

MECHATRONICS CERTIFICATE

Program Description

From smart home devices to drones, robots, and autonomous cars, we are surrounded by electronic devices that are increasingly ingrained into our daily lives. Mechatronics is a rapidly growing field that encompasses the inner workings of these devices.

In this certificate program, you will prototype your own device, applying best practices at every step in the process from design to pitching, assembly, and reporting. Leading experts from Cornell's College of Engineering will guide you through both the theoretical basis for the concepts and the technical skills, including circuit construction, microcontroller programming, the application of sensors and actuators, and the use of professional-grade test equipment. Equipped with a kit of electrical components, you will dive into the building blocks of various mechatronic systems. You will discover how to program a microcontroller in C then program and control sensors and actuators to build circuits that interact with the physical world. By the final course, you will have gained a strong foundation for your capstone project: prototyping a design from start to finish.

This program requires the purchase of a kit of electronic components and microcontrollers. To be successful in these courses, you should have some programming experience (any language) and familiarity with basic circuit theory (at the level of a high school or introductory college physics course).

Key Takeaways

- Design, build, measure, and analyze a simple circuit
- Assemble time-varying circuits, using formulas and tools to predict their behavior
- Build an Arduino circuit with inputs and outputs
- Build and program circuits to control three common types of motors
- Integrate sensors into a circuit, collecting data from the sensors and programming the circuit to act based on sensor input
- Complete a prototype from start to finish, including design, pitch, assembly, and reporting

What You'll Earn

- Mechatronics Certificate from Cornell University's College of Engineering
- 96 Professional Development Hours (9.6 CEUs)

Who Should Enroll

- Engineers (mechanical, software, civil, systems, chemical, biomedical)
- Robotics and automation technicians
- Programmers and computer scientists
- Technology researchers
- High school teachers
- Hobbyists

Total Investment

3 months to complete the courses.

How to Enroll

For more information and to enroll, please visit Mechatronics Certificate (<https://ecornell.cornell.edu/certificates/engineering/mechatronics/>).

The courses in this certificate program are required to be completed in the order that they appear.

Courses

Code	Title	Hours
eCornell MAE131	Building and Analyzing a Basic Circuit	0
eCornell MAE132	Building and Measuring a Time-Varying Circuit	0
eCornell MAE133	Programming a Microcontroller	0
eCornell MAE134	Using and Controlling Motors	0
eCornell MAE135	Collecting Data with Sensors	0
eCornell MAE136	Designing and Building Your Own Mechatronic Device	0