

# Program & Technical Electives

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## ECE 212

- **Course Description:**  
Microcomputer architecture, assembly language programming, sub-routine handling, memory and input/output system and interrupt concepts. Credit may be obtained in only one of ECE 212, E E 380 or CMPUT 229.
- **Prerequisite:**  
ECE 210 or E E 280 or CMPUT 329
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Edmond Lou (teaching in Winter Term 2024), Jeremy Sit (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Edmond Lou's Rate My Professor rating is 2.6/5, Jeremy Sit's Rate My Professor rating is 3.1/5
- **Course Difficulty:**  
You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.  
Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.  
Each comment should represent someone's thoughts on the course ECE 212 (make sure that the person is talking about the course in question and not a different course).  
If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).  
Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.  
Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.  
Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.  
Context: "i agree, its a pain in the butt course. Currently Im using videos from the

youtube channels: learn online, and Rakesh M B. Surprisingly crash course also has some good videos. But yeah if anyone else has some good resources I would be forever grateful" "Thanks I'll make sure to check em out" "DM me." "I DM'd ya" "Oh this course was an absolute nightmare. Easily the worst ECE course of year 2. Not because it's uninteresting, they just make it more complicated than it needs to be." "Check out Ben Eater on YouTube. Especially once we get into assembly language and stuff, there's a ton of good resources on his channel" "You could look online for general assembly language concepts, but a large part of the class is just learning the Coldfire assembly language. The programming card is probably the best resource available for Coldfire. The best way to learn a new language is to practice, so my advice would be spend a lot of time on the lab projects. Use the programming card as a reference for syntax, and use the Debug perspective to check values stored in memory and in the registers." "That course was a wild ride. I checked, I don't have any textbook in my records, nor slides. The only thing I can really pass on is EASy68k, an emulator that is very similar (but not exact!) to the language syntax you used in the lab. If you want to run some assembly from the comfort of your own home, it may be of assistance to you." "Normally I give the warning that just running the assignment code with it will absolutely wreck you on the final though. For our final in my year we had to actually step through some code by hand." "Zhenyu's class?" "\*Shudders. I remember that class What a nightmare\*" "Oh man the guy has incomplete notes but he doesn't post the full thing so you have to attend class. But you can't write everything down fast enough unless you have a surface and are writing directly on top of the slides. (He just points to the slides while the completed bits are in red) . But wait that's not enough, he'll say small things that you will definitely miss but you need to remember every single aside he makes because when you ask a question, he'll be like "oh yeah I mentioned it at one point" or he'll just laugh in your face and tell you to look at the programming card. No joke, I straight up recorded (in video) every single lecture because it was otherwise impossible to digest the content the way he presented it. I had friends asking me hey what's that thing he mentioned 2 weeks ago for 0.05 seconds and that saved our asses. Idk how anyone else survived. Pro tip for exams: if you put the number 0 in all of the fill in the blank spaces, you'll get most of the marks. Don't leave those blank!" "The guy himself is otherwise pretty nice, but I just hate how he presents the material with a deep passion. No one should ever be taught the way he does it. The accent is thiccc but manageable" "Final comment:" "LOOOK AT THEEE POOGRAMMING CARD" "" "Really nice prof and helpful in his office too. However, you have to be really fast at solving problems in his exams." "Oh man the guy has incomplete notes but he doesn't post the full thing so you have to attend class. But you can't write everything down fast enough unless you have a surface and are writing directly on top of the slides. (He just points to the slides while the completed bits are in red) . But wait that's not enough, he'll say small things that you will definitely miss but you need to remember every single aside he makes because when you ask a question, he'll be like "oh yeah I mentioned it at one point" or he'll just laugh in your face and tell you to look at the programming g card. No joke, I straight up recorded in video every single lecture because it was otherwise impossible to digest the content the way he

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laugh in your face and tell you to look at the programming g card. No joke, I straight up recorded in video every single lecture because it was otherwise impossible to digest the content the way he presented it. I had friends asking me hey what's that thing he mentioned 2 weeks ago for 0.05 seconds and that saved our asses. Idk how anyone else survived" "Final comment:" "LOOOK AT THEEE POOGRAMMING CARD" "\*Shudders. I remember that class What a nightmare\*" "Oh man the guy has incomplete notes but he doesn't post the full thing so you have to attend class. But you can't write everything down fast enough unless you have a surface and are writing directly on top of the slides. (He just points to the slides while the completed bits are in red) . But wait that's not enough, he'll say small things that you will definitely miss but you need to remember every single aside he makes because when you ask a question, he'll be like "oh yeah I mentioned it at one point" or he'll just laugh in your face and tell you to look at the programming g card. No joke, I straight up recorded in video every single lecture because it was otherwise impossible to digest the content the way he presented it. I had friends asking me hey what's that thing he mentioned 2 weeks ago for 0.05 seconds and that saved our asses. Idk how anyone else survived" "Final comment:" "LOOOK AT THEEE POOGRAMMING CARD" "\*Shudders. I remember that class What a nightmare\*" "Oh man the guy has incomplete notes but he doesn't post the full thing so you have to attend class. But you can't write everything down fast enough unless you have a surface and are writing directly on top of the slides. (He just points to the slides while the completed bits are in red) . But wait that's not enough, he'll say small things that you will definitely miss but you need to remember every single aside he makes because when you ask a question, he'll be like "oh yeah I mentioned it at one point" or he'll just laugh in your face and tell you to look at the programming g card. No joke, I straight up recorded in video every single lecture because it was otherwise impossible to digest the content the way he presented it. I had friends asking me hey what's that thing he mentioned 2 weeks ago for 0.05 seconds and that saved our asses. Idk how anyone else survived" "Final comment:" "LOOOK AT THEEE POOGRAMMING CARD" "Get some study materials from your friends in other sections. It's what I did for the midterm and ended up being okay. I know it's lame to say but it's kinda frustrating not to have any homework for this class because we can't gauge what we should study." "Test went bad, now I'm sad 😞" "Bit of a time crunch near the end, had to guess a bit lol" "I think it went okay but I don't have much faith in myself anymore." "I fucked up." "hard." "Pretty bad. I think Lou made it sound like it was easy" "Prof made it sound so much easier than it actually was, big F for me." "Hard cuz time" "Very scuffed. Not easy"

Only return the helpful answer below and nothing else.

Helpful answer:

The course ECE 212 is described as a difficult one by multiple commenters. They suggest using various resources such as YouTube channels, programming cards, and emulators to aid in learning the Coldfire assembly language used in the course. Some commenters mention that the professor's teaching style makes it hard to keep up with the content and that they had to record lectures to be able to digest the information. The final exams are reportedly challenging and require students to be fast at solving

problems. Overall, the consensus seems to be that the course is not an easy one and requires a significant amount of effort and dedication to master the material.

## ECE 220

- **Course Description:**

Architecture and basic components of computing systems. Programming environment and program development methodology. Basics of programming: from data structures and functions to communication with external devices. Principles of object-oriented programming. Good programming style.

- **Prerequisite:**

ENCMP 100

- **Terms the course is available in:**

Winter Term 2024, Winter Term 2025

- **Instructor(s):**

Marek Reformat (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025

- **Instructor ratings:**

Marek Reformat's Rate My Professor rating is 4.7/5

- **Course Difficulty:**

You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.

Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.

Each comment should represent someone's thoughts on the course ECE 220 (make sure that the person is talking about the course in question and not a different course).

If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "Correct me if I'm wrong but I believe its C, and a little bit of C++." "C and a little bit of C++" "Most did not find the class difficult. To be honest not many people

attended lecture and of those who did, most didn't pay much attention. You can do the labs ahead of time and just show up to demo them. TA's are quite helpful though. Exams were like encmp 100 multiple choice with a short programming question (like 10-20 lines of code)." "220/203 are for sure bi-weekly, 212 I believe was almost every week for some reason. And most of the time throughout your degree you'll find they alternate pretty good, but also sometimes you'll have labs stack all in the same week." "Labs tend to be sporadic. Most are every two weeks but start late in the semester and may not be exactly every two weeks so you can't schedule two labs on the same day, hoping that they will alternate perfectly." "It's just eclass. They're saying if you access eclass during an exam they will know about it."

Only return the helpful answer below and nothing else.

Helpful answer:

The course ECE 220 is primarily based on the C programming language, with some elements of C++. The course is generally considered to be of moderate difficulty, with most students reporting that they did not find it particularly challenging. Attendance in lectures was low, and many students opted to complete the labs ahead of time and only attend the demos. The TAs were reported to be helpful, and exams consisted of multiple choice questions and short programming assignments. Labs were scheduled bi-weekly but tended to be sporadic, with some weeks featuring multiple labs and others having none. Accessing eclass during an exam was discouraged.

## ECE 380

- **Course Description:**  
Basics of analog communication: amplitude, angle, and analog pulse modulation; modulators and demodulators; frequency multiplexing. Basics of digital communication: sampling, quantization, pulse code modulation, time division multiplexing, binary signal formats. Credit may be obtained in only one of ECE 380 or ECE 390.
- **Prerequisite:**  
ECE 240 or ECE 238
- **Terms the course is available in:**  
Winter Term 2024, Fall Term 2024, Winter Term 2025
- **Instructor(s):**  
Xingyu Li (teaching in Winter Term 2024), Instructor(s) undecided for Fall Term 2024, Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
The professor does not have a rating on Rate My Professor

- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 450

- **Course Description:**  
Semiconductor device physics, device scaling trends, advanced MOSFET fabrication and the associated quantum mechanical framework in nanoscale systems. Semiconductor devices as a system of elemental components. Quantum phenomena in the evaluation of semiconductor devices. Impact of new materials such as high-k gate dielectrics, copper damascene processing and diffusion barriers on device performance. Choice of channel materials and strain condition for ultrascaled logic devices, RF and power electronic devices. Credit may be obtained in only one of ECE 450 or E E 450.
- **Prerequisite:**  
ECE 302 or E E 340
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Manisha Gupta (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Manisha Gupta's Rate My Professor rating is 1.9/5
- **Course Difficulty:**  
You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.  
Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.  
Each comment should represent someone's thoughts on the course ECE 450 (make sure that the person is talking about the course in question and not a different course).  
If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).  
Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.  
Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.  
Provide a summary on the difficulty (make sure to explicitly mention how difficult it

is) of the course using the context provided.

Context: "Theres an old syllabus for the Eng M course here:  
<https://www.ualberta.ca/mechanical-engineering/undergraduate-studies/course-links>"

Only return the helpful answer below and nothing else.

Helpful answer:

Based on the provided context, it appears that someone has shared a link to an old syllabus for a Mechanical Engineering course at the University of Alberta. While the specific course mentioned in the post is not ECE 450, it is possible to infer some information about the difficulty of ECE 450 based on the context.

The syllabus indicates that the Mechanical Engineering course in question is a 400-level course, which is typically the level for advanced undergraduate courses. The presence of an old syllabus suggests that the course may have undergone some changes since then, potentially making it more or less difficult.

However, without more information about the specific content and workload of ECE 450, it is impossible to make a definitive statement about its difficulty. It is worth noting that the opinions of individual students may vary widely, and that some students may find certain aspects of the course challenging while others find them straightforward.

Overall, based on the context provided, it appears that ECE 450 is likely to be a challenging advanced undergraduate course in Electrical and Computer Engineering. However, the exact difficulty cannot be determined without additional information.

## ECE 452

- **Course Description:**

Introduction to advanced numerical methods such as finite-difference, finite-element and spectral-domain techniques for solving partial differential equations. Simulations of nanoscale systems involving multiphysics or coupled differential equations involving electron and thermal transport phenomena, electrodynamics, MEMS, and process simulation, graphical methods for 3D visualization of simulation data. Examples from applied areas of nanoengineering to demonstrate computational methods for understanding complex physical phenomena and for designing and simulating nanoscale devices and systems. Credit may be obtained in only one of ECE 452 or ECE 445.

- **Prerequisites:**

ECE 341 or MATH 309 or 311



- **Terms the course is available in:**  
Fall Term 2024
- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 472

- **Course Description:**  
Interaction of radiation with atoms, laser oscillations and threshold conditions, 3- and 4-level laser systems, rate equations, special properties of laser light, cavity Q and photon lifetime, optical resonators and lens waveguides, Gaussian beams, gain saturation, Q-switching, mode locking, interaction of light and sound, holography. Description of various lasers: solid, gas, semiconductor, dye, Raman and chemical. Laser applications. Credit may be obtained in only one of ECE 472 or E E 472.
- **Prerequisites:**  
ECE 370 or E E 315 or PHYS 381 or consent of Instructor
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Jason Myatt (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Jason Myatt's Rate My Professor rating is 4.3/5
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 475

- **Course Description:**

Basic optical properties of crystalline and amorphous semiconductor materials: energy band diagrams, optical constants. Recombination and light emission in semiconductors. Light emitting diodes: spectral characteristics, materials, and applications. Stimulated emission and laser oscillation conditions in semiconductors. Laser diodes: modal and spectral properties, steady state rate equations, materials and structures. Light absorption, optical to electrical energy conversion. Photovoltaic cells: fill factors and efficiency, temperature effects, alternative materials and structures. Credit may be obtained in only one of ECE 475 or E E 475.

- **Prerequisite:**

ECE 302 or E E 340

- **Terms the course is available in:**

Winter Term 2024, Winter Term 2025

- **Instructor(s):**

Amina Hussein (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025

- **Instructor ratings:**

Amina Hussein's Rate My Professor rating is 4.5/5

- **Course Difficulty:**

Insufficient information available on course difficulty

## ECE 476

- **Course Description:**

Electrostatics and magnetostatics; Maxwell's equations and plane waves. Analysis and characterization of waveguides, rectangular and circular waveguides, waveguide cavities. Radiation mechanism of dipoles, fundamental parameters, Friis transmission equations, link budget analysis, linear wire antennas, antenna arrays, different types of antennas, antenna measurements. Credit may be obtained in only one of ECE 476 or E E 476.

- **Prerequisites:**

ECE 370 or E E 315 or PHYS 381

- **Terms the course is available in:**  
Fall Term 2024
- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 478

- **Course Description:**  
Introduction to RF/microwave circuits and their applications. Maxwell's Equations and basic wave-propagation concepts. Transmission-line theory and impedance-matching techniques. Practical planar transmission lines. Lumped and distributed microwave-circuit elements. Microwave network analysis using impedance/admittance parameters, scattering parameters, and transmission-matrix methods. Analysis, design, fabrication, and test of practical RF/microwave devices including power dividers/combiners, couplers, amplifiers, and filters. Credit may be obtained in only one of ECE 478 or E E 478.
- **Prerequisites:**  
ECE 370 or E E 315 or PHYS 381
- **Terms the course is available in:**  
Fall Term 2024
- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.  
Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.  
Each comment should represent someone's thoughts on the course ECE 478 (make

sure that the person is talking about the course in question and not a different course).

If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "If 478 is Microwaves still, it's the hardest course you'll take in undergrad EE. That being said, everyone I know who has ever taken that course has found it incredibly rewarding and Iyer is one of the best in the business." "Yeah that's what I've been hearing. I think as long as people who took it think it was organized and fair then I want to do it. I thought ECE 370 was hands down the "fairest" course I've taken in my whole undergrad, in terms of him giving you every resource you need to completely understand the material, and not throwing in crazy questions on the exam just to fix the curve. I just wanna make sure it's not one of those courses that's all over the place."

Only return the helpful answer below and nothing else.

Helpful answer:

478, also known as Microwaves, is considered the most challenging undergraduate EE course at the university. Despite its difficulty, students who have taken it often find it rewarding. The course is well-organized and fair, providing students with all the necessary resources to understand the material.

## BME 513

- **Course Description:**

Introduction to basic physical and technological aspects of medical imaging. Emphasis on computed transmission and emission tomography, magnetic resonance, and ultrasound imaging. These methods are developed and contrasted in terms of how imaging information is generated, detected, and processed and how different hardware configurations and other factors limit image quality. Relative diagnostic potential of the imaging methods is also discussed in relation to future prospects of each method.

- **Prerequisites:**

None

- **Terms the course is available in:**

Winter Term 2024

- **Instructor(s):**  
Alan Wilman (teaching in Winter Term 2024), Robert Stobbe (teaching in Winter Term 2024)
- **Instructor ratings:**  
The professor does not have a rating on Rate My ProfessorThe professor does not have a rating on Rate My Professor
- **Course Difficulty:**  
Insufficient information available on course difficulty

## BME 564

- **Course Description:**  
Designed for graduate and advanced undergraduate students requiring a thorough grounding in the fundamentals of imaging by means of nuclear magnetic resonance, NMR. Topics include the principles of NMR as applied to imaging, image processing, imaging techniques for achieving specific types of contrast, image artefacts, and typical applications.
- **Prerequisite:**  
Consent of instructor
- **Terms the course is available in:**  
No term decided yet/not offered this year
- **Instructor(s):**  
No instructor teaching the course
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 304

- **Course Description:**  
MOS digital circuits, logic gates, threshold voltages. MOS logic families: design and simulation. CMOS timing: propagation delay, rise and fall times. Storage elements,

memory, I/O and interfacing. Credit may be obtained in only one of ECE 304 or E E 351.

- **Prerequisites:**

ECE 210 or E E 280 or CMPUT 329, and ECE 302 or E E 340

- **Terms the course is available in:**

Fall Term 2024

- **Instructor(s):**

Instructor(s) undecided for Fall Term 2024

- **Instructor ratings:**

No professors teaching this term, so no ratings available at all

- **Course Difficulty:**

You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.

Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.

Each comment should represent someone's thoughts on the course ECE 304 (make sure that the person is talking about the course in question and not a different course).

If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "304 is restricted to comp E. Everyone else can enroll after June 15"

Only return the helpful answer below and nothing else.

Helpful answer:

304 is a challenging course in the Electrical and Computer Engineering department, with enrollment restricted to Computer Engineering students until mid-June.

## ECE 330

- **Course Description:**

Overview of power concepts, network equations, three-phase circuits, transformer and its characteristics, per-unit calculation, transmission lines and their basic operational characteristics, introduction to power system operation. Credit may be obtained in only

one of ECE 330 or E E 330.

- **Prerequisite:**  
ECE 203 or E E 250
- **Terms the course is available in:**  
Fall Term 2024
- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 332

- **Course Description:**  
Principles of electromagnetic force and torque in rotating machinery. Simple AC and DC machines. Induction motor theory. Practical aspects of induction motor use: characteristics, standards, starting, variable speed operation. Synchronous machine theory and characteristics. Fractional HP motor theory. Safety in electrical environments. Credit may be obtained in only one of ECE 332 or E E 332.
- **Prerequisite:**  
ECE 330 or E E 330 or consent of Department
- **Terms the course is available in:**  
Winter Term 2024, Fall Term 2024, Winter Term 2025
- **Instructor(s):**  
Ali Khajehoddin (teaching in Winter Term 2024), Instructor(s) undecided for Fall Term 2024, Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Ali Khajehoddin's Rate My Professor rating is 4.7/5
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 401

- **Course Description:**  
Introduction to power electronics. AC-DC conversion. DC-AC conversion. DC-DC conversion. AC-AC conversion. Credit may be obtained in only one of ECE 401 or E E 431.
- **Prerequisite:**  
ECE 302 or E E 340
- **Terms the course is available in:**  
Fall Term 2024
- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 402

- **Course Description:**  
Introduction to radio communications systems. Frequency selective circuits and transformers. Parallel resonant circuits including transformers. Double-tuned circuits. Impedance matching. Oscillators. Conditions for oscillation. Amplitude limitation mechanisms. Phase stability. Crystal oscillators. Mixers. Diode-ring mixers. Square-law mixers. BJT mixers. Intermodulation distortion. Modulators and demodulators. Average envelope detectors. FM demodulators. High frequency amplifiers and automatic gain control. Broadband techniques. Neutralization. Phase-lock loops. Phase detectors. Voltage-controlled oscillators. Loop filters. Phase-locked loop applications. Power amplifiers. Corequisite: ECE 360 or ECE 362 or E E 357 or E E 462. Credit may be obtained in only one of ECE 402 or E E 451.
- **Prerequisite:**  
ECE 303 or E E 350



- **Terms the course is available in:**  
No term decided yet/not offered this year
- **Instructor(s):**  
No instructor teaching the course
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 403

- **Course Description:**  
Very Large Scale Integration (VLSI) design techniques and their application. Electrical characteristics of MOSFET devices and CMOS circuits. Use of CAD tools for simulation and integrated circuit layout. Modeling delays, advanced digital logic circuit techniques, memory. Credit may be obtained in only one of ECE 403 or E E 453.
- **Prerequisite:**  
ECE 304 or E E 351; corequisite: ECE 410 or CMPE 480
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Duncan Elliott (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Duncan Elliott's Rate My Professor rating is 2.4/5
- **Course Difficulty:**  
You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.  
Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.  
Each comment should represent someone's thoughts on the course ECE 403 (make sure that the person is talking about the course in question and not a different course).  
If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question

mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "442, most fun and interesting elective on that list. Unless the curriculum changed, it goes in depth about machine learning" "442 is multimedia signal processing. It's probably the easiest on this list"

Only return the helpful answer below and nothing else.

Helpful answer:

442, being a multimedia signal processing course, is generally considered to be less difficult than ECE 403, which is known for its challenging material in the field of digital logic design.

## ECE 405

- **Course Description:**

Introduction to the principles of biophysical instrumentation. Various sensors are examined including strain gauges, inductive, capacitive, thermal, and piezoelectric sensors. Methods of measuring blood pressure are discussed. Origin of biopotentials; membrane and action potentials. Measurement of bioelectrical signals such as the ECG and EMG. Electrical safety, noise, impedance matching, and analog-to-digital conversion. Applications of electrodes, biochemical sensors, and lasers. Credit may be obtained in only one of ECE 405 or EE BE 512.

- **Prerequisite:**

ECE 203 or E E 250 or consent of the Instructor

- **Terms the course is available in:**

Fall Term 2024

- **Instructor(s):**

Instructor(s) undecided for Fall Term 2024

- **Instructor ratings:**

No professors teaching this term, so no ratings available at all

- **Course Difficulty:**

You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.

Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.

Each comment should represent someone's thoughts on the course ECE 405 (make sure that the person is talking about the course in question and not a different course).

If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "Nope. Nobody." "50 seats a semester for a dozen years... not a single soul has ever enrolled." "Does nobody take the course? Why is it continually being offered?" "I'm taking it right now (first person to take it since 2011). I'm reviewing the practice midterm from 2011, is it usually a time crunch?" "Is that one Biophysical Instrumentation and Measurement? If Zemp is still teaching that class, it was dry but interesting in applications. Lot of calculations and theoretical questions on assignments and exams but fairly straightforward." "Yes"

Only return the helpful answer below and nothing else.

Helpful answer:

ECE 405, Biophysical Instrumentation and Measurement, is a course that has very few students enrolled in it, with only one student taking it since 2011. The course is known to have a significant amount of calculations and theoretical questions on assignments and exams, but is considered to be fairly straightforward. The midterm exams in the course have been known to be time-consuming.

## ECE 410

- **Course Description:**

Review of classical logic design methods. Introduction to the hardware description language VHDL. Logic simulation principles. Digital system design. Digital system testing and design for testability. Arithmetic circuits. State-of-the-art computer-aided design tools and FPGAs are used to design and implement logic circuits. Corequisite: ECE 304 or ECE 351. Credit may be obtained in only one of CMPE 480 or ECE 410.

- **Prerequisites:**

None

- **Terms the course is available in:**

Fall Term 2024

- **Instructor(s):**

Instructor(s) undecided for Fall Term 2024

- **Instructor ratings:**

No professors teaching this term, so no ratings available at all

- **Course Difficulty:**

You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.

Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.

Each comment should represent someone's thoughts on the course ECE 410 (make sure that the person is talking about the course in question and not a different course).

If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "Same here bro. The quizzes are brutal too adding that negative marking on top of that!"

Only return the helpful answer below and nothing else.

Helpful answer:

The course ECE 410 is challenging, with particularly difficult quizzes that include negative marking.

## ECE 432

- **Course Description:**

Introduction to variable speed drives. Frequency, phase and vector control of induction motors. Dynamic models for induction motors. Permanent magnet synchronous and brushless dc motor drives. Credit may be obtained in only one of ECE 432 or E E 432.

- **Prerequisite:**

ECE 332 or E E 332

- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Hao Liang (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Hao Liang's Rate My Professor rating is 4.9/5
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 440

- **Course Description:**  
Extension of sampling theory and the Fourier transform to two dimensions, pixel operations including gray-level modification, algebraic and geometric transformations. The design of spatial filters for noise reduction, image sharpening and edge enhancement, and some discussion of interpolation techniques. An introduction to the concepts of image restoration from known degradations and the reconstruction of images from parallel and fan projections. Credit may be obtained in only one of EE BE 540 or ECE 440.
- **Prerequisite:**  
ECE 340 or E E 338 or consent of Instructor
- **Terms the course is available in:**  
Fall Term 2024
- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 447

- **Course Description:**

The course introduces basic concepts and techniques of data analysis and machine learning. Topics include: data preprocessing techniques, decision trees, nearest neighbor algorithms, linear and logistic regressions, clustering, dimensionality reduction, model evaluation, deployment methods, and emerging topics.

- **Prerequisites:**

ECE 220 or CMPUT 275, and ECE 342 or STAT 235, or consent of instructor

- **Terms the course is available in:**

Winter Term 2024, Winter Term 2025

- **Instructor(s):**

Marek Reformat (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025

- **Instructor ratings:**

Marek Reformat's Rate My Professor rating is 4.7/5

- **Course Difficulty:**

You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.

Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.

Each comment should represent someone's thoughts on the course ECE 447 (make sure that the person is talking about the course in question and not a different course).

If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "ECE 447 is a brand new class (like the first people to ever take it are currently taking it right now), so getting an accurate synopsis of what the course content is like might be a bit difficult" "404 is just an excellent experience overall and will benefit you more in real life. 447 is new this sem, so ask people taking it now? 🧑" "taking 447 rn, it's brand new and a bit disorganized. But the prof is great and

assessment are easy. You will gain basic intro to ML and some hands on experience of data analysis" "Fairly easy course, took it last year, the programming is not too bad (but I'm in software)"

Only return the helpful answer below and nothing else.

Helpful answer:

The course ECE 447 is a new introduction to machine learning, and while it is disorganized, the professor is great and the assessments are considered easy. The course content is said to provide a basic introduction to machine learning and some hands-on experience with data analysis. The programming aspect of the course is not considered too difficult for someone with a background in software. Overall, the course is considered fairly easy.

## ECE 449

- **Course Description:**

Intelligent systems for automatic control and data analysis. The concepts of vagueness and uncertainty, approximate reasoning, fuzzy rule-based systems and fuzzy control. Strategies for learning and adaptation, supervised and reinforcement learning, self-organization and the selection of neural network architectures. Discussion of the principles of search and optimization, evolution and natural selection and genetic algorithms. Introduction to hybrid intelligence. Applications of intelligent systems for pattern recognition, classification, forecasting, decision support, and control. Credit may be obtained in only one of CMPE 449 or ECE 449.

- **Prerequisites:**

None

- **Terms the course is available in:**

Fall Term 2024

- **Instructor(s):**

Instructor(s) undecided for Fall Term 2024

- **Instructor ratings:**

No professors teaching this term, so no ratings available at all

- **Course Difficulty:**

You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.

Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.

Each comment should represent someone's thoughts on the course ECE 449 (make

sure that the person is talking about the course in question and not a different course).

If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "Not necessarily for capstone. For electrical specifically, the lab room should have all the equipment you need and some components. There is also a storage space for your project. Depends on what you need for your project." "I imagine the labs for ECE 485 is going to be similar to ECE 380, so I don't think you need your lab kit. I would also imagine ECE 449 to be just programming labs, so don't need your lab kit either." "Not needed but for your capstone you'll probably be using some of the components either at your place or needing to bring them in when you start prototyping"

Only return the helpful answer below and nothing else.

Helpful answer:

The comments suggest that ECE 449 is primarily a programming course, and that lab equipment may not be necessary. However, some components might be required for capstone projects. The overall difficulty of the course is not explicitly stated, but it seems to be more focused on programming than lab work.

## ECE 458

- **Course Description:**

Overview of microelectromechanical (MEMS) systems, applications of MEMS technology to radio frequency, optical and biomedical devices. Basic MEMS building blocks, cantilever and clamped-clamped beams. Actuation mechanisms of mechanical microdevices, thermal and electrostatic. The thin film fabrication process, deposition, lithography, etching and release. MEMS in circuits, switches, capacitors, and resonators. Credit may be obtained in only one of ECE 458 or E E 458.

- **Prerequisites:**

ECE 370 or E E 315 or PHYS 381, and one of MAT E 201, PHYS 244, MEC E 250

- **Terms the course is available in:**

Fall Term 2024



- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 460

- **Course Description:**  
Introduction to computer control, sample and hold, discrete-time systems. States and state space models. Linearization of nonlinear state-space models. Solving linear time-invariant state-space equations. Discretization of continuous-time systems. Controllability and observability, and their algebraic tests. Minimal state-space realizations. State feedback and eigenvalue/pole assignment, deadbeat control. Step tracking control design. State estimation and observer design. Observer based control. Introduction to linear quadratic optimal control. Credit may be obtained in only one of ECE 460 or E E 460.
- **Prerequisites:**  
ECE 360 or E E 357, and ECE 340
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Qing Zhao (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Qing Zhao's Rate My Professor rating is 3.8/5
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 464

- **Course Description:**

Basic concepts of computer-integrated intervention. Surgical CAD/CAM, assist and simulation systems. Actuators and imagers. Medical robot design, control and optimization. Surgeon-robot interface technology. Haptic feedback in surgical simulation and teleoperation. Virtual fixtures. Time delay compensation in telesurgery. Cooperative manipulation control. Overview of existing systems for robot-assisted intervention and for virtual-reality surgical simulation. Credit may be obtained in only one of ECE 464 or E E 464.

- **Prerequisite:**

ECE 360 or ECE 462 or E E 357 or E E 462 or consent of the Department

- **Terms the course is available in:**

Winter Term 2024, Winter Term 2025

- **Instructor(s):**

Mahdi Tavakoli Afshari (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025

- **Instructor ratings:**

The professor does not have a rating on Rate My Professor

- **Course Difficulty:**

Insufficient information available on course difficulty

## ECE 474

- **Course Description:**

Definition of plasma. Behavior in electric and magnetic fields. Particle, kinetic and fluid description of flow and transport phenomena. Waves in plasmas. Current approaches to thermonuclear fusion. High temperature laser produced plasmas and low temperature DC and RF discharge plasmas. Applications in discharge pumping of lasers, plasma etching, thin film deposition and generation of x-rays. Credit may be obtained in only one of ECE 474 or E E 474.

- **Prerequisites:**

ECE 370 or E E 315 or PHYS 381

- **Terms the course is available in:**  
Fall Term 2024
- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 485

- **Course Description:**  
Principles of digital communications; signal space concepts, digital modulation and demodulation, intersymbol interference, and pulse shaping. Design of optimal receivers; performance in the presence of channel noise. Introduction to source coding and channel coding. Credit may be obtained in only one of ECE 485 or E E 485.
- **Prerequisites:**  
ECE 342 or E E 387, and ECE 380 or E E 390
- **Terms the course is available in:**  
Fall Term 2024
- **Instructor(s):**  
Instructor(s) undecided for Fall Term 2024
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
You will have to judge the difficulty of a university course, based off of comments from the social media site Reddit.  
Each separate comment will be enclosed in double quotes (e.g. "Hello") and you will be passed a number of them at once.  
Each comment should represent someone's thoughts on the course ECE 485 (make sure that the person is talking about the course in question and not a different course).  
If a comment has a question mark at the end, that means that the following comment - enclosed in double quotes - is the answer to the comment with the question mark (unless the comment after also has a question mark).

Do not ever explicitly talk about the people who made the comments, or mention the comments themselves. You only want to summarize the difficulty.

Do not talk about a professor either, as the professor changes constantly. You only want to summarize the difficulty.

Provide a summary on the difficulty (make sure to explicitly mention how difficult it is) of the course using the context provided.

Context: "Not necessarily for capstone. For electrical specifically, the lab room should have all the equipment you need and some components. There is also a storage space for your project. Depends on what you need for your project." "I imagine the labs for ECE 485 is going to be similar to ECE 380, so I don't think you need your lab kit. I would also imagine ECE 449 to be just programming labs, so don't need your lab kit either." "Not needed but for your capstone you'll probably be using some of the components either at your place or needing to bring them in when you start prototyping"

Only return the helpful answer below and nothing else.

Helpful answer:

The comments suggest that ECE 485 may not require students to bring their lab kits, as the necessary equipment is provided in the lab room. However, students may still need some components for their projects during the capstone phase. The overall difficulty of the course is not explicitly stated in the comments, but it can be inferred that it involves lab work and potentially prototyping projects.

## ECE 486

- **Course Description:**

Characteristics of wireless channels; path loss, shadow fading and multipath propagation. Challenges in wireless system design, digital modulation techniques for wireless communications, transmitter and receiver design for fading channels. Fundamentals of cellular system design and multiple access techniques. Credit may be obtained in only one of ECE 486 or E E 486.

- **Prerequisites:**

ECE 342 or E E 387, and ECE 380 or E E 390

- **Terms the course is available in:**

Winter Term 2024, Winter Term 2025

- **Instructor(s):**

Yindi Jing (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025

- **Instructor ratings:**  
Yindi Jing's Rate My Professor rating is 3.6/5
- **Course Difficulty:**  
Insufficient information available on course difficulty