

SAN DIEGO STATE UNIVERSITY
Department of Electrical and Computer Engineering
Electrical Engineering Program

This document is subject to change. For the most recent revision, please see the ECE Department website

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1. Overview of the Electrical and Computer Engineering (ECE) Department

Welcome to San Diego State University! The Department of Electrical and Computer Engineering offers a variety of courses in different areas of specializations in the Electrical or Computer Engineering Master's Program. These areas include Communication Systems, Computer Networks, Electromagnetic Systems, Embedded Systems, Energy Systems and Control, Machine Learning and Scientific Computing, Signal Processing, and VLSI Systems. The mission of the Electrical (MSEE) and Computer (MSCompE) Engineering Graduate Programs is to provide a high-quality education with a focus on hands-on research and scholarly activities to train competent engineers for the local industry to take the lead in design and innovation in the San Diego area. Graduate students are prepared for the challenges of the 21st Century and will be ready to take important roles in the industry to be leaders and entrepreneurs. The existence of Ph.D. programs at SDSU gives opportunities to our MSEE and MSCompE graduates to pursue their education towards Ph.D. degrees and be ready to assume more important roles in industry and academia.



2. Faculty Members

The ECE Department consists of very active faculty members who are teaching and conducting research in various areas. The list of faculty members is given below. To know more about their area of research and teaching, please contact them individually. You can go to our faculty website at <https://electrical.sdsu.edu/people/faculty>.

	Dr. Abu Naim Ahmed	Integrated Photonics Integrated Photonics for AI Hardware & Quantum Communication Silicon Photonics Ultra-High Speed Optical Modulators & Relevant System
	Dr. Baris Aksanli	Embedded Systems
	Dr. Amir Alimohammad	Computational Neuroscience Digital VLSI
	Dr. Ashkan Ashrafi	Digital Signal Processing Brain Signal Processing Estimation Theory
	Dr. A. Ege Engin	Electromagnetic Interface Signal Integrity
	Dr. Ke Huang	VLSI, Machine Learning Data Mining Computer Aided Design

	Dr. Tong Huang	Cyber-Physical Security Modeling and Control Data Analytics for Electric Power Grids with Rich Renewables
	Dr. Sunil Kumar	QoS-Aware Wireless Networks Error Resilient Video Compression Multimedia Communication Image Processing
	Dr. Saeed Manshadi	Interdisciplinary Problems in Smart Grid, Power Systems, Optimization, Machine Learning
	Dr. Chris Mi	Power Electronics and Electric Drives Battery Management Systems Wireless Power Transfer
	Dr. Santosh Nagaraj Graduate Advisor	Communication Systems
	Dr. Duy Nguyen	Wireless Communication
	Dr. Yusuf Ozturk	Mobile Computing

	Dr. Christopher Paolini	Machine Learning Embedded Systems Internet of Things Device Development
	Dr. Tharm Ratnarajah	Digital Signal Processing Digital Communications
	Dr. Reza Sabzehgar	Power Electronics Smart Grid Renewable Energies Electric and Hybrid Electric Vehicles
	Dr. Mahasweta Sarkar	Wireless Data Networks Wireless Health Green Networks
	Dr. Sridhar Seshagiri	Nonlinear Control Applications to Energy Systems
	Dr. Satish Sharma Interim Department Chair	Electromagnetics Antennas Microwave Engineering
	Dr. Ying-Khai Teh	Microelectronics

	<p>Dr. Hakan Töreyn</p>	<p>Electrical & System Design for Biomed Applications Real-Time Signal Processing Translational Research</p>
	<p>Dr. Junfei Xie</p>	<p>Large-Scale Dynamic System Design & Control Unmanned Aerial Systems Airborne Networks</p>

3. Degree Evaluation (or Degree Audit Report)

The College of Graduate Studies is offering a new electronic resource for students and advisors to track progress toward graduation. This resource is called the Degree Evaluation (or Degree Audit Report). The report can be found in your my.SDSU account under the 'Degree Evaluation' tile. When you click on the Degree Evaluation, your coursework and other degree requirements will be converted into a customized report. The Degree Evaluation is your official guide for tracking progress toward graduation.

IMPORTANT – As the Degree Audit Report defaults to Plan B (Project), **students doing Plan A will need to submit** a Petition for Adjustment of Academic Requirements (PAAR) form <https://grad.sdsu.edu/current-students/forms> **stating they are doing the Plan A (Thesis) option.** If this is not done, the student's Degree Evaluation will not reflect the correct courses.

Please let the ECE Graduate Advisor, Dr. Santosh Nagaraj at snagaraj@sdsu.edu know if you have any questions about your Degree Evaluation, or contact the College of Graduate Studies office at gra@sdsu.edu.

4. Rules and Policies

Every classified graduate student admitted into the Electrical or Computer Engineering program at San Diego State University can obtain an MS degree by the following two options: **Plan A (thesis option) or Plan B (project option).**

Plan A: Thesis Option

Students selecting Plan A must complete 21 units of coursework (7 courses), 6 units of 797 “Research” (typically as two 3-units of 797 Research, taken in two different semesters) under the supervision of a full-time ECE professor and, 3 units of 799A “Thesis”.

Plan A students must complete the *797: Research Registration Request* form, which they can obtain from the ECE Department website <https://electrical.sdsu.edu/graduate/thesis-project-proc>, in order to register for 797. This form needs to be approved by the Thesis Advisor and the Graduate Advisor. Once the form is approved, the student will obtain the class number for 797

from their Thesis Advisor.

Before the student can register for 799A, he/she must be advanced to candidacy (see the Advancement to Candidacy section). An oral defense of the thesis is required. A completed thesis in the required format shall be submitted to the University.

Plan A students cannot receive credit for taking 798.

Plan B: Project Option

Students selecting Plan B must complete 27 units of approved coursework (9 courses) and 3 units of 798 “Project”. 798 should be taken after completing 18 units of coursework (as early as the third semester) but must be taken after completing 27 units. An oral presentation of the project is required.

Plan B students must take 798 (Project) under the supervision of a professor as the Project Advisor. The project will be evaluated and approved by the Project Advisor and the second member of the project committee in a 30-minute presentation session. **Before presenting the project, the student must be advanced to candidacy.**

Plan B students must complete the 798: *Project Registration Request* form, which they obtain from the ECE Department website <https://electrical.sdsu.edu/graduate/thesis-project-proc>, in order to register for 798. This form needs to be approved by the Project Advisor and the Graduate Advisor. Once approved, the student will obtain the class number for 798 from their Project Advisor.

Plan B students cannot take and receive credit for 797, 799A or 799B.

5. Official Program of Study (POS)

- Before meeting with the department Graduate Advisor, each classified student should prepare an Official Program of Study (POS). The *Program of Study* form and *Course Selection Guidelines* are provided on the ECE Department website <https://electrical.sdsu.edu/graduate/thesis-project-proc>. The guidelines given below should be followed when preparing the POS:

General

- Core courses must be taken in the first year of the program.
- No more than four (4) 500-level courses are accepted for the graduate program.
- Other courses may also be taken for credit under the depth area, subject to the approval of the Graduate Advisor.
- Students are allowed to take two courses from outside the ECE Department, with the approval of their Thesis/Project Advisor and the Graduate Advisor. The *Authorization to Take Non-ECE Courses (ATNEC)* form needs to be completed and approved by the Thesis/Project Advisor and the Graduate Advisor **prior** to the course being taken or added to the POS. The *ATNEC* form can be obtained from the ECE Department website <https://electrical.sdsu.edu/graduate/thesis-project-proc>.

NOTE – If the student changes their Thesis/Project Advisor, these non-ECE courses may not be used as part of their POS. The student will need to submit a new *ATNEC* form and obtain the approval of their new Thesis/Project Advisor and the Graduate Advisor.

- Students need to submit their POS before enrolling in 797 (Research) or 798 (Project).
- 797, 799A or 799B cannot be used in Plan B. If students switch from Plan A to Plan B, they need to remove 797, 799A and 799B from their POS and take 6 units of regular courses and 3 units of 798, with the approval of the Graduate Advisor.

NOTE – *The POS is required for advancement to candidacy, switching to Plan B, reduced course load and Curricular Practical Training (CPT).*

Plan A: Thesis Option

- Declare a depth area.
- Take four (4) courses in the depth area including the core course. (**12 units**).
- Take two breadth courses: (**6 units**).
- Take one course either from the depth area or as a breadth course. (**3 units**).
- Register for six units of 797 (research) and three units of 799A (thesis): (**9 units**).
- Credit is not given for 798 to Plan A students.
- Submit the POS to the department signed by the Thesis Advisor.

Plan B: Project Option

- Declare a depth area.
- Take six (6) courses in the depth area including the core course(s). (**18 units**).
- Take three breadth courses: (**9 units**).
- Take 798 (Project) advised by the Project Advisor. (**3 units**).
- Submit the POS to the department signed by the Project Advisor.

6. Changes to the Program of Study

Students must submit a *Petition for Adjustment of Academic Requirement* (PAAR) form anytime changes to their POS are made. This form is only accessible online at https://grad.sdsu.edu/current_grad_students/forms. Click on *Student E-Forms User Guide* (https://grad.sdsu.edu/current-students/eform_student_guide.pdf) for step-by-step instructions on how to fill out the E-Forms.

7. Transfer Courses

Up to three courses (9 units) may be transferred from another accredited institution or San Diego State University Extended Studies program. All credits earned in other universities, including foreign universities and San Diego State University extension courses, are subject to approval by the Graduate Advisor and Graduate Dean. Credit earned by correspondence, by examination, or by extension at other institutions is not accepted as satisfying advanced degree requirement.

8. Grade Point Average/Grades

Grade Point Average of at least 3.0 (B) must be maintained in:

- All courses listed on the official degree Program of Study
- All courses, 300-level and above, taken at San Diego State University concurrently with or subsequently to the earliest course listed on the official degree program, including the courses accepted for transfer credit.

Further, students should be aware of the university restrictions for the degree program. They are:

- No transfer or extension credit may be used to improve the grade point average of the courses completed at San Diego State University whether computed to determine the average or the overall average.
- No grades in which final grade below “C” (2.0) was earned may be used to satisfy the requirements of the master’s degree.
- 500-level courses graded Credit/No Credit are not acceptable to satisfy the master’s degree program unless they are offered as Credit/No Credit courses only.
- At least 70 percent of the units used to fulfill the minimum requirements on master’s degree program must be lettergraded.
- A course completed prior to seven years of the date that the official master’s degree program is approved cannot be listed on the program.

9. Advancement to Candidacy

In addition to meeting the GPA requirements above, the following steps are required to advance to candidacy:

1. Complete at least 12 units of Program of Study Courses with a minimum 3.00 GPA.
2. All program courses obtained a grade of C or better.

Once you feel you have completed these requirements, complete the Advancement to Candidacy form in your Degree Evaluation under the Advancement to Candidacy section. The form will be listed as:

[ADVANCE FORM \(https://grad.sdsu.edu/current-students/forms\)](https://grad.sdsu.edu/current-students/forms)

Once submitted, your advancement to candidacy request will be reviewed by your department advisor, after which it will be subject to Graduate Studies approval.

10. Procedure for Enrolling in 797 (Plan A)

1. In consultation with a full-time ECE Department faculty member, define your thesis title. Only graduate students who are in good academic standing may enroll in 797.
2. Write an outline proposal of the thesis project or research to include goals, design activities, level of effort, and timetable.

3. Obtain the *797: Research Registration Request* form from the ECE Department website <https://electrical.sdsu.edu/graduate/thesis-project-proc>. Take this form and the proposal to your Thesis Advisor for their review and signature of approval. The Thesis Advisor's approval means that facilities and his/her time are available to support the thesis research.
4. Submit this form along with the *POS* and the proposal to the Graduate Advisor for approving signature. Graduate Advisor's approval states that all requirements have been met and student's recommendation for research has been approved.
5. The student will get the class number for 797 from the Thesis Advisor to enroll in the course.
6. At the end of the research, the student will receive a CR/NC grade for 797, which will be given by the Thesis Advisor.

11. Procedure for Enrolling in 798 (Plan B)

1. After choosing Plan B, the student should choose a Project Advisor.
2. Write a one-page proposal of the work that will be done during the project. The Project Advisor must approve the proposal.
3. Obtain the *798: Project Registration Request* form from the ECE Department website <https://electrical.sdsu.edu/graduate/thesis-project-proc>, fill it out and get the signature of the Project Advisor.
4. Submit this form along with the proposal to the Graduate Advisor for approving signature. Graduate Advisor's approval states that all requirements have been met and the student can take the project.
5. The student will get the class number for 798 from the Project Advisor to enroll in the course.
6. Before the end of the semester in which the project is taken, the student must arrange for a minimum 30-minute presentation before the Project Advisor and another ECE professor (a two-member project committee). **The student must be advanced to candidacy before presenting the 798 project to their committee.** At the end of the presentation, the student should present the committee members with the *798 Project Completion* form (obtained from the ECE Department website <https://electrical.sdsu.edu/graduate/thesis-project-proc>) and the committee members should sign it if they are satisfied by the presentation.

If the project committee is not satisfied with the project presentation, the student must continue working on the project and the Project Advisor will give the student an "RP" (Report Progress) grade until the project committee is satisfied with the outcome of student's project.

7. The student will receive a CR/NC grade for 798, which will be given by the Project Advisor.

12. Procedures to Enroll in 799A (Plan A)

All students presenting a thesis must follow the procedures discussed below. The procedures listed below are presented in the order to be accomplished, although some of the procedures may be handled concurrently.

1. Establish the thesis committee and title in consultation with your Thesis Advisor.
2. Obtain the *Appointment of Thesis/Project Committee Packet* form from the Graduate Studies

website <https://grad.sdsu.edu/current-students/forms>. **Student must be advanced to candidacy before filing the *Appointment of Thesis Committee Packet* form.**

3. Once Graduate Studies approves the *Appointment of Thesis/Project Committee Packet* form, the student will get the class number to enroll in 799A. **You will get the class number for 799A from the Graduate Studies and NOT your Thesis Advisor.**
4. File an Application for Graduation (on the WebPortal).
5. Read and follow the thesis formatting regulations.
6. Write and edit the manuscript.
7. Defend your thesis to your thesis committee.
8. After defending your thesis, you will need to submit a copy of the signature page and the Turnitin (plagiarism) report to the ECE Department.
9. Submit the approved and formatted manuscript to Montezuma Publishing for review and publishing.

For details, please refer to the website: <http://grad.sdsu.edu/>.

12. Curricular Practical Training (CPT)

Additional CPT information and the CPT form may be found on the International Student Center web site:

<https://www.sdsu.edu/international-student-center/employment-in-the-us/f-1-employment>.

Background

Curricular Practical Training is defined as any required or optional internship that is an **integral** part of the established curriculum for a program of study. Only internships that are directly related to the course curriculum qualify as curricular practical training and can be either an optional or required part of the program. It should be noted that the CPT is a **privilege** and **not a right** for international students.

General Requirement

Be in good standing by having an SDSU overall and program GPA of at least 3.0 and has made progress towards the degree. Note that progress towards the degree implies that a student has his/her Program of Study (POS) on file and is enrolled in 799A or 799B to complete the thesis (Plan A) or has chosen their Project Advisor (Plan B). Student must enroll in EE795 (one unit). Students must submit a *Thesis (Plan A)/Project (Plan B) Advisor's CPT Approval* form to have the consent of their Thesis or Project Advisors to go for CPT. Students can obtain this form from the ECE Department website <https://electrical.sdsu.edu/graduate/cpt>.

Summer CPT

The student must have completed at least 18 units of coursework and enroll in EE795 (one unit) in one of the summer sessions. Students may sign up for up to 40 hours per week during summer. Summer CPT **MUST** be approved by students' Thesis or Project Advisor. Out-of-state internship locations are allowed during summer.

Academic Year CPT

In an academic year, students who meet the General Requirement mentioned above and the criteria below can work up to 20 hours per week. Plan A students can work up to 40 hours per week in a semester if they do not take courses in that semester. The following criteria are the requirement for 20 hours per week CPT:

- Have received a satisfactory grade in at least 18 units of coursework in the POS.
- A written approval by the Thesis or Project Advisor.
- Students who enroll in 799B are qualified for the CPT.

Please note that for using the CPT in each semester (including summer), you need to obtain separate offer letters stating the beginning and ending dates of the internships. Please look at SDSU Academic Calendar to indicate the correct beginning and ending dates of each semester. https://registrar.sdsu.edu/calendars/academic_calendars?_ga=2.18991793.868057901.1687963717-1822213977.1687963717

Content of the Offer Letter

The offer letter must contain the beginning and ending dates of the internship, the job description, and the pay rates (per hour). The letter must be original and written on company letterhead. For each working period (Summer, Fall or Spring semester) a separate letter must be provided. The beginning and ending dates should fall within the semester the CPT is being done.

How to Receive a “CR” Grade for the EE795 Internship

IMPORTANT!! Although the internship may not be over, **one week prior to the grades being due** by the faculty (see the Academic Calendar for deadline dates), the student must submit to the Graduate Advisor (for Spring and Fall semesters):

1. A typed report (1-2 pages) on how the internship has helped in their degree.
2. A letter from the supervisor of internship (on company letterhead), stating whether the student has met the requirements of the internship.

Dependent upon the student’s report and supervisory letter, the Graduate Advisor will issue a “CR” grade for EE795. **If the student fails to complete these steps prior to grades being submitted, the student will not get credit for the CPT internship.**

For **Summer CPTs**, the report and letter need to be submitted to the ECE Department Chair, Dr. Satish Sharma at ssharma@sdsu.edu. The grade for EE795 will be submitted by Dr. Sharma.

Application and Processing Time Periods

There is no specific application period for the CPT. Students who satisfy the requirements mentioned above, must allow enough time after obtaining the job offer for administrative processes as follows:

1. Give the offer letter and the completed CPT form to the ECE Graduate Advisor. The ECE

Graduate Advisor will review the letters and make a decision on whether the student satisfies the requirements or not. If the student is eligible for the CPT, the ECE Graduate Advisor will sign the CPT form.

2. Once the CPT form has been signed, you can then enroll in EE795 (adding after the add/drop deadline will require submitting a Late Schedule Adjustment petition to late add EE795 late and could take an additional 7-10 business days).
3. Submit the signed *CPT Application Form* (https://drive.google.com/file/d/1_a1-DsMuf_kTMPmt5_tWD3tIp-eroUEW/view) to the International Student Center, along with the job offer letter using their *Curricular Practical Training (CPT) Request Form* (<https://sdsuisc.wufoo.com/forms/k1pdhiyq0rrxy4f/>). Processing time is 7 business days.

IMPORTANT!! Plan ahead as there are no same day appointments and the process could take as long as 5-7 business days! Employment may not begin until the training has been authorized. ***Under no circumstances will the CPT be backdated to include illegal work done before it was authorized.*** SDSU follows the United States Immigration Law on the CPT. For more information about the law please see the Immigration and Custom Enforcement website.

13. Responsible Conduct of Research (RCR) and Plagiarism

Training in RCR, plagiarism and required regulatory considerations should occur early in a student's progression through the program. Students involved in teaching may need to be prepared to articulate and enforce policies related to RCR and plagiarism in their classrooms and syllabi.

There are multiple online resources available from the Division of Research Affairs that provide training in RCR, as well as regulatory procedures, e.g., the protection of human subjects, that may be required prior to the conduct of certain research. Please visit the following pages for more information:

<https://newscenter.sdsu.edu/researchaffairs/ethicstraining.aspx>

https://curriculum.sdsu.edu/curriculum-services/graduate-bulletin/19_20_gb/019-University-Policies.pdf

University Policies relating to cheating and plagiarism are described by the Center for Student Rights and Responsibilities and in the Graduate Bulletin:

http://go.sdsu.edu/student_affairs/srr/cheating-plagiarism.aspx

All students must prepare a Turnitin report of their theses to the department. The Thesis Advisors are responsible to evaluate the reports and make sure that the report does not have more than 15% match with the existing documents. The Thesis Advisors will be responsible for submitting the reports with the signed Theses Originality Attesting Form (TOAF) to the department.