(For students admitted in 2017-18 under the 4-year degree)

BEng in Computer Engineering

In addition to the requirements of their major programs, students are required to complete the University requirements for graduation. For details please refer to the respective section on this website.

Some courses can be used to fulfill both Major and University Common Core Requirements. Students may reuse a maximum of 9 credits of these courses to count towards both Requirements.

Major Requirements

Engineering Fundamental Course(s)

				Credit(s) attained
COMP			Note: COMP 1021 OR COMP 1022P OR COMP 1022Q	3
	COMP	1021	Introduction to Computer Science	3
	COMP	1022P	Introduction to Computing with Java	3
	COMP	1022Q	Introduction to Computing with Excel VBA	3
ENGG	1010		Academic Orientation	0
LANG	2030		Technical Communication I	3
MATH			Note: [(MATH 1012 OR MATH 1013 OR MATH 1023) AND (MATH 1014 OR MATH 1024)] OR [MATH 1020]	4-7
	MATH	1012	Calculus IA	4
	MATH	1013	Calculus IB	3
	MATH	1014	Calculus II	3
	MATH	1020	Accelerated Calculus	4
	MATH	1023	Honors Calculus I	3
	MATH	1024	Honors Calculus II	3
MATH	2011		Introduction to Multivariable Calculus	3
MATH	2111		Matrix Algebra and Applications	3
PHYS			Note: PHYS 1112 OR PHYS 1312	3
	PHYS	1112	General Physics I with Calculus	3
	PHYS	1312	Honors General Physics I	3
PHYS			Note: PHYS 1114 OR PHYS 1314	3
	PHYS	1114	General Physics II	3
	PHYS	1314	Honors General Physics II	3
SENG			Engineering Introduction course (If the students take an introduction course included in their major, this course can be counted towards their major requirement.)	3-4
	COMP	1021	Introduction to Computer Science	3
	ELEC	1100	Introduction to Electro-Robot Design	4

ELEC	1200	A System View of Communications: from Signals to Packets	4
CENG	1000	Introduction to Chemical and Biological Engineering	3
CIVL	1100	Discovering Civil and Environmental Engineering	3
ENGG	1100	First Year Cornerstone Engineering Design Project Course	3
IELM	2010	Industrial Engineering and Modern Logistics	3
IELM	2200	Engineering Management	3
MECH	1901	Automotive Engineering	3
MECH	1902	Energy Systems in a Sustainable World	3
MECH	1905	Buildings for Contemporary Living	3
MECH	1906	Mechanical Engineering for Modern Life	3

Required Course(s)

			Credit(s) attained
CPEG	1971	Industrial Experience	0
CPEG	2930	Academic and Professional Development I	0
CPEG	3930	Academic and Professional Development II	0
COMP		Note: (COMP 2011 AND COMP 2012) OR COMP 2012H	5-8
COMP	2011	Introduction to Object-oriented Programming	4
COMP	2012	Object-Oriented Programming and Data Structures	4
COMP	2012H	Honors Object-Oriented Programming and Data Structures	5
COMP/ELEC		Note: COMP 2611 OR ELEC 2300	4
COMP	2611	Computer Organization	4
ELEC	2300	Computer Organization	4
COMP/ELEC		Note: COMP 2711 OR COMP 2711H OR ELEC 2600	4
COMP	2711	Discrete Mathematical Tools for Computer Science	4
COMP	2711H	Honors Discrete Mathematical Tools for Computer Science	4
ELEC	2600	Probability and Random Processes in Engineering	4
COMP	3511	Operating Systems	3
COMP/ELEC		Note: COMP 4521 OR COMP 4611 OR ELEC 4310	3-4
COMP	4521	Mobile Application Development	3
COMP	4611	Design and Analysis of Computer Architectures	3
ELEC	4310	Embedded System Design	4
COMP/ELEC		Note: COMP 4988 OR COMP 4989 OR ELEC 4918 OR ELEC 4919 (Students taking the Research Option must take either COMP 4989 or ELEC 4919)	6
COMP	4988	Computer Engineering Final Year Project	6
COMP	4989	Computer Engineering Final Year Thesis	6
ELEC	4918	Computer Engineering Final Year Project	6
ELEC	4919	Computer Engineering Final Year Thesis	6

ELEC		Note: ELEC 1100 OR ELEC 1200	4
ELEC	1100	Introduction to Electro-Robot Design	4
ELEC	1200	A System View of Communications: from Signals to Packets	4
ELEC		Note: ELEC 2100 OR ELEC 2400	4
ELEC	2100	Signals and Systems	4
ELEC	2400	Electronic Circuits	4
ELEC	2200	Digital Circuits and Systems	4
ELEC	3300	Introduction to Embedded Systems	4
ENGG	2010	Engineering Seminar Series	0
LANG		Note: LANG 4030 OR LANG 4031	3
LANG	4030	Technical Communication II for CSE & CPEG	3
LANG	4031	Technical Communication II for ECE & CPEG	3

Elective(s)

			Minimum credit(s) required
COMP/ELEC		Area Courses (At least 4 courses from the specified elective list , of which at least 2 courses should be taken from one single area and at least 2 courses outside that area. Courses taken as Major Required Courses may not be counted towards the elective requirement.)	15

Artificial Intelligence / Theory Area

COMP	3211	Fundamentals of Artificial Intelligence	3
COMP	3711	Design and Analysis of Algorithms	3
COMP	3711H	Honors Design and Analysis of Algorithms	4
COMP	3721	Theory of Computation	3
COMP	4211	Machine Learning	3
COMP	4221	Introduction to Natural Language Processing	3
COMP	4331	Data Mining	3
COMP	4332	Big Data Mining and Management	3
COMP	4421	Image Processing	3
COMP	5421	Computer Vision	3
COMP	5711	Introduction to Advanced Algorithmic Techniques	3

Communications Area

ELEC	3100	Signal Processing and Communications	4
ELEC	3600	Electromagnetics: From Wireless to Photonic Applications	4
ELEC	4110	Digital Communications and Wireless Systems	3
ELEC	4150	Information Theory and Error-Correcting Codes	3
ELEC	4610	Engineering Optics	4
ELEC	4620	Photonics and Optical Communications	4
ELEC	4630	Radio Frequency Engineering	4
ELEC	4640**	Modern Optics	3

Embedded System / Robotics Area

COMP	4521	Mobile Application Development	3
COMP	4611	Design and Analysis of Computer Architectures	3
ELEC	3200	System Modeling, Analysis and Control	4
ELEC	4210**	Digital Control Systems	3
ELEC	4310	Embedded System Design	4
ELEC	4320	FPGA-based Design: From Theory to Practice	3
ENGG	4950	Engineering Special Project	1-4

Graphic / Multimedia Area

COMP	4411	Computer Graphics	3
COMP	4421	Image Processing	3
COMP	4431	Multimedia Computing	3
COMP	4441	Computer Music	3
COMP	4451	Game Programming	3
COMP	5411	Advanced Computer Graphics	3
COMP	5421	Computer Vision	3
ELEC	4170	Digital Media and Multimedia Applications	4

Semiconductor / VLSI Area

ELEC	3400	Introduction to Integrated Circuits and Systems	4
ELEC	3500	Microelectronic Devices and Technology	4
ELEC	4410	CMOS VLSI Design	3
ELEC	4420	Analogue Integrated Circuits Design and Analysis	4
ELEC	4430	Integrated Power Electronics	3
ELEC	4510	Semiconductor Materials and Devices	3
ELEC	4520	Integrated Circuit Fabrication Technology	3

Signal Processing Area

ELEC	3100	Signal Processing and Communications	4
ELEC	4130	Digital Image Processing	3
ELEC	4140	Speech and Image Compression	3
ELEC	4160	Introduction to Digital Speech Recognition	4
ELEC	4810	Introduction to Biosensors and Bioinstrumentation	4
ELEC	4820	Medical Imaging	3

Software / Database Area

COMP	2021	Unix and Script Programming	3
COMP	3021	Java Programming	3
COMP	3031	Principles of Programming Languages	3
COMP	3111	Software Engineering	4
COMP	3111H	Honors Software Engineering	4
COMP	3311	Database Management Systems	3
COMP	4021	Internet Computing	3
COMP	4111	Software Engineering Practices	3
COMP	4311	Principles of Database Design	3

COMP	4321	Search Engines for Web and Enterprise Data	3
COMP	4331	Data Mining	3
COMP	4332	Big Data Mining and Management	3
COMP	4521	Mobile Application Development	3

Systems / Networking Area

COMP	4511	System and Kernel Programming in Linux	3
COMP	4611	Design and Analysis of Computer Architectures	3
COMP	4621	Computer Communication Networks I	3
COMP	4622	Computer Communication Networks II	3
COMP	4631	Computer and Communication Security	3
COMP	4632	Practicing Cybersecurity: Attacks and Counter-measures	3
COMP	4641	Social Information Network Analysis and Engineering	3
ELEC	4120	Computer Communication Networks	3
ELEC	4310	Embedded System Design	4

Student may opt to graduate with or without an option. Students who take an option MUST complete all requirements specified in addition to the major requirements.

Option(s)

Research Option

> Students in the Research Option should also take either COMP 4989 or CPEG 4919 as specified in the major requirements.

Elective Course(s)			**Minimum credit(s) required**
COMP/ELEC/ UROP		Research Electives [Students should take either (ELEC 5900 <u>AND</u> UROP 1100) or a 3-credit COMP 5000-level course to fulfill this requirement.]	2-3
COMP		Any COMP course at 5000-level	
ELEC	5900	Modern Engineering Research Methodologies	1
UROP	1100	Undergraduate Research Opportunities Series 1	1
COMP/ELEC		CPEG Electives (1 PG-level course as approved by advisor)	3

**Remarks on course(s):		
-	ELEC 4210:	The course was last offered in 2010-11 and was deleted subsequently.
-	ELEC 4640:	The course was last offered in 2011-12 and was deleted subsequently.