obtaining a Master's degree. Alternatively, the PhD degree can be pursued following the completion of the MS degree.

Each student is admitted into one of the above degree programs. Students may choose between any of the degree tracks that may be offered within a specific degree program. Every attempt will be made to accommodate students into the track of their choice but, given the limited capacity of each track, this cannot be guaranteed. Specific academic requirements including track requirements must be completed before the degree can be awarded. These requirements are summarized in Section 3.

MS and PhD students are required to select a thesis/dissertation advisor as early as possible after joining the graduate program, and certainly within the first academic year. In addition to providing advice related to the execution and documentation of the student's thesis/dissertation research, the thesis/dissertation advisor is responsible for providing academic advising to the student. MEng students receive academic advising from an academic advisor assigned at the beginning of the student's graduate studies. MEng students who choose either the capstone project or capstone paper options will have a project advisor who can be any member of the EECS faculty. MEng students who choose the internship option receive capstone advising from their assigned academic advisor.

In addition to the degree programs described above, the EECS department currently offers three (3) graduate certificates:

- Certificate in Biomedical Informatics
- Certificate in Cyber Operations
- Certificate in Data Sciences

These graduate certificates may be taken in combination with a graduate degree program or may be taken as a stand-alone certificate by non-matriculated graduate student (i.e. working professionals) to enhance employment credentials. The EECS Graduate Program Assistant coordinates with the Graduate Program Director to manage the admission and administrative processes for these certificate programs.

2.2 Application

The EECS graduate program is open to qualified individuals with a GPA of 3.0 or better and a BS (or equivalent degree) in Computer Engineering, Computer Science, Electrical Engineering, or related areas from an accredited college (or equivalent if from an international institution). Prospective applicants with degrees in other fields should see Section 2.6, *Admission with a Degree in Other Disciplines*.

For guidance regarding expectations for standardized testing and typical admissions cutoffs based on standardized test scores see the *Frequently Asked Questions* section on the CEAS graduate studies website (http://ceas.uc.edu/Graduate_Studies/AdmissionsFAQ.html).

Applicants should indicate their degree goal and research interest areas that best match their area of research and coursework interest. The Graduate Program Director, in consultation with the Graduate Council, will coordinate the evaluation of all the completed EECS applications received

and offer admission & financial awards to selected applicants.

2.3 Full-time Admission

A full-time student needs to register for at least 15 graduate credits of coursework for each Fall and Spring semester, attend new student orientation, participate in required seminars, make satisfactory progress toward the degree while maintaining a satisfactory GPA (3.0 or higher), and adhere to the time limits for degree completion.

MS and PhD students who have completed their coursework and all of their required thesis/dissertation hours may go on reduced course load while they complete and defend their thesis/dissertation research. On reduced course load, students must register for at least 1 credit hour of thesis/dissertation research every academic year term (Fall and Spring semesters) that they are on campus and working towards completion of their thesis/dissertation. Registration during the Summer term is not required. Domestic (U.S.-based) students who have completed their thesis/dissertation research and are working off campus while writing of their thesis/dissertation documents may register for a minimum of one credit hour per academic year. International students are not allowed to work off campus during the writing of their thesis/dissertation and therefore must continue to register for 1 credit hour in both the Fall and Spring semesters.

MENG students who have completed their coursework and all of their required MENG capstone project hours may go on reduced course load while they complete their capstone project. On reduced course load, students must register for at least 1 credit hour of MENG capstone project every academic year term (Fall and Spring semesters) that they are on campus and working towards completion of their capstone project. Registration during the Summer term is not required. Domestic (U.S.-based) students who continue to work on the capstone project may register for a minimum of one credit hour per academic year. International students are performing internship option for their capstone project must continue to register for 1 credit hour MENG capstone project in both the Fall and Spring semesters.

Only full-time students are eligible for financial aid.

2.4 Part-time Admission

Part-time admission is provided mainly for the convenience of students who are employed full-time in the Cincinnati area or for students whose family responsibilities preclude full-time study.

International students are not eligible for part-time status. Successful completion of a degree on a part-time basis requires extraordinary commitment on the part of the student. Obtaining a PhD degree requires that a student be full-time for at least two semesters, and the PhD degree cannot be awarded for less than the equivalent of 3 years of full-time graduate study. The EECS Department discourages the pursuit of the PhD on a part-time basis.

The requirements for part-time students are the same as those for full-time students (see above). The only difference is that the student is not required to register for 15 or more credits each academic term, and is not eligible for financial aid. However, to remain active in the EECS graduate program, the student must register for at least one credit hour *each* term (except in the Summer semester) until all

required course work and thesis/dissertation research credits has been completed. After all required course work and thesis/dissertation research credits have been completed, part-time students are only required to register for one credit hour for each academic term that they are on campus working towards completion of the thesis/dissertation research. As with full-time domestic students who are only working to complete the thesis/dissertation research, students must register for a minimum of one credit hour per academic year.

2.5 Provisional Admission

Occasionally, provisional admission may be granted to applicants who lack undergraduate course work considered essential for study in EECS. Specific courses will be required to make up such deficiencies before admission to full graduate standing can be granted. This additional course work, the conditions, and the timeline in which it has to be completed will be detailed in the student's admission letter. If the student does not meet these conditions in the allotted time, they will be dismissed.

2.6 Admission with a Degree from Other Disciplines

Applicants with a Bachelors or Masters degree in another branch of engineering, physics, or mathematics are often able to pursue graduate study in EECS. They may be asked to take additional undergraduate, dual or graduate-level courses beyond the standard requirements in order to be on par with students with a degree in the proper field. Some of this additional coursework may be required prior to admission confirmation. Applicants are encouraged to contact the Graduate Program Director prior to submission of a graduate school application to determine if their background is likely to constitute a competitive application. Additional coursework completed to qualify for admission to the program cannot be counted towards the subsequent graduate degree.

2.7 Special Degree Programs

In collaboration with the General Electric (GE) Corporation, EECS has established a special MS program entitled the Advanced Course in Engineering (GE-ACE) program. This program is only available to GE employees and details are described in Section 4.8. A similar program has been established for students from Xetron (Northrop-Grumman).

EECS offers a special non-thesis MS program only to students who pay full tuition. Students in this program are not eligible for GIA or any other financial aid. Details are described in Section 4.9.

2.8 Application Procedure

Applications to the EECS graduate program are submitted through an online application process. Completion of the application process requires the following items.

- **Transcripts** – Applicants must upload transcripts to the application.
- **Test Scores** - Applicants must enter any required standardized test scores.
- **Recommendations** – Letters of recommendation are requested on line and the application must list the names of recommenders.
- **Statements** - A statement of purpose and a statement of research are required from each applicant. The statement of research should describe any research that the applicant has been involved in (including senior projects and Masters thesis. If an applicant has not participated in

anything related to research or projects, they should simply state this in their statement of research.

- **Research Areas of Interest** - Applicants must also choose areas of research interest from a drop down menu on the application.

For more information about the application process including information regarding application deadlines and application fees, please see the detailed admission FAQ on the CEAS Graduate Admissions website (http://ceas.uc.edu/Graduate_Studies/ApplyOnline.html).

2.9 Students Not Matriculated in EECS

Full-time or part-time students at the University of Cincinnati who are not undergraduate/graduate students in the Department of Electrical Engineering and Computer Science (i.e. non-matriculated students) may take EECS graduate courses with permission from the course instructor. Non-matriculated students enrolled without instructor consent are subject to administrative withdrawal from the course. Non-matriculated students are also subject to administrative withdrawal if space is needed in the course for students who are matriculated in an EECS undergraduate/graduate degree.

Permission to enroll in graduate courses does not imply admission to the EECS graduate degree program, nor does it imply that such courses will be accepted toward the EECS graduate degree if the student is admitted in the future.

2.10 Transfer of Credits

Transfer of graduate credits towards graduate degree programs in EECS is not allowed for course work taken as part of a program that has already resulted in the award of a Bachelors or Masters degree (i.e. no double counting of the same course for multiple degrees). The number of transfer credits from another university accepted for the graduate degree program is at the discretion of the Graduate Program Director and Graduate Council, but ordinarily will not exceed 9 semester hours of graduate credit. Approval of transfer of credits for courses taken at other institutions must be obtained within the first semester of the student's degree program. Thesis/dissertation course work cannot be transferred. For students entering with an MS degree, no further non-UC credits may be accepted for transfer.

2.11 International Student Admission

No international student will be granted admission on any basis other than full graduate standing and they ***must*** register for 15 program approved graduate credits each academic term, except during the Summer semester. Only in the final semesters, when the only task left is writing a thesis, can an international student register for just one credit each term.

All international students are required to carry the University Health Insurance. A physical examination is required of each international applicant. A tuberculin tine test or chest X-ray is required within 1 week of arrival.

For matters concerning visa and immigration rules, international students must contact: Office of International Student Services, PO Box 210640, University of Cincinnati, Cincinnati, OH 45221-0640. For more information see the UC International Services website (www.issso.uc.edu), call the office at 513-556-4278 or email the office at international.students@uc.edu.

2.12 Change of Degree Program

A student wishing to change their degree program must petition the EECS Graduate Program Director. The petition must include the reason for the change and evidence for the student's preparation for the new degree program. If the Graduate Program Director approves such a change, the student will be required to completely meet the degree requirements of their new degree program.

The following rules apply to specific degree change situations:

Conversions from MS or PhD to MEng

can be requested within the first year of the student's admission to UC, and will require permission of the Graduate Program Director and the CEAS MEng Director. If the student already has a research advisor, the change will first require that advisor's approval. CEAS will also require the student to take classes to meet MEng requirements, and to pay tuition based at current rate with no GIA scholarship funds unless the change is made before the student begins their program. Conversions requested after two semesters in the MS program will generally not be approved, except under extraordinary circumstances.

Conversions from MEng to MS

can only be requested after the completion of at least one semester in the MEng program. Approval requires the following: 1) A GPA of 3.5 or higher in the engineering courses taken up to that point (excluding the core MEng non-engineering courses, seminars, research credits, and self-study research); 2) A written commitment from an EECS faculty member to serve as the student's MS thesis advisor. The GPA requirement is strictly enforced, and can only be waived by permission of the Graduate Program Director and Department Head under extraordinary circumstances (e.g., if a faculty member commits to supporting the student on a funded research project for the duration of their degree). Approval can be obtained after one semester but the degree change will take place after two full-time semesters under MEng tuition and GIA rules, converting to the MS GIA amount in the third academic semester.

Conversions from MEng to PhD

will *not* be approved, except by permission of the Graduate Program Director and Department Head under extraordinary circumstances (e.g., if a faculty member commits to supporting the student on a funded research project for the duration of their degree).

Conversions from PhD to MS

must be requested by the third semester of study at UC. If a PhD student has received more than 4 semesters of GIA funding then they may not change to the MS program and must finish the PhD program or withdraw from the University unless approved by the Graduate Program Director. If a student already has a dissertation research advisor, their approval for the conversion must be obtained first.

Conversions for MS/PhD students between areas (EE, CompE, CS, and various tracks)

can be requested with the written approval of the student's research advisor (if already assigned) and the EECS Graduate Program Director. The student must also provide written commitment by a faculty member in the new area to serve as the student's research advisor. If the transfer is approved, the student will be responsible for satisfying all the course requirements of their new program.

Conversions for MEng students between areas (EE, CompE, CS, and various tracks)

can be requested with the written approval of the EECS MEng Program Director. There is no guarantee that the transfer will be approved – especially for transfers into tracks which already have many students. If the transfer is approved, the student will be responsible for satisfying all the course requirements of their new track. Given the tight schedule of the MEng program, transfer requests should preferably be made as early as possible.

All degree conversions are final.

Any further change will require approval of the EECS Department Head and the CEAS Office of Graduate Studies.

3 EECS Degree Requirements

3.1 *Master of Science:*

Minimum of 30 semester credits consisting of:

- A minimum of 21 credits of graduate coursework that satisfy the following requirements:
 - A minimum of 9 course credits must be completed from the list of **required** and **core** courses for student's degree track.
 - A minimum of 6 course credits must be completed at the 7000+ level.
 - The remaining course credits should be determined in consultation with the student's thesis advisor.
- 9 credit hours of Thesis Research (EECE/CS 9089)
- 2 credits of seminar (EECE/CS 7001 & 7002) and 1 credit of EECE/CS 7004 Practical Experience. Seminar and Practical Experience do not count as coursework or towards the 30 minimum credit hours.

In order to be awarded the MS degree, the student must complete all degree requirements and graduate within 5 years. The student must have at least a B average (GPA of 3.0+) for all graduate credits. In addition, at least 2/3 of the graduate credits of the coursework necessary for the degree must be at a level of B or higher. (B- counts as below B). More detailed requirements for the MS degree are given in Section 4.

3.2 *Master of Engineering:*

A minimum of 30 credit hours with *no grades below a C* in:

- 6-9 credit hours in MEng program core
- 10-15 credit hours in required track core courses
- 2-9 credit hours in elective courses
- 1-4 credit hours in Capstone Project

In order to be awarded the degree of MEng, the student must have at least a B average (GPA of 3.0+) for all graduate credits. In addition, at least 2/3 of the graduate credits of the coursework necessary for the degree must be at a level of B or higher. (B- counts as below B).

Each student admitted into the MEng Program is assigned to a program track. Each track has a faculty advisor (track advisor) and specific course requirements. The list of tracks and track advisors is given later in this section. More detailed requirements for the MEng degree are given in Section 5.

3.3 *Doctor of Philosophy:*

3.3.1 Credit hours for the Direct PhD Route Beyond a Bachelor's Degree:

90 credit hours consisting of:

- A minimum of 30 credits of graduate coursework that cover the following requirements:
 - A minimum of 9 course credits must be completed from the list of **track** courses for student's degree area.
 - A minimum of 15 course credits must be completed at the 7000+ level.
 - The remaining course credits should be determined in consultation with the student's

- research advisor.
- A minimum of 40 credits of Dissertation Research.
 - 2 credits of seminar (EECE/CS 7001 & 7002) and 1 credit of EECE/CS 7004 Practical Experience. Seminar and Practical Experience do not count as course work or towards the 90 minimum credit hours.
 - No more than 6 credits of EECE/CS 9080, Doctoral Dissertation Proposal, may be counted towards fulfilling the 90 credits of PhD degree requirement. The 6 credits of EECE/CS 9080 may only be applied to research related to the preparation of the dissertation proposal and not towards the requirements of the classroom coursework credits.

3.3.2 Credit hours for PhD beyond the Master's Degree:

60 credit hours consisting of:

- A minimum of 18 credits of classroom coursework that cover the following requirements:
 - A minimum of 9 course credits must be completed from the list of **required** and **core** courses for student's degree track.
 - A minimum of 9 course credits must be completed at the 7000+ level.
 - The student should consult their research advisor for the remaining courses.
- At minimum of 30 credits of Dissertation Research
- 2 credits of seminar (EECE/CS 7001 & 7002) and 1 credit of EECE/CS 7004 Practical Experience. Seminar and Practical Experience do not count as course work or towards the 60 minimum credit hours.
- No more than 6 credits of EECE/CS 9080, Doctoral Dissertation Proposal, may be counted towards fulfilling the 60 credits of PhD degree requirement. The 6 credits of EECE/CS 9080 may only be applied to research related to the preparation of the dissertation proposal and not towards the requirements of the classroom coursework credits.

3.4 Rules applicable to all PhD students

1. The doctoral degree requires, at a minimum, the equivalent of three years of full time graduate study. All requirements for PhD must be completed within nine (9) years of initial enrollment. A student's candidacy will terminate automatically if they fail to register appropriately during an academic year.
2. The last 30 credits must be completed under the direction of UC faculty at the University of Cincinnati.
3. At least 9 credit hours of classroom coursework at 7000 or higher level must be completed from the course categories marked as Primary to the student's degree program.
4. No more than 6 credits of Doctoral Dissertation Proposal, may be counted towards fulfilling the 90 credits of PhD degree requirement. These 6 credits may only be applied to research related to the preparation of the dissertation proposal and not towards the requirements for classroom coursework credits.
5. In order to be awarded the degree of Doctor of Philosophy, the student must have at least a B average (GPA of 3.0) for all graduate credits. In addition, at least 2/3 of the graduate credits of the course work necessary for the degree must be at a level of B or

- higher (B- counts as below B).
6. All PhD students must successfully write and defend a dissertation proposal in order to be admitted into PhD candidacy. The written proposal must follow a format defined by the graduate council that is consistent with proposal guidelines for federal funding agencies. The oral defense of the dissertation proposal may not be attempted any sooner than concurrently with the last semester of required coursework and must be successfully completed no later than 1 year after completion of required coursework.
 7. The final public oral defense of the dissertation must be completed within four years of admission into PhD candidacy. A two week public notice must be submitted to the CEAS Graduate Program Director, 665 Baldwin Hall to announce the final defense and the student must post a notice of the defense on the Graduate School's website at www.grad.uc.edu. Both notices are mandatory and failure to submit them will result in the defense being invalid. A notice submitted less than two weeks prior to the defense will not be accepted. If there are any changes in the date or time of the defense, a new two-week notice must be submitted. Committee members must receive a copy of the dissertation a minimum of two weeks prior to the defense. The Department requires that a minimum of 7 months must elapse between admission to doctoral candidacy and the receipt of the PhD degree. This requirement can be waived in exceptional circumstances by written permission from the Graduate Program Director, with appropriate justification.

More detailed requirements for the PhD degree are given in Section 7.

3.5 Course Requirements for MS/PhD Degree Tracks

The set of track courses is given below for the currently recognized EECS degree tracks.

- A. **EE MS/PhD Sensors and Microsystems** (take at least 3 out of 7)

| | |
|------------|---|
| EECE 6007 | Introduction to Biomedical Microsystems (Fall) |
| EECE 6008 | Fundamentals of MEMS (Fall) |
| EECE 6018 | Microfabrication of Semiconductor Devices (Fall) |
| EECE 6041C | Microfabrication Lab for Semicond Dev & MEMS (Spring) |
| EECE 6050 | Compound and Organic Semiconductor Physics (Spring) |
| EECE 6088 | Nanoelectronic Devices for VLSI Technologies (Fall) |
| EECE ##### | Introduction to Sensors (Spring) |
- B. **EE MS/PhD Systems** (take at least 3 out of 7)

| | |
|------------|--|
| EECE 6016C | Electric Machines & Drives (Fall) |
| EECE 6019 | Introduction to Random Processes (Fall) |
| EECE 6024 | Introduction to Digital Signal Processing (Fall) |
| EECE 6026 | Communication Systems (Spring) |
| EECE 6036 | Intelligent Systems (Fall) |
| EECE 6042 | Digital Image Processing (Spring) |
| EECE 7033 | Linear Systems Theory (Spring) |
- C. **CompE MS** or **CSE PhD (CompE Track)** (take at least 4 out of 6)

| | |
|-----------|---|
| EECE 6029 | Introduction to Operating systems (Fall & Spring) |
| EECE 6030 | Trust in Digital Hardware (Fall) |

| | |
|------------|--|
| EECE 6051 | Database Theory (Fall & Spring) |
| EECE 6080C | Introduction to VLSI Design (Fall) |
| EECE 6083 | Compiler Theory and Practice (Spring) |
| EECE 7095 | Introduction to Computer Architecture (Fall) |

D. **CS MS** or **CSE PhD (CS Track)** (take one course from each discipline area)

Algorithms:

| | |
|---------|-------------------------------------|
| CS 7081 | Advanced Algorithms (Fall & Spring) |
| CS 6070 | Automata Theory (Fall) |

Systems:

| | |
|---------|---|
| CS 6029 | Operating Systems (Fall) |
| CS 6043 | Computer Networking (Fall) |
| CS 6097 | Intro to Wireless and Mobile Systems (Fall) |

Artificial Intelligence:

| | |
|---------|---|
| CS 6033 | Artificial Intelligence (Fall) |
| CS 6052 | Intelligent Data Analysis (Fall & Spring) |
| CS 6037 | Machine Learning (Fall) |

E. **VLSI Design Track** (Coordinator: Prof. Wen-Ben Jone)

The VLSI Design Track can be taken by students enrolled in EE, CompE or CSE degree programs. It has a required sequence of VLSI focused courses. Students must also complete a minimum of two courses from the list of core courses associated with their degree designation

Required Course Sequence

| | |
|------------|---|
| EECE 6080C | Introduction to VLSI Design (Fall) |
| EECE 6082C | VLSI Design for Test and Power (Spring) |
| EECE 6086C | VLSI Design Automation (Spring) |

Students registered as EE students (i.e. EE-Sensors & Microsystems or EE-Systems) must complete 2 courses from the following list:

| | |
|------------|---|
| EECE 6007 | Introduction to Biomedical Microsystems (Fall) |
| EECE 6008 | Fundamentals of MEMS (Fall) |
| EECE 6016C | Electric Machines & Drives (Fall) |
| EECE 6018 | Microfabrication of Semiconductor Devices (Fall) |
| EECE 6019 | Introduction to Random Processes (Fall) |
| EECE 6024 | Introduction to Digital Signal Processing (Fall) |
| EECE 6026 | Communication Systems (Spring) |
| EECE 6030 | Trust in Digital Hardware (Fall) |
| EECE 6036 | Intelligent Systems (Fall) |
| EECE 6041C | Microfabrication Lab for Semicond Dev & MEMS (Spring) |
| EECE 6042 | Digital Image Processing (Spring) |
| EECE 6050 | Compound and Organic Semiconductor Physics (Spring) |
| EECE 6088 | Nanoelectronic Devices for VLSI Technologies (Fall) |

| | |
|------------|----------------------------------|
| EECE ##### | Introduction to Sensors (Spring) |
| EECE 7033 | Linear Systems Theory (Spring) |

Students registered as CompE MS or CSE PhD students must complete 2 courses from the following list:

| | |
|-----------|---|
| EECE 6029 | Introduction to Operating Systems (Fall & Spring) |
| EECE 6030 | Trust in Digital Hardware (Fall) |
| EECE 6051 | Database Management (Fall & Spring) |
| EECE 6088 | Nanoelectronic Devices for VLSI Technologies (Fall) |
| EECE 6083 | Compiler Theory and Practice (Spring) |
| EECE 7095 | Introduction to Computer Architecture (Fall) |

F. **Bioinformatics Track** (Coordinator: Prof. Raj Bhatnagar)

The Bioinformatics Track can be taken by students enrolled in the CS-MS or CSE-PhD degree programs. This track has a required sequence of Bioinformatics focused courses. In addition, students must select one course from a list of core courses in the Computer Science discipline

Required Course Sequence

| | |
|---------|--|
| CS 7097 | Introduction to Functional Genomics (Fall) |
| CS 7099 | Introduction to Bioinformatics (Spring) |

Bioinformatics Core Courses (take 1 of 3)

| | |
|---------|---|
| CS 6033 | Artificial Intelligence (Fall) |
| CS 6052 | Intelligent Data Analysis (Fall & Spring) |
| CS 7081 | Advanced Algorithms (Fall & Spring) |

NOTE: PhD student in the Bioinformatics Track who receive financial support from the Bioinformatics research area are also required to complete two research rotations during the first year of study

G. **Cyber Operations Track** (Coordinator: Prof. John Franco)

The Cyber Operations Track can be taken by students enrolled in the CompE-MS, CS-MS or CSE- PhD degree programs. Students in the EE graduate programs may be admitted to this track with permission from the graduate director. This track has a required sequence of courses focused on cyber operations topics. Students must take all these courses.

Required Course Sequence:

| | |
|---------|---------------------------------|
| CS 6021 | Mathematical Logic (Spring) |
| CS 6055 | Cyber Defense Overview (Fall) |
| CS 6056 | Security Vulnerability (Spring) |
| CS 7038 | Malware Analysis (Spring) |

H. **Data Science Track** (Coordinator: Prof. Raj Bhatnagar)

The Cyber Operations Track can be taken by students enrolled in the CompE-MS, CS-MS or CSE- PhD degree programs. Students in the EE graduate programs may be admitted to this track with permission from the graduate director. This track has a required sequence of courses focused on cyber operations topics. Students must take all these courses.

Required Course Sequence:

| | |
|---------|---|
| CS 6052 | Intelligent Data Analysis (Fall & Spring) |
| CS 6054 | Information Retrieval (Fall) |
| CS 6065 | Cloud Computing (Spring) |
| CS 7070 | Big Data Analytics (Spring) |

For all tracks, the remaining courses necessary to satisfy the general MS or PhD degree requirements will be selected with direction from the student's thesis advisor. Students are encouraged to look at the current course offerings available on the EECS website or by checking course availability through One Stop (<http://onestop.uc.edu>)

3.6 MEng Program Tracks

The following table lists all MEng Tracks and track advisors. The course requirements for each track are available in the MEng Graduate Handbook.

| Track Name | Program | Advisor |
|---|------------------------------------|---|
| Artificial Intelligence (CEAS Track) | Any | Prof. Ali Minai |
| AI-Cyber | Any | Prof. Anca Ralescu |
| Bioinformatics | Any | Prof. Raj Bhatnagar |
| Cyber Security | CS, CompE, EE (with permission) | Prof. John Franco |
| Data Science | CS, CompE | Prof. Raj Bhatnagar Prof. Yizong Cheng |
| Embedded Systems | Any | Prof. Carla Purdy |
| Computer Engineering - General | CompE | Prof. Yiming Hu Prof. Carla Purdy |
| Computer Science - General | CS | Prof. Dharma Agrawal Prof. Fred Annexstein Prof. Gowtham Atluri Prof. Kenneth Berman Prof. Yizong Cheng Prof. Chia Han Prof. Nan Niu Prof. Boyang Wang |
| Robotics & Intelligent Autonomous Systems (RIAS) (CEAS Track) | Any | Prof. Ali Minai |
| Semiconductor and Sensor Technologies | EE | Prof. Tao Li |
| Systems Engineering | EE | Prof. Howard Fan |
| VLSI | CS, CompE | Prof. Wen-Ben Jone |

4 Requirements for Master of Science (MS) Degree

4.1 Basic Requirements

A master of science degree provides students with the opportunity to acquire in-depth knowledge in specific areas of their field, and to conduct substantial original research. The degree is suitable for those who wish to pursue a Ph.D. degree, or to do advanced work in industry. A minimum total of 30 semester credit hours are required for the MS degree: 21 credit hours of graduate course work, of which 6 credit hours must be 7000+ level or higher and 10 credits of thesis research, 2 credits of seminar, and 1 credit of Practical Experience. (Seminar credits and Practical Experience credit cannot be counted towards the 20 course credit requirements or the 30 total credit hour requirements.) In order to be awarded the degree of Master of Science, the student must have at least a B average (GPA of 3.0) for all graduate credits. In addition, at least 2/3 of the graduate credits of the above required course work necessary for the degree must be at a level of B or higher (B- counts as below B).

4.2 Research Advisor

Thesis research must be performed under the supervision of a research advisor, who must be a faculty member with a full, joint, or secondary appointment in the EECS Department. If the research advisor has a secondary appointment in EECS, the student must choose an additional full or joint appointment EECS faculty member as their academic advisor, who will work jointly with the research advisor to guide the student, and will be a member of the student's thesis committee.

4.3 Program of Study and Courses

Each student admitted into a MS degree program must satisfy the requirements of their degree program to graduate. The following are rules that apply to **ALL** MS degrees in EECS:

- Courses taken on an audit basis do not count towards the degree.
- No credits of Doctoral Dissertation Proposal are counted towards the degree.
- Every student must register in Seminar for both Fall and Spring semester during the first year of study. These seminar credits are not counted toward the degree requirements.
- The student must prepare a Program of Study in conjunction with their academic advisor satisfying the degree requirements and also completing the courses required or recommended by their degree track. Required and recommended courses in each degree track are determined by the faculty comprising that track and approved by the Graduate Council. A student must get **prior** approval from their advisor and the EECS Graduate Program Director for any deviation from the track requirements. **Post-facto deviations will not be approved.**
- The Program of Study must be updated and approved by the student's research advisor in May of each year for the student to be eligible for a Graduate Incentive Award (GIA) in the following year.
- A student who changes degree program or degree track will be expected to complete the courses required by the new degree program and track as of the date the change is made. Any

deviations from this procedure must be approved in writing by the EECS Graduate Program Director.

- In individual cases a student may be asked to take additional graduate level courses in order to make up any deficiencies. A course taken for remedial reasons cannot be counted towards the required coursework for the degree, unless approved by the student's thesis advisor and the EECS Graduate Program Director.
- A minimum of 2/3 of the course credit hours completed to satisfy the degree coursework requirement must be taken from courses offered by the EECS department. Waiver of this requirement is allowed in rare circumstances with permission of the student's thesis advisor and the EECS Graduate Program Director.
- A maximum of 1/3 of the course credit hours completed to satisfy the degree coursework requirement may be earned outside of the EECS department. These outside courses must be approved in writing by the faculty advisor and the EECS Graduate Program Director prior to course registration. These courses may not include independent study, research, and seminar courses. Students who do not possess the equivalent of a B.S. degree in Computer Science, Computer Engineering or Electrical Engineering are generally urged to take the maximum amount of their graduate course work in EECS.
- A minimum of 6 credits must be completed at 7000+ level. 7000+ level coursework taken outside of EECS may be used to satisfy this requirement with the approval of the student's thesis advisor and the EECS Graduate Program Director.
- No more than ~~half of the credits~~ 9 credits towards the MS may be earned at another university, and in no case may the final experience requirement (thesis) be satisfied by work done mostly elsewhere.

4.4 Time Limit

Full-time and part-time students must complete all requirements for the MS degree no later than five years from the date of first registration. A student who exceeds this limit must request an extension. Extension forms are available at:

http://www.grad.uc.edu/file_pdf/RevisedRandEGraduatePetition.pdf

4.5 Formation of Thesis Committee

After a student has chosen their permanent research advisor, the faculty advisor guides the student in selection of a thesis committee. The MS thesis committee is composed of a minimum of 3 full-time faculty members with professorial rank. The student's permanent research advisor will be the chairperson of the committee. A majority of the faculty that comprise the MS thesis committee must be tenure track, full-time, UC faculty with Graduate Faculty rank at UC, and a full or joint (not secondary) appointment in the EECS Department. An appropriate committee member from outside the University of Cincinnati can be included with permission from the CEAS Graduate Office provided that the majority rule stated above is satisfied.

The major responsibility of the thesis committee is to evaluate the MS thesis written by the student and to approve or disapprove the final defense of the MS thesis. Other responsibilities include assisting in the advising of thesis research, and helping to develop the student's program of study, if requested by the thesis advisor and the student.

4.6 Thesis Submission, Defense and Acceptance

When the research is essentially completed to the satisfaction of the permanent research advisor, the student should prepare a final draft of their thesis. Guidance for preparation of the thesis document can be found on the University of Cincinnati Graduate School website (<https://grad.uc.edu/student-life/etd.html>) including links that address required order of pages within the thesis document and thesis formatting guidelines. It is the student's responsibility to ensure that their thesis document conforms to the guidelines imposed by the Graduate School to insure uniformity in thesis submitted to the Electronic Thesis/Dissertation (ETD) system.

The student should give the advisor sufficient time to review the final draft of the thesis before scheduling the final defense. After the advisor has reviewed the thesis, recommended changes have been made, and the final text and form of the document have been approved by the advisor, the student should prepare the thesis in the final form and submit copies to their thesis committee for evaluation and oral defense before the committee.

A final defense of the thesis is required of every student after they have fulfilled all other requirements of the MS program. The student, in consultation with their advisor, should schedule the thesis defense, which is presented in an open and announced meeting. The thesis advisor will instruct the student regarding specific materials that must be presented at the defense and will preside over the meeting.

A copy of the thesis should be in the hands of each member of the thesis committee **at least one week before the final defense** so that the committee members have ample time for a careful review. Failure to meet this deadline may result in rescheduling of the thesis defense date. All the members of the thesis committee should be present at the final defense.

Students must submit a one week public notice to the CEAS Graduate Studies Office, 665 Baldwin Hall, and also must post their public notice on the UC Graduate School's web site at www.grad.uc.edu. Both notices are required no less than one week prior to the thesis defense. If notice is not given the defense is not valid.

The thesis presentation is important and should be well prepared. The student is allowed approximately 30-40 minutes for the oral presentation and visual aids are recommended. Following the oral presentation, the thesis committee, other faculty, students, and any others are allowed to ask questions. At the conclusion of the discussion period, all those present other than the members of the thesis committee will be excused. The committee may then continue to question the student until they are satisfied that they have sufficient information to vote on whether or not the student should pass the thesis defense. The student's MS thesis committee will make a decision on this forthwith by vote. A majority of the committee must concur in the final decision. If the student does not pass the thesis defense, then the thesis committee in consultation with the Graduate Program Director will decide upon a future course of action.

There may be changes and additions or deletions required in the thesis as a result of the defense. These must be made by the student and approved by the advisor. The final corrected version must be submitted in electronic form by the date established by the CEAS Graduate School.

While not a formal requirement, successful MS students are expected to have at least one research paper in a journal or high-quality conference published or in advanced stages of acceptance by the time of their thesis defense.

There is no longer an expectation to produce bound copies of the final thesis document. If students and/or faculty choose to have a final copy of the thesis bound, resources for thesis binding can be

found online.

4.7 *Timeline for completion of the MS Degree*

The MS program of study can typically be completed in 2 academic years. Highly motivated students may be able to complete all required MS degree milestones early in their second year. Students who face significant research challenges may take longer than 2 academic years. The timeline below shows the significant MS degree milestones for the typical student.

MS Degree Milestones:

- Prepare Program of Study with support of Temporary Advisor during Department Orientation (attendance is mandatory)
- Attend Program Seminar I
- Choose research faculty advisor by the middle of the Spring semester of Year 1. Revise Program of Study if needed.
- Attend Program Seminar II
- Complete one semester of Practical Experience after all course requirements are completed.
- Obtain final approval of Program of Study by the EECS Graduate Program Director by the end of Year 1.
- Explore feasibility of MS Thesis Research project
- Fulfill research requirements as defined by the thesis advisor
- Write the thesis document.
- Establish MS Thesis Committee.
- Schedule final thesis defense, submit public notice one week prior and post on graduate school website
- Successfully defend MS Thesis Research project and submit the final approved version to the University system.
- Publish 1 manuscript in peer-reviewed scientific journal or competitive archival conference proceedings

4.8 *Master of Science GE-ACE Program*

In concert with the General Electric (GE) Corporation, EECS has established a special MS program entitled the GE Advanced Course in Engineering (GE-ACE) Program. This program awards advanced standing to GE employees admitted to this program that have successfully completed well-defined, in-house programs of study at GE whose content has been approved by the Department's faculty. The student is awarded advanced standing with the number of credits as defined below.

A student completes the remainder of their program of study for the MS degree by taking graduate courses from EECS and other CEAS departments. A student who is subsequently dropped from this program after completing the in-house (GE) courses may no longer receive advanced standing credit in the department for these GE in-house courses, but may remain enrolled in the MS degree program provided they maintain an adequate GPA and make adequate progress towards the degree.

Admission of a student by General Electric to this program does not imply admission to EECS. Each student must apply individually and directly, following normal application procedures. Admission is considered on a case-by-case basis; the Department retains the right to refuse admission to any student whom it considers unacceptable, even though the student may have successfully passed the in-house GE courses and be in good standing with GE in the ACE program. A student will be informed in writing of their admission status.

At the outset of their program of course work each student must submit and file a Program of Study approved both by GE and the EECS Graduate Program Director. No specific courses are required, but the student's program of study must contain a concentration of at least 18 credits of course work in a focused research area.

Subsequent changes in selected courses must be approved in advance by both parties (GE and EECS); unapproved substitutions will result in unapproved courses not being applied towards the degree requirements. Additionally, the student must specify in writing their selection of the thesis or project option. When the project option is selected, the specific project to be undertaken must be agreed to in writing by the student, GE and the faculty member serving as the project advisor. It is the student's responsibility to secure these approvals.

The program requirements for the Advance Course in Engineering ACE program are specified below:

Project Option

6 credits A courses at GE
4 credits B courses at GE
+ 18 credits course work at UC; (minimum of 6 credit hours must be 7000+)
28 credits total course work
+ 2 credits project (MS Project)
30 credits in total

Thesis Option

6 credits A courses at GE
4 credits B courses at GE
+ 14 credits course work at UC; 12 credits minimum in EECS
24 credits total course work
+ 6 credits thesis (Thesis/Dissertation Research)
30 credits in total

4.9 Master of Science in Computer Science Non-Thesis Program

This option allows students to obtain a MS degree in Computer Science without doing a thesis.

Students choosing this option are not eligible for the Graduate Incentive Award (GIA) or any other financial aid, including GA, TA or RA. They must complete 30 credit hours of graduate coursework. They must meet all the CS MS requirements, and take three additional elective EECS graduate courses in place of the thesis. Applications are accepted to this program in Fall semester annually. Spring semester admission can be opened on a requested basis. This option can be taken on a part-time basis, where students generally take 2 classes each academic semester. Students in this program must be admitted directly into it. Those originally admitted to the regular (thesis-based) MS program, the MEng program, or the Ph.D. program cannot transfer into this non-thesis MS program.

5 Requirements for a Master of Engineering (MEng) Degree

5.1 General Program Information

A Master of Engineering degree focuses on the practice of engineering in order to better serve working professionals. Rather than culminate in a research experience and a thesis, the MEng curriculum provides skills and expertise that enhance the individual's ability to contribute to the technical workforce in today's competitive environment.

Depending on a student's interest, the degree could add significant depth to an individual's understanding of the practice of engineering or the program could be constructed to focus on greater inter-disciplinary breadth if that is the educational objective of the student. The MEng degree also provides registered professional engineers an academically-based program to obtain the continuing education requirements to maintain licensure.

Students can obtain the Master of Engineering degree in the following areas:

Electrical Engineering Computer Engineering Computer Science

5.2 Application and Admission

Admission requirements for the MEng Program are the same as those for the MS Program. MEng applicants may request a waiver of some of the admissions requirements if they provide strong evidence to the EECS MEng Program Director that they have had sufficient experience to warrant a waiver. Potential applicants seeking a waiver of admissions requirements should discuss their admissions situation prior to submitting an application for admission.

5.3 MEng Tracks

Each student admitted into the MEng Program is assigned to a program track. Each track has a faculty advisor (track advisor) and specific course requirements, which can be found in the MEng Program Handbook, or from the EECS MEng Program Director. Students who wish to apply for a track change must apply to the EECS MEng Program Director at or shortly after Orientation, or as early as possible if the choice is made later. **There is no guarantee that track change requests will be approved.**

5.4 Advising

In addition to the EECS MEng Program Director, students can meet with the CEAS Manager of the Master of Engineering programs for initial academic planning and course recommendations. Each MEng track also has at least one dedicated Track Advisor who will provide guidance on track-specific courses. Each student will be assigned to a specific Track Advisor. Since the structure of the MEng program is more flexible than most graduate programs, it is very important that students meet with the specific Track Advisor or EECS MEng Program Director to establish the program of study early in the first semester of study.

Students seeking an MEng degree do not complete a thesis. Rather, there is a capstone project that is to be completed (see below for details). The student should meet with the EECS MEng Program Director and/or capstone course instructor in the first week of second semester (Spring Semester) regarding the project to seek guidance commensurate with the academic requirements. *It is not the responsibility of the advisor to identify a project for each student.*

Changes or exceptions to MEng requirements including course substitution, special topics, and credit hour distribution between core and track areas must be approved by the MEng Graduate Program Director and/or the CEAS Manager of MEng Programs.

The EECS MEng Program Director or the CEAS Manager of MEng Programs is required to sign off on graduation certifications for MEng students approving that they have met the MEng requirements for graduation.

5.5 *Basic Requirements*

The degree is based on the successful completion of a minimum of 30 credits of graduate-level course work. The curriculum is structured to provide a foundation of advanced engineering topics while allowing students flexibility to meet their specific educational objectives. The curriculum includes:

- Program core courses taken by all MEng students regardless of the track they pursue (2 courses providing 4-8 credit hours). The core provides skills in the effective practice of engineering recognizing that for experienced practitioners, effectiveness includes technical skills, project and task management skills, and interpersonal skills.
- Track required courses from the discipline of interest (3-5 courses providing 9-15 credit hours depending upon the track)
- Elective courses which permit breadth, depth, or interdisciplinary focus depending on student educational objectives (number of course credit hours required depends upon the track)
- Capstone project demonstrating applications of skills and synthesis of knowledge (0-4 credit hours depending on the options described below). If additional credit hours are taken they do not count towards a course requirement. With the approval of the EECS MEng Program Director, students can choose:
 - 1) to complete a project under the supervision of a faculty advisor, 2) to perform an internship or 3) to prepare a written paper under the supervision of a faculty advisor..

5.6 *Capstone Project*

The capstone project is focused on the application of principles and the practice of engineering and is not meant to be a mini-thesis. The capstone projects provide a mechanism to demonstrate a synthesis of knowledge and the application of advanced concepts learned in class to a specific problem. It is expected to take one semester to complete, and can take one of the following three forms:

- ***Project:*** A project is done under the guidance of a specific project advisor, and typically involves work on solving a specific problem, e.g., writing application software, analyzing data, etc. The student must identify the project and advisor by exploring available opportunities in a timely manner. includes a written report and a presentation. The report will be read and graded by the specific project advisor. If the project is performed in conjunction with work duties, the report and presentation should also be given to the student's employer.
- ***Internship:*** Students can choose to perform an internship if this furthers their learning and career goals. The internship must be related to the student's degree area. Students selecting this option will also prepare a report and submit it to the Track Advisor (assigned).

Internships will be approved for 3 months and can be extended for an additional 3 months with the approval of the advisor. International students can be approved for CPT to participate in an internship. Additional documentation is needed for the extension if requested. CPT cannot be done until two semesters of study are completed. CPT can only be done prior to or up until a graduation date. CPT will be terminated upon graduation.

- **Paper:** A written paper can be completed under the supervision of the MEng advisor. The paper will address a topic related to the discipline (track) and require the integration of multiple topics within that discipline.

Students should register for their Capstone Project in the Spring term. Detailed expectations for the spring’s Capstone Project course together with a series of assignments to help students complete the capstone projects will be given at the beginning of Spring Semester.

Students who seek to finish a project or paper during their second semester must work closely with the capstone advisor and / or other faculty member throughout the semester in order to complete the capstone by the end of the spring semester or the following summer semester. Please note that students can complete the project in the Summer or Fall term if needed.

5.7 Full Time MEng Schedule

The table below provides a sample schedule for MEng Students. It should be noted that the number of required courses for each track varies.

| | Fall Semester | Spring Semester |
|-------------------------------------|--|--------------------|
| Core Courses | Core Course #1 | Core Course #2 |
| Track Required Courses ¹ | Track Course #1 | Track Course #3 |
| | Track Course #2 | Track Course #4 |
| Elective Courses ² | Elective Course #1 Elective Course #2 | Elective Course #3 |
| Capstone Project | | Capstone Project |
| Credit Hours | 15 | 15 |

¹Discipline specific course

²At the discretion of the program, student and the advisor

The MEng program of study can typically be completed in 1 academic year, though an internship will typically be done in the Summer semester of that year. Full-time and part-time Students must complete all requirements for the MEng degree no later than five years from the date of first registration.

5.8 Transfer from MEng to MS or PhD

Students will be allowed to transfer from MEng status to MS or PhD status only after one full semester of residency as an MEng. Only students meeting *all* of the following requirements will be considered:

- A GPA of 3.5 or higher in the *engineering* graduate courses taken up to that point (excluding the core MEng non-engineering courses, seminars, research credits, and self-study research).
- A written application indicating the proposed objectives of the transfer.

- A written and signed commitment from an EECS faculty member to serve as the student's MS thesis advisor.
- Signature of the EECS Graduate Program Director.
- Satisfaction of any financial and other requirements imposed by the College of Engineering and Applied Science.

The GPA requirement is strictly enforced, and can only be waived by permission of the Graduate Program Director and Department Head under extraordinary circumstances (e.g., if a faculty member commits to supporting the student on a funded research project for the duration of their degree). Approval of a transfer is not automatic even if all requirements are met, and may be denied by the EECS Graduate Program Director or Department Head. If approved, the transfer is final and the student will not be allowed to transfer back to MEng except under extremely rare extenuating circumstances. Direct transfers into the PhD program will not be allowed unless the student's proposed advisor commits to funding them for the duration of their degree.

5.9 Graduation Requirements

Students must complete all the academic requirements of the program to graduate including:

- Minimum of 30 credit hours with no grades below a C
- Capstone project
- Minimum of 3.0 GPA
- 2/3 of courses needed for graduation with grade of B or higher (B- does not count)

In addition, students must complete the following forms, have them signed, and returned to the CEAS Graduate Office (665 Baldwin):

- Final program of study form
- Capstone Completion form

Students must apply online for graduation <http://grad.uc.edu/student-life/graduation.html> and pay the graduation fee even if a student does not intend to attend graduation ceremonies.

5.10 MEng Miscellaneous

Students must be registered every academic year until they graduate or go on approved OPT.

6 ACCEND Program for EECS Undergraduates

6.1 Basic Requirements

The Accelerated Engineering Degree, ACCEND, is a program offered by the College of Engineering and Applied Sciences for undergraduates with GPA greater than 3.2. The ACCEND program allows students to earn their undergraduate and master's degrees in a shortened time frame while still enjoying the benefits of UC's top five nationally ranked cooperative education program. After their first year in an engineering or technology degree program, qualified students are able to apply for admission to the ACCEND program. Students enrolled in ACCEND are able to earn their undergraduate and master's degrees in part from classes taken during their co-op placement.

Students in the program fulfill part of the requirement for additional classes by taking courses during their co-operative work assignments. These are generally done through distance learning or in the evenings and usually amount to about a third of the added courses. The remaining graduate courses are taken in lieu of advance placement credits (generally earned during high school) and by sacrificing one co-op assignment in favor of a full class load.

Degree combinations available within the EECS ACCEND program include:

- EE undergraduate and EE/CompE/CS MS or MEng
- CompE undergraduate and EE/CompE/CS MS or MEng
- CS undergraduate and CompE/CS MS or MEng
- EE/CompE/CS undergraduate and MBA

MS - The ACCEND programs that offer an undergraduate degree in engineering along with the Master of Science in an engineering discipline will appeal to students who are interested in research and greater depth in a particular engineering field. These students often go on to PhD programs or work in fields that require more specialized knowledge. The MS ACCEND track culminates in a research experience and thesis.

MEng - The ACCEND programs that offer an undergraduate degree in engineering along with the Master of Engineering will appeal to students who are interested in greater breadth in engineering and want to focus on the practice of engineering. These students often are seeking pragmatic skills and knowledge that will allow them to improve the contribution they make to a technical organization. The MEng provides a traditional coursework-based master's and does not include a thesis component.

MBA - The ACCEND programs that offer an undergraduate degree in engineering along with the Master of Business Administration will appeal to students who want to understand both the technical side of an organization and the business aspects of the organization. Students seek this program because it increases their value to an organization and prepares them to take on a management role earlier in their careers. For more information on the ACCEND Program including links to the program application and the ACCEND Graduate Handbook see the ACCEND program webpage on the CEAS graduate studies website

(http://ceas.uc.edu/programs_degrees/accelerated_engineeringdegreeaccend.html).

6.2 *Rules for ACCEND Students*

ACCEND student must apply for graduate student status in the year that they will take their first graduate level course that will count towards their graduate degree, e.g., if a 4th year student wants to take one graduate level course in the Fall of the coming academic year, they must apply for graduate status for the Fall of that year. Applications for Fall admission are open each year until August 1st. The link to apply is <https://grad.catalyst.uc.edu/apply/> . In the application, the student can upload a copy of their transcripts from Catalyst; an original transcript is not needed. The application will have a question, “Are you continuing to the AIM program?” The answer is YES. AIM/ACCEND are the same program types. The student should complete the on-line application and confirm their admission. From this point forward all graduate level courses will count towards their MS/MEng degree.

ACCEND student qualify for a maximum of 2 semesters of Graduate Incentive Award Funds (GIA). Students must take a minimum of 7 graduate credit hours and a maximum of 18 graduate credit hours to qualify for GIA funds.

ACCEND students do not qualify for GA/RA/TA support unless they have graduated with their BS degree. They do qualify to work as a student worker. The rate of pay for student workers is \$12.00/hour for undergraduate students who have not applied for graduate status and are not receiving a GIA scholarship, and \$14.00/hour for graduate-level ACCEND students that are taking a minimum of 7 graduate credit hours and receiving GIA funding.

If an ACCEND student is offered a position, they must let the business manager know that they are an ACCEND student and their registration status: an undergraduate ACCEND student not receiving GIA funds, or a graduate ACCEND student receiving his/her GIA funds. Students should be in their 5th year to be a graduate ACCEND student receiving GIA funds.

7 Requirements for Doctor of Philosophy (PhD) Degree

7.1 Basic Requirements

The Doctor of Philosophy degree is conferred on the basis of extended study and high scholarly attainment in a specific field of study. For the PhD degree, a minimum of 60 graduate semester credits are required beyond the MS degree (90 semester credits beyond the B.S. degree) including 30 credits for doctoral dissertation research, 2 credits of seminar, and 1 credit of Practical Experience. The student must write and defend a dissertation proposal to be admitted to doctoral candidacy. They must write and defend a doctoral dissertation in a public setting to complete their degree. The doctoral program is normally a full-time program throughout all of the course work and the dissertation. A minimum of three years of full-time study is required by the University and the Department does not encourage part-time studies in the PhD program.

The basic requirements and rules applicable to all PhD students are listed in Sections 3.3 and 3.4. All these must be followed strictly as required.

7.2 Direct Route to the PhD

Students entering the graduate program with a bachelor's degree (in accordance with the admission requirements of Section 2) and wishing to proceed directly into the doctoral program without obtaining the MS degree may do so by satisfying the requirements listed in Sections 3.3.1 and 3.4. No MS thesis is required.

Students committed to the direct route program, who subsequently decide to terminate their program before completing the PhD, may only receive the MS by satisfying the normal MS degree requirements.

7.3 Research Advisor

Dissertation research must be performed under the supervision of a research advisor, who must be a faculty member with a full, joint, or secondary appointment in the EECS Department. If the research advisor has a secondary appointment in EECS, the student must choose an additional full or joint appointment EECS faculty member as their academic advisor, who will work jointly with the research advisor to guide the student, and will be a member of the student's dissertation committee. The Chair of the student's dissertation committee must be a member of the University's Graduate Faculty (see Section 1.6).

7.4 Program of Study

In order to obtain a PhD from the Department of Electrical Engineering and Computer Science, a student must complete courses for the degree program (Electrical Engineering or Computer Science & Engineering) and meet the course requirements for the degree track in which the student is working. Additional courses to make up the total required for the PhD should be chosen in consultation with the student's advisor. Because of the need to complete the degree program and degree track required courses, each student needs to plan their program of study carefully. Required and recommended courses in each degree track are determined by the faculty comprising that track and approved by the Graduate Council. A student must get **prior** approval from their advisor and the

EECS Graduate Program Director for any deviation from the track requirements. ***Post-facto deviations will not be approved.*** A student who changes degree program or degree track will be expected to complete the courses required by the new degree program and track as of the date the change is made. Any deviations from this procedure must be approved in writing by the EECS Graduate Program Director in consultation with the Graduate Council.

It is the responsibility of both the student and their advisor to formulate a program of study to meet the objectives and needs of the student. An initial Program of Study Form for the first year should be completed by the student and approved by the EECS Graduate Program Director during the student's initial orientation, and a more comprehensive plan of study should be formulated with the approval of the student's faculty research advisor and the EECS Graduate Program Director once the student has an advisor. This program of study should contain both breadth of knowledge and depth of specialization. The final authority for a student's program of study is vested in the student's advisor and the EECS Graduate Program Director, but the program of study must meet the appropriate requirements for the degree program and degree track in which the student is working. Revisions of a student's program of study are to be expected but must be approved by their advisor and the EECS Graduate Program Director.

The Program of Study must be updated and approved by the student's research advisor in May of each year for the student to be eligible for a Graduate Incentive Award (GIA) in the following year.

A direct route PhD student is expected to complete their coursework within 5 semesters after enrolling in the PhD program. For students entering the PhD program with a Master's degree, coursework is expected to be completed within three semesters. The Program of Study submitted for approval should follow these guidelines, and serious deviations from this schedule must be approved by the EECS Graduate Program Director.

If a student does not have a BS or MS in the area they wish to pursue for their graduate degree (Computer Engineering, Computer Science, Electrical Engineering), they may be required to complete additional graduate or undergraduate course work in addition to the minimum graduate credits required for the PhD degree. The Department recognizes that, in such cases, the timeline for completion of coursework may be longer. A program of study can also be interdisciplinary, requiring course work from multiple schools. However, in such cases the student's faculty advisor should consult the student's dissertation committee during the development of their program of study, and the changes must be approved by the EECS Graduate Program Director.

Full-time students must be registered for a minimum of 15 graduate credits each semester excluding the summer. Courses taken on an audit basis are excluded from these numbers and do not count towards the degree. The student must include in their registration the appropriate department seminar in the Fall and Spring semesters of their first year; however, these credits are not counted towards the degree.

7.5 Formation of the Dissertation Committee

After a student has selected their dissertation research advisor, the advisor will guide the student in selection of a PhD Dissertation committee. The PhD committee is composed of at least 5 full-time members of whom a minimum of one must be from outside the EECS Department (external member). The committee must include at least 3 tenured or tenure-track faculty members with full or joint (not secondary) appointment in the EECS Department. The dissertation advisor will be the chairperson of the committee. If the chairperson is not a member of the Graduate Faculty, at least

two other members of the committee must be members of the Graduate Faculty. The external committee member may be a University of Cincinnati faculty member who does not have either a primary or joint appointment in EECS. It can also be someone who is either on the faculty at another institution or who has distinguished credentials that justify their inclusion as a member of the dissertation committee. The inclusion of any committee member from outside the University of Cincinnati must be pre-approved by the Graduate School through the CEAS Graduate Office in 665 Baldwin Hall.

The responsibilities of the committee include the following:

- Assisting the student in developing their program of study, if requested by the student's dissertation advisor.
- Evaluating the student's dissertation research proposal, its presentation and the student's defense, and the overall performance in the oral examination for admission to doctoral candidacy.
- Advising and assisting the student in dissertation research if requested by the student or by the faculty advisor.
- Evaluating the PhD dissertation written by the student and approving or disapproving the final defense of the dissertation.

7.6 Dissertation Proposal and Oral Examination

On or near the completion of the doctoral course requirements, the student must prepare, in consultation with their faculty advisor, a detailed and well-written proposal of the doctoral dissertation research to be undertaken. A proposal template and format guidelines are available in the current Graduate Students section of the EECS website. The dissertation proposal must then be presented in an oral presentation (approximately 50 minutes) before the dissertation committee and defended to the committee's satisfaction. In general, the oral examination will be restricted to matters pertaining to the dissertation proposal and its presentation. The written proposal must be submitted to the advisor for review and evaluation well in advance of the presentation. After the advisor's approval, the copies of the written proposal must be given to all the members of the dissertation committee at least one week before the oral presentation.

The proposal is meant to describe and justify proposed scholarly research work based on the state-of-the-art (as substantiated by the bibliography in the written proposal) and preliminary research results. It is not meant to be a description of substantially already completed dissertation research. Typically, a dissertation proposal will be no more than 15-25 single-spaced pages including figures and tables but exclusive of the bibliography. It should also lay out a clear statement of remaining work and a timeline for completion. Once the proposal is approved, the student's advisor and dissertation committee are expected to hold the students to the promised work and timeline unless a justifiable case can be made for substantive changes.

The student may register for a maximum of 6 credits of Doctoral Dissertation Proposal, which may be counted towards the doctoral coursework requirements to receive academic credit for the proposal.

The dissertation proposal presentation and the oral examination are to be in an announced meeting open to the dissertation committee, as well as EECS faculty and other invited faculty, with

arrangements made by the faculty advisor. Following the oral presentation, the dissertation committee and any other faculty present will be allowed to ask questions. After the question and discussion period is concluded, all those present other than the committee members will be excused and the committee may continue questioning the student in a closed-door session until they feel they have sufficient information to determine an outcome. After the student is asked to leave the room, a vote will be taken to determine whether the student has passed the presentation and oral exam. The majority decision of the dissertation committee will determine the outcome. At this point, provided the student has completed all the course work, and completed any special requirements imposed by the dissertation committee, the student will be formally accepted into doctoral candidacy. The dissertation committee may, at this time, direct the student to modify their research plans in specific ways, and these requirements will be a factor in the committee's evaluation of the student's final dissertation.

In general, direct route PhD students are expected to defend their proposal no later than their sixth semester in the program, and preferably in the fifth. PhD students with a Master's degree are expected to defend their proposal no later than their fourth semester in the PhD program. Thus, it is extremely important for all PhD students to obtain a research advisor by the end of their first Spring semester, so they have adequate time to plan their research and write a proposal on schedule. Significant deviations from this schedule may elicit a query from the EECS Graduate Program Director and require justification.

7.7 Admission to Doctoral Candidacy

All doctoral students must meet the following requirements for admission to doctoral candidacy:

- Successful completion of all doctoral course work with a grade point average of at least 3.00.
- Selection of a dissertation advisor and successful formation of a dissertation committee.
- Successful completion of the dissertation proposal and passing of the oral examination.
- Completion of any special requirements imposed by the PhD dissertation committee.

Acceptance into candidacy will be formally indicated and the student will be so notified by letter from the University Dean of Graduate Studies.

7.8 Time Limits and Residency

The doctoral degree requires, at a minimum, the equivalent of three years of full time graduate study. The residency requirement is stated in the University Graduate Handbook. All full-time students meet the residency requirement. Because of this requirement the Department does not encourage part-time studies in the PhD program.

All requirements for the PhD must be completed within nine (9) years of initial enrollment. A student's candidacy will automatically terminate if they fail to register appropriately during an academic year. The Department requires that a minimum of 7 months must elapse between admission to doctoral candidacy and the receipt of the PhD degree.

7.9 Dissertation Submission, Final Defense, and Acceptance

Dissertation research is to be done in residence. The research must be completed, the dissertation written, and successfully defended before the PhD is conferred. The primary requirement of a

dissertation is that it shows evidence of high scholarly attainment through original and independent research work. The acceptability of a dissertation depends upon its quality rather than the time and credit hours spent on the research work.

When the dissertation research is completed to the satisfaction of the dissertation advisor, the student should prepare a final draft of the PhD dissertation. This draft should be submitted to the dissertation advisor for critical review and evaluation before scheduling the final defense of the dissertation. The student must give the advisor sufficient time to review the draft of the dissertation.

After the advisor has gone over the draft and has approved the document, the student should prepare the dissertation in the final form and submit a copy of the completed dissertation to each dissertation committee member for critical evaluation *at least one week* before the final defense. Information concerning the required dissertation format, reproduction, and other regulations for preparing a dissertation is available from the University of Cincinnati Graduate School at <https://grad.uc.edu/student-life/etd.html>

A final defense of the dissertation (final oral examination) is required of every doctoral candidate after they have fulfilled all of the other requirements of the doctoral program. This examination is administered by each student's dissertation committee and is restricted to the content of the dissertation and closely related subject matter. The dissertation advisor (who is also the chairperson of the committee) will help schedule the final dissertation defense in consultation with the other committee members. All the members of the dissertation committee should be present at the final defense of the dissertation. The defense is a public event, and is open to other faculty and students. The student or the committee members may also invite personal guests to the defense.

Students must submit a 2 week public notice to the CEAS Graduate Studies Office, 665 Baldwin Hall and also must post their public notice on the UC Graduate Schools web site at www.grad.uc.edu. Both notices are required no less than two weeks prior to the dissertation defense. If notice is not given the defense is not valid.

The dissertation defense includes approximately 45-50 minutes of oral presentation of the dissertation research by the student, followed by questions and comments from members of the dissertation committee. The dissertation presentation is important and should be well prepared in consultation with the faculty advisor. Visual aids are highly recommended.

After the committee has completed its questioning, attending faculty, students and others will be allowed to pose questions. At the conclusion of the question and discussion period, all those present other than the dissertation committee members will be excused. The committee may then choose to continue questioning of the student until they are satisfied that they have sufficient information to make a decision regarding the defense outcome. The candidate will then leave the room, and the dissertation committee will make a decision forthwith by vote regarding the acceptability of the dissertation and its defense, and report to the candidate. At least a majority of the committee must concur in the final decision.

If the student does not pass the final defense of the dissertation, the committee, in consultation with the EECS Graduate Program Director, will decide upon a future course of action. If the student passes, the committee will complete and sign the dissertation approval page and other EECS forms and forward them to the Graduate Program Director.

There may be major or minor changes and additions or deletions required in the dissertation by the committee. These must be made by the student and approved by the dissertation advisor before the student can be certified. The final corrected version must be submitted in electronic form by the date

dissertations are due for the appropriate semester.

While there is no longer an expectation to produce bound copies of the final dissertation document, if students and/or faculty choose to have a final copy of the dissertation bound, resources for dissertation binding can be found online. It is also generally expected that the doctoral candidate will write up the dissertation research as papers for publication in refereed journal or for presentation at a conference where papers receive a comparable review. PhD candidates are expected to have one or more papers published before their final defense.

7.10 Timeline for Completion of the PhD Degree

The Direct Route PhD program can be completed in 4-5 academic years. The PhD program beyond the MS degree can typically be completed in 3 academic years. Highly motivated students may be able to complete all required PhD degree milestones in less time than the typical completion timeline. Students who face significant research challenges may take longer than the typical completion time. The timeline below shows the significant PhD degree milestones for the typical student.

PhD Degree Milestones (3-5 years):

- Prepare Program of Study with support of Temporary Advisor during Department Orientation
- Attend Program Seminar I in Fall of Year 1.
- Choose research faculty advisor by the middle of Spring semester in Year 1.
- Revise Program of Study if needed.
- Attend Program Seminar II in Spring of Year 1.
- Complete one semester of Practical Experience after all course requirements are completed.
- Explore feasibility of dissertation Research project during Summer of Year 1 and Fall of Year 2.
- Obtain final approval of Program of Study by the EECS Graduate Program Director by the beginning of Year 2.
- Finalize feasibility studies of PhD dissertation research project and complete degree coursework.
- Write dissertation proposal based on EECS Proposal Guidelines
- Establish PhD Dissertation Committee (at least 5 faculty -- majority from EECS faculty plus 1-2 outside experts)
- Schedule and pass PhD proposal defense and oral exam to advance to PhD candidacy.
- Fulfill research requirements as defined by the dissertation proposal.
- Publish one or more manuscripts as first author in peer-reviewed scientific journal or major conference proceedings.
- Present research results at one or more major conferences.
- Write the dissertation document.
- Submit public notice of final defense 2 weeks prior and post on graduate school website
- Successfully defend PhD dissertation.

8 Registration and Grades

8.1 Program of Study Form

Newly admitted graduate students are required to attend the CEAS Graduate Student Orientation and the EECS Department Orientation before classes start in the Fall semester. At these orientation meetings, general CEAS and department policies will be discussed. A temporary advisor will be assigned to all students at this time. By default, the temporary advisor will be the EECS Graduate Program Director unless otherwise specified. The temporary advisor and faculty members from each degree program will be available during the department orientation to answer questions and assist students in course selection. Each student will keep their temporary advisor until a permanent research advisor is chosen. With the temporary advisor, the student will determine a preliminary program of study and fill out the Program of Study Form for the first year. A final and complete Program of Study will be filled out by each student after they have a research advisor and have advanced further into their coursework. This Plan of Study must satisfy the requirements of the student's degree program unless a deviation is authorized explicitly by the advisor and the EECS Graduate Program Director using an orange change form.

8.2 Registration

Only after the student has obtained the signature of the advisor on the Program of Study Form and submitted a copy to the CEAS Graduate Program Coordinator should the student register for courses. The preliminary Program of Study filled out during the orientation is a planning document, and the student may take courses other than those listed in it, *provided that the courses fall within the requirements of the student's degree program as listed in this Handbook*. Any deviations beyond that must be approved by the student's advisor and by the Graduate Program Director using an orange change form. It is the student's responsibility to ensure that required courses in the program are taken and that any remedial course work is done as early as possible.

8.3 Changes in Registration

The deadlines for any changes (Add/Drop) in registration are listed each semester on <http://www.onestop.uc.edu/calendars.html>. An instructor may withdraw a student from a course when excessive absences have occurred. The College of Engineering and Applied Science (CEAS) enforces deadlines, and only the most extreme and unusual circumstance would justify a deviation.

Any changes that conflict with the student's formal Plan of Study after it has been submitted must be authorized by the student's advisor and the EECS Graduate Program Director on an orange change form. Failure to do so may affect completion of the degree or the renewal of any financial aid.

8.4 Full-Time Course Load

Full-time graduate students must register and maintain a minimum of 15 program approved graduate credits in each semester of the academic year. These credits include seminars, self and independent study, research, and thesis/dissertation research, but courses taken on an audit basis are excluded. Withdrawing and falling below 15 credits hours will cancel any Graduate Incentive Award (GIA) or other financial aid that the student has, and the student will be responsible for payment of any fees

and tuition resulting from this. Once a student has completed all course work and has sufficient thesis/dissertation research credits for their degree, they are eligible to go on reduced course load. For international students this means registering for one credit hour each Fall and Spring semester until graduation. For US students, this means registering for one credit hour each Fall and Spring semester that they are on campus working towards completion of their thesis/dissertation research. US students may drop to one credit hour per academic year if they are working off-campus to complete the writing of their thesis/dissertation document.

8.5 *Part-time Course Load*

Part-time graduate students must register for at least one credit during the Fall semester of each academic year to remain active in the EECS graduate degree programs. However, it is generally expected that every part-time student will take at least one course per semester or register for thesis/dissertation research to complete the degree program within the time frame prescribed by the University. Registration is required for at least one credit hour during a semester of the academic year in which the student graduates.

8.6 *Changes to Part-time/Full-time Status*

A student wishing to change between part-time and full-time status must submit a request for this change using the appropriate change form. The reason for the request must be included and the change must be approved with signatures from the faculty advisor and Graduate Program Director. International students must maintain full-time status and cannot switch to part-time status.

8.7 *Students Receiving Financial Aid*

Students receiving a Graduate Incentive Award (GIA), a Graduate Assistantship (GA), or other financial assistance must maintain full-time status. If a student withdraws from a course during the semester so as to fall below the minimum 15 program approved graduate credits, they may be liable for tuition for that semester. Students with a GIA must also pay for any credits over 18 credits, including audit credit hours.

For more information and guidelines applicable to students receiving financial aid, see Section 10.

8.8 *Grading Policies*

- All required or elective coursework that counts toward a Certificate, MEng, MS, or PhD degree must have a letter grading option (A, A-, B+, B, B-, C+, C, or F.)
- At least 2/3 of the graduate credits of required course work necessary for a degree must be at a level of B or higher (B- is 2.67 credits and is below a B).
- A student must maintain a cumulative GPA of 3.0 or better in required course work.

A student who fails to maintain the required GPA will usually receive a warning and will be placed on academic probation with specific instructions on how to avoid dismissal by a specific date. Failure to meet these requirements by the designated time will result in dismissal from the graduate program.

8.9 I, IP, SP, UP, NG, X and F grades

If a grade of incomplete (I) is assigned at the end of a course, the student must clear the incomplete from the record as soon as possible and at most within one calendar year. It is the student's responsibility to ensure that the work is completed and that they discuss the grade change with the instructor. After one calendar year, the grade lapses to a failure grade called I/F. No student can graduate with an I, IP (in progress), SP (satisfactory progress), UP (unsatisfactory progress), X (unofficial withdrawal), or NG (no grade reported) on their record unless this is approved explicitly by the Associate Dean of the Graduate School, which will only be done in exceptional circumstances. A student having a grade of F in any required course will not be considered to have completed the requirement of that course for the degree. The student must repeat that course and receive a grade of C or better to graduate without approval from the Associate Dean of the Graduate School. However, in this case, the original F still remains on the transcript alongside the new grade, and is still counted in the calculation of the student's GPA.

A student who completes a course and either did not receive a grade, or received an F or I grade may not subsequently withdraw from the course to avoid grade point average difficulties without prior advisor permission. Such permission will ordinarily not be given except in rare circumstances where the student can provide adequate justification, such as a physician's written, dated, and signed statement if a medical reason is claimed.

It is the student's responsibility to know these rules and make sure that any grades that need modification are updated in time.

8.10 Audit Regulations

Admissions and conditions for participation in audit courses are at the discretion of the instructor of the course, who is not obligated to accept a student for audit. Students must follow any Audit requirements set by the instructor. Grades that an instructor can give for an Audit class are "T" (for satisfactory completion of Audit requirements) or "F" (Unsatisfactory completion of Audit requirements). It is the student's responsibility to clearly understand the Audit requirements of the course.

Audit credits do not count toward degree requirements or full-time status. However, they do count for tuition purposes. Hence a student on a GIA/GA will be assessed for any credits over 18, including audit hours. A student cannot take a course for credit after having audited it in a prior semester.

8.11 Seminars

Seminars are offered to familiarize the students with research done inside/outside of the EECS Department and to help students develop professional skills necessary for successful completion of their degree program. Attendance at the seminar is required of all first year MS and PhD students for Fall and Spring semesters. Specific requirements that each student needs to complete for a passing grade varies among the degree programs and will be announced during the first meeting of the seminar. Attendance will be taken and missing more than one seminar class may result in an irreversible "F" grade.

8.12 *Independent Study, Research Courses*

EECS offers several graduate courses that can be taken on an individual basis with a separate section number allocated for each faculty member. These courses serve different purposes:

Self-Study Research: First year students who have not been assigned a permanent advisor may register for the appropriate section of this course with the approval of the EECS Graduate Program Director. Students may register for a maximum of 9 credits per semester in order to maintain full-time status. The grade of P is given for Self-Study Research, but the credits do not count towards MS or PhD degree course requirements.

Thesis/Dissertation Research: This course may be taken for 1 to 18 credits each semester while the student is engaged in research for the MS thesis or doctoral dissertation under the supervision of their permanent research advisor.

Independent Study: Individualized study under the direction of a faculty member must be arranged in advance between a student and a faculty member with mutual consent and agreement on the requirements for earning the credits. With the approval of the EECS Graduate Program Director and the CEAS Graduate Office, a student may register for a maximum of 6 credits per semester in order to maintain full-time status. Approval of each Independent Study course requires the following:

- Written consent by the student's research advisor.
- Submission of a syllabus, plan of study and grading basis signed by the student and the faculty teaching the class.

One 3-credit Independent Study course may be counted as an elective course in satisfying a student's graduate coursework requirement.

Doctoral Dissertation Proposal: Individualized study and research taken for 1 to 6 credits per semester for the purpose of preparing the doctoral dissertation proposal and its defense before the student's doctoral advisory committee. A maximum of 6 credits may be counted towards the total credit requirement. This should not be used on a regular basis in place of Thesis/Dissertation Research.

9 Graduation

Students may graduate at the end of any semester including the summer semester provided they meet the necessary degree requirements and all Department and University deadlines. Students need not be registered for any courses in the semester in which they graduate provided that they have been registered for at least one credit at the graduate level in their graduate program in the academic year in which they are graduating. All international students must maintain a minimum registration of 1 credit hour every academic semester (Fall and Spring) until graduation.

The initial step in the graduation process consists of the student formally applying for graduation. Applications can be done on line at <http://www.grad.uc.edu/graduation.aspx>. This must be done by the announced deadline. A deadline schedule can be found at <http://www.grad.uc.edu/graduation-deadlines.aspx>. If the student is unable to meet all of the graduation deadlines they must reapply at the beginning of the following semester in order to graduate in that semester. There is a fee to apply for graduation. Students must pay the fee every time they apply for graduation. The fee is non-refundable if the student fails to meet the graduation deadlines.

The graduation process for MS and PhD includes:

- Following and completing all the guidelines found at the graduate school web site at <http://www.grad.uc.edu/graduation.aspx> and all guidelines required from the CEAS at http://www.ceas.uc.edu/Graduate_Studies/CurrentStudents/GraduationRequirements.html
- Resolving all grade issues on record. The Department must certify not only that students have met all degree credit requirements, but that any grades of I, IP, SP, and NG have been resolved. Graduating with any of these or an F grade on the transcript requires a special waiver petition to the Graduate School, which is frequently denied.
- Meeting with the thesis/dissertation advisor and deciding on an acceptable date and time for the final defense. Verifying with the committee members that they all will be available. Scheduling a room and confirming the scheduling of the defense in writing with the advisor and committee.
- Submitting a Public Notice of Final Defense of Thesis/Dissertation form. For PhD students this notice must be given two weeks prior to the final defense. For the MS degree, the public notice must be submitted one week in advance. If notice is not given, the thesis/dissertation defense is not considered valid. Public notices are also required to be posted on the graduate school website at www.grad.uc.edu. They must be posted on this website 2 weeks prior for PhD and one week prior for MS.
- Preparing completed copies of the thesis/dissertation including all chapters and sections appropriately numbered, and all figures, tables, equations, etc. in final form (subject to committee recommended changes). The thesis/dissertation must be prepared in accordance with University guidelines. The student should consult these guidelines before writing the thesis or dissertation. Guidelines can be found at <http://www.grad.uc.edu/index.cfm?fuseaction=home.ETDSubmission>.
- Delivering a final copy of the thesis/dissertation to each member of the committee at least one week before the defense for an MS thesis and at least two weeks before for the defense

of a doctoral dissertation.

- Submitting the thesis or dissertation through Blackboard on SafeAssign. Approval of the SafeAssign from the student's advisor must be obtained to graduate.
- Obtaining instructions on electronic submission and downloading the necessary forms from <http://www.etsd.uc.edu/> . Additional help is available at gradhelpdesk@uc.edu
- At the defense, the following forms must be signed by the committee and the advisor:
 - The Committee Approval Form generated at <http://www.grad.uc.edu/Roadmap/>
 - EECS Thesis or Dissertation Defense Form located at http://www.ceas.uc.edu/content/dam/ceas/documents/EngGrad/CEAS_Defense_Forms_2010.pdf
- All final corrections required by the advisor and committee must be incorporated in the thesis/dissertation before electronic submission and binding can take place. The final corrected version must be submitted in electronic form in accordance with the instructions provided by the CEAS Graduate School.

In order to graduate at the end of the semester, a student must complete all of the above steps and meet all of the above deadlines.

The graduation process for MEng students includes completion of the following forms, signed and return to the CEAS Graduate Office (665 Baldwin) by the set deadline:

- Final program of study form
- Capstone Completion form

The EECS Graduate Program Director certifies to the CEAS Graduate School that all requirements have been met before the student can graduate.

Finally, every doctoral candidate is expected to attend the hooding ceremony preceding commencement. At this ceremony, the advisor hoods the student as a mark of the distinction accompanying the doctorate.

10 Financial Aid

The Department of Electrical Engineering and Computer Science awards tuition scholarships to incoming and continuing students for the purpose of assisting them in the pursuit of their degree objectives. Some students may be awarded an Assistantship in addition to the tuition scholarship. Below are a description of the Assistantships and tuition scholarships.

10.1 Graduate Assistantship (GA)

Graduate assistantships – including Graduate Teaching Assistantships (TA) – are available to qualified full-time EECS graduate students including incoming first year graduate students and are normally accompanied by a full-time tuition scholarship. The Graduate Assistant is required to provide at least 20 hours per week of service in teaching, research, and/or other work as stipulated in the award. The student is expected to carry out assigned duties in a professional manner, regardless of what those duties may be. These assistantships are usually for a 9-month or 2-semester period with the possibility of the student earning additional compensation during the three summer months.

Continuation of the assistantship award beyond the initial 9-month or 2-semester period is not implied.

Appointments and renewals are determined by the EECS Graduate Program Director or another designated EECS faculty member in consultation with the Graduate Council on the basis of the Department's needs in teaching and research as well as the student's performance and availability of funds. The student must normally register for at least 15 program approved graduate credits per semester to receive this award. Failure to register full time can result in student repaying all funds received. Students on reduced load after completing their graduate coursework must get explicit written approval from the CEAS Graduate Office in order to be considered for a TA or GA. Students with more than 174 credit hours are not eligible to receive a GA or TA.

10.2 Research Assistantship (RA)

Research assistantships are available as a result of grants and contracts obtained by faculty members doing sponsored research. RA appointments are available for graduate students to participate in particular research projects, which may often serve as thesis/dissertation research topics. Many RAs go to students who have finished one year of study in the department but first year graduate students with strong research potential may also be considered.

These assistantships are normally awarded either for 9-months (sometimes with the possibility of additional compensation during the three summer months) or for 12 months. Appointments for a shorter term are also possible. A tuition scholarship usually accompanies a research assistantship but the semester general fee and health insurance premium are not included.

Awards are made directly by the faculty member leading the research project in consultation with the EECS Graduate Program Director. The RA is required to devote at least 20 hours per week of effort to the research project to which they are assigned. Continuation or termination of the appointment is decided by the faculty advisor and/or principal investigator on the basis of the availability of funds and the student's progress in research and academic areas. The student will be notified by letter of the amount and period of support. Students with RA positions must be registered full-time unless they

have reached the maximum number credit hours of 174, after which they may be on reduced course load.

10.3 Graduate Incentive Award (GIA)

The Department awards tuition scholarships (GIA) that pay for all or part of the full-time tuition but do not cover the general fee, the ITIE fee, or the premium for student health insurance, all of which must be paid by the student. The GIA is awarded each semester and is not available in the summer semester.

Awarded by the EECS Graduate Program Director in consultation with the Graduate Council, GIA is available to qualified full-time MS/PhD graduate students in the Department on a competitive basis. The student must register for at least 15 program approved graduate credits per semester and the GIA may be renewed each semester or on a yearly basis, subject to availability of funds, the student's progress, and completion of the degree requirements. If a student is not registered for 15 program approved graduate credits, the GIA can be removed at any time during the semester and the student will be responsible for any fee and penalties incurred due to the removal of the GIA.

GIA Course Load Guidelines

- GIA recipients must be registered for 15 graduate credit hours in the College of Engineering and Applied Science (CEAS) ONLY
- Students can register for up to a maximum of 18 credit hours as part of their GIA. Costs for more than 18 credit hours will be the responsibility of the student.
- GIA recipients must maintain a 3.0+ grade point average (GPA.) If a student drops/withdraws from classes, and falls below 15 credit hours after the 14th day of an academic term, the GIA will be removed and the student may be required to pay 100% of tuition and fees.
- International students on reduced course load must be registered for one credit hour in their program EVERY academic semester until they graduate or are on Optional Practical Training (OPT.)
- PhD students who receive more than 4 semesters of GIA funding cannot change to the MS program without permission of the advisor and the Graduate Program Director (see Section 2.1.2).
- Students who have taken 174 credit hours thereafter become ineligible to receive a GIA.
- Students must be registered each academic semester if they are on campus. The only time a student does not have to be registered is if they will not be on campus at all during the semester.
- Students on CPT must be registered for the duration of their CPT.
- If a student is going to drop and add classes, the class should be added BEFORE dropping a class. When adding/dropping classes, students ***must not*** go below 10 credit hours or above 18 credit hours even temporarily to avoid the risk of automatically triggering complications. Adding/Dropping courses can be done online during the first 7 days of the term. After day 7 it is best to do this on an add/drop form.

- If a student wishes to register for any course outside of their program/college, they must request permission to enroll using a change form. The request must include a justification for the request and include a signature from the student's advisor and the Graduate Program Director. The completed form should be submitted to the CEAS Graduate Office for approval. Failure to comply with this will result in the cancellation of the GIA.

Please see the CEAS Graduate Program Coordinator in 665 Baldwin Hall if you have any questions regarding any of these issues.

10.4 Excessive Credit Hours

The Ohio Board of Regents denies state subsidy for graduate students who have earned more than 174 graduate credit hours. Graduate students whose graduate credit hours at the University of Cincinnati exceed 174 are not eligible for financial aid from general funds (GIA or GA).

10.5 Summer Support

The University of Cincinnati awards Summer Research Fellowships to a number of full-time graduate students in the summer for two-month duration. Fellowships are awarded on a competitive basis based upon proposals for research projects, the student's academic record, and faculty recommendations. Students are required to submit a report to the University Dean's Office after the summer semester, detailing the accomplishments under the Fellowship. Information regarding the Summer Research Fellowships will be sent out to the student email listserv in December/January each year.

10.6 Renewal of Financial Aid

Financial awards are made for a fixed term with the possibility of renewal if 1) sufficient funds are available, 2) the student is making satisfactory research progress, and 3) subject to the Department's needs in teaching and research. The receipt of an award does not imply a commitment by the Department for subsequent awards. In particular, teaching and research assistantships are awarded for a specified period with the term and amount of the award included in the letter of offer to the student. If there is to be a continuation of the award beyond the specified period, the student will be advised in writing with a subsequent letter of offer. The awarding of financial aid, either as a new award or the continuation of previous support, is subject to the availability of funds and any restrictions that may apply.

The funds for GA, GIA, and Doctoral GIA are allocated to EECS every year by the University on a competitive basis, based on the quality of graduate studies and research in the Department. The best assurance that a student has regarding financial assistance is to devote their best efforts toward high scholastic achievement and the best possible progress toward the completion of the degree objective.

Since school funds for teaching assistantships are very limited while funding from grants and contracts is more extensive, students should discuss the possibilities for research assistantship support with faculty members when considering the selection of a permanent research advisor.

11 Advising

11.1 The Research Advisor

Every MS or PhD student must choose a faculty advisor to guide their thesis/dissertation research. Each degree program will choose one or more faculty advisors to temporarily assist new students and each student will be assigned one of these temporary advisors. The student will keep this advisor until they have been accepted as a student by a permanent research advisor. Unless otherwise specified, the temporary advisor for MS and PhD students is the EECS Graduate Program Director.

Choosing a permanent advisor is one of the most important things a student will do, and so this choice should be made carefully, with both student and advisor taking into account the research interests and preparation of the student, the courses the student has taken in the Department so far and their performance in these courses, the research interests of the advisor, and the ability for student and advisor to interact successfully with one another. Each degree track will provide opportunities for first-year students to learn about the work being done by the faculty in that area, usually through the seminar course. Students are also encouraged to make appointments with individual faculty members to discuss their research projects and the prospects for the student's participation in that work. The student is responsible for completing all required courses and other requirements necessary to obtain the degree they are working toward.

A student may choose a permanent faculty advisor as soon as they wish and the prospective advisor agrees. The choice should occur within 9 months of the student's entrance into the program. The CEAS Graduate Program Coordinator and the EECS Graduate Program Director will facilitate this process. If the student is unable to find an advisor, the Graduate Program Director will work with them and the faculty to identify a permanent advisor. In all cases this process must be completed by the end of the spring semester. The chosen faculty advisor must be a faculty member with a full, joint, or secondary appointment in the EECS Department. If the research advisor has a secondary appointment in EECS, the student must choose an additional EECS faculty member as their academic advisor, who will work jointly with the research advisor to guide the student, and will be a member of the student's thesis/dissertation committee.

11.2 Change of Advisor or Degree Track

Occasionally a student may wish to change the degree track and/or the permanent faculty advisor. The rules for change in the student's degree track are detailed in Section 2.1.2.

A student who already has a permanent research advisor must obtain written approval from the advisor to request a change of advisor or degree track. No requests for changes will be considered without such approval. The advisor may require the student to complete specific remaining work, which the student has to complete, including any work for which the student has received a Research Assistantship. In some cases, a change in advisors may affect the financial aid the student is receiving. The Graduate Program Director will sign the change request form only after the student, the old advisor and the new advisor have all signed the change request form. The form should then be submitted to the CEAS Graduate Office where it will be placed in the student's Department file. Individual cases which cannot be resolved according to these procedures will be referred to the Graduate Council for resolution.

11.3 Advisor for MEng Students

Students in the MEng program will be assigned an advisor at the time of initial Orientation, and will continue being advised by this advisor for the duration of their program. By default, this advisor in the EECS MEng Program Director. However, students may choose to do their capstone project under the guidance of any EECS faculty member.

11.4 Advisor for Part-time Students

Part-time students should follow the procedures listed in Section 11.1 to find a permanent faculty advisor. Part-time students may initiate the search near the completion of their required course work but must have their faculty advisors chosen by the time they finish the course requirements for the degree.

11.5 Duties of the Advisor

While the student is encouraged to consult with other members of the faculty with regard to thesis/dissertation work, the faculty advisor has final authority and responsibility to guide the student's research work as they believe appropriate. The steps for formation of the MS thesis and PhD dissertation committees are listed below in Sections 4.5 and 7.5 respectively.

The primary responsibilities of the faculty advisor are:

- Developing a program of study in cooperation with the student. The faculty advisor has the authority for final approval of a student's program of study; however, the program must be in agreement with the rules and regulations of the EECS graduate program and must be approved by the EECS Graduate Program Director (GPD).
- Reviewing the student's progress and revising the program of study (if required) each registration period.
- Submitting recommendations (positive or negative) for financial aid for the student to the Graduate Program Director.
- Helping to form the student's thesis/dissertation examining committee in consultation with the student.
- Assisting and guiding the student in the performance of their thesis/dissertation research.
- Arranging the doctoral proposal defense and reporting the results to the CEAS Graduate Program Coordinator.
- Arranging the thesis/dissertation defense, and reporting the results to the CEAS Graduate Program Coordinator

12 Practical Experience and Training

12.1 Practical Experience - 1 credit hour

The required Practical Experience credit provides the graduate student with the opportunity to gain experience by either working off-campus with a company or on-campus. It is a required course for all MS and PhD students, requiring one semester of work, and should only be done once all course requirements are completed. The CEAS Graduate Coordinator must pre-approve the suitability of the experience (relation to the thesis/dissertation topic), employment period (three month maximum), and assign a Pass/Fail grade at the end of the semester or upon completion of the practical experience.

The student's advisor can waive the off-campus industrial requirement and allow on-campus practical experience such as classroom teaching, applied work, STEP program, etc. If the student is an international student and will be working off campus, they must follow the curricular practical training (CPT) procedures described below. The three-month time period used to complete Practical Experience will count as part of the total CPT allowable by the College (6 month maximum total.)

Forms can be found at:

http://www.ceas.uc.edu/Graduate_Studies/CurrentStudents/GraduateSchoolForms.html

12.2 Curricular Practical Training (CPT)

Definition: CPT is authorized and defined by the United States government in the Code of Federal Regulation (C.F.R), Title 8, Section 214.2 as:

“Curricular practical training. An F-1 student may be authorized by the DSO to participate in a curricular practical training program that is an integral part of an established curriculum. Curricular practical training is defined to be alternative work/study, internship, cooperative education, or any other type of required internship or practicum that is offered by sponsoring employers through cooperative agreements with the college. Students who have received one year or more of full time curricular practical training are ineligible for post-completion academic training. Exceptions to the one academic year requirement are provided for students enrolled in graduate studies that require immediate participation in curricular practical training. A request for authorization for curricular practical training must be made to the DSO. A student may begin curricular practical training only after receiving their Form I-20 with the DSO endorsement.” [8 C.F.R. 214.2 (f) (10) (i)]

The University of Cincinnati International Student Services Office (ISSO) and the College of Engineering and Applied Science (CEAS) restate C.F.R. 214.2 (f)(10)(i) as:

“Curricular Practical Training is an employment option available to F-1 students where the practical training employment is considered to be an integral part of the curriculum or academic program. According to United States Citizenship and Immigration Services regulations, this employment may be an internship, cooperative education job, a practicum, or any other work/study experience that is either required for the degree (as defined in the course catalog) or for which academic credit is awarded. The employment must be offered by sponsoring employers through cooperative agreements with the school.”

Policy: Consistent with the Code of Federal Regulations, the University, and the College of Engineering and Applied Science Graduate Office, the Department of Electrical Engineering and Computer Science will approve Curricular Practical Training for an EECS graduate student for a

period no longer than three contiguous months to satisfy the Practical Experience course requirement and/or to acquire quantitative information required for a thesis or dissertation where the information cannot be acquired at the University of Cincinnati or other easily accessible locations. Any further extension of CPT requires certification that the employment is integral to and necessary for the completion of the student's thesis or dissertation research.

Note that this view implies the student is not participating in CPT for the purpose of financial support, gaining industrial experience, trying out for future full-time employment, or performing a service for the CPT employer (although the employer usually sees the student in this light.) Nor is the student participating in CPT to acquire general or specific knowledge in a technical area.

Constraints and Requirements:

Constraints: CPT is limited to thesis (MS) or dissertation (PhD) students. CPT is limited to three consecutive months. Extensions beyond three months may be requested in writing from the student's research advisor, and must be approved by the advisor, EECS Graduate Program Director, EECS Department Head, and CEAS Associate Dean for Graduate Studies. Extension requests must fully document the reason for the extension including a detailed explanation why the initial CPT period could not satisfy the original approved proposal. Note that an extension is for exceptional reasons only and is expected to be a rare occurrence. No student can go on CPT for more than 6 months.

Requirements during the CPT: The student must register for at least one research credit per semester of CPT. The student's thesis/dissertation advisor or the EECS Graduate Program Director can cancel the training at any time due to insufficient progress in thesis/dissertation work.

Requirements following the CPT: The student attending CPT shall identify (e.g., specific references to thesis/dissertation text, tables, figures, etc.) to the EECS Graduate Program Director in writing or email the specific information gathered from the CPT that was required to complete the research investigation.

Application Procedure:

Students must apply for CPT a minimum of two weeks before the CPT start date and follow these steps:

- Obtain an employer letter with the format shown below
- Register for Practical Experience credit if completing CPT for the Practical Experience requirement
- Read and understand information found at <http://www.uc.edu/international/services/students/employment/cpt.html>
- Complete the **iBearcatsGLOBAL** request <https://ibearcatsglobal.uc.edu/istart/controllers/start/start.cfm>
- Complete the **iEngineering** request: <https://www.ceas3.uc.edu/iEngineering/>

Format and Content Requirements for the Application Package:

1. Employer Letter:

A signed letter on company letterhead from the employer is required in the application package. At a minimum the letter must include:

- Concurrence with the proposed work. A job description composed of the tasks

outlined in the proposal for the CPT site; the letter must state that the student's tasks are consistent with, and in support of, the student's thesis/dissertation research.

- A start date and an end date for the appointment that matches the timeline of the proposal.
- A statement indicating that the company will comply with the federal requirements for CPT by following the agreed work plan, and deviations from this plan will not be made without UC approval.
- A clear statement that all information pertinent to the student's thesis/dissertation obtained while the student is on CPT and obtained using company resources shall be unconditionally released for use and publication in published research papers and the thesis or dissertation.

2. **Detailed Proposal** (only needed if not being done for Practical Experience credit) :

The detailed proposal describes the scope and nature of the work during CPT that applies to the student's thesis/dissertation. The proposal must clearly justify the essential need for CPT to complete the thesis/dissertation. At a minimum, the proposal must have the following sections:

- **Goals and Objectives**: These must be clearly defined.
- **Literature Review**: A thorough literature review justifying the need for the work.
- **Research Accomplished**: A detail description of the progress that has been made at UC toward fulfilling the thesis/dissertation objectives.
- **Proposed Work**: A detailed description of the proposed research work with a description of tasks to be accomplished for each project objective. The tasks must be presented as a list with a detailed description for each task and a projected timeline. Each task that is planned for completion at the CPT site must be identified, and a justification for each must address two questions: 1) Is this task essential for completing the thesis/dissertation? and 2) Why is it necessary to go to the proposed CPT site to complete the task?
- **Timeline**: A timeline for each task as described above and an overall degree timeline.

13 EECS MS Thesis and PhD Dissertation Awards

To promote research excellence and inspire graduate students, the Department of Electrical Engineering and Computer Science has established the following awards:

- EECS Outstanding MS Thesis Award
- EECS Outstanding PhD Dissertation Award
- EECS Graduate Service Award
- EECS Outstanding Graduate Assistant Award

In addition, up to three runners-up in each category (MS Thesis or PhD Dissertation), depending upon the recommendation of the award committee, will receive a "Certificate of Merit." These awards will be presented at the EECS Annual Honors and Awards Ceremony. The eligibility requirements and the procedures for each award are as follows:

- In order to be eligible for the award, the student must have completed all requirements for the MS or PhD degree, and passed the MS thesis/PhD dissertation oral defense examination during the calendar year ending with the Spring semester during which the awards ceremony is held.
- A committee appointed by the EECS Graduate Program Director will review all nominations and select one student in each category for each award. Up to three runners-up in each category, as recommended by the committee, will receive a "Certificate of Merit."

Any member of the faculty can make a nomination for these awards by submitting a nomination letter that includes:

- Name of the student being nominated
- Award for which the student is being nominated
- Thesis/dissertation title and abstract (if award nomination is for Outstanding Thesis/Dissertation)
- Brief justification for the nomination

The award recipients will be selected based on the overall quality and the demonstrated impact of the contributions made by the students' work

14 Continuation and Dismissal

14.1 Completion of Thesis/Dissertation Research

It is expected that the research done for either degree (MS/PhD) and the resulting thesis or dissertation will be completed while the student is still in full-time residence, and this is especially to be expected of those students who have received financial aid. Departure before final acceptance of the thesis or dissertation generally results in long delays before completion, in some cases so long that the work has been superseded by the work of others and may no longer be acceptable to meet the requirements. Foreign students must, of course, maintain full-time status and remain in residence until all requirements for the degree are met.

In those instances where unusual circumstances exist and the student wishes to complete their degree while no longer in residence, the student must provide adequate justification and secure in advance both the advisor's and the EECS Graduate Program Director's concurrence in writing. The student and the advisor must also agree on a timetable to complete the degree. Failure to do so can result in the advisor's resignation and/or the student being considered as withdrawn from the program.

14.2 Continuation

A student may continue in the Department as long as reasonable progress is being made toward the degree. From an academic viewpoint, this means that the student's record in graduate course work, exclusive of thesis/dissertation research and seminars, continues to exhibit an average of B or better with an appropriate distribution of A, B, and C grades, that I grades appear only infrequently and for good cause, and that such grades are converted into acceptable grades within one year, and preferably within the next semester. If reasonable progress is not being made, the student's faculty advisor should bring the matter to the attention of the EECS Graduate Program Director, who will inform the student in writing that their progress is inadequate. Further, the EECS Graduate Program Director will include in the written communication steps that must be undertaken to return status as a student in good standing in the program.

14.3 Dismissal

Dismissal of the student from the graduate program of the Department of Electrical Engineering and Computer Science will occur if they fail to maintain a B average or the proper distribution of grades. After one semester of performance below B average or when it becomes obvious that a satisfactory distribution of grades is not being achieved, a student will be warned by a letter from the EECS Graduate Program Director that their performance is below standard and, if continued, will result in dismissal. If substantial improvement as specified in the letter does not occur in the next semester, the student may be dismissed from the graduate program by a majority vote of the full-time EECS faculty.

It is expected that the student will conduct their relationships with faculty and other students in a professional manner. If it is determined that a student has been dishonest in completion of coursework, writing of an exam, or the writing of a research paper or any other assessable work product, they will receive a grade of F for the course for that semester. The Graduate Program Director will be informed and a letter of warning will be issued to the student with a copy placed in

the student's record. A second infraction may result in the student's immediate dismissal from the graduate program by a majority vote of the full-time EECS faculty. A student who willingly aids another student in academic dishonesty will receive the identical penalty.

Persistent nonprofessional activities or activities detrimental to the Department's reputation may result in a student's immediate dismissal from the graduate program by a majority vote of the full-time EECS faculty.

15 Special Rules

15.1 Nondiscriminatory Policy

The Department of Electrical Engineering and Computer Science affirms University policy that discrimination on the basis of race, color, religion, national origin, sex, sexual orientation, disabilities, or age will not be practiced or tolerated in its activities. Complaints involving discrimination should be directed to the EECS Graduate Program Director and/or the EECS Department Head.

15.2 Right to Review Records

Students, once enrolled, have the right to review their educational records, except for those excluded by law, such as those maintained by a physician or psychiatrist or a parent's financial statement. Records are maintained in such offices as UC Student Records, College of Engineering and Applied Science Dean's Office, the Office of the Vice President for Research and University Dean for Advanced Studies, Student Financial Aid, Career Development and Placement, and Educational Advising, and the Department of Electrical Engineering and Computer Science Office. To review records and any appropriate explanation, the student should address the proper office. In EECS, students must submit a request to the Graduate Program Director. If the student feels there are inaccuracies, they may place a letter of explanation in the file.

15.3 Academic Honesty

Academic dishonesty in any form is a serious offense and cannot be tolerated in an academic community. Dishonesty including cheating, plagiarism, deception of effort, or unauthorized assistance, may result in a failing grade in a course and/or suspension or dismissal from the Division of Research and Advanced Studies). The University's *STUDENT CODE OF CONDUCT* covers all aspects of student academic dishonesty and misconduct and specifies possible sanctions or penalties. Disciplinary procedures are detailed, as are procedures for the appeal of decisions

15.4 Grievance Procedures

In those instances where a student objects to actions taken by the Department of Electrical Engineering and Computer Science or any of its faculty, they are advised to discuss those objections with the faculty member(s) involved, the EECS Graduate Program Director, and/or the Department Head. Where a mutually acceptable solution is not possible, procedures for the redress of grievances are detailed in the *UC Graduate Student Grievance Procedures Manual*:

<http://grad.uc.edu/student-life/policies/grievances.html>

Each student will receive a copy of these procedures at the time they first register as a graduate student in EECS. Additional copies are available from the University of Cincinnati Graduate School. The EECS Department affirms its adherence to these procedures.

15.5 Change of Degree Requirements

Any student in an EECS graduate degree program must, at a minimum, meet all requirements for the appropriate degree that were in effect when the student first registered for the program.

16 Planned EECS Course Offerings for 2020-2021

Fall 2020

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|-----------|---|
| EECE6007 | Introduction to Biomicrosystems |
| EECE6008 | Fundamentals of MEMS |
| EECE6011 | RF and Microwave Wireless Communications |
| EECE6016C | Electric Machines and Drives (4 credits) |
| EECE6017C | Embedded Systems (4 credits) |
| EECE6018 | Microfabrication of Semiconductor Devices |
| EECE6019 | Probability and Random Processes |
| EECE6024 | Introduction to Digital Signal Processing |
| EECE6028C | Intelligent Machine Design (4 credits) |
| EECE6029 | Operating Systems |
| EECE6030 | Trust in Digital Hardware |
| EECE6032 | Software Testing and Quality Assurance |
| EECE6036 | Intelligent Systems |
| EECE6048C | Optics for Engineers (4 credits) |
| EECE6080C | Introduction to VLSI Design (4 credits) |
| EECE7001 | EECE Seminar |
| EECE7004 | Practical Experience |
| EECE7023 | Thermoelectric Energy |
| EECE7095 | Introduction to Computer Architecture |
| CS6027 | Requirements Engineering |
| CS6033 | Artificial Intelligence |
| CS6037 | Machine Learning |
| CS6043 | Computer Networks |
| CS6051 | Database Theory |
| CS6052 | Intelligent Data Analysis |
| CS6054 | Information Retrieval |
| CS6055 | Cyber Defense Overview |
| CS6058 | Data Security & Privacy |
| CS6060 | Computer Graphics |
| CS6065 | Cloud Computing |
| CS6067 | User Interface |
| CS6068 | Parallel Computing |
| CS6070 | Automata Theory |
| CS6072 | Network Science |
| CS6097 | Introduction to Wireless Networks |
| CS7001 | CS Seminar |
| CS7003 | BMI Seminar |
| CS7081 | Advanced Algorithms 1 |
| CS7097C | Intro to Functional Genomics (4 credits) |

Spring 2021

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| EECE6015C | Instrumentation & Industrial Control (4 credits) |
| EECE6023C | Security & Trust in Cyberphysical Systems (4 credits) |
| EECE6025 | Power Electronics |
| EECE6026 | Introduction to Communication Systems |
| EECE6029 | Operating Systems |
| EECE6031 | Interconnection Networks |
| EECE6033 | GPS System and Receiver Principles |
| EECE6034C | Hardware Design with FPGA: Secure and Trustworthy Systems |
| EECE6035 | Information Theory |
| EECE6038C | Advanced Microsystems (4 credits) |
| EECE6041C | Microfabrication Lab for Semiconductor Devices and MEMS (4 credits) |
| EECE6042 | Digital Image Processing |
| EECE6045 | Introduction to Quantum Computing |
| EECE6050 | Compound and Organic Semiconductor Physics |
| EECE6078C | Biomicrofluidic Systems (4 credits) |
| EECE6082C | VLSI Design for Test and Power (4 credits) |
| EECE6083 | Compiler Theory and Practice |
| EECE6086C | VLSI Design Automation (4 credits) |
| EECE7002 | EECE Seminar |
| EECE7004 | Practical Experience |
| EECE7011 | Electromagnetic Systems |
| EECE7017C | Trustworthy Embedded Systems (4 credits) |
| EECE7019 | Bio-Inspired Robotics |
| EECE7022 | Wireless Communications Electronics |
| EECE7031 | Advanced MEMS Technologies |
| EECE7032 | Biosensors and Bioelectronics |
| EECE7026 | Biochips and Lab-on-a-Chip |
| EECE7033 | Linear Systems Theory |
| EECE7035 | Reinforcement Learning |
| EECE7036 | Neuromorphic Computing for AI |
| EECE7065 | Complex Systems and Networks |
| EECE7075 | Principles Modern Networking |
| EECE8023 | Nondestructive Remote Sensing |
| EECE8025 | Electrical Engineering of the Human Body |
| EECE8080C | Topics in Circuits and Systems Design (4 credits) |
| EECE8085C | Topics in VLSI CAD & Testing (4 credits) |
| EECE8115C | Human-Machine/Robot Interaction (4 credits) |
| CS6021 | Mathematical Logic |
| CS6025 | Data Encoding |
| CS6026 | Formal Methods |
| CS6028 | Large Scale Software Development |
| CS6035 | Learning Probabilistic Models |
| CS6051 | Database Theory |
| CS6052 | Intelligent Data Analysis |

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| CS6053 | Network Security |
| CS6056 | Security Vulnerability |
| CS6065 | Intro to Cloud Computing |
| CS6073 | Deep Learning |
| CS 60XX | Evolutionary Computing |
| CS7002 | CS Seminar |
| CS7003 | BMI Seminar |
| CS7038 | Malware Analysis |
| CS7051 | Advanced Spatial-Temporal Mining |
| CS7054 | Data Science for Biomedical Research |
| CS7063 | Adv. Methods in Machine Learning |
| CS7070 | Big Data Analytics |
| CS7081 | Advanced Algorithms 1 |
| CS7082 | Advanced Algorithms 2 |
| CS7092 | Sensor Systems |
| CS7099 | Introduction to Bioinformatics |

All courses with a C in their code are 4-credit courses with a laboratory component.