

ECE MS Workshop

Thursday, September 14th, 2023



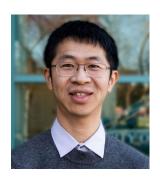
Graduate Advising Team



Ms. Michelle T. Walker

Graduate Program Coordinator

- Main point of contact
- Reviews and receives all paperwork
- Academic Advising
- Funding Questions
- Faculty and/or student concerns
- <u>mtwalker@ucdavis.edu</u>



Professor Weijian Yang

Graduate Advisor (PhD students)

- Academic advising for PhD students
- Faculty and/or student concerns
- Approvals
 - Remedial courses & program of study
 - Grad studies paperwork
 - ECE paperwork



Professor Lifeng LaiECE Graduate Program Chair

- Approves petition to change degree objective
- Faculty and/or student concerns



Professor Sebastian Gomez-Diaz

MS Director

- Academic advising for MS students
- Faculty and/or student concerns
- Approvals:
 - Program of studies & remedial courses
 - Grad studies paperwork
 - ECE paperwork



MS Program Director



Professor Sebastian Gomez-Diaz

MS Director

- Goal: Advise MS students so they can be successful.
- Resolve faculty and student concerns.
- Many questions/doubts could be resolved through e-mail: <u>jsgomez@ucdavis.edu</u>
- Administrative paperwork should be directed to Ms. Michelle Walker
 - Program of study, remedial courses, etc.
 - MS director will review and approve those at due time.
- In-person office hours are offered for MS advising:
 - Tuesdays 3:30-4:30pm
 - Appointments are required. Use: https://appointments.ucdavis.edu



Topics

- Introduction to the MS Program
- Master Program
 - Plan I Thesis
 - Plan II Comprehensive Exam
- ECE Resources
 - Additional information
 - Funding



Topics

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Master's Program

MS Plan I - Thesis

- Performs in-depth research and thesis writing
- More research, less courses
- 14-24 months full-time study

MS Plan II – Comprehensive Exam

- Course-based, project
- More courses, less research
- 12-20 months full-time study



Which degree objective are you planning to pursue?

You do not have to decide it now!



Research Areas





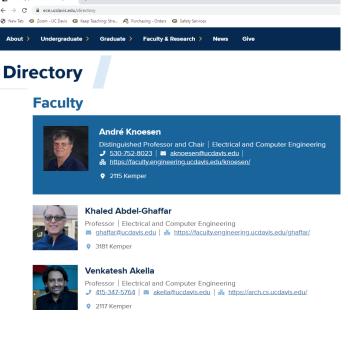
Do you have a major Professor?

- A major Professor will guide your studies at UC Davis.
 - MS director will officially serve as your major Professor until you find one.
- A major Professor will supervise your work at UC Davis.
 - Dissertation thesis for MS plan I.
 - Capstone project for MS plan II.
- You are requested to find, contact, and identify a major Professor to work with.
 - ECE Department does not assign major Professors to students.
 - As a graduate student, it is your duty to find a major Professor.



Faculty Directory (I)

Faculty in the Electrical and Computer Engineering Department





Chen-Nee Chuah

Professor | Electrical and Computer Engineering | Computer Science

3 530-752-5825 |
chuah@ucdavis.edu |
https://www.ece.ucdavis.edu/~chuah

3125 Kemper



Zhi Ding

Distinguished Professor | Electrical and Computer Engineering

3 530-752-4625 | ■ zding@ucdavis.edu | ♣ https://www.ece.ucdavis.edu/~zding/

3187 Kemper



Soheil Ghiasi

Professor | Electrical and Computer Engineering | Computer Science

3 530-752-0836 | ■ qhiasi@ucdavis.edu | ♣ https://www.ece.ucdavis.edu/~soheil/

3171 Kemper



J. Sebastian Gomez-Diaz

2039 Kemper



John Owens

Child Family Professor of Engineering and Entrepreneurship \mid Electrical and Computer Engineering \rightarrow 530-754-4289 \mid \equiv jowens@ece.ucdavis.edu \mid $\frac{1}{8}$ https://www.ece.ucdavis.edu/~jowens/research.htm

3175 Kemper



Anh-Vu Pham

Professor | Electrical and Computer Engineering

J 530-752-7472

ahpham@ucdavis.edu

Lab website

Faculty website

3141 Kemper



William Putnam

Assistant Professor | Electrical and Computer Engineering

J 530-752-7347 | ■ bputnam@ucdavis.edu | & https://faculty.engineering.ucdavis.edu/putnam.

3133 Kemper



Marina Radulaski

Assistant Professor | Electrical and Computer Engineering | Physics

J 530-754-0648

mradulaski@ucdavis.edu

https://rlab.engineering.ucdavis.edu

https://rlab.engineering.ucdavis.edu

3179 Kemper

Faculty Directory (and II)

- Faculty in the Electrical and Computer Engineering Department
- Faculty in the Graduate Program
 - Members of other Departments, like Computer Science, Mechanical and Aerospace Engineering, Biomedical Engineering, Physics, Mathematics, etc.

Graduate Program Faculty



Ashwin Aravindakshan

Associate Professor | Graduate School of Management

3 530-752-5767 | ■ aravind@ucdavis.edu | ♣ https://ashwin.faculty.ucdavis.edu.

3312 Gallagher



Matthew Bishop

Professor | Computer Science

3 530-752-8060 | ■ mabishop@ucdavis.edu | # https://nob.cs.ucdavis.edu/bishop.

2209 Watershed Sciences



Andre Daccache

Assistant Professor | Biological and Agricultural Engineering

3 530-752-5714 | adaccache@ucdavis.edu | https://faculty.engineering.ucdavis.edu/daccache/

3052 Bainer



Cristina Davis

Warren and Leta Giedt Endowed Professor and Chair | Mechanical and Aerospace Engineering

3 530-754-9004 |

cedavis@davis.edu |

http://mae.engr.ucdavis.edu/faculty/davisc/

2004 Bainer Hal



Vladimir Filkov

Professor | Computer Science

J 530-752-8393 | ■ filkov@cs.ucdavis.edu | ♣ https://web.cs.ucdavis.edu/~filkov/

Academic Surge 2077



Dipak Ghosal

Professor | Computer Science

3 530-754-9251 | ■ dqhosal@ucdavis.edu | ♣ https://faculty.engineering.ucdavis.edu/qhosal/

3045 Kemper



How to Find a Major Professor

Seek for offered MS projects at https://ece.ucdavis.edu/graduate/ms-degree-plan-i-thesis

Projects Offered

- > Area of Research: Computer Engineering
- > Area of Research: Photonic and Electronic Devices
- > Area of Research: Information Systems
- > Area of Research: RF-to-THz Electronics and Waves
- > Area of Research: Integrated Circuits and Systems
- > Area of Research: Bio Ag and Health Technologies



How to Find a Major Professor (II)

Seek for offered MS projects at https://ece.ucdavis.edu/graduate/ms-degree-plan-i-thesis

Projects Offered

Area of Research: Computer Engineering

Project: GPU Solvers for Flow Computation

Sponsors: Professor John Owens and Postdoc Serban Porumbescu

Description: We are working with the US Army Corps of Engineers to develop a GPU implementation of their "HEC-RAS" river analysis system, the leading system for flow computation. The current implementation of this package is on CPUs and we would like to bring it to GPUs. The core computation is modeling hydraulic flow on unstructured grids, and the research problems are both algorithmic and systems ones. The ideal student will be interested in writing high-quality open-source software in collaboration with fellow graduate students as well as domain experts from government, in the context of a large and active group that is interested in problems across many domains of parallel computing. It is likely that this position will be funded. It is expected that an interested student will pursue a thesis that will result in publication in a high-quality venue. This position should be equally interesting for new PhD students.

Requirements: Desirable: Expertise in numerical computation and/or parallel computing. Highly desirable: C++ expertise, and even more desirable, CUDA experience. Good communicator and collaborator.

Link: https://github.com/gunrock/gunrock/projects/5

Area of Research: Photonic and Electronic Devices

Project: MS projects in the Integrated Nanodevices & Nanosystems Laboratory

Sponsor: Professor Saif Islam

Description: Project opportunities include:

- 1.- Silicon photodiodes for 100gigabit/sec and beyond data communication.
- 2.- Computational imaging with photon-trapping photdiodes.
- 3.- Photon detectors for quantum internet.
- 4.- Transparent solar cells for window based on UV and IR light absorption.
- 5.- High resolution time-of-flight (TOF) sensing with ultra-fast photodiodes.
- 6.- LIDAR: technological challenges and recent developments.
- 7.- Ionizing air and gases to trap COVID-19 virus and prevent airborne transmission. Financial support available

for strong candidates!

- 8.-Ultra-fast silicon photodiodes for real-time visualization of tumor boundaries during surgery enabled by fluorescent lifetime imaging (FLIm).
- 9.-Semiconductor transistors/memory for extreme temperature and harsh environment.
- 10.- Memory and logic based on memristors: Simulations and design.

Link: https://www.ece.ucdavis.edu/~saif/



How to Find a Major Professor (III)

Seek for offered MS projects at https://ece.ucdavis.edu/graduate/ms-degree-plan-i-thesis

Area of Research: RF-to-THz Electronics and Waves

Project: Nonreciprocal phased array antennas

Sponsors: Professor J. Sebastian Gomez-Diaz

Description: This project deals with the analysis, design, fabrication and characterization of nonreciprocal phased-array antennas able to transmit and receive RF signals with different patterns at the same operation frequency with polarization control. The project entails the design of antenna in simulation software (HFSS or CST), the use of nonlinear circuit analysis (ADS), fabrication, and measurement in an anechoic chamber.

Requirements: Knowledge of electromagnetic waves and electronic circuits. Experience with full-wave simulation software (such as HFSS/CST and ADS) would be great but it is not required. It is a project for 1°2 students.

Link: https://sites.google.com/site/jsebastiangomezdiaz/

Area of Research: Bio Ag and Health Technologies

Project: Time-resolved near-infrared spectroscopy for blood oxygenation measurement

Sponsor: Professors Weijian Yang and Soheil Ghiasi

Description: Blood oxygenation is the fraction of oxygen-saturated hemoglobin relative to total hemoglobin (unsaturated + saturated) in the blood. A healthy individual regulates a very precise and specific balance of oxygen in the blood and there is medical significance to monitor oxygen saturation in patients. Near-infrared (NIR) spectroscopy provides a noninvasive approach to conveniently measure the blood oxygenation. In this project, we will study the various approaches of NIR spectroscopy for such measurements. In particularly, we will investigate and develop a time-resolved NIR spectroscopy system, which could not only provide the measurement results from the typical continuous-wave (CW) systems, but also rich information of the tissues under the measurement probe. We will develop the model, perform simulation, explore the components, build and characterize the prototype and perform in-vitro (and in-vivo) measurements.

Requirements: Electronic circuits, Basic optics, Matlab. It is a project for 2 students.



How to Find a Major Professor (IV)

Continuation of a project initiated in a graduated course

Area of Research: Integrated Circuits and Systems

Project: CMOS Analog IC design

Sponsor: Professor Stephen Lewis

Description: Continue the class project in EEC 210 or do another project related to analog CMOS integrated-

circuit design.

Requirements: Receiving a B or higher in EEC 210.

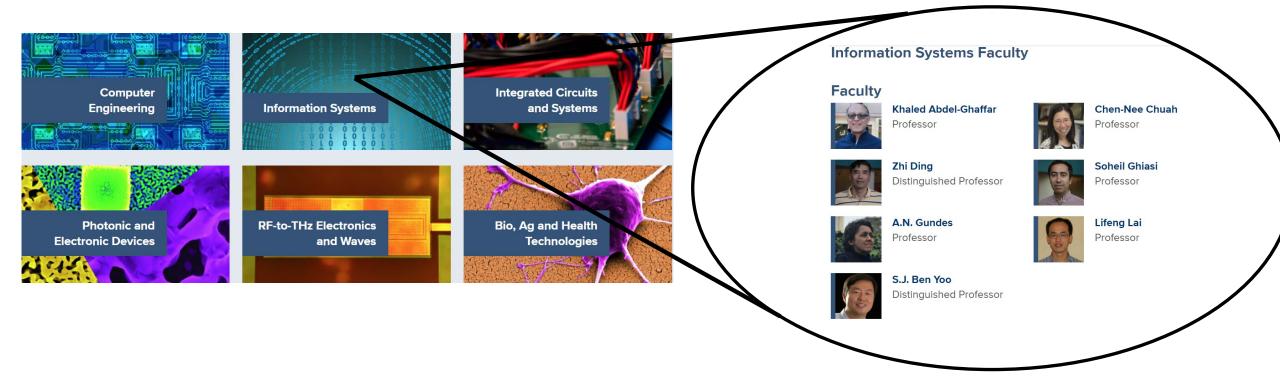
Link: https://www.ece.ucdavis.edu/~lewis/



How to Find a Major Professor (and V)

Contact professors working in the research areas that you are interested in

Include professors in the ECE Graduate Program





Contacting a Professor

Send a *concise* e-mail

- Dear Prof. XXX....
- Succinctly introduce yourself
- Highlight the projects/research lines that you are interested on
- Connect projects with your background
- Request more information / meeting

If the professor does not reply

• Send a polite reminder after \sim 1 week

Do NOT:

- Grammar mistakes / name misspelling
- Send a generic e-mail
- Send reminders everyday

Explore your options

- Contact several professors and learn about their research
- Financial support might be available
- Find the best fit



Questions?

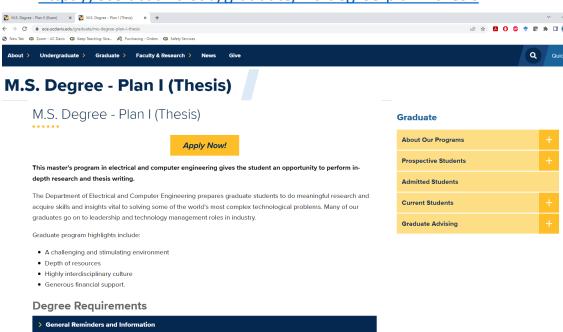


Topics

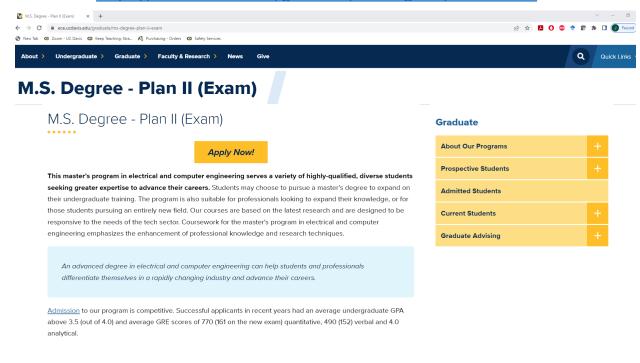
- Introduction to the MS Program
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 - Additional information
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Check the ECE Webpage

https://ece.ucdavis.edu/graduate/ms-degree-plan-i-thesis



https://ece.ucdavis.edu/graduate/ms-degree-plan-ii-exam





Degree Requirements

MS Plan I

- Declare a Major Professor
- Program of Study
- Advance to Candidacy
- Thesis Committee Selection
- Thesis
- Graduate Exit Form
- Meeting with a Senior Academic Advisor

MS Plan II

- Declare a Major Professor
- Program of Study
- Advance to Candidacy
- Comprehensive Examination
- Graduate Exit Form



Milestones

https://ece.ucdavis.edu/graduate/milestones

Master's Plan I Milestones

> Submitting forms related to the M.S. Plan I Degree Requirement
> Declare a Major Professor End of Winter Quarter - First Year
> Program of Study End of Fall Quarter - Second Year
> Advance to Candidacy End of Fall Quarter - Second Year
> Thesis Committee Selection End of Fall Quarter - Second Year
> Thesis Second Year
> Schedule an appointment with a Senior Academic Advisor in Graduate Studies Second Year

Master's Plan II Milestones

- > Submitting forms related to the M.S. Plan II Degree Requirement
- > Declare a Major Professor -- End of Winter Quarter First Year
- > Program of Study -- End of Fall Quarter Second Year
- > Advance to Candidacy -- Program of Study Approved Second Year
- > Comprehensive Examination Application -- Second Year
- > Comprehensive Examination -- Second Year

When you are ready to submit any form(s) that needs a signature from Graduate Advisor or a Graduate Coordinator please:

- Make sure you get all required signatures before sending in the form. Once signatures are complete, email form to ecegradinfo@ucdavis.edu
- Your form will be reviewed and signed by the appropriate person in the ECE department and forwarded onto Graduate Studies and your student file.
- Do NOT send the forms directly to the MS program director.

Declaring a Major Professor

Common step for MS Plan I and II

Master's Plan I Milestones

- > Submitting forms related to the M.S. Plan I Degree Requirement
- Declare a Major Professol End of Winter Quarter First Year

All students must select a major professor from the <u>ECE Graduate Program</u> directory. You must declare a major professor by completing the <u>Declaration of a Major Professor/Co-Advisor</u> form.

- > Program of Study -- End of Fall Quarter Second Year
- > Advance to Candidacy -- End of Fall Quarter Second Year
- > Thesis Committee Selection -- End of Fall Quarter Second Year
- > Thesis -- Second Year
- > Schedule an appointment with a Senior Academic Advisor in Graduate Studies -- Second Year



Declaration of Major Professor/Co-Advisor

Select a Major Professor by the third quarter of enrollment in your first year.

The Major Professor (Faculty Advisor) is the primary mentor during a student's academic career and oversees a student's research and progress. The Graduate Council defines mentoning as a close relationship between a graduate student and a faculty member who provides guidance, support and research advising in an individualized manner.

Student Name:		Date:		
Student ID:		A 1 14 T		
Degree Objective (check one):	☐ MS Plan I (Thesis)	☐ MS Plan II (Project)	□PhD	
The Major Professor relationship select a Major Professor from the https://www.ece.ucdavis.edu/peopl	members of the ECE Gradi		faculty. Please	
Major Professor (Print N	Jame)	Signature	Date	
(NOTE: CO-ADVISORIS NOT REQUIRED.) Co-Advisor (Print Nan	ne)	Signature	Date	
School:	Departn			
FOR OFFICE USE ONLY:				
□ Approved □ Not Approved	Graduate Advisor S	Signature	Date	
□Major Professor ECEGP Membe	r 🗖 GradHub 🗖 G	rad Tracker □Facul	ltv Emailed	

Updated: July 2018

- Find the form at https://ece.ucdavis.edu/graduate/milestones
- Fill the form
- Obtain your major professor's signature
- Send the form to <u>ecegradinfo@ucdavis.edu</u>

Milestones

https://ece.ucdavis.edu/graduate/milestones

Master's Plan I Milestones

- > Submitting forms related to the M.S. Plan I Degree Requirement
- > Declare a Major Professor -- End of Winter Quarter First Year
- Program of Study -- End of Fall Quarter Second Year
- > Advance to Candidacy -- End of Fall Quarter Second Year
- > Thesis Committee Selection -- End of Fall Quarter Second Year
- > Thesis -- Second Year
- > Schedule an appointment with a Senior Academic Advisor in Graduate Studies -- Second Year

Master's Plan II Milestones

- > Submitting forms related to the M.S. Plan II Degree Requirement
- > Declare a Major Professor -- End of Winter Quarter First Year
- > Program of Study -- End of Fall Quarter Second Year
- > Advance to Candidacy -- Program of Study Approved Second Year
- > Comprehensive Examination Application -- Second Year
- > Comprehensive Examination -- Second Year

Course Requirements (I)

MS Plan I

- Course Requirements: 36 units minimum (100 and 200 series only)
- At least 16 units of graduate ECE courses
 - Excluding 29X and seminar series and 299.
- At most 3 units of graduate seminar
- At most 9 units of EEC 299 research units
- Additional courses might be employed
 - Undergraduate upper division and graduate courses
 - ECE as well as other departments
- Courses with grades B- or better
- Restricted courses are not allowed

MS Plan II

- Course Requirements: 36 units minimum (100 and 200 series only)
- At least 24 units of graduate ECE courses
 - Excluding 29X and seminar series and 299.
- At most 1 units of graduate seminar
- At most 3 units of EEC 299 research units
- Additional courses might be employed
 - Undergraduate upper division and graduate courses
 - ECE as well as other departments
- Courses with grades B- or better
- Restricted courses are not allowed

Course Requirements (I)

IDP MS Plan I

- Course Requirements: 36 units minimum (100 and 200 series only)
- At least 12 units of graduate ECE courses
 - Excluding 29X and seminar series and 299.
- At most 3 units of graduate seminar
- At most 17 units of EEC 299 research units
- Additional courses might be employed
 - Undergraduate upper division and graduate courses
 - ECE as well as other departments
- Courses with grades B- or better
- Restricted courses are not allowed

IDP MS Plan II

- Course Requirements: 36 units minimum (100 and 200 series only)
- At least 18 units of graduate ECE courses
 - Excluding 29X and seminar series and 299.
- At most 3 units of graduate seminar
- At most 5 units of EEC 299 research units
- Additional courses might be employed
 - Undergraduate upper division and graduate courses
 - ECE as well as other departments
- Courses with grades B- or better
- Restricted courses are not allowed



Course Schedules

		Course Offerings	2023-2024		
		Summer Session	Schedule		
Fall		Winte	r	Spr	ing
Fall 2023 Course	Schedule	Winter 2024 Cours	e Schedule	Spring 2024 Co	ourse Schedule
EEC 001	EEC 189U	EEC 007	EEC 180	EEC 010	EEC 195B
EEC 007	EEC 196	EEC 010	EEC 181A	EEC 018	EEC 231C
EEC 018	EEC 200	EEC 100	EEC 189L	EEC 110A	EEC 232B
EEC 100	EEC 210	EEC 110A	EEC 195A	EEC 110B	EEC 244
EEC 116	EEC 224	EEC 112	EEC 201	EEC 111	EEC 247
EEC 130A	EEC 230	EEC 130A	EEC 211	EEC 113	EEC 248
EEC 132A	EEC 231A	EEC 132B	EEC 216	EEC 118	EEC 252
EEC 136A	EEC 239A	EEC 134A	EEC 231B	EEC 130B	EEC 264
EEC 140A	EEC 240	EEC 136B	EEC 235	EEC 132C	EEC 269B
EEC 145	EEC 250	EEC 140A	EEC 238	EEC 134B	EEC 272
EEC 146A	EEC 254	EEC 150	EEC 242	EEC 135	EEC 273
EEC 151	EEC 260	EEC 157A	EEC 281	EEC 140B	EEC 286
EEC 160	EEC 266	EEC 170	EEC 289KQ	EEC 150	EEC 289KLQS
EEC 161	EEC 270	EEC 172	EEC 290	EEC 151	EEC 290
EEC 170	EEC 289Q	EEC 173A	ENG 006	EEC 161	ENG 006
EEC 173A	EEC 290	EEC 174BY	ENG 017	EEC 165	ENG 017
EEC 174AY	ENG 006	EEC 175B *(Previously	ENG 100	EEC 172	ENG 100
EEC 175A *(Previously	ENG 017	193AB IOT Design)		EEC 180	
193AB IOT Design)	ENG 100			EEC 181B	



Course Catalog

Course Offerings

Iome - Course Offerings

Course Offerings and Schedules

> 2022-2023 Academic Year

Course Catalog
List of classes offered by the ECE department



Special Topic Courses
EEC 189s, EEC 193, and EEC 289

Graduate Courses

Disciplines Key: Photonics (Pho); Physical Electronics (PE); Biology, Agriculture, Health (Bio); Circuits (Cir), (CE).

> EEC 201 – Digital Signal Processing [Info, RF, Bio]

> EEC 205 – Computational Methods in Biomedical Imaging [Bio, Info, Pho]

EEC 206 – Digital Image Processing [Info, Pho]

> EEC 210 – Mos Analog Circuit Design [Cir]

EEC 211 - Advanced Analog Circuit Design [Cir]

EEC 212 – Analog Mos Ic Design For Signal Processing [Cir, Info]

EEC 213 – Data-Conversion Techniques and Circuits [Cir, Info]

EEC 215 - Circuits For Digital Communications [Cir, Info, CE]

> EEC 216 – Low Power Digital Integrated Circuit Design [Cir, PE]

> EEC 221 – Radio Frequency and Microwave Filter Design [RF, Circ]

> EEC 222 – RF IC Design [RF, Circ]

> EEC 223 – RF Integrated Circuits for Wireless Communications [RF, Circ, Info]

> EEC 224 – Terahertz and mm-Wave Integrated Circuit Design [RF, Circ, Info]

> EEC 228 – Advanced Microwave And Antenna Design Techniques [RF, Circ]

> EEC 230 - Electromagnetics [RF, Circ]

EEC 212 – Analog Mos Ic Design For Signal Processing [Cir, Info]

Units: 4 (3 Lecture)

Prerequisites: EEC 210

Course Description: Analysis and design of analog MOS integrated circuits. Passive components, single-ended and fully differential op amps, sampled-data and continuous-time filters.

Expanded Course Description:

This is an advanced course in analog MOS integrated circuit design. The focus is on the design of circuits for signal processing applications. The first half of the course covers advanced MOS device modeling, passive components, and a number of CMOS operational amplifiers, both single-ended and fully differential. In the second half of the quarter, switched-capacitor (SC) circuits are introduced and analyzed using the Z-transform and charge-transfer analysis. A SC sample-and-hold circuit is analyzed. Then first-an advanced cord-order SC filters. Filt filters, ladder filters, and nonideal effects in SC filters are covered. Continuous-time CMOS

filters are also presented. Homework requiring computer simulation will be carried out by the student. One midterm and a final will be given

I. CMOS Pro

A. Second-order effects in MOS transistors

B. Passive components, matching

II. Operational Amplifiers

A. The two-stage op amp

3. Folded cascode op amp

b. Folded cascode op amp

D. Output stages

E. Feedback analysis using return ratio

F. Fully differential op amps, continuous-time common-mode feedback (CMFB)

III. Switched-Capacitor (SC) Circuits

A. Simple sample & hold

B. Charge transfer equations, Z-transform analysis

C. SC integrators, active SC filters, S-to-Z transforms

D. Sampling effects, sin x/x, decimation/interpolation, SWITCAP

E. SC ladder filters

F. FIR filters, SC gain circuits

G. kT/C noise, op-amp noise, double correlated sampling, chopping

H. SC common-mode feedback

IV. Continuous-Time Filters

A. R-C active filters

B. MOSEET-C filters

B. MOSFET-C filters









Important Advice

Do not overload your schedule

- Some courses could be challenging and time consuming.
- Find a balance: graduate courses / undergraduate upper-division courses / research / TA.
- Talk with your major professor to take EEC299 units for your research project.

Be smart about your schedule

- First quarter could be quite challenging **Do not take more than 1 (maximum 2) graduate courses**
- Upper division undergraduate courses count toward your program of study and MS program
 - They may be pre-requisite for graduate courses
 - Do not assume that you have the level to follow a graduate course.
- Have a strategy: take courses that are related to your research interests.
- Take language courses
- Adjusting to UC Davis and the quarter system may take some time

GPA is important

• You must maintain an average above 3.0 to be in a good standing state



EEC200 Navigating Grad School

- Mandatory course
- Goal is to orient first-year graduate students (MS and PhD)
- Topics of the course include
 - Finding a major professor
 - Constructing a degree plan
 - Developing effective time-management and study skills while maintaining a good work-life balance
 - Learning the essential of research integrity/ethics
- Several professors will join to talk about their research lines
- This course will NOT count toward your program of studies.



Full-time student status

- All active students must enroll in at least 12 units per quarter.
- Several options to obtain units
 - Graduate courses (ECE & other departments)
 - Upper-division undergraduate courses (not restricted). ECE & other departments
 - GSR Research work carried out under your major professor supervision (EEC299)
 - TA work Work as a teaching assistant
- All courses count toward your full-time student status
 - Not all course might count toward your Program of Study
- Advice:
 - Do not take 3 graduate courses to be in full-time student status. You will likely not be successful.
 - Find a balance with graduate courses, upper-division undergraduate courses, languages, courses from other departments, teaching assistant position, EEC299 research units, etc. → This will help boosting your GPA.





Program of Study Master of Science Plan I - Thesis

Abbreviated Title, Prefix, and Number		(excluding 29X seminar series a Quarter Completed	Grade	Units
Abbreviated Title, Frenx, and Number	instructor	Quarter completed	Grade	Unit
			Total:	0
Research (299) – at most 9 units				
Abbreviated Title, Prefix, and Number	Instructor	Quarter Completed	Grade	Units
The state of the s		Quarter completes	0.000	0
			Total:	0
Seminar (290-297, excluding 290C) – at mos	st 3 units			
Abbreviated Title, Prefix, and Number	Instructor	Quarter Completed	Grade	Units
			Total:	0
Additional courses – upper division technica				
Abbreviated Title, Prefix, and Number	Instructor	Quarter Completed	Grade	Units
			Total:	0
				require
	Total Number of	f Units in items 1-4	(36 units	
			_	
Do you have a B.S. in ECE?		f Units in items 1-4 0	_	
Do you have a B.S. in ECE?			_	
Do you have a B.S. in ECE?			_	
	No If no, you nee	d to complete a Remedial Co	ourse Form.	
Do you have a B.S. in ECE? Yes			ourse Form.	Date

Program of Study – Plan I

Graduate Engineering Courses • 16 units ECE courses

Research Units

Seminar

Other courses

- EEC299 Maximum 9 units
- Approved by your major professor
- EEC290 Maximum 3 units
- Include upper-division undergraduate courses and graduate courses
- ECE and other departments



UCDAVIS ELECTRICAL AND COMPUTER ENGINEERING

Program of Study Master of Science Plan II – Comprehensive Exam

ajor Professor:		□ Draf	ft Final Quarter of Com	pletion:	
Graduate Engin	eering Courses - at least 24	must be ECE course	s (excluding 29X seminar series	and 299)	
Abbreviated	Title, Prefix, and Number	Instructor	Quarter Completed	Grade	Unit
				Total:	0
Posearch (200)	- at most 3 units				
	Title, Prefix, and Number	Instructor	Quarter Completed	Grade	Unit
Appleviated	ride, Frenz, and Number	III3ti uctoi	Quarter Completed	Grade	Oilit
				Total:	0
Sominar /290-20	27 evoluting 290C\ – at most	t 1 unit		Total:	0
	97, excluding 290C) – at most		Quarter Completed		
	97, excluding 290C) – at mos Title, Prefix, and Number	t 1 unit	Quarter Completed	Total:	
			Quarter Completed		
Abbreviated	Title, Prefix, and Number	Instructor		Grade Total:	Unit
Abbreviated Additional cours	Title, Prefix, and Number	Instructor or graduate course	es (excluding 29X seminar seri	Grade Total:	Unit
Abbreviated Additional cours	Title, Prefix, and Number	Instructor		Grade Total:	Unit
Abbreviated Additional cours	Title, Prefix, and Number	Instructor or graduate course	es (excluding 29X seminar seri	Grade Total:	Unit
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Program of Study – Plan II

Graduate Engineering Courses

24 units from ECE courses

Research Units

Seminar

Other courses

- EEC299 Maximum 3 units
- Approved by your major professor
- EEC290 Maximum 1 unit
- Include upper-division undergraduate courses and graduate courses
- ECE and other departments



Restricted Course List for ECE Graduate Degrees

Courses required for the ECE undergraduate degree and the following courses cannot be used to satisfy the requirement for an ECE graduate degree:

EEC 170

EEC 172

EEC 173A

EEC 196

EEC 18 (formerly EEC 180A)

EEC 180 (formerly EEC 180B)

Electrical and Computer Engineering Courses

- EEC 100
- EEC 110A/B
- EEC 130A/B
- EEC 140A/B
- EEC 150
- EEC 151
- EEC 161
- o Computer Science

Courses

- ECS 122A
- ECS 150
- ECS 188
- Engineering Courses
 - ENG 160
 - ENG 190

ADDITIONAL NOTES:

- ECS 154A at most, 1 unit may be used toward graduate coursework requirements in Box 4 on the MS Program of Study
- ECS 122A only students admitted in 2016 or earlier may use ECS 122A
- EEC 105ABC for undergraduate sophomores and juniors only. Graduate students cannot take the course.

ECE Forms and Documents Page: Restricted Courses

Restricted courses

- Considered key in the undergraduate ECE curriculum
- They CANNOT be used in your program of study
- They CAN be used to keep your full-time student status
- May be needed as a pre-requisite of advanced courses.



Remedial Courses

- Students without a B.S. in ECE
 - Meet with Academic Advisor during first quarter of residence
 - Determine if some remedial ECE courses must be taken.
 - Remedial courses DO NOT contribute to your program of studies
 - Remedial courses DO contribute to full-time student status
 - Once all remedial courses have been taken, a form must be filled and routed to the Graduate Coordinator.
 - Six courses must be selected from a least three of the six areas listed

Active and Passive Circuits

- EEC110A Electronic Circuits I
- EEC110B Electronic Circuits II

Electromagnetics

- EEC130A Introductory Electromagnetics I
- EEC130B Introductory Electromagnetics II

Physical Electronics

- EEC140A Principles of Device Physics I
- EEC140B Principles of Device Physics II

Signals and Systems

- EEC150 Introduction to Signals and Systems
- EEC151 Digital Signals and Systems

Computer Systems and Software

- ECS36A Introduction to Programming and Problem Solving
- ECS36B Introduction to Software Development and Object-Oriented Programming

Digital Systems

- EEC170 Introduction to Computer Architecture
- EEC18 Digital Systems I (formerly EEC 180A)



Academic Probation

- GPA < 3.0
- Graduate studies is notified
- Academic hold
 - You cannot register for new courses
 - Must meet with the MS Program Director to define a strategy to graduation
- You cannot TA
- You cannot graduate if you are in academic probation

R	ecommendation for Release of Academic Hole
Student Name	Student ID
Email	Graduate Program
nt's Signature:	Date:
uate Program Advisor Recommendation ompleted by the Graduate Advisor	
of Advising Appointment with the Student:	
nmendation: Release the hold Do NOT release to not recommend release of the hold, please specify the reason and distalement.	the hold*
ate Advisor Signature	Date:
Graduate Advisor Name:	
	ood standing (i.e. study or time management methods, developme the student or the Graduate Advisor. Attach additional page if



Questions?



Milestones

https://ece.ucdavis.edu/graduate/milestones

Master's Plan I Milestones

- > Submitting forms related to the M.S. Plan I Degree Requirement
- > Declare a Major Professor -- End of Winter Quarter First Year
- > Program of Study -- End of Fall Quarter Second Year
- Advance to Candidacy -- End of Fall Quarter Second Year
- > Thesis Committee Selection -- End of Fall Quarter Second Year
- Thesis -- Second Year
- > Schedule an appointment with a Senior Academic Advisor in Graduate Studies -- Second Year

Master's Plan II Milestones

- > Submitting forms related to the M.S. Plan II Degree Requirement
- > Declare a Major Professor -- End of Winter Quarter First Year
- Program of Study -- End of Fall Quarter Second Year
- > Advance to Candidacy -- Program of Study Approved Second Year
- > Comprehensive Examination Application -- Second Year
- > Comprehensive Examination -- Second Year



MS Advancement to Candidacy

Eligibility

- Maintain 3.0 GPA in all coursework listed on the Program of Study
- Program of Study is approved



Candidacy MS Plan I

Candidacy for the Degree of Master of _____(Science or Arts)

INSTRUCTIONS TO APPL Please complete both page and file this form with Grad	s, secure appropriate o				
NOTE: \$55 Candidacy Fee movithout notice.	ust be paid at Cashier's O	Office before this for	m is presented to Gradu	iate Studies.	Fee subject to change
Last Name	F	irst Name	Middle Nam	е	Student ID Number
Current Address		City	State/Zip Cod	ie	Telephone Number
Degree Sequence Number	Graduate Prog	gram	Program Code		E-mail
All requirements including to	hesis to be completed b	v: (fill in one)			
	ptember 20	•	Ma	rch 20	
Applicant Signature: Master's Thesis Committee					re approved by the
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Graduate Studies use only: TOTAL UNITS LISTED					

GRADUATE STUDIES SECTION	ı		
Matriculation:	Fee Paid:	_Thesis Filed:	
Full Time:	Qtrs/Res:	Degree Conferred:	
G.P.A.:	Registered/Filling Fee:	_(at time of submission)	
Deficiencies:			
ETD Number:	Embargo:	Copyright: Yes No	
APPROVED			
Dean of Graduate Studies Signate	ure:	Date:	
Staff Initials:			

Rev. 10/17 This version supersedes any earlier revisions. GS-313 2





Candidacy MS Plan II

			Candidacy for	the Degree of Master of:
	☐Advanced S	tudy □Arts □Engineeri	ing 🗆 Law 🗆 Pr	ofessional Accountancy
		□Public Health □Scie	ence Plan II – Co	mprehensive Exam Plan
consult Graduate S	oth pages, secur Studies and your	e appropriate departmental appro graduate program for filing deadlii d at Cashier's Office before this form	nes.	
Last Na	ıme	First Name	Middle Name	Student ID Number
Current Ac	ddress	City	State/Zip Code	Telephone Number
Degree Sequence Number		Graduate Program	Program Code	E-mail
All requirements inc	luding comprehe	ensive examination to be completed	d by: (fill in one)	
June 20	September 2	20 December 20	March	20
Applicant Signature:				_Date:
DEPARTMENT AP	PROVAL			
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Print Name:				_
Graduate Program Co	oordinator's Signa	ture:		Date:
Print Name:				_



LIST ONLY COURSES RELEVANT TO DEGREE

Upper division courses completed or to be completed for the Master's degree	Leave Blank	Units	Quarter and Year taken	Institution	Instructor
Graduate level courses completed or to be completed for the Master's degree					
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Graduate Studies use only: TOTAL UNITS LISTED					

GRADUATE STUDIES	SECTION		
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Full Time:	Qtrs/Res:	Degree Conferred:	
G.P.A.:	Registered/Filing Fee:	(at time of submission)	
Deficiencies:			
APPROVED			
Dean of Graduate Studies	Signature:	Date:	
Staff Initials:	_		

Candidacy Payment

UC Davis Graduate Studies





Graduate Forms

	Candidacy for the D	octoral Degree	(Plan A, B, or C
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Selecting Your Committee Members

- Coordinate with your major professor to make your selection
- Visit the ECE Directory for ECEGP members
 - The majority of your members must be from the ECEGP list
 - Faculty listed by Research area <u>Faculty & Research</u>
- External Membership
 - External Membership Application
 - CV of the member you are requesting to be member of your committee



Master of Science Plan I Thesis Committee Application

Complete and return to the Graduate Program Coordinator in Electrical and Computer Engineering office as soon as you have chosen your thesis committee.

- 3 Committee Members
 - Chair = Major Professor
 - o 2 of 3 must be ECEGP Members

Student Name:		
Student ID:		
Thesis Title:		
	Committee	• Members
Chair	Print Name	Chair Signature
Membe	er Print Name	Signature
Membe	er Print Name	Signature





Master of Science Plan II Comprehensive Exam Application

Complete and return to the Graduate Program Coordinator in Electrical and Computer Engineering office as soon as you have chosen your thesis committee.

- 2 Committee Members
 - Chair = Major Professor
 - o ECEGP Faculty Member
- Include a copy of your approved MS Plan II Program of Study

Student Name:			
Student ID:			
Seminar Topic:			
Proposed Date/T	ime:		
		Committee	• Members
Chair	Print Na	me	Chair's Signature
Membe	r Print N	ame	Member's Signature



MS Plan I - Graduation

Thesis

- Thesis Committee
- Submit electronically using ProQuest and Title Page is signed
- Graduate Exit Form
- Presentation is not required

Master's Plan I Milestones

Thesis Committee Selection -- End of Fall Quarter - Second Year

Submit the <u>M.S. Thesis Committee</u> application. The responsibility of this committee is to assist in the guidance of the student and to read and approve the thesis.

- ♦ Chaired by the major professor and made up of two other members
- ♦ The majority of this committee must be members of the <u>ECE Graduate Program</u>
- ♦ <u>External Membership Application</u> For members outside of the UC System

Thesis -- Second Year

- Master's Candidate Degree Completion List
- ♦ Preparing and Filing Your Thesis or Dissertation
- Dissertation submitted electronically
- ♦ Check filing deadlines on the <u>Academic Calendar</u>

v Schedule an appointment with a Senior Academic Advisor in Graduate Studies -- Second Year

Take the following documents to Graduate Studies

- ♦ <u>Graduate Exit Form</u> Submit to the Graduate Program Coordinator for signature
- ♦ Thesis/Dissertation Copyright and Embargo Agreement
- ♦ One title page with original signatures in ink

Make an <u>appointment</u> with a Senior Academic Advisor. Be prepared to spend 10 - 15 minutes with Graduate Studies.



Master's Plan II Graduation

- Main professor + 1 committee members
- Written report
 - Brief description of the project
- Poster/Oral presentation
 - 15~20 minutes

Comprehensive Examination Application -- Second Year

Submit the M.S. Comprehensive Examination Application. The responsibility of this committee is to assist in the guidance of the student and to give the Comprehensive Exam and approve the final report.

- ♦ Chaired by the Major Professor and made up of two other members
- ◆ The majority of this committee must be members of the ECE Graduate Program

Comprehensive Examination — Second Year

The examination has two parts: an oral presentation and a written report.

Preparing for your Comprehensive Exam

- ♦ Coordinate with your committee members to schedule an exam time
- In-Person Meeting Reserve a room for your exam using <u>COWS</u>; Schedule at least 30 minutes of prep time prior to the exam.
- ♦ Virtual Presentation Work with your Major Professor to set-up for a Zoom meeting
- ♦ Verification of Completion of the Comprehensive Examination
- ♦ Master's Report Form Plan II

Submit the following documents to the Graduate Program Coordinator

- ♦ Verification of Completion of the Comprehensive Examination
- ♦ Master's Report Form Plan II
- ♦ IEEE format of your written report
- ♦ Graduate Exit Form Submit to the Graduate Program Coordinator

See <u>Academic Calendar</u> for filing deadlines



MS Plan II Route: Comprehensive exam vs Paper critique route

Comprehensive exam

- Written report
- Oral presentation

Paper critique route

- MS director is the Major Professor
 - Rare option for exceptional cases
 - Discuss your case with the MS director
- Critique of a paper
 - Specific to your research area
 - Paper database provided by ECE faculty
 - Evaluation by ECE faculty + MS director
 - Poster/oral presentation



Preparing for Graduation

Deadlines

Thesis/Dissertation/Final Reports Graduation Filing Deadlines

Use the table below to help you decide when to submit your thesis/dissertation/ masters report for graduation. Review the <u>Filing Your Thesis or Dissertation</u> webpage for information about the filing process, formatting, and paperwork.

Master Report forms, dissertation, required filing paperwork, and signed title page must be submitted to Graduate Studies by 11:59 PM on the deadline.

Submission Deadline	Degree Awarded Date	Last Qtr in a Student Status (Enrolled or on Filing Fee):
September 8, 2023	September. 15, 2023 (Summer)	Enrolled or on Filing Fee in Spring 2023
December 8, 2023	December 15, 2023 (Fall)	Enrolled or on Filing Fee in Fall 2023
March 15, 2024	March 22, 2024 (Winter)	Enrolled in Winter 2024
June 6, 2024	June 13, 2024 (Spring)	Enrolled or on Filing Fee in Spring 2024



Graduation Documents

Thesis

- Preparing and Filing Your Thesis or Dissertation
 - 1. Title Page
 - 2. Copy of your abstract
 - 3. Copyright/Embargo Agreement
 - 4. Graduate Exit Form
 - 5. Meet with a Senior Academic Advisor

Comprehensive Exam/Paper Critique

- Schedule your exam
 - 1. Verification of Completion of the Comprehensive Exam
 - 2. Master's Report Form
 - 3. Written report in IEEE format
 - 4. Graduate Exit Form



250 Mrak Hall • One Shields Ave. Davis, CA 95616 (530) 752-0650 ucdavisgradsludies.edu

Master's Candidate Degree Completion List

GS-304

All theses must be submitted electronically using the ProQuest Electronic Thesis/Dissertation (ETD) Administrator. You must submit the finalized version of the thesis. Forms and formatting information can be found on the Office of Graduate Studies website at http://gradstudies.ucdavis.edu/current-students/admissions-academic-services/filing-thesis-or-dissertation. Published deadlines for turning in the thesis will be strictly observed. If you miss the deadline you will be placed on the next degree list.

Be prepared to spend 10-15 minutes in Graduate Studies while forms and documents are checked. In order to submit your forms and documents, it is REQUIRED you contact your Senior Academic Advisor to make an appointment or arrange to file remotely (http://gradstudies.ucdavis.edu/about/directory.html). Your thesis must have been submitted at least two business days prior to your appointment. Exam plan students do not need to have an appointment to finish their degrees. They may mail in the Graduate Program Exit Information form to Graduate Studies to receive a Certificate of Completion.

DOUBLE CHECK...

- Are you currently registered or on Filing Fee status? Is your Filing Fee status current? If your status has lapsed, you will need to consult with your Graduate Coordinator as to your next step.
- Have you made any changes to your thesis committee since you advanced to candidacy? If so, have you submitted a Request for Reconstitution of Committee? http://gradstudies.ucdavis.edu/sites/default/files/upload/files/current-students/gs332-reconcommittee-membership-request.pdf
- Have you checked to ensure that your name is correct as it appears on the Student Information System? If your name is incorrect, or you wish to include or exclude middle name and/or initial, or your name has a character such as an accent mark, please complete a Name Change petition with the Office of the University Registrar.
- Have all "I" Incomplete Grades and "NG" No Grades been completed?
- Have all course requirements been completed?

THESIS OPTION

Your thesis must have been submitted electronically to the PQIL ETD website at least two business days prior to your appointment with Graduate Studies, Graduate Studies must have approved the electronic thesis prior to your appointment.

PLEASE BE SURE TO BRING THE FOLLOWING WITH YOU TO YOUR APPOINTMENT:

- One title page with original signatures in ink. Faculty names must be typed beneath the signature line.
 - Sample and Template title pages are located here: https://grad.ucdavis.edu/academics/finishing-your-degree/filing-thesis-or-dissertation.
- One copy of your abstract.
- Copyright/Embargo Agreement: https://grad.ucdavis.edu/sites/default/files/upload/files/current-students/gs341-copyright-embargo-agreement.pdf
 - You must sign on the Student's Signature line in the Embargo section
 - Embargo section must be signed by Major Professor even if you select "No Embargo"
 - Copyright section should be signed only if you register your thesis/dissertation through ProQuest during upload
- Graduate Program Exit form this form must be printed off, signed by your Graduate Coordinator, and presented at the time
 you meet with Graduate Studies staff. http://gradstudies.ucdavis.edu/sites/default/files/upload/files/current-students/gs312-graduate-program-exit.pdf

EXAM OPTION

- Have you taken and passed your comprehensive exam by the appropriate date? M.F.A. students will use a form specifically for M.F.A. programs. http://oradstudies.ucdavis.edu/current-students/forms-information
- Graduate Program Exit form this form must be printed off, signed by your Graduate Coordinator, and forwarded to Graduate
 Studies staff. http://gradstudies.ucdavis.edu/sites/default/files/upload/files/current-students/gs312-graduate-program-exit.pdf

Note: This form does NOT go to the Office of Graduate Studies. The form is for your information only.

Rev. 12/19 This version supersedes any earlier revisions.

MS Plan I

Preparing & Filing Your Thesis or Dissertation

MS Plan II

Master's Exam or Project Filing Requirements



Student Assessment Report (SPA)

- 1. A survey to keep track of students' performance and collaboration with Professors
 - Help identifying potential challenges
- 2. Student completes the SPA
- Major Professor reviews and finalizes the SPA
- 4. MS Program Director approves
 - Courses
 - Degree Progress
 - Committee Members
 - Accomplishments and Expectations
 - Career Goals
 - Overall Assessment (Completed by major professor)
 - Satisfactory
 - Marginal
 - Unsatisfactory



Tips: Student Assessment Report

- Be specific
- Understand the degree requirements
- Have personal expectations, set clear goals
- Communicate with your major professor
 - Goals/Expectations
 - Degree requirements
 - Accomplishments
 - Graduation date



Questions?



Topics

- Introduction to the MS Program
- Master Program
 - Plan I Thesis
 - Plan II Comprehensive Exam
- ECE Resources
 - Additional information
 - Funding



Student Status

Full-time – All active student must enroll in at least 12 units

Part-time – Submit a Part-time Petition Webform by the 10th day of instruction

- F-1 or J1 status cannot drop below 12 units without SISS authorization
- Register for 6 units or less

Planned Educational Leave Program

- PELP up to a year
- Email Graduate Program Coordinator for PELP application
- International students must return to their home country

<u>In-Absentia</u> - In absentia is a reduced-fee registration status for full-time, regularly enrolled students who have an academic need to conduct research or study outside of the state of California for a period of one academic year.

Filing Fee

- Must have Advanced to Candidacy (program of studies approved)
- Research project should be have completed, except cosmetic edits



Degree Changes

Petition for Degree Objective Change

- Change major (connect with advisor in new major)
- Change degree objective
- Double major
- Complete the Petition to Change Graduate Major, Degree Objective, or Double Graduate Major



Transferring Coursework

Petition to Transfer Coursework

You may transfer coursework from another university as long as the course was not required for your undergraduate degree objective

- Coursework must be approved by Graduate Faculty Advisor
- Submit syllabus for the course
- Must have a letter that confirms the course <u>was</u> <u>not</u> required for your undergraduate degree

Transfer Quick-Reference

Source of Transfer Coursework	Student Standing During Course(s)	Transfer Units/Courses Permitted	Transfer Course Level	Units Transferred	GPA Transferred	Residence Reduced
Another UC Campus (not a UC Extension)	Graduate	Up to 50% of units required for the UC Davis master's degree	Upper- division or Graduate	Yes	Yes	Yes
A Non-UC Campus	Graduate	Up to two courses (no unit max)	Upper- division or Graduate	Yes	No	No
UC Davis Extension	Postbac (after undergrad but before grad)	Up to 12 quarter units	Upper- division or Graduate	Yes	Yes	No
UC Davis Summer Session	Postbac (after undergrad but before grad)	Up to two courses (no unit max)	Upper- division or Graduate	Yes	By Request	No
Undergraduate (any Institution)	Undergraduate	Up to two courses (no unit max)	Graduate Only	Yes	No	No



Funding Information

Master's students are self-funded

You are supposed to cover your tuition fees

Potential funding sources

- Teaching assistant (TA) appointment
- GSR might be available
 - Professors may have funded projects available
 - Funding may vary
- FAFSA (Domestic Students) Free Application for Federal Student Aid



Teaching Assistant Positions (I)

Teaching Assistants - TA appointment

- You work as a support teacher in an undergraduate or graduate courses ECE and other departments
- You will receive an e-mail every quarter with a list of TAs positions. You should apply if you are interested.

Eligibility

- Full-time status
- Good academic standing (3.0 GPA minimum)
- Complete EEC 390
- Language Proficiency

EEC390 is Mandatory

- Register as soon as possible
- Only available in the Fall
- 2-day course
- Does not count toward your program of study.
- September 25 & 26, 2023.

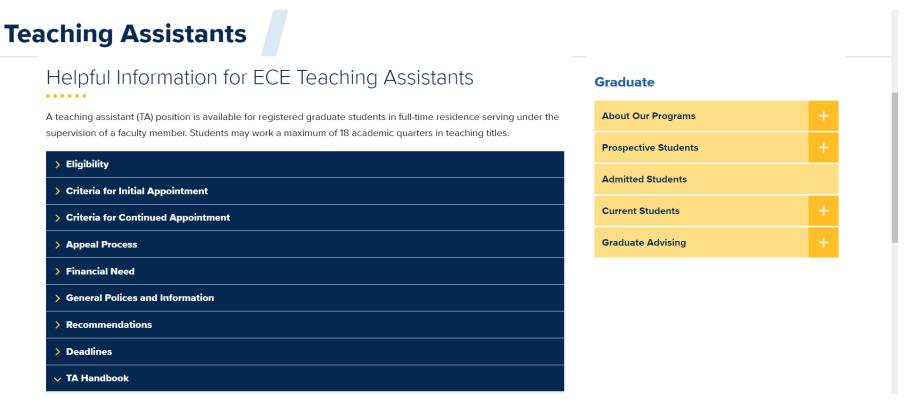
If you are working as a TA...

- Enroll in EEC396 to get units (1 to 4) to satisfy full-time student status requirements.
- These units cannot be employed in your program of study



Teaching Assistant Positions (and II)

https://ece.ucdavis.edu/graduate/teaching-assistants





Employment Eligibility & Work Study

Employment

- 3.0 minimum GPA
- Full-time status a 12 units for the quarter
- 50% total appointment maximum during the academic year
- GSR Appointment 21 academic quarters max

Note: Must file a Petition for Exception to Policy (to the Dean of Graduate Studies) if any of these criteria are not met during a given quarter

Work Study

- Must be a Domestic Student (US citizen/permanent resident)
- FAFSA Required each year by June 30th
- Must demonstrate Financial Need
- Must have at least a 25% GSR Appointment with a faculty Research Advisor



Thank you!!

Resources:

- Milestones https://ece.ucdavis.edu/graduate/milestones
- Schedules and Classes https://ece.ucdavis.edu/schedules-classes
- MS Plan I Degree Requirements https://ece.ucdavis.edu/graduate/ms-degree-plan-i-thesis
- MS Plan II Degree Requirements https://ece.ucdavis.edu/graduate/ms-degree-plan-ii-exam
- Faculty & Research https://ece.ucdavis.edu/faculty-research
- Faculty Directory https://ece.ucdavis.edu/directory
- Graduate Studies Forms https://grad.ucdavis.edu/financial-support/forms
 - Preparing & Filing Your Thesis or Dissertation
 - Master's Exam or Project Filing Requirements
 - Academic Calendar
 - <u>Form Store</u> Electronic payments



Questions?