Video Link: https://macdrive.mcmaster.ca/f/213ce7e228514283a605/

ECE Level 2 Orientation

Welcome!

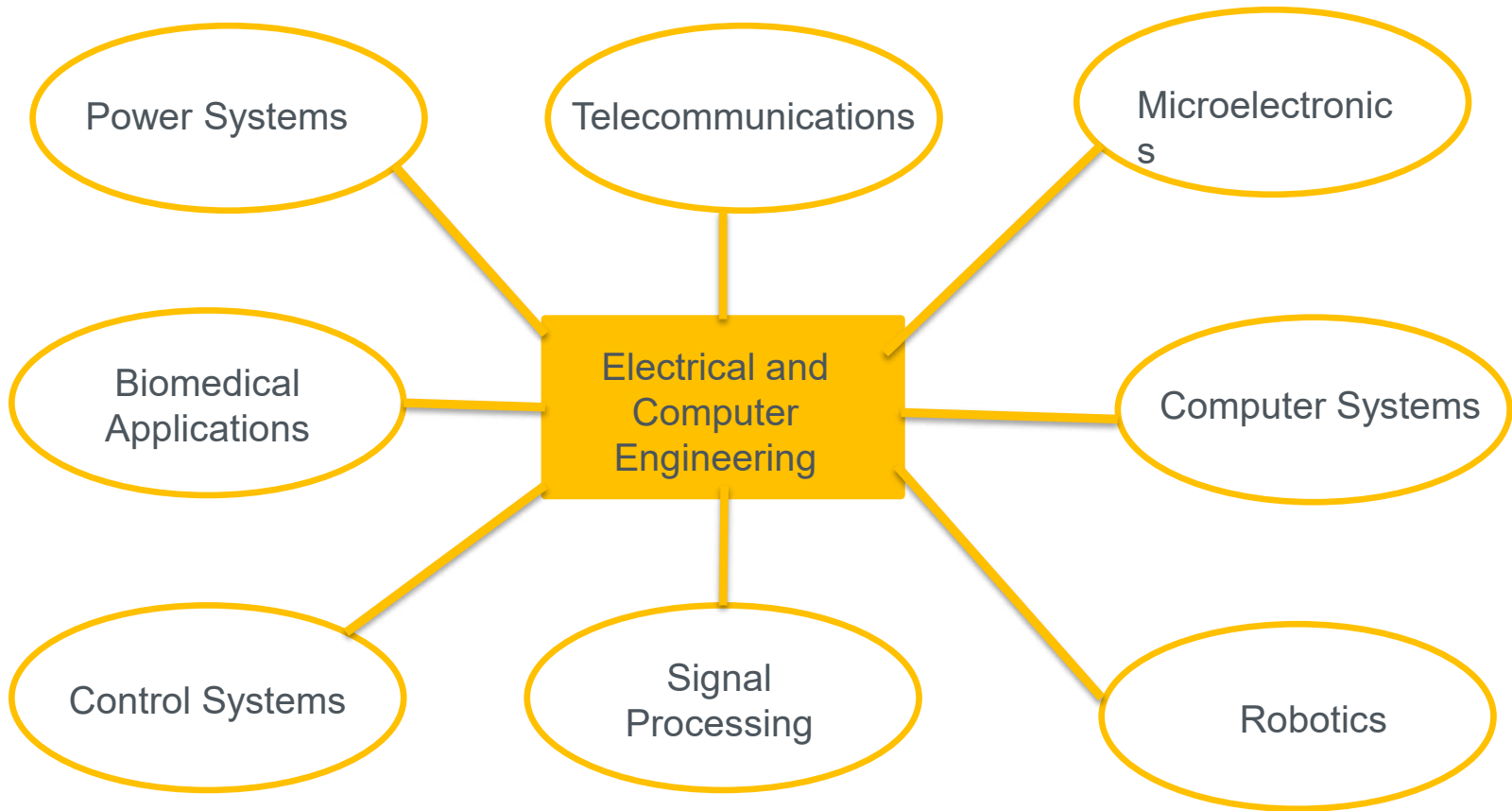**September 6, 2024**

3:30-4:20PM

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At McMaster

we recognize that the strength of our brand is integral to the achievement of our institutional objectives on a national and international scale.

Welcome to ECE!

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Power Systems

Telecommunications

Microelectronics

Biomedical Applications

Electrical and Computer Engineering

Computer Systems

Control Systems

Signal Processing

Robotics

Department Leadership

Dr. Mohamed
Bakr
(Chair)

Dr. Xun Li
Associate Chair,
undergraduate

Dr. Shiva Kumar
Associate Chair,
graduate

Dr. Natalia
Nikolova
Associate Chair,
research

General Advices

- attend lectures and ask questions

- seek help and do not allow problems to persist

- exercise, make friends, socialize

- participate in extracurricular activities

- consider graduate school

- give feedback!

Questions?

Program Advisors

ECE's contact persons for questions on course selection in your program

- EE: Dr. Schwartz, Dr. Bilgin, Dr. Noseworthy

- CE: Dr. Dumitrescu, Dr. Hassan, Dr. Athar

- E&BME: Dr. Singh

- They can be consulted for your course selection options and scheduling

- Other persons to contact:
  - UG Associate Chair: Dr. Li
  - UG Admin. Assist.: Tracey Coop
  - Academic Advisor (Associate Dean's Office): Sally Williams

Program Layouts

Example for Comp Eng program – 4-year program completed in 4 years

LEVEL II — Total units: 37

Course	Description	Units	Course	Description	Units
ELEC ENG 2CI4	Introduction to Electrical Engineering	4	ELEC ENG 2EI4	Electronic Devices and Circuits I	4
COMP ENG 2SH4	Principles of Programming	4	COMP ENG 2SI3	Data Struct., Algo. and Discrete Maths	3
COMP ENG 2DI4	Logic Design	4	COMP ENG 2DX3	MicroProcessor Systems Project	3
MATH 2Z03	Engineering Mathematics III	3	ENG 2PX3	Interdisciplinary project level 2	3
STATS 3Y03	Probability and Statistics for Engineering	3	ELEC ENG 2CF3	Circuits and Waves	3
			ELECTIVE	Complementary Studies Elective	3
	TERM 1 UNITS	18		**TERM 2 UNITS**	19

LEVEL III — Total units: 38

Course	Description	Units	Course	Description	Units
COMP ENG 3DQ5	Digital Systems Design	5	ELEC ENG 3TR4	Communications Systems	4
ELEC ENG 3EJ4	Electronic Devices and Circuits II	4	ELEC ENG 3CL4	Introduction to Control Systems	4
SFWR ENG 3K04	Software Development	4	COMP ENG 3DY4	Computer Systems Integration Project	4
ELEC ENG 3TQ3	Advanced Probability and Random Processes	3	COMP ENG 3SM4	Algorithm Design and Analysis	4
ELEC ENG 3TP3	Signals and Systems	3	ENG 3PX3	Interdisciplinary project level 3	3
	TERM 1 UNITS	19		**TERM 2 UNITS**	19

LEVEL IV — Total units: 38

Course	Description	Units	Course	Description	Units
COMP ENG 4DK4	Computer Communication Networks	4	COMPENG 3SK3	Computer-Aided Engineering	3
COMP ENG 4DM4	Computer Architecture	4	COMP ENG 4DS4	Embedded Systems	4
ENGINEER 4A03	Sustainability and Ethics in Engineering	3	ELEC ENG 4OI6	Engineering Design	3
ELEC ENG 4OI6	Engineering Design	3	SFWR ENG 3SH3	Operating Systems	3
ELECTIVE	ECE Technical Elective	4	ELECTIVE	ECE Technical Elective	4
			ELECTIVE	Complementary Studies Elective	3
	TERM 1 UNITS	18		**TERM 2 UNITS**	20

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YEAR 2 — **Total units: 28**

Course	Description	Units	Course	Description	Units
ELECENG 2CI4	Introduction to Circuit Analysis	4	COMP ENG 2SI3	Data Struct., Algo. and Discrete Maths	3
COMPENG 2SH4	Principles of Programming	4	ELECENG 2EI4	Electronics Devices and Circuits I	4
MATH 2Z03	Engineering Mathematics III	3	ENG 2PX3	Interdisciplinary project level 2	3
COMPENG 2DI4	Logic Design	4	COMPENG 2DX3	Microprocessor Systems Project	3
	TERM 1 UNITS	15		**TERM 2 UNITS**	13

YEAR 3 — **Total units: 28**

Course	Description	Units	Course	Description	Units
SFWRENG 3K04	Software Development for Computer Engineering	4	SFWR ENG 3SH3	Operating Systems	3
ELECTIVE	Complementary Studies Elective	3	COMP ENG 3SM4	Algorithm Design and Analysis	4
COMPENG 3DQ5	Digital Systems Design	5	ENG 3PX3	Interdisciplinary project level 3	3
STATS 3Y03	Probability and Statistics for Engineering	3	ELEC ENG 2CF3	Circuits and Waves	3
	TERM 1 UNITS	15		**TERM 2 UNITS**	13

YEAR 4 — **Total units: 28**

Course	Description	Units	Course	Description	Units
ELECENG 3EJ4	Electronics II	4	ELECENG 3TR4	Communication Systems	4
ELECENG 3TQ3	Advanced Probability and Random Processes	3	COMPENG 3DY4	Computer Systems Integration Project	4
ENGINEER 4A03	Sustainability and Ethics in Engineering	3	ELECENG 3CL4	Introduction to Control Systems	4
ELECENG 3TP3	Signals and Systems	3	ELECTIVE	Complementary Studies Elective	3
	TERM 1 UNITS	13		**TERM 2 UNITS**	15

YEAR 5 — **Total units: 29**

Course	Description	Units	Course	Description	Units
COMPENG 4DK4	Computer Communication Networks	4	COMPENG 3SK3	Computer-Aided Engineering	3
COMPENG 4DM4	Computer Architecture	4	COMPENG 4DS4	Embedded Systems	4
ELECTIVE	ECE Technical Elective	4	ELECTIVE	ECE Technical Elective	4
ELECENG 4OI6	Engineering Design	3	ELECENG 4OI6	Engineering Design	3
	TERM 1 UNITS	15		**TERM 2 UNITS**	14

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Spring/Summer Programming Courses

- COMPENG 2SH4 (Principles of Programming)

- COMPENG 2SI3 (Data Structures and Algorithms)

- 2SH4 is offered in the Fall term (13 weeks) and also in the Spring term (7 weeks).

- 2SI3 is offered in the Winter term (13 weeks) and also in the Summer term (7 weeks).

- Compared to Fall/Winter offerings, same amount of content is covered in the Spring/Summer offerings – only compressed in time.

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Spring/Summer Programming Courses

- **Primary motivation:** An option to lighten the course load of students in the Fall and Winter terms of their Level 2 year.

- Open to Level 2 (and above) students.

- Require in-person attendance.

- Enrolment in the Spring/Summer offerings will only be through permission requests.

- Note: COMPENG 2DX3 (offered in Winter) has COMPENG 2SH4 as a pre-requisite. Without 2SH4:

  o Enrolment in 2DX3 would require a permission request.

  o Students would be required to demonstrate basic proficiency in the C programming language to 2DX3 instructors to get permission.
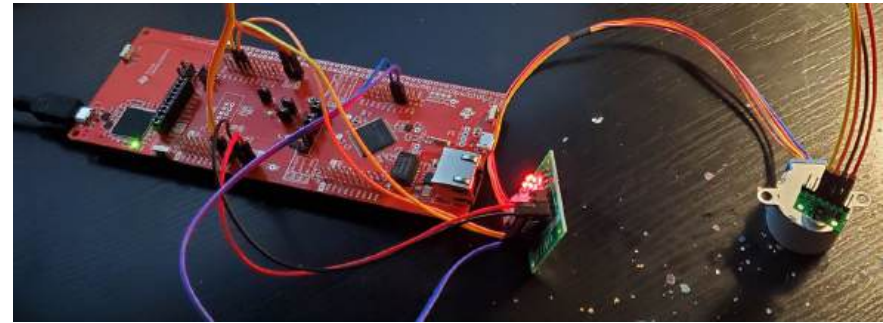
Project-based Courses

- Each engineering course is like a puzzle piece.

- While each course is important on its own, the bigger picture makes sense only when these puzzle pieces are connected!

- The goal of project-based courses is to:

  o Integrate knowledge from multiple courses already taken in the curriculum to build a design project

  o At times, in building this project, utilize concepts that are to be learned in the future, thus highlighting what is coming next.

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COMPENG 2DX3 - Microprocessor Systems Project

- Your first project-based course in ECE.

- Embedded Intelligence – "Observe, Reason, and Act".

- Builds upon knowledge learned in three previous courses (ELECENG 2CI4, COMPENG 2DI4, COMPENG 2SH4).

- **Project: Spatial mapping using time-of-flight.**

- Briefly introduces concepts that students will learn in various future courses such as analog-to-digital conversion, electric motors, communications, images!
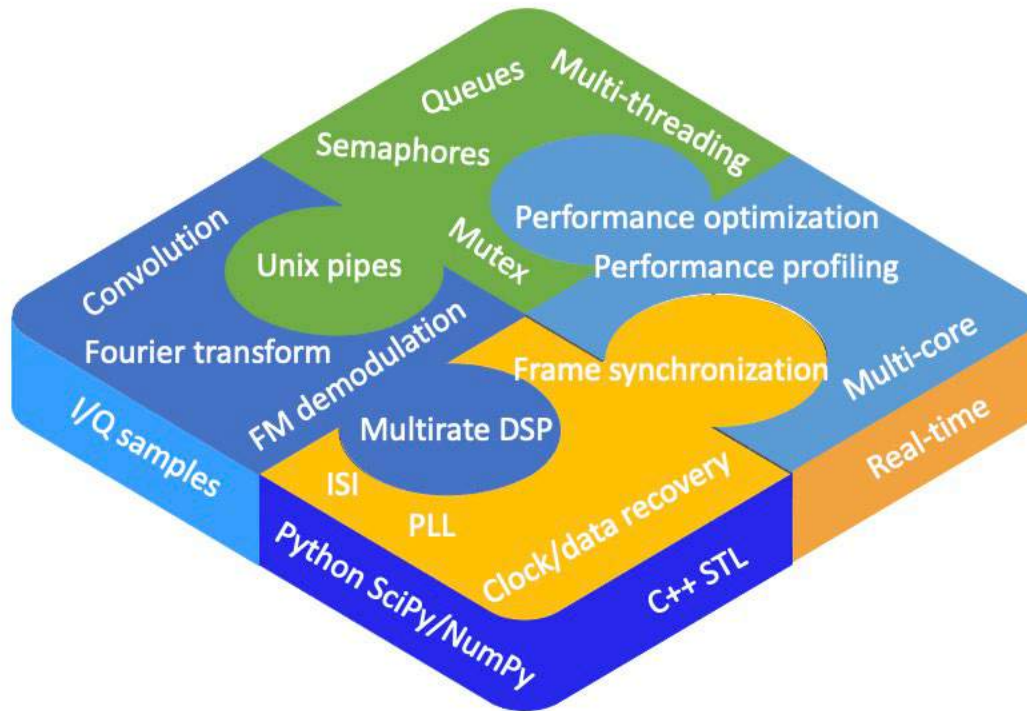
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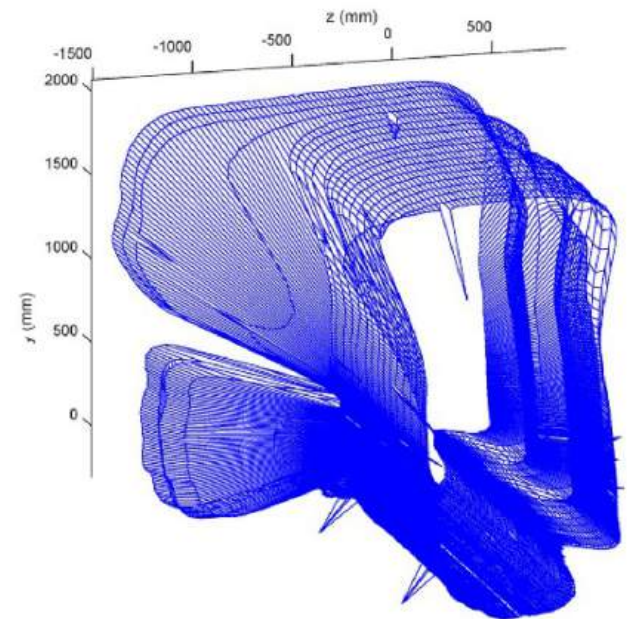
3EY4 – Electrical Systems Integration Project

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3DY4 – Computer Systems Integration Project

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3DY4 – Computer Systems Integration Project

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Project-based Knowledge Integration Courses

| I DO | WE DO | YOU DO | EXTEND IT |

Learn it **Link it**

https://barbaraoakley.com/books/uncommon-sense-teaching/

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Project-based Knowledge Integration Courses

Faint initial learning

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Engineering Design (Capstone) Course

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Engineering Design (Capstone) course

- A two-term design course that applies all acquired knowledge from the undergraduate program

- Students work in teams of 4 or 5 members on the topic of their choice

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Engineering Design (Capstone) course

Sample previous projects:

Air Hockey Robot

Keep up

https://www.youtube.com/watch?v=mvKW7WNYCgA

https://www.youtube.com/watch?v=6ZMBBnZ_W5s

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ElecEng 4th Year Electives

Biomedical Engineering

ElecEng-4BF4 (winter term)

Advanced Medical Imaging

Prerequisites:

- ElceEng-2FH3/2FH4

- ElecEng-3TP3/3TP4

- registered in 4th year

- 3hrs lecture, 1hr tutorial, 6 labs

INSTRUCTOR
Dr. Michael Noseworthy

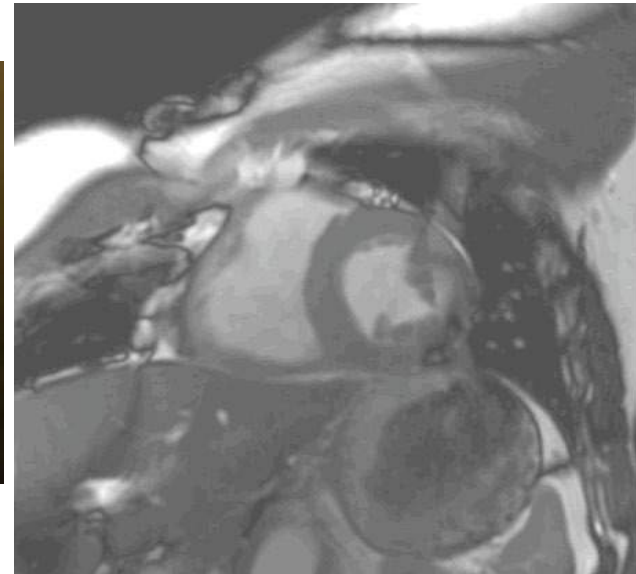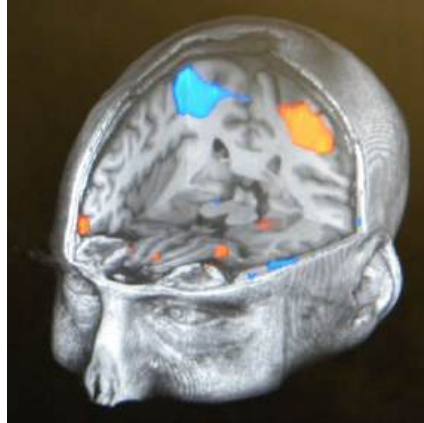## ElecEng-4BB4 (winter term)

Cellular Bioelectricity

Prerequisites:

- registered in at least 3rd year

- 3hrs lecture 1hr tutorial per week

INSTRUCTOR
Dr. Kanwarpal Singh

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ElecEng-4BF4 Medical Imaging

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Administrative Details

Undergrad Administrative Team:

ece_ug@mcmaster.ca

Academic Department Manager:

Shelby Gaudrault

Academic Team Lead:

Mary-Anne Bechamp

Undergrad Admin Assistant:

Tracey Coop

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ECE Website

www.eng.mcmaster.ca/ece

- Important information regarding ECE

- Undergraduate resources:

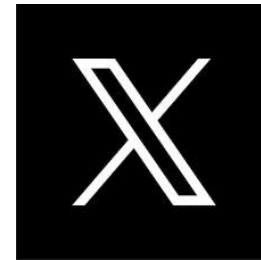| Program advisors	Overload request form	Course conflict form
Access advisors →	Download file ⬇	Visit website ⬀
Course permission form	Undergraduate ambassadors	Elective information
Visit website ⬀	Visit webpage →	Visit webpage →
Information for ECE students in their final year		
Visit webpage →		

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Social Media – Stay Informed!

Check out all the great things happening in ECE!

@ece.mcmaster   @ecemcmaster

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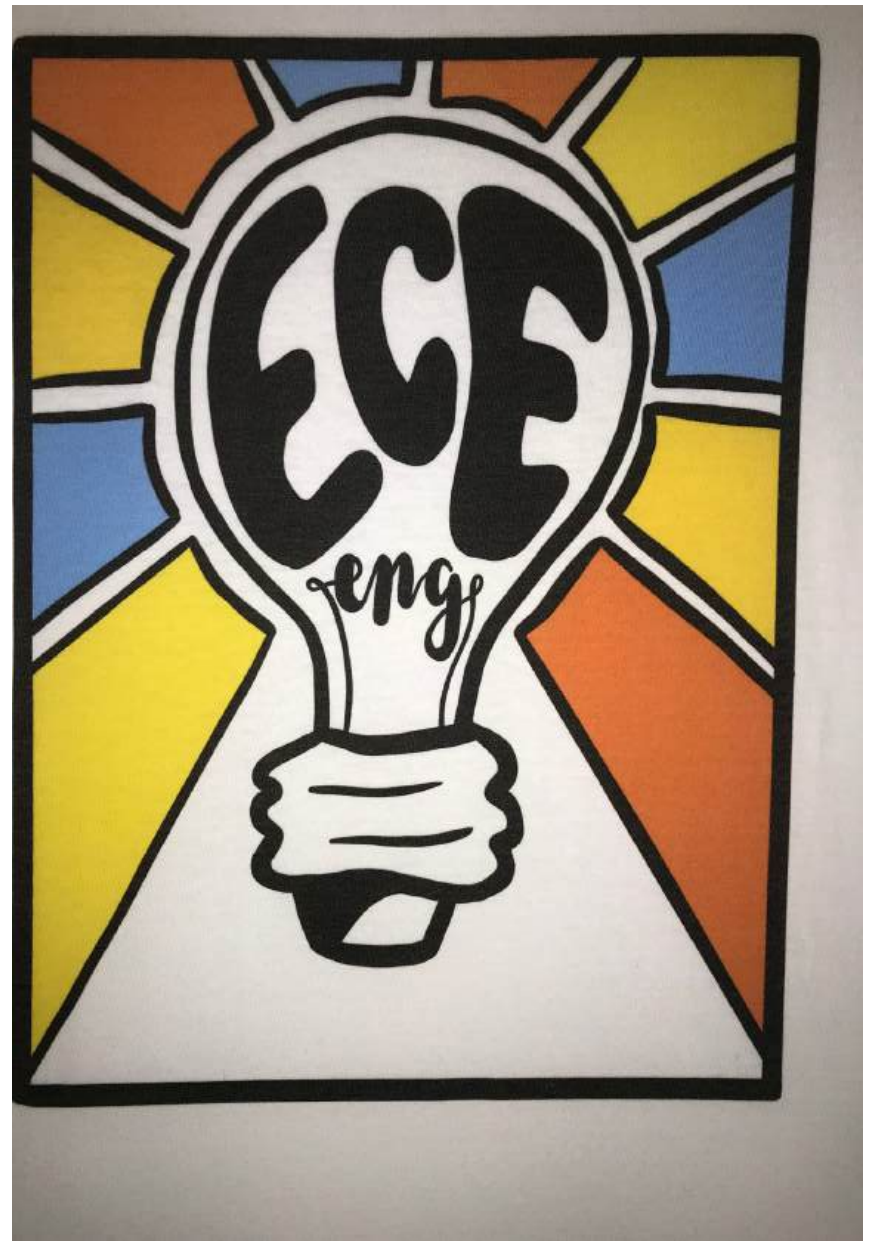McMaster
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ECE Ambassadors

The department of ECE Ambassador program is a leadership opportunity for upper level ECE students to represent the department at various faculty and department run events.

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Be Involved!

Student Groups

- **ECES** – Electrical & Computer Engineering Society ECES@mcmaster.ca

- **MES** – McMaster Engineering Society

- **IEEE** – Institute of Electrical and Electronic Engineers ieee@mcmaster.ca

- **BEAMS** – BioEngineering at McMaster Society macbeams@mcmaster.ca

- **Mac Formual Electric https://macformularacing.com/**

- **EcoCar ecocar@mcmaster.ca**

- **McMaster Solar Car Project https://www.mcmastersolarcar.com/**

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Thank you for attending the orientation.

We hope you have a great academic year!