



Software Engineering

Department of Electrical and Computer Engineering

The development of software systems is now regarded among the most innovative work performed by mankind. Software Engineers are trained for the specification, design, implementation, and maintenance of software systems. They apply the principles of engineering and the fundamentals of computing science in the production of large-scale software applications such as communication systems, information systems, health informatics, geographic information systems, internet applications, virtual reality environments, avionics controls, smart phones, and entertainment systems. Career opportunities for software engineers are essentially endless.

Since software permeates many aspects of today's society, software engineering is forecast to be one of the fastest growing employment fields for many years to come. In order to cope with the needs of that growth, our graduates acquire knowledge and expertise to develop high-quality software systems. At Western, the Software Engineering program has a core of disciplines that covers all phases of the software life cycle, offers a solid foundation in computer hardware and computer networks, and explores the essentials of computer science. Graduates acquire the management skills necessary to lead a software team that can engineer software systems that meet specified requirements of industrial quality and professional standards. Team work and entrepreneurship are also emphasized in our Software Engineering program. Laboratories are equipped with the latest technologies and products used by software engineers in industry.

Western's Software Engineering program is one of the first to be accredited by the Canadian Engineering Accreditation Board (CEAB), which means that our graduates are among the first generation of accredited Professional Software Engineers in the world.

Program

First year courses are common to all Engineering programs. Upon completion of first year, students must be admitted into the Software Engineering program. For admission to the Software Engineering program, students must have completed the common first year curriculum of Engineering with at least 60% Year Weighted Average (YWA) and passing grades in Applied Mathematics 1411a/b, Applied Mathematics 1413, Physics 1026 and Engineering Science 1036a/b. The remaining three years are devoted to courses in programming, software processes, aspects of the software life cycle, project management, networks, and software quality issues. Students may choose from a broad range of technical electives in fourth year, which can include appropriate topics in Computer Science.

Employment Opportunities

According to Industry Canada statements, Software Engineers are the most sought-after engineers in our society. The current need is so great that it will be years before the supply can satisfy the demand. In addition, skills possessed by Software Engineers have wide applicability in most areas of engineering and business. Many Software Engineers will become self-employed in entrepreneurial activities or as private consultants. Because of the ubiquitous presence of the Internet, Software Engineers are independent of their physical location, making the profession an ideal one for engineers opting to work out of their homes.



Software Engineering cont'd



First year program (2010-2011): Applied Math 1413, Eng Sci 1050, Physics 1026, Applied Math 1411a/b, Chemistry 1024a/b, Eng Sci 1021a/b, Eng Sci 1022a/b/y, Eng Sci 1036a/b, 1.0 non-technical elective.

Second year program (2011-2012):

Term 3:	Course Title	Term 4:	Course Title
AM 2415	Applied Mathematical Methods	AM 2415	Applied Mathematical Methods
SE 2250a	Software Construction	SE 2203b	Software Design
SE 2251a	Discrete Structures for Software Engineering	SE 2205b	Algorithms and Data Structures
ECE 2277a	Digital Logic Systems	ECE 2238b	Introduction to Electrical Engineering
CS 1037a	Computer Science Fundamentals II	ES 2211G	Engineering Communications
SS 2141a	Applied Probability and Statistics		0.5 Science course from the approved list

Third year program (2012-13):

Term 5:	Course Title	Term 6:	Course Title
SE 3350y	Software Engineering Design I	SE 3350y	Software Engineering Design I
SE 3309a	Database Management Systems	SE 3310b	Theoretical Foundations of Software Engineering
SE 3313a	Operating Systems for Software Eng.	SE 3314b	Computer Networks Application
SE 3316a	Web Technologies	SE 3351b	Software Project and Process Management
SE 3352a	Software Requirements & Analysis	SE 3353b	Human-Computer Interface Design
ECE 4436a	Networking: Principles, Protocols, and Architecture	ECE 3375b	Microprocessors and Microcomputers

Fourth year program (2013-14):

Term 7:	Course Title	Term 8:	Course Title
Bus 2299	Business Organization	Bus 2299	Business Organization
SE 4450	Software Engineering Design II	SE 4450	Software Engineering Design II
SE 4452a	Software Verification and Validation	SE 4453b	Software Quality, Reliability and Maintenance
SE 4472a	Information Security	ES 4498G	Engineering Ethics, Sustainable Development and the Law
Two technical electives		One technical elective	
		Non-technical elective taken from the approved list. (in either a or b term)	

Technical electives:

ECE 4460a/b	Real-Time and Embedded Systems	SE 4410a/b	Wireless LANs and WANs
ECE 4470a/b	Microcomputer Engineering	SE 4470a/b	Selected Topics in Software Eng. I
ECE 4489a/b	Computer Architectures	SE 4471a/b	Selected Topics in Software Eng. II
CS 3346a/b	Artificial Intelligence I Computer Graphics I		
CS 3388a/b			
CS 4442a/b	Artificial Intelligence II		
CS 4482a/b	Game Engine Development		
CS 4483a/b	Game Design		
CS 4488a/b	Computer Graphics II		

Some technical electives may not be offered in a given academic year.