

# Group 2 Electives

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## CMPUT 313

- **Course Description:**

Introduction to computer communication networks; protocols for error and flow control; wired and wireless medium access protocols; routing and congestion control; internet architecture and protocols; multimedia transmission; recent advances in networking.

- **Prerequisites:**

CMPUT 201 and 204 or 275; one of CMPUT 229, E E 380 or ECE 212; and STAT 252 or 266

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

Winter Term 2024, Winter Term 2025

- **Instructor(s):**

Ehab Elmallah (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025

- **Instructor ratings:**

Ehab Elmallah's Rate My Professor rating is 2.8/5

- **Course Difficulty:**

The course CMPUT 313 is reportedly quite difficult and unengaging, with students relying mostly on online resources for learning.

## CMPUT 379

- **Course Description:**

Introduction to the structure, components, and concepts behind modern general-purpose operating systems. Processes: process state transitions; operations on processes; interrupt processing; multiprocessor considerations; resource allocation; synchronization; critical sections and events; semaphores; deadlock: avoidance, detection, and recovery; memory management; virtual memory; paging and segmentation; page replacement strategies; working sets; demand paging; process scheduling; scheduling algorithms; file system functions; file organization; space

allocation; virtual machines.

- **Prerequisites:**  
CMPUT 201 and 204, or 275; one of CMPUT 229, E E 380 or ECE 212
- **Terms the course is available in:**  
Winter Term 2024, Fall Term 2024, Winter Term 2025
- **Instructor(s):**  
Ehab Elmallah (teaching in Winter Term 2024), Instructor(s) undecided for Fall Term 2024, Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Ehab Elmallah's Rate My Professor rating is 2.8/5
- **Course Difficulty:**  
The course CMPUT 379 is considered to be a challenging one, with students expressing that it requires a significant amount of work and time investment. However, it is also seen as a valuable learning experience, providing insights into the inner workings of operating systems and topics such as CPU scheduling, memory segmentation, synchronization, and multi-threading. Some students have found these concepts useful in their careers, while others have expressed that they did not find the course material to be directly applicable to their interests. The assignments are not representative of exam material and require students to start from scratch, which can be time-consuming. The professor is reported to be difficult and unapproachable, with limited support provided. Overall, the course is considered to be more difficult than CMPUT 229, but also more relevant and applicable to various types of programming. Students are encouraged to consider their career goals and interests before deciding to take the course.

## ECE 340

- **Course Description:**  
Discrete time signals and systems; Sampled signals and sampling theorem, aliasing, A/D converter; Z-transform, stability analysis; Discrete-time Fourier transform; Discrete Fourier transform, leakage, spectral analysis; Digital filter design, filter structure. Credit may be obtained in only one of ECE 340 or E E 338.
- **Prerequisite:**  
ECE 240 or E E 238

- **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:**  
The comments suggest that the course ECE 340, taught by Horacio Marquez, is perceived as difficult by some students. They mention struggling with the midterms and feeling that they have not learned much from the lectures. Some students suggest that the professor only posts recorded lectures and that the exams are difficult and have an uneven distribution of marks. Others mention that they had different experiences with the same professor in previous courses. Overall, the comments indicate that the course is challenging and that students may need to rely on textbooks and their own understanding to succeed.

## ECE 370

- **Course Description:**  
Review of vector calculus, electrostatics, and magnetostatics. Electric and magnetic fields in material media, including polarization mechanisms and general boundary conditions. Solutions to static field problems. Maxwell's equations and waves in free space, dielectrics and conducting media. Reflection and refraction, standing waves. Credit may be obtained in only one of ECE 370 or E E 315.
- **Prerequisites:**  
MATH 102, 209 and PHYS 230
- **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:**  
The course ECE 370 is reportedly difficult by some students, with comments suggesting

that the professor does not effectively teach the material, does not provide clear examples or explanations, and has a biased grading system. The textbooks used for the course may vary, with some focusing on integral forms of Maxwell's equations and others on differential forms. Students recommend using the textbook for understanding the material and passing the exams, as the exams are reportedly challenging. Some students have reported feeling overwhelmed by the difficulty of the course and have not been satisfied with their grades.

## 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 E E 390.
- **Prerequisite:**  
ECE 240 or E E 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:**  
The course ECE 380 is reportedly challenging, with some students expressing the need for additional help from the professor or teaching assistants. It appears that a deeper understanding of the concepts may not be immediately clear, and seeking assistance early on could potentially lead to greater success.

## ECE 406

- **Course Description:**  
This course is intended to enable individuals or a small group of students to study topics in their particular field of interest under the supervision of a member of the Department of Electrical and Computer Engineering or the Department of Computing Science or

other appropriate departments.

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

## ECE 407

- **Course Description:**  
This course is intended to enable individuals or a small group of students to study topics in their particular field of interest under the supervision of a member of the Department of Electrical and Computer Engineering or the Department of Computing Science or other appropriate departments.
- **Prerequisites:**  
None
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Instructor(s) undecided for Winter Term 2024, Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
No professors teaching this term, so no ratings available at all
- **Course Difficulty:**  
Insufficient information available on course difficulty

## ECE 422

- **Course Description:**  
Causes and consequences of computer system failure. Structure of fault-tolerant computer systems. Methods for protecting software and data against computer failure. Quantification of system reliability. Introduction to formal methods for safety-critical systems. Computer and computer network security. Corequisite: ECE 487. Credit may be obtained in only one of CMPE 420 or ECE 422.
- **Prerequisite:**  
CMPUT 301
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
An Ran Chen (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 423

- **Course Description:**  
Topics include distributed communication models (e.g., sockets, remote procedure calls, distributed shared memory), distributed synchronization (clock synchronization, logical clocks, distributed mutex), distributed file systems, replication, consistency models, fault tolerance, QoS and performance, scheduling, concurrency, agreement and commitment, Paxos-based consensus, MapReduce and NoSQL datastores, cloud infrastructures and microservices.
- **Prerequisites:**  
CMPUT 379 and (ECE 487 or CMPUT 313)
- **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 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:**  
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:**

Insufficient information available on course difficulty

## 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 455

- **Course Description:**  
Microfluidic and nanobiotechnological devices. Fabrication techniques for devices: self-assembly, lithographic technologies. Applications of nanobiotechnology in computing, electronics, human health, environment and manufacture. Credit may be obtained in only one of ECE 455 or E E 455.
- **Prerequisites:**  
MATH 201 or PHYS 230
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Xihua Wang (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Xihua Wang's Rate My Professor rating is 4.5/5
- **Course Difficulty:**  
Based on the comments, ECE 455 appears to be a challenging course, with some students expressing that it is an "absolute ass" and that they were forced to take it due to graduation requirements. In contrast, another student mentioned that they found a group II elective, 442, to be more enjoyable and less difficult, describing it as "the

easiest on this list" and "most fun and interesting." The specific topic of 442 is multimedia signal processing.

## ECE 456

- **Course Description:**

Fundamental concepts related to current flow in nanoelectronic devices. Energy level diagram and the Fermi function. Single-energy-level model for current flow and associated effects, such as the quantum of conductance, Coulomb blockade, and single electron charging. The Schroedinger equation and quantum mechanics for applications in nanoelectronics. Matrix-equation approach for numerical band structure calculations of transistor channel materials. k-space, Brillouin zones, and density of states. Subbands for quantum wells, wires, dots, and carbon nanotubes. Current flow in nanowires and ballistic nanotransistors, including minimum possible channel resistance, quantum capacitance, and the transistor equivalent circuit under ballistic operation. Credit may be obtained in only one of ECE 456 or E E 456.

- **Prerequisite:**

ECE 302 or E E 340

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

Winter Term 2024, Winter Term 2025

- **Instructor(s):**

Mani Vaidyanathan (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025

- **Instructor ratings:**

Mani Vaidyanathan's Rate My Professor rating is 5/5

- **Course Difficulty:**

Insufficient information available on course difficulty

## ECE 487

- **Course Description:**

Network topologies. Layered architectures and the Open Systems Interconnection (OSI) reference model. Peer-to-peer protocols, medium access control protocols, and local area network standards. Packet switched networks and routing, the TCP/IP suite of protocols. Credit may be obtained in only one of ECE 487, CMPUT 313 or CMPE 487.

- **Prerequisites:**  
None
- **Terms the course is available in:**  
Winter Term 2024, Winter Term 2025
- **Instructor(s):**  
Hai Jiang (teaching in Winter Term 2024), Instructor(s) undecided for Winter Term 2025
- **Instructor ratings:**  
Hai Jiang's Rate My Professor rating is 4.7/5
- **Course Difficulty:**  
The final exam in ECE 487 contained questions that were not covered in the lectures, making the exam particularly challenging.  
The presence of a question asking for a student ID further increased the difficulty, as this information was not provided during the course.