Information Session
Class of 2023
2021-2022 Academic Year
Return to Campus

In-person classes and laboratories are expected to resume on first day of classes, September 7\textsuperscript{th}, 2021. We look forward to welcoming students back to campus!

Follow the guidelines for a safe return to campus:

https://www.queensu.ca/safereturn/students
ECE Advisors

- ECE UG Assistants
  - Irina Pavich (irina.pavich@queensu.ca), WLH-416
  - Alisa Darbinyan (alisa.darbinyan@queensu.ca), WLH-416

- EE Undergraduate Chair:
  - Prof. Karen Rudie (eeugradchair@queensu.ca)

- CE Undergraduate Chair:
  - Prof. Jenny Zou (ceugradchair@queensu.ca)

- UG Program Advisors [https://www.ece.queensu.ca/undergraduate/contacts.html](https://www.ece.queensu.ca/undergraduate/contacts.html)
  - ELEC: Prof. Majid Pahlevani
  - CMPE: Prof. Xiaodan Zhu
  - Exchange Program/Transfer: Prof. Brian Frank
Faculty of Engineering and Applied Science (FEAS)

- 2021-2022 FEAS Academic Calendar - course information
- Policies and Regulations
- **FORMS**: Substitution request, Incomplete Grade request, Supplemental Exam request, Late Course Add/Drop requests, Waivers etc.
- **Resources** (academic considerations, accommodations, embedded counsellors, exchange program, dual degree, supplemental exam, EPT etc.)
Online Resources

Dept. of Electrical and Computer Engineering web site

- ECE Degree Planning Spreadsheets
- ECE Undergraduate Courses
- ECE Wiki
- ECE Course Offering List
- EE/CE Prerequisite Charts
- ECE research groups, ECE faculty contact information
- Book an academic advising appointment

(Available at ece.queensu.ca)
CE Graduation Requirements

Computer Engineering

• Satisfy the minimum Accreditation Units (AU) set by ECE in each CEAB category.

• Have at least 5 four-hundred level elective courses.

• Have at least 4 courses from Electives Lists A, B and C that satisfy the Department criteria for qualified accreditation units in the categories of engineering science and engineering design.

• Have at least 3 courses from Elective List B.

• Counting required core courses and elective courses in all four years, result in a total of no fewer than 157.5 credits for the complete program.
# 3rd-year Comp. Eng.

## CMPE Program Core in Third Year

### FALL
- ELEC 326 Probability & Random Processes
- ELEC 371 Microprocessor Interfacing ...
- ELEC 377 Operating Systems
- CMPE 365 Algorithms I

### WINTER
- ELEC 373 Computer Networks I
- ELEC 374 Digital Systems Engineering
- ELEC 390 ECE Design

### Optional Core:
- CMPE 320 Fund. Software Develop
- OR
- CMPE 223 Software Specification

1. Technical Elective Course (any term)
2. Complementary Studies (F/W/S)
3. Non-ECEi: APSC 221 Economics... (F/W/S)

### COMM 301 Launching New Ventures (ECEi) | COMM 302 Funding New Ventures (ECEi)
ELEC 390/490/498 design project courses
✓ Instructors and project supervisors
✓ Groups of 3 to design/build/document
✓ Course information on ECE Website
Computer Engineering

- **List A** for ECE-controlled courses (ELEC and SOFT);
- **List B** for external courses (mainly CMPE);
- **List C** for Internship and project-based courses;
**Electives List A**

- ELEC 224 Continuous-Time Signals and Systems
- ELEC 324 Discrete-Time Signals and Systems
- ELEC 344 Sensors and Actuators
- ELEC 353 Electronics II
- ELEC 372 Numerical Methods and Optimization
- ELEC 408 Biomedical Signal and Image Processing N/O
- ELEC 409 Bioinformatic Analytics
- ELEC 421 Digital Signal Processing:
- ELEC 422 Digital Signal Processing... N/O
- ELEC 425 Machine Learning and Deep Learning
- ELEC 431 Power Electronics
- ELEC 443 Linear Control Systems
- ELEC 444 Modeling & Comp. Control of Mechatronic Syst. N/O
- ELEC 448 Introduction to Robotics: Mechanics and Control
- ELEC 451 Digital Integrated Circuit Engineering
- ELEC 461 Digital Communications N/O
- ELEC 464 Wireless Communications
- ELEC 470 Computer System Architecture
- ELEC 472 Artificial Intelligence and Interactive Systems
- ELEC 473 Cryptography and Network Security
- ELEC 474 Machine Vision
- ELEC 497 Research Project
- SOFT 423 Software Requirements
- SOFT 437 Performance Analysis

**Electives List B**

- CMPE 204 Logic for Computing Science
- CMPE 251 Data Analytics
- CMPE 320 Fundamentals of Software Development
- CMPE 322 Software Architecture
- CMPE 325 Human-Computer Interaction
- CMPE 327 Software Quality Assurance
- CMPE 332 Database Management Systems
- CMPE 351 Advanced Data Analytics
- CMPE 422 Formal Methods in Software Engineering
- CMPE 425 NOT OFFERED 2021-22 Adv. User Interface Design
- CMPE 432 NOT OFFERED 2021-22 Adv. Database Systems
- CMPE 434 NOT OFFERED 2021-22: Distributed Systems
- CMPE 452 Neural Networks and Genetic Algorithms
- CMPE 454 Computer Graphics
- CMPE 457 Image Processing and Computer Vision
- CMPE 458 Programming Language Processors
- APSC 250 Biology through an Engineering Lens
- ENPH 336 Solid State Devices

**Electives List C**

- APSC 303 Professional Internship
- APSC 400 Technology, Engineering & Management N/O
- APSC 401 Interdisciplinary Projects
STREAMS - Flexibility

• ECE with streams instead of options

- suggested streams give a coherent set of courses in a particular area, e.g., mechatronics.
- streams provide primary and secondary course suggestions;
- streams allow you to mix and match as you wish and provide larger number of courses to choose from; Use interest and passion as your guide;
- options are limiting.
CE Streams

Streams of Specialization for Elective Courses in Computer Engineering

- Computer Hardware
- Computer Systems
- Software Engineering
- Mechatronics
- Artificial Intelligence
Electrical Engineering

• Satisfy the minimum Accreditation Units (AU) set by ECE in each CEAB category.

• Have at least 5 courses from Electives List A.

• Have at least 5 four-hundred level elective courses.

• Counting required core courses and elective courses in all four years, result in a total of no fewer than 157.5 credits for the complete program.
ELEC Program Core in Third Year

FALL

ELEC 324 Discrete-Time Signals & Systems
ELEC 353 Electronics II
ELEC 371 Microprocessor Interfacing ... 

WINTER

ELEC 372 Numerical Methods & Optim.
ELEC 381 Applications of Electromagnetics
ELEC 390 ECE Design
ENPH 336 Solid State Devices

1 Technical Elective Course (any term)
Complementary Studies (F/W/S)
non-ECEi: APSC 221 Economics... (F/W/S)

COMM 301 Launching New Ventures (ECEi)  
COMM 302 Funding New Ventures (ECEi)
### Electives List A

- ELEC 270 Discrete Mathematics with CompEng. Applications
- ELEC 279 Introduction to Object Oriented Programming
- ELEC 333 Electric Machines
- ELEC 344 Sensors and Actuators
- ELEC 373 Computer Networks
- ELEC 408 Biomedical Signal and Image Processing N/O
- ELEC 409 Bioinformatic Analytics
- ELEC 421 Digital Signal Processing...
- ELEC 425 Machine Learning and Deep Learning
- ELEC 431 Power Electronics
- ELEC 433 Energy and Power Systems
- ELEC 436 Electric Machines and Control N/O
- ELEC 443 Linear Control Systems
- ELEC 444 Modeling & Comp. Control of Mechatr. Systems N/O
- ELEC 448 Introduction to Robotics: Mechanics and Control
- ELEC 451 Digital Integrated Circuit Engineering
- ELEC 454 Analog Electronics N/O
- ELEC 457 Integrated Circuits and System Applications
- ELEC 461 Digital Communications
- ELEC 470 Computer System Architecture
- ELEC 472 Artificial Intelligence and Interactive Systems
- ELEC 473 Cryptography and Network Security
- ELEC 474 Machine Vision
- ELEC 481 Applications of Photonics N/O
- ELEC 486 Fiber Optic Communications
- ELEC 497 Research Project

### Electives List B

- APSC 303 Professional Internship
- APSC 400 Technology, Engineering & Management (TEAM)
- APSC 401 Interdisciplinary Projects
- CHEE 340 Biomedical Engineering
- ENPH 460 Laser Optics
- CMPE 3XX Any Third Year Computing Science Course | 3
- CMPE 4XX Any Fourth Year Computing Science Course | 3
- MTHE 337 Introduction to Operations Research Models
- MTHE 367 Engineering Data Analysis
- MTHE 430 Modern Control Theory
- MTHE 455 Stochastic Processes and Applications
- MTHE 472 Control of Stochastic Systems
- MTHE 474 Information Theory
- MTHE 477 Data Compression and Source Coding
- MTHE 478 Topics in Communication Theory
- MECH 228 Kinematics and Dynamics
- MECH 328 Dynamics and Vibration
- MECH 393 Biomechanical Product Development
- MECH 423 Introduction to Microsystems
- MECH 455 Computer Integrated Manufacturing
- MECH 465 Computer-Aided Design
- MECH 478 Biomaterials
- MECH 494 Kinematics of Human Motion
- MINE 472 Mining Systems, Automation, and Robotics
EE Streams

Streams of Specialization for Elective Courses in Electrical Engineering

- Biomedical Engineering
- Communications & Signal Processing
- Communications Systems & Networks
- Electronics & Photonics
- Mechatronics
- Power Electronics & Systems
- Robotics and Control
Complementary Studies – not Innovation stream

- must have a total of 9 credits (108 units) of CS:
  - 3 credits must be from List A (Humanities and Social Sciences);
  - 6 credits from List B (other);

- Typically take 1 CS course in each of 2nd, 3rd, 4th year, but whenever it can fit into schedule is fine (e.g., PSYC100 is 6 credits and goes fall and winter);

- Some CS courses are available online (see Arts and Science ONLINE).
ECE Innovation Stream: Business & Complementary Studies

- ECEi: No reduction in technical content

<table>
<thead>
<tr>
<th>Year</th>
<th>Courses</th>
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<tbody>
<tr>
<td>2nd</td>
<td>COMM 201 - Introduction to Business for Entrepreneurs – F</td>
</tr>
<tr>
<td>3rd</td>
<td>COMM 301 - Funding New Ventures – F</td>
</tr>
<tr>
<td></td>
<td>COMM 302 - Launching New Ventures – W</td>
</tr>
<tr>
<td></td>
<td>List “A” Complementary Studies Course – F/W/S</td>
</tr>
<tr>
<td>4th</td>
<td>COMM 405 – New Business Development - F</td>
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</tbody>
</table>
For **2021-2022**, some electives *not offered* (planned alternation or instructor unavailable):

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ELEC 408</td>
<td>Biomed. Image</td>
</tr>
<tr>
<td>ELEC 422</td>
<td>Dig. Signal Process.: Random Models &amp; Apps</td>
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### 2021-2022 ECE Technical Electives

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<td>ELEC 433* Energy and Power Systems</td>
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<td>ELEC 421* Digital Signal Processing: Filters and Syst.</td>
<td>ELEC 457 Analog Integrated Circuits and Systems</td>
</tr>
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<td>ELEC 472 Artificial Intelligence</td>
</tr>
<tr>
<td>ELEC 443 Control Systems I</td>
<td>ELEC 483* Microwave and RF Circuits &amp; Systems</td>
</tr>
<tr>
<td>ELEC 448 Intr. Robotics: Mechanics &amp; Control</td>
<td>SOFT 423* S/W Requirements</td>
</tr>
<tr>
<td>ELEC 451 Digital Integrated Circuit Engineering</td>
<td>SOFT 437 Performance Analysis</td>
</tr>
<tr>
<td>ELEC 464* Wireless Communications</td>
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<tr>
<td>ELEC 473* Cryptography and Network Security</td>
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<tr>
<td>ELEC 474 Machine Vision</td>
<td></td>
</tr>
<tr>
<td>ELEC 486* Fiber Optic Communications</td>
<td>* - requires 3rd year prerequisite/s</td>
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<td>Fall</td>
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<td>CMPE 458 Program. Language Processors</td>
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* - requires 3rd year prerequisite/s
Course Planning

• Use your **degree planning spreadsheet** to verify that all program requirements will be met

• Follow Calendar & registration instructions:
  - Confirm core courses are preloaded
  - Select electives (technical and/or complementary studies)
  - Check course prerequisites and **exclusions**
  - Submit substitution requests for courses outside ECE that are not listed as official technical electives (CISC, MECH, MTHE)
  - Avoid Negative Service Indicators (SOLUS account, unpaid tuition)

• Respect deadlines to avoid difficulties (Add/Drop courses)
Course Planning

• Not all electives offered every year. Some 400 level courses will not be offered the following year

  ➔ Plan both 3rd and 4th years together!

• You are not limited to ‘300’ level technical courses;

• If you have prerequisites for a ‘400’ level elective & it fits in your timetable, you can take it in your 3rd year;

• APSC 221 F/W/S (not for ECEi)

• Use the Calendar information and the ECE planning spreadsheets to ensure you are on track to complete all requirements by the end of the fourth year. This is one of the most important responsibilities for all ECE students.
Course Planning

• You are strongly encouraged to consult the detailed course summaries for each of the courses

  • See how the third-year courses constitute a bridge from the fundamental courses in second year to the advanced technical courses in fourth year.

  • You have much flexibility in EE and CE

    - but that comes with greater responsibility
Selecting Electives

Example:

- ELEC 224 Signals & Systems
  - ELEC 443 Controls
  - ELEC 409 Bioinformatic Analytic
- ELEC 448 Robotics
- ELEC 444 Modeling & Comp. Control
Timetabling

• Timetabling of all courses is done by University Registrar centrally each year

• No guarantee that desired combinations of electives are completely conflict-free
  • ECE Dept. makes requests to Registrar to help avoid conflicts, but no guarantee

• You must be flexible in 3\textsuperscript{rd}-year \textit{and} 4\textsuperscript{th}-year, as needed
Add/Drop Deadlines

• Add courses (and drop courses without financial penalty) by Sept 20, 2021 (Fall) and Jan 21, 2022 (Winter)

• Drop courses without academic penalty by November 1st 2021 (Fall) and March 4th, 2022 (Winter)

Respect add/drop deadlines!

• Late requests:
  - Need a valid reason and documentation (e.g., medical)
  - Need to be further approved by the Academic Progress Committee at the Faculty level
  - There is a fee of $60

Sessional Dates 2021-22

https://www.queensu.ca/registrar/resources/sessional-dates
NSERC Undergraduate Summer Research Assistantship (USRA)

• USRA awards are meant to nurture your interest and fully develop your potential for a research career in the engineering and applied science. If you are considering a research career in the ECE we invite you to apply for an NSERC USRA through the ECE Department at Queen's University in January 2022.

• ECE quota in Summer 2021: 6 awards

• The NSERC USRA is valued at 6,000 dollars and will be supplemented with an additional dollars amount (includes vacation pay) from the research supervisor. Students are required to work 16 consecutive weeks, on a full-time basis, between May and August.

**Why Graduate Studies and Research?**

- Enjoy the challenge of learning advanced material
- Acquire skills sought by industry – knowledge is power
- Contribute to global knowledge base (write paper, file patents, technology transfer to industry)
- Start at a higher level of responsibility in a company
- Higher starting salary: ~25% more for an M.A.Sc. than a B.Sc.
- Statistics Canada survey: higher income people tend to have an advanced degree
4+1 Program – Accelerated BASc./ MASc. Program

• Start the 4+1 program in the summer or fall following 3rd year (or after internship)

• You will need a thesis research supervisor

• After 5 years, you’ll have the BASc and MASc degrees

*More information will be provided in November 2021*

Minimum GPA to apply for 4+1 program: ~3.5
Research Project Course

ELEC 497 (FW/S): research project course –

4th Year Students only

✓ Learn research methods
✓ Get a feel for graduate studies
✓ Must get faculty advisor first, then department approval
Queen’s University Internship Program (QUIP):

- 12 to 16 month, paid, professional work experience;
- Eligible to participate after completing your 2nd or 3rd year of studies;
- The QUIP courses count towards your Professional Internship Designation and towards your degree requirements. Professional Internship is recognized as experiential learning and APSC 303 replaces one elective course in your program at 3.5 credits.
- You are required to complete a work term report or seminar for evaluation at the end of your placement as well as successful employer evaluations after four, eight and twelve months. Your diploma will read: Bachelor of Applied Science, with Professional Internship.
- Internship courses require tuition. APSC 302 and APSC 303 carry tuition fee of 3.0 units per course.
Accommodation - LOA

- Students requiring accommodation must submit their Letter Of Accommodation to the FEAS Cognito forms portal at the beginning of each term: [https://qfeas.it/accom](https://qfeas.it/accom) (instructors do not accept LOAs)

- As of July 2021, Short-term Academic Accommodation forms (STAA) and Short-term Academic Consideration forms (STAC) are no longer issued to students. To request temporary, interim, or permanent accommodations, you must submit an LOA request.

- Student is responsible to approach Instructor to make arrangements for completing missed work/tests.

- We do not reschedule labs, tests or final exams for travel, social events, or extracurricular activities.
Accommodation: Request for Academic Consideration

Used to request consideration for unforeseen medical issues

- Request form available here: [https://qfeas.it/accom](https://qfeas.it/accom)

More about required documentation and submission process on the FEAS website

If you require information or assistance, contact your Academic Accommodation Coordinator (Catherine Gurnsey) [engineering.aac@queensu.ca](mailto:engineering.aac@queensu.ca)
Substitution

• Courses in each curriculum (CORE, TECH, COMP) meet CEAB requirements and Faculty regulations, and have been approved by the Operations Committee

• If a student takes a course that is not on the approved curriculum for their program, the course will not count towards their program

......except....

• Sometimes a student can substitute a course with
  a) Courses taken during the summer at another university.
  b) Courses taken while on exchange at another university.
  c) Courses that are not on the approved TECH lists.
  d) A course to replace a CORE course. (NOTE: This form of substitution is rare and requires detailed information as to why the student is not taking the CORE course at their home university.)
Substitutions: Process

1. Send an email to the Undergraduate Program Assistant (Irina Pavich) indicating the course you would like to take and what course you would like to substitute it for. Also include a web link to the following information:
   a) Course syllabus
   b) Total # of lecture/lab/tutorial hours
   c) Course grading scheme
   d) Reason why you would like to substitute one course with another.

2. Instructor Signature: a) CORE/TECH Courses: The instructor of the course to be substituted will also need to sign the form as an indication that the course is a good substitute b) COMP Courses: No instructor signature required.

3. Irina will submit the course substitution material(s) to the Undergraduate Program Chair for review. The Undergraduate Chair will sign the form if they support the request.

4. Irina then submit the completed paperwork to the Faculty Office for review by the Operations Committee. For courses taken outside of Queen's, the $60.00 administration fee needs to be paid via online system at https://store.engineering.queensu.ca/index.php?main_page=index&cPath=8

5. You will receive an email from the Faculty Office with the Operations Committee's decision. This email can be used as a letter of permission to register for courses at another institution.
Prerequisites & prerequisite Waivers

• Prerequisites: capture material necessary to do the course
  • If the professor thought you could do the course without knowing that material, it would not have been made a prerequisite

• So prerequisites only waived in exceptional circumstances
  • Submit to Undergraduate Program Assistant the Prerequisite Waiver Form which asks Undergrad Chair to waive prerequisite:
    http://my.engineering.queensu.ca/Current-Students/Registration-Guide/files/Prerequisite_CorequisiteWaiver.pdf

• Before submitting the form, the instructor of the course for which the waiver is required must approve the waiver justification in writing (sign the form or provide the approval over the email).
Exclusions

ELEC 425 Machine Learning (List A TE) and CMPE 452 Neural Networks (List B TE)

ELEC 425 Machine Learning and Deep Learning F | 3.5

Lecture: 3
Lab: 0.25
Tutorial: 0.25

Academic Units:
Mathematics 11
Natural Sciences 0
Complementary Studies 0
Engineering Science 20
Engineering Design 11

PREREQUISITE(S): ELEC 278 or CISC 235, ELEC 326 or permission of the instructor
EXCLUSION(S): CMPE 452

ELEC 474 Machine Vision (List A TE) and CMPE 457 Image Processing & Computer Vision (List B TE)
Academic Integrity and Conduct

• Queen’s University Code of Conduct

• Departure from Academic Integrity