Thank you very much for your interest in McMaster's Computer Engineering Program. We believe that our program will provide you with a platform of knowledge and skills from which you will be able to launch an exciting career at the confluence of computing hardware, electronics, and software. We hope that the following answers to some frequently asked questions will help you evaluate the potential of the field of computer engineering and will assist you in selecting the field of specialization for your engineering degree.

1) What is Computer Engineering?

We view computer engineering as the art of integrating computing hardware, electronics, and software to design systems that will improve the quality of life of individuals and communities, and in doing so advance our society as a whole. However, you should not just take our word for it.

According to the joint task force on curriculum recommendations from the two major professional organizations in the field (the Association for Computing Machinery, ACM, and the Institute of Electrical and Electronic Engineers, IEEE), Computer Engineering is defined as follows:

"Computer engineering as an academic field encompasses the broad areas of electrical or electronics engineering and computer science. [...] Computer engineering is a discipline that embodies the science and technology of design, construction, implementation, and maintenance of software and hardware components of modern computing systems and computer-controlled equipment.

Therefore, this unique combination prepares students for careers that deal with computer systems from their design through their implementation. Computing systems are components of a wide range of products for example, as fuel injection systems in vehicles, medical devices such as x-ray machines, communication devices such as smart phones, and household devices such as alarm systems and washing machines. Designing computing systems and computing components for products, designing network computers and devices for the internet of things, developing and testing their prototypes, and implementing them to market are examples of what computer engineers typically do."

2) What is the difference between Computer Engineering and Software Engineering?

Computer engineering is concerned with the design of computer systems, which includes both the electronic components, like microprocessors or graphics cards, as well as the software that enables access to and maximizes the performance offered by the computer

hardware. In contrast, software engineering is concerned with the entire software lifecycle, ranging from requirements and specifications to design and implementation to testing and maintenance. For differentiation purposes, at the links below you can find accessible descriptions of computer engineering and software engineering disciplines that have been developed by the ACM:

https://ccecc.acm.org/guidance/computer-engineering

https://ccecc.acm.org/guidance/software-engineering

3) What makes Computer Engineering at McMaster stand-out?

Because Computer Engineering overlaps with both Electrical Engineering and Computer Science, our students take courses across disciplines, which offers them not only a strong foundation, but also broad perspectives on emerging technologies.

A good example is the third year of studies when our students take several Electrical Engineering courses, such as Electronics, Signals and Systems, Communications and Control. These courses are critical to develop the fundamental knowledge for more advanced topics like microelectronics, imaging, wireless communications and robotics. At the same time our students take courses that share a common focus with Computer Science, like Software Development and Algorithm Design. Concurrently with all of the above, there are a few distinctive courses for the Computer Engineering students that tie together these seemingly disparate topics: Digital Systems and the Computer Systems Integration project, whose purpose is to also provide the bridge to the specialized courses from the final year on Computer Architecture, Networking and Embedded Systems. Examples of projects in these unique third-year courses for Computer Engineers include the development and validation of a digital hardware device for image processing and, more recently, system modeling and multi-threaded implementation on multi-core processors of software-defined radios.

4) What do Computer Engineering students do after graduation?

In a fast-evolving field, classifying jobs in terms of hardware vs. software is perhaps outdated. While our graduates have started successful careers at traditional hardware companies, such as Intel, AMD, or Qualcomm, and traditional software companies, such as Microsoft, Google, or Amazon, the unique background of Computer Engineering students makes them well-prepared for a broad range of emerging application domains that rely on specialized computing systems, many of which are defined by the growing areas of machine learning, autonomous mobility, and aerospace.