**What do Electrical and Computer Engineers do?**

Electrical and Computer Engineers work at the heart of new electronics and computing technologies. Almost everything we use and rely on in our everyday life relies on electricity and electronics, making Electrical and Computer Engineers in high demand. In fact, Electrical Engineering is the largest branch of engineering worldwide.

- They develop the electronics and computing technologies that are behind the electronic devices we use every day, such as televisions, cell phones, microwave ovens, video game systems, and more.
- They work in transportation industries, and their skills are essential for the design of modern automobiles and aircraft.
- They work in healthcare industries, designing instruments and diagnostic systems such as prosthetic limbs, hearing aids, MRI, and ultrasound.
- They work in communication industries, developing advanced antenna technologies, software systems, satellite systems, and networking technologies.
- They work in energy industries, developing systems for electric power generation (hydroelectric, wind, solar, and more), electric power delivery, and power electronic devices to control and convert electric power (motors, ac/dc converters, hybrid vehicle drive systems, and more).
- They are involved in diverse research areas such as nanotechnologies, quantum computing, nano-medicine, photonics, and computational intelligence.
- Many work in the business world where their knowledge of technology and their problem-solving and team-building skills are highly valued. Many apply their mathematics and analysis skills in the banking and finance sectors.

**What are the Typical Courses?**

Electrical Engineering and Computer Engineering students have many courses in common. Common courses include mathematics, modern physics, circuits and electronics, computer programming, microprocessors, digital systems, economics and engineering law. However, each program provides students with additional advanced study in their respective areas.

- Electrical Engineering students take courses in electromagnetics, electric power and machines, communication systems, control systems, and the physics of electronic materials. They can select from elective courses covering antenna systems, electric power systems, photonic systems, biomedical technologies, microelectronic fabrication, computer vision, and advanced mathematics.
- Computer Engineering students take courses in software engineering, digital system design, computer programming, and telecommunication networks. They can select from elective courses such as communication systems, control systems, computer vision, parallel processing, wireless networks, and advanced Computer Science courses such as computer graphics, user interfaces, human-computer interaction, and artificial intelligence.

---

**Computer Engineering or Computer Science?**

Computer Science is primarily concerned with the programming side of computers, as well as computational theory and artificial intelligence. Computer Engineering focuses on the entire system – and offers students both a computing background and an electronic hardware background. Therefore, they learn how to integrate digital technologies in industrial systems. Also, an Engineering degree leads to professional registration.
Is There Practical or Work Experience?
Courses are geared toward continuous learning and industrial technologies. Engineering design concepts are part of many courses, including a team-based group design project course in the final year.

Students can also choose to add valuable work experience to their undergraduate degree by participating in an industry internship program between the final two years of course work. This is a paid work experience, and most internship students have offers of full-time jobs after graduation or subsidized education for their final year of study.

Areas of Focus in Electrical and Computer Engineering:
Students can choose to focus their technical elective courses in the following areas, and this advanced study will be indicated on their final degree.

- Power and Energy Systems (Elec. Eng.)
- Wireless Communication Devices (Elec. Eng.)
- Engineering Physics (Elec. Eng.)
- Biomedical (Elec. Eng.)
- Communication Networks (Comp. Eng.)
- Embedded Systems (Comp. Eng.)
- Machine Vision (Comp. Eng.)

Students in the Biomedical area can complete courses required for admission to the Faculty of Medicine if desired.

How Do I Get In?
Students are accepted each year from University 1, or following the 1st year of direct entry to Engineering. For more information, refer to The University of Manitoba General Calendar.

Contact Information:
Dept. of Electrical and Computer Engineering
Room E2-390 EITC Building
75A Chancellor's Circle
University of Manitoba
Winnipeg, MB, R3T 5V6, Canada
Tel: 204-474-9099
Web: www.ece.umanitoba.ca