Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

Master's of Science
Computer Engineering – Handbook

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Overview of the Computer Engineering M.S. Degree

Students who have not completed requirements or submitted required forms to the [Graduate Coordinator](#) by the due dates may be dropped from the program. Students should graduate in the semester in which 30 hours of coursework are completed. All students who are on visas must be registered for at least 9 credit hours of coursework in every semester (excluding summer), including their final semester, unless they receive permission from the Department Graduate Committee *prior* to the beginning of the semester.

TABLE 1: This schedule summarizes the requirements for the Computer Engineering M.S. Degree

	Requirement	Process	Due Date
Supervisory Committee	3 members. The chair of the committee must be a regular ECE faculty member. The chair is chosen by the student; the two remaining members are assigned by the department.	Submit a [Request for Supervisory Committee Form](#) To amend, resubmit form.	*Full time:* drop deadline of second semester of study *Part time*:* drop deadline of third semester of study **Please note that international students must be full-time students.*
Candidacy (Program of Study)	30 semester hours of coursework beyond B.S. degree in ECE including: • CS/ECE 6710 Digital VLSI Design (4.0) • CS/ECE 6810 Computer Architecture (3.0) • At least 18 hours of ECE coursework must be at the 6000- or 7000-level classes • *Project*: 3-6 hours of ECE 6950 Special Study • *Thesis*: 10+ hours of ECE 6970 Thesis Research (must meet with [Graduate Coordinator](#) to register)	Submit a [Program of Study Form](#) To amend, resubmit form for approval prior to registering for added courses.	Full time: drop deadline of second semester of study *Part time*:* drop deadline of third semester of study *If making an amendment:* Changes must be made before an added class is taken; classes cannot be dropped after they have been completed
Proficiency Requirement	Yes, students with a non-EE/ECE B.S. degree must complete additional steps to satisfy the [ECE proficiency requirements](#)	Submit [Fulfillment of Proficiency Requirements Form](#)	*Full time:* drop deadline of third semester of study *Part time*:* drop deadline of fourth semester of study
Residency Requirement	At least 24 hours must be in resident study		

Final Exam (Coursework and Project Options)	*Coursework*: The department has an approved list of 6000-7000 level courses that incorporate either an oral presentation or a written report as a required component of the class. *Project*: The completion of the project could include a formal presentation or report. This combination could serve as the final exam. These decisions are dependent on the student's committee.	*Coursework / Project*: MS Course Designation for Final Exam (Non-Thesis) *Project*: MS Project Final Exam Verification Form	
Thesis Option	**Requirement**	**Process**	**Due Date**
Research Comprehensive Exam (Thesis Proposal)	Pass a Research Comprehensive Exam administered by the supervisory committee (including defense of a written formal thesis proposal)	Notify the Graduate Coordinator in the ECE Office at least four weeks prior to the date of the exam	No later than third semester of study (may not be taken in the same semester as the thesis defense)
Final Exam (Thesis Defense)	Must be enrolled in at least 3 credits of ECE 6970 Thesis Research at the time of defense.	Notify the Graduate Coordinator in the ECE Office at least four weeks prior to the date of the exam	Defend the thesis at the end of coursework requirements

Requirements and Criteria

Master of Science Computer Engineering students should graduate in the semester in which 30 hours of coursework are completed. All students who are on visas must be registered for at least 9 credit hours of coursework in every semester (excluding summer) unless they receive permission from the Department Graduate Committee prior to the beginning of the semester.

Requirements

1. All coursework is to be completed within 4 consecutive calendar years.
2. Coursework listed on the program of study must total a minimum of 32 hours of graduate coursework including:
   - CS/ECE 6710 Digital VLSI Design (4.0 credit hours)
   - CS/ECE 6810 Computer Architecture (3.0 credit hours)
   - Restricted Elective List courses; number based on option
     - *Coursework*: 4 Courses; *Project*: 3 Courses; *Thesis*: 2 Courses
   - A minimum of 18 hours of ECE courses must be at the 6000 or 7000 level
   - Up to 12 credit hours of 5000-7000 level allied courses will be accepted (Math, Science, or other Engineering courses)

3. **Coursework Option**: The department has an approved list of 6000-7000 level courses that incorporate either an oral presentation or a written report as a required component of the class. Students will select their course by completing the MS Course Designation for Final Exam form. Once completed, the course instructor or a designated department representative must approve it to signify that the student has passed the final exam.
   - Thesis (ECE 6970) and M.S. Special Study (ECE 6950) are not permitted. Students wishing to take ECE 6950 should pursue the Project option.

4. **Project Option**: 3-6 hours of M.S. Special Study (ECE 6950) are permitted and will count towards the 18 credit hours of required ECE coursework.
   - ECE required courses are not to include thesis hours (ECE 6970/7970).

5. **Thesis Option**: 10 hours of thesis research (ECE 6970), this will count towards the 18 hours of ECE courses
   - Students may only register for thesis research after they have set up a supervisory committee.

Additional Criteria

1. A minimum GPA of 3.0 on coursework listed on the program of study with no grade lower than C- is required for graduation. A student who receives a grade lower than C- in a course listed on the program of study must repeat that same course and receive a higher grade. **Courses cannot be removed from the program of study after they are taken.**
2. Students who receive an "Incomplete" grade in a class must complete the class by the following semester, even if the semester is the summer semester.
3. Coursework cannot be used for more than one degree on the same level.
4. Cross-listed courses must be registered through the ECE course numbers.
5. A course taken for 5000-level credit cannot be taken again for 6000-level credit.
   - Where a course has both a 5000- and 6000-level number, the 5000-level version is intended for undergraduates and the 6000-level version for honors and graduate students. The two versions of the class will meet together, but extra work will be expected of honors and graduate students.

Restricted Elective List

Courses selected should be in an area of specialization selected by the student. Number of courses based on degree option:

Coursework - 4 courses; Project – 3 courses; Thesis – 2 courses

- CS 6110 – Software Verification
- CS 6140 - Data Mining
- CS 6150 – Advanced Algorithms
- CS 6235 – Parallel Programming for Many Cores
- CS 6300 - Artificial Intelligence
- CS 6350 - Machine Learning
- CS 6353 - Deep Learning
- CS 6460 – Operating Systems
- CS 6470 – Compiler Principles and Techniques
- CS 6475 – Advanced Compilers
- CS 6480 – Advanced Computer Networks
- CS 7460 – Distributed Operating Systems
- ECE 5325 – Wireless Communication Systems
- ECE 5520 – Digital Communication Systems
- ECE 6530 – Digital Signal Processing
- ECE 6531 – Advanced Digital Signal Processing
- ECE 6580 – Implementation of Digital Signal Processing Systems
- CS/ECE 6720 – Analog Integrated Circuit Design
- CS/ECE 6740 – Computer-Aided Design of Digital Circuits
- CS/ECE 6745 – Testing and Verification of Digital Circuits
- CS/ECE 6750 – Synthesis and Verification of Async. VLSI Systems
- CS/ECE 6770 – Advanced Digital VLSI Systems Design
- CS/ECE 6780 – Embedded System Design
- CS/ECE 6785 – Advanced Embedded Software
- CS/ECE 6830 – VLSI Architecture
- CS/ECE 7810 – Advanced Architecture
- CS/ECE 7820 – Parallel Architecture

Additional courses on the program of study must be approved by the student's committee.

Supervisory Committee

A student's supervisory committee will guide the student's graduate program and must be selected by the beginning of the second semester of study. **If a student does not choose a committee, they will be placed with the default supervisory committee.**

A supervisory committee consists of three faculty members. The chair of the committee is chosen by the student, and the two remaining members are assigned by the Graduate Committee. Typically, the other members include one member from the Graduate Committee and the Department Associate Chair.

Any regular Electrical & Computer Engineering faculty member may serve as a supervisory committee chair. After the faculty member has agreed to chair a supervisory committee, the student should submit a completed Request for Supervisory Committee. The form can be re-submitted if an amendment needs to be made to the committee. The Graduate Committee approves all supervisory committee forms; final approval is granted by the Graduate School.

Application for Admission to Candidacy (Program of Study)

After consulting with the approved supervisory committee chair, the student must plan a program of study. They must complete and submit the Program of Study Form by the drop deadline of the second semester of study. After approval of the Department Graduate Committee, the program of study is submitted to the Graduate School for their approval. In preparation to submit a Program of Study form, it is recommended that students use the MS - Computer Engineering Checklist and/or meet with the Graduate Coordinator.

Modifications to the Program of Study may be made by re-submitting a Program of Study Form for approval prior to registering for added courses with the supervisory committee and obtaining required approval before enrollment in any added courses. Completed courses cannot be removed from the program of study. **Credit towards obtaining a degree will not be granted for classes taken prior to approval of the form, unless the student is changing degree status.**

Report of Final Examination (Non-Thesis Options)

Report of Final Examination (Coursework and Project Options)
The department has an approved list of 6000-7000 level courses that incorporate either an oral presentation or a written report as a required component of the class. Students will select their course by completing the Course Designation for Final Exam form. Once completed, the course instructor or a designated department representative must approve it to signify that the student has passed the final exam.

Additional Examination (Project Option)
The completion of the ECE 6950 Project could include a formal presentation or report. This combination could serve as the final exam. These decisions are dependent on the student's committee

If the student's supervisory committee requires it: The topic and scope of the project must be approved in advance by a faculty advisor (i.e. the ECE 6950 instructor). The completion of the project requires that a formal report be submitted to the advisor and that a public presentation be given. The combination of the report and the presentation serves as the final exam. Students must complete the top portion of the Final Exam Verification Form and attach a copy of their abstract. The Graduate Coordinator will obtain the signature of the Project Advisor or designated department representative to signify that the student has passed the final exam.

Examinations (Thesis Option)

Students must be registered for at least 3 credit hours in the semester in which they take an exam. **The Research Comprehensive Exam and Final Oral Exam (oral thesis defense) may not be done during the same semester.**

Research Comprehensive Examination (Thesis Proposal)
M.S. candidates must take a Research Comprehensive Examination (thesis proposal) to be administered by their supervisory committee at a time determined by that committee, but no later than the third semester of study.

The candidate writes a proposal on their research in the NSF or NIH format which would include only the technical proposal and the vita sections. The page limit for the proposal should be 10 pages for M.S. students. The choice of which format to use would be based on the area of research. The faculty advisor would help the student choose. The following are the links to the NSF and NIH websites for their format information.

- NSF Preparing your Proposal
- NSF Grant Proposal Guide
- NIH Grants

This proposal should be submitted to the members of the candidate's supervisory committee at least 2 weeks before the comprehensive exam.

Students must notify the ECE Graduate Coordinator at least four weeks before they are going to take the Research Comprehensive Examination. The Graduate Coordinator will inform the Graduate School after the exam has been taken.

Final Exam (Thesis Defense)

The Final Oral Examination (oral thesis defense) is conducted by the supervisory committee according to Graduate School regulations. A student will be passed only if the committee is satisfied that the thesis research and documentation are unquestionably of the quality that will bring distinction to the candidate and the department**.** The committee may request further work of the candidate before a final decision is made.

All students must understand that they are responsible for ensuring that the submitted thesis meets the requirements of the Graduate School for proper format. Ample help is available from the Graduate School Thesis and Dissertation Editor in the form of a Handbook for Theses and Dissertations as well as seminars. Theses with improper format will be rejected. When students send a draft to their committee, they must also upload their thesis for Preliminary Review to the Graduate School.

The student must contact the ECE Graduate Coordinator at least four weeks prior to the exam for assistance to schedule the date, time and location with the student's Supervisory Committee. At least one week before the exam the student must provide the Graduate Coordinator with a copy of the abstract and title of the thesis. A *Report of the Final Oral Examination and Thesis for the Master's Degree* form will be completed by the Graduate Coordinator for approval signatures during the defense and then submitted to the Graduate School.

Thesis Requirements
The supervisory committee must give preliminary approval of the thesis prior to the defense. The defense can be scheduled after this approval. The student must provide one copy of the thesis to the chair of the supervisory committee at least three weeks before the defense, and one copy to each of the other committee members at least two weeks prior to the defense.

After successfully defending the thesis, the student must upload the final version of their thesis to the Graduate School. You will be required to know the UNIDs of each of your faculty members. If you do not have these, you can contact the Graduate Coordinator.

Detailed policies and procedures concerning the thesis are contained in A Handbook for Theses and Dissertations published by the Graduate School.

M.S. Degree Forms
- MS - Computer Engineering Checklist
- Request for Supervisory Committee - resubmit form to amend
- Program of Study - resubmit form to amend
- Fulfillment of Proficiency Requirements - for non-EE/ECE BS degree students
- Application for Graduation

Coursework Option
- MS Course Designation for Final Exam

Project Option
- ECE 6950 Project Form
- MS Project Final Exam Verification Form

Thesis Option
- Thesis Final Exam Verification Form

Safety and Wellness

Your safety is our top priority. In an emergency, dial 911 or seek a nearby emergency phone (throughout campus). Report any crimes or suspicious people to **801-585-COPS**; this number will get you to a dispatch officer at the University of Utah Department of Public Safety (DPS; https://publicsafety.utah.edu/). If at any time, you would like to be escorted by a security officer to or from areas on campus, DPS will help — just give a call.

The University of Utah seeks to provide a safe and healthy experience for students, employees, and others who make use of campus facilities. In support for this goal, the University has established confidential resources and support services to assist students who may have been affected by harassment, abusive relationships, or sexual misconduct. A detailed listing of University Resources for campus safety can be found at https://registrar.utah.edu/handbook/campussafety.php

Your well-being is key to your personal safety. If you are in crisis, call **801-587-3000**; help is close. The university has additional excellent resources to promote emotional and physical wellness, including the following:

- Counseling Center https://counselingcenter.utah.edu
- The Wellness Center https://wellness.utah.edu
- Women's Resource Center https://womenscenter.utah.edu

Counselors and advocates in these centers can help guide you to other resources to address a range of issues, including substance abuse and addiction.

You may also call the **ECE department at 801-581-6941** if you need help or have questions.