

Carleton University
Department of Electronics

ECOR 1044 - MECHATRONICS

3 credit hours

Instructor: Dr. Hicham Chaoui, MC 7066, hicham.chaoui@carleton.ca

Head TA: Masood Nekoei, masoodnekoei@email.carleton.ca

Prerequisites (if applicable):

- ECOR 1041 and ECOR 1043 with a minimum grade of C-.
- This course may not be taken concurrently with ESLA 1300 or ESLA 1500.

Texts and References:

- *None.*

Course Description: Mechatronics applications. Introduction to Raspberry Pi and Basic Coding in Python. Input devices, including sensors. Data collection and processing. Output devices, including displays, actuators, and motors. Analog to digital signal conversion. Control systems and PID controllers. Project design and economics. Environmental Impact of Mechatronic Engineering. System failures and failsafe design. Introduction to Robotics and Microcontrollers.

Instructional Outcomes:

Upon completion of this course, a student will be able to:

1. Interact with electrical hardware such as sensors, motors, and other devices to integrate them into a simple system.
2. Analyze analog to digital signal conversion, and control systems to solve basic problems.
3. Apply the engineering design process to improve upon a simple system.
4. Integrate the various lab components in the project design.
5. Generate a project report based on the findings of the project lab experiment.

Graduate Attributes:

1. Cooperative group work
2. An introduction to mechatronic system design
3. Familiarization with electrical hardware such as sensors, stepper motors and DC motors
4. An introduction to analog to digital signal conversion, control systems and PID controllers
5. Design aspects such as safety, performance, cost and environmental impacts
6. Electrical engineering hardware
7. Electrical specifications
8. Engineering documentation and technical writing
9. Project economics

Major Teaching Methods: lectures, labs, discussions.

Special Instructional Platform/Materials: (e.g., laptop, etc.)

Grading and Evaluation Procedures:

- Labs 30%
- Project 20%
- Final Exam 50%

Attendance Policy: When you miss a class, it is your duty to obtain the missed information.

Academic Integrity: It is the aim of the faculty of Carleton University to foster a spirit of complete honesty and a high standard of integrity as well as academic excellence. Any attempt by students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension.

Civility in the Classroom: Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from engaging in any form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.

Examination Policy: The use of communication or recording/playback devices, with the exception of devices explicitly permitted by the course instructor, is prohibited during quizzes and examinations. This includes, but is not limited to, cell phones, PDAs, iPods and MP3 players, tablets, computers, cameras, and headphones or in-ear earphones. All such devices must be turned off and put away in an inaccessible location such as a backpack. Accessing a prohibited device will result in the immediate termination of the quiz or examination and may result in a charge of academic misconduct.

Student Email Policy: The University sends official communications to Carleton email addresses. This address will receive notices about schedules, grade results, billing information, emergency alerts, important deadlines, newsletter, and all other official university information. It is your responsibility to read and manage this email. Make sure you receive any correspondence in regards to this course. Please note the instructor of this course is not responsible for missed email communication directed to your spam folder.

Examination Policy: The use of communication or recording/playback devices, with the exception of devices explicitly permitted by the course instructor, is prohibited during quizzes and examinations. This includes, but is not limited to, cell phones, PDAs, iPods and MP3

players, tablets, computers, cameras, and headphones or in-ear earphones. All such devices must be turned off and put away in an inaccessible location such as a backpack. Accessing a prohibited device will result in the immediate termination of the quiz or examination and may result in a charge of academic misconduct.

Academic Accommodation: You may need special arrangements to meet your academic obligations during the term.