(For students admitted in 2012-13 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

				Credit(s)
Engineering Fundamental Course(s)				
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 1013 OR MATH 1023) AND (MATH 1014 OR MATH 1024)] OR [MATH 1020]		4-6
	MATH 1013	Calculus I	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 1152 OR PHYS 1312		2-3
	PHYS 1112	General Physics I with Calculus	3	
	PHYS 1152	Accelerated General Physics I with Calculus	2	
	PHYS 1312	Honors General Physics I	3	
PHYS		Note: PHYS 1114 OR PHYS 1154 OR PHYS 1314		2-3
	PHYS 1114	General Physics II	3	
	PHYS 1154	Accelerated General Physics II	2	
	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 Biomolecular Engineering	3	
CIVL 1100	Discovering Civil and Environmental Engineering	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	

Required Course(s)

COMP 2011	Introduction to Object-oriented Programming		4
COMP	Note: COMP 2012 OR COMP 2012H		4
COMP 2012	Object-Oriented Programming and Data Structures	4	
COMP 2012H	OOP and Data Structures (Honors Study Track)**	4**	
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	Embedded Systems Software	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 1971	Industrial Experience (Computer Engineering)		0
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 2930	Academic and Professional Development I		0
ELEC 3300	Introduction to Embedded Systems		4
ELEC 3930	Academic and Professional Development II		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)

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

AI / Theory

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

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 4180	Wireless Communication Engineering	3
ELEC 4520	Integrated Circuit Fabrication Technology	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

COMP 4521	Embedded Systems Software	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
ENGG 4950	Engineering Special Project	1-4

Graphic / Multimedia

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

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 4440	ASIC Design with Field Programmable Gate Arrays	3
ELEC 4510	Semiconductor Materials and Devices	3

Signal Processing

ELEC 3100	Signal Processing and Communications	4
ELEC 3110	Digital Signal Processing	4
ELEC 3210	Signals and Systems II	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

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 Laboratory	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	Embedded Systems Software	3

Systems / Networking

COMP 4511	Operating Systems Laboratory	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 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 ELEC 4919 as specified in the major requirements.

Required Course(s)

ELEC	5900	Modern Engineering Research Methodologies	1
UROP	1100	Undergraduate Research Opportunities Series 1	1

Elective Course(s)

COMP/ELEC		CPEG Electives (1 PG-level course as approved by advisor)	3

***Remarks on course(s):*

- COMP 2012H: The course title will be changed to "Honors Object-Oriented Programming and Data Structures" starting from Fall, 2014-15.
- COMP 2012H: The credit value will be changed to 5 starting from Fall, 2014-15.