BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

Computer engineering involves the design and application of computer hardware and computer software. Computer hardware consists of the physical components that implement a computer system: processor and memory chips, circuit boards, and peripheral devices. Computer software consists of computer programs that accomplish a specific task using sequences of simple, programmable steps. Computers have become an integral part of many large systems that require sophisticated control, including automobiles, medical instrumentation, telecommunication systems, and factory automation. Computers are a driving force behind many of today's exciting new technologies, including wireless communications, interactive multimedia, and high-speed computer networks. Computer engineers must have detailed knowledge of both hardware and software to design, build, and use complex information processing systems for a wide range of applications.

The objectives of the ECE undergraduate computer engineering program are to produce electrical engineering graduates who are prepared to:

- Enter their profession and make intellectual contributions to it.
- Embark on a lifelong career of personal and professional growth.
- Take advanced courses at the graduate level.

Required Courses

Electrical Engineering Requirements			(28)
ECE 100	Introduction to the Profession I		3
ECE 211	Circuit Analysis I		3
ECE 213	Circuit Analysis II		4
ECE 218	Digital Systems		4
ECE 242	Digital Computers and Computing		3
ECE 311	Engineering Electronics		4
ECE 441	Microcomputers		4
ECE 485	Computer Organization and Design		3
Computer Science Major Requirements			(16)
CS 115	Object-Oriented Programming I		2
CS 116	Object-Oriented Programming II		2
CS 330	Discrete Structures		3
CS 331	Data Structures and Algorithms		3
CS 351	Systems Programming		3
CS 450	Operating Systems		3
Junior Computer Engineering Elective			(3-4)
Select one of the following:			3-4
ECE 307	Electrodynamics	4	
ECE 308	Signals and Systems	3	
ECE 312	Electronic Circuits	4	
ECE 319	Fundamentals of Power Engineering	4	
Professional ECE Electives			(6-8)
Select 6-8 credit hours			6-8
Computer Systems/Software Elective			(3-4)
Select one of the following:			3-4
ECE 407	Introduction to Computer Networks with Laboratory	4	
ECE 408	Introduction to Computer Networks	3	
ECE 443	Introduction to Computer Security	4	
ECE 449	Object-Oriented Programming and Computer Simulation	3	
CS 425	Database Organization	3	
CS 487	Software Engineering I	3	
Hardware-Design Elective			(4)
ECE 429	Introduction to VLSI Design		4
or ECE 446	Advanced Logic Design		

Mathematics Requirements			(24)
MATH 151	Calculus I		5
MATH 152	Calculus II		5
MATH 251	Multivariate and Vector Calculus		4
MATH 252	Introduction to Differential Equations		4
MATH 374	Probability and Statistics for Electrical and Computer Engineers		3
MATH 333	Matrix Algebra and Complex Variables		3
or MATH 350	Introduction to Computational Mathematics		
Physics Requirements			(11)
PHYS 123	General Physics I: Mechanics		4
PHYS 221	General Physics II: Electricity and Magnetism		4
PHYS 224	General Physics III for Engineers		3
Chemistry Requirement			(3)
CHEM 122	Principles of Chemistry I Without Laboratory		3
Engineering Science Requirement			(3)
MMAE 200	Introduction to Mechanics		3
or MMAE 320	Thermodynamics		
Science Elective			(3)
Select one of the following:			3
BIOL 105	Introduction to Biology	3	
BIOL 114	Introduction to Human Biology	3	
CHEM 126	Principles of Chemistry II Without Laboratory	3	
MS 201	Materials Science	3	
Interprofessional Projects (IPRO)			(6)
See IIT Core Curriculum, section E			6
Humanities and Social Sciences Requirements			(21)
See IIT Core Curriculum, sections B and C			21
Total Credit Hours			131-135

Bachelor of Science in Computer Engineering Curriculum

			Year 1
Semester 1	**Credit Hours**	**Semester 2**	**Credit Hours**
ECE 100	3	MATH 152	5
MATH 151	5	PHYS 123	4
CHEM 122	3	CS 116	2
CS 115	2	Social Sciences Elective	3
Humanities 200-level Course	3	Science Elective[1]	3
	16		17

			Year 2
Semester 1	**Credit Hours**	**Semester 2**	**Credit Hours**
MATH 252	4	MATH 251	4
PHYS 221	4	PHYS 224	3
ECE 211	3	ECE 213	4
ECE 218	4	ECE 242	3
CS 331	3	CS 330	3
	18		17

			Year 3
Semester 1	**Credit Hours**	**Semester 2**	**Credit Hours**
ECE 311	4	CS 450	3
CS 351	3	MATH 374	3
MMAE 200 or 320	3	Junior CPE Elective[2]	3-4
MATH 333 or 350	3	IPRO Elective I	3
Humanities Elective (300+)	3	Social Sciences Elective (300+)	3
	16		15-16

			Year 4
Semester 1	**Credit Hours**	**Semester 2**	**Credit Hours**
ECE 441	4	IPRO Elective II	3
ECE 485[3]	3	Professional ECE Elective[5]	3-4
Computer Systems/Software Elective[4]	3-4	ECE 429 or 446	4
Professional ECE Elective[5]	3-4	Humanities Elective (300+)	3
Humanities or Social Sciences Elective	3	Social Sciences Elective (300+)	3
	16-18		16-17

Total Credit Hours: 131-135

1. Science elective must be BIOL 105, BIOL 114, CHEM 126, or MS 201.
2. Junior CPE elective: Choose one of ECE 307, ECE 308, ECE 312, or ECE 319.
3. CS 470 may be substituted with adviser approval.
4. Computer systems/software elective: Choose one of ECE 407, ECE 408, ECE 443, ECE 449, CS 425, or CS 487.
5. Professional electives may be chosen from the 400-level ECE courses identified with a (P) in the course descriptions, and any 400-level computer science courses except CS 485. A maximum of 3 credit hours of Undergraduate Research (ECE 491) or Special Problems (ECE 497) may be used as a professional elective with adviser approval.

This program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).