

SCHOOL OF ENGINEERING			
Degree: BACHELOR OF SCIENCE Credits: 128		CURRICULUM Since: August 2018 (201901)	
Program: COMPUTER ENGINEERING			
Description: The Computer Engineering Program provides students with a rigorous academic preparation on the principles of hardware and software design and their interfacing for building complex computer applications.			
Course Code	Course Title	Credits	Prerequisites
General Education Courses			
SPAN 152	Fundamentals of Reading and Writing	3	Placement Exam
SPAN 250	Writing Techniques	3	SPAN 152
ENGL 152	Fundamentals of Reading and Writing	3	Placement Exam
ENGL 153	Advanced Communicative English	3	ENGL 152
ENGL 231	Research and Writing	3	ENGL 153
MATH 152	Pre-Calculus II	4	Placement Exam
PHSC 215	Physics for Engineering I (includes Lab)	4	MATH 221
CHEM 203	General Chemistry I	4	MATH 151
HUMA 111	Universal Culture and Civilization I	3	
SOSC 111	Individual, Community, Government and Social Responsibility I	3	
SOSC 112	Individual, Community, Government and Social Responsibility II	3	SOSC 111
FSEN 105	Introduction to Engineering	3	
MATH 221	Calculus I	4	MATH 152
MATH 222	Calculus II	4	MATH 221
MATH 395	Differential Equations	3	MATH 222
	Free Elective ¹ (see note for Entrepreneurship & Innovation minor)	3	Depends on Elective
Core Courses			
COMP 311	Discrete Mathematics for Engineers	3	ENGI 223
ENGI 122	Introduction to Computer Programming	3	MATH 152
ENGI 223	Intermediate Programming	3	ENGI 122 / MATH 221
ENGI 398	Engineering Mathematics	3	MATH 222 / ENGI 122
Concentration Courses			
COMP 315	Analysis & Design of Data Structures and Algorithms	3	ENGI 223
COMP 315L	Analysis & Design of Data Structures and Algorithms Laboratory	1	ENGI 223
COMP 411	Numerical Methods with Programming	3	COMP 311
CPEN 358	Object Oriented Programming	3	ENGI 223
CPEN 358L	Object Oriented Programming Laboratory	1	ENGI 223
CPEN 410	Mobile Web and Internet Programming	3	CPEN 358
CPEN 425	Software Engineering	3	CPEN 455
CPEN 444	Computer Architecture and Organization	3	ELEN 312

Course Code	Course Title	Credits	Prerequisites
Concentration Courses (continued)			
CPEN 452	Operating Systems	3	ENGI 223
CPEN 455	Introduction to Databases	3	COMP 315 / CPEN 358
CPEN 481	Telecommunication Networks and Security	3	ELEN 312
CPEN 491	Senior Design Project I	3	CPEN 425 / ELEN 330
CPEN 492	Senior Design Project II	3	CPEN 452 & 491 / ELEN 442 / Last semester status
ELEN 301	Electrical Networks I	3	MATH 221
ELEN 302	Electrical Networks I Laboratory	1	MATH 221
ELEN 312	Digital Logic Design I	3	ELEN 301 / ENGI 122
ELEN 313	Digital Logic Design I Laboratory	1	ELEN 302 / ENGI 122
ELEN 330	Electronics I	3	ELEN 301 & 302
ELEN 332	Electronics I Laboratory	1	ELEN 302
ELEN 360	Random Signals and Systems	3	MATH 222 / ELEN 301
ELEN 442	Microprocessors I	3	ELEN 312
ELEN 447	Microprocessors Laboratory	1	ELEN 313
Selected Electives (Select a minimum of 9 credits from a single or combination of lists given below.)			
Departmental Electives (Courses at the 500-level or above count toward the MSCpE or MSEE degrees.)			
	Any ELEN or ENGI course in the B.S. Electrical Engineering curriculum	3	As required by EE Program
CPEN 456	Database Management Systems	3	CPEN 455
CPEN 457	Programming Languages	3	COMP 315
CPEN 458	Introduction to Compilers	3	CPEN 452
CPEN 459	Artificial Intelligence	3	ENGI 223
CPEN 478	Distributed Systems	3	CPEN 444 / CPEN 452
CPEN 488	Advanced Computer Architectures	3	CPEN 444
CPEN 497	Special Topics	3	ECE Head's permission
ECEN 400	Survey of Electrical and Computer Engineering Topics	3	Next to last semester status
ENGY 103	Electrical Energy: Basic Concepts	1	
ENGY 203	Fundamentals of Electrical Energy Systems	1	[ENGY 103] Co-Req.
ENGY 303	Energy and Electrical Power Systems	1	[ENGY 203] Co-Req.
CPEN 502	Advanced Analysis & Design of Algorithms	3	COMP 315 or instructor consent
CPEN 503	Computer and Network Security	3	CPEN 481 or instructor consent
CPEN 504	Advanced Computer Architectures	3	CPEN 444 or instructor consent
CPEN 505	Database Management Systems	3	CPEN 455 or instructor consent
CPEN 511	Distributed Systems	3	CPEN 444 & 452, or instructor consent
CPEN 520	Numerical Optimization	3	COMP 411 or instructor consent
CPEN 550	Operating Systems Programming	3	CPEN 452 or instructor consent
CPEN 552	Computer Graphics	3	ENGI 223 or instructor consent
CPEN 640	Embedded Systems	3	ELEN 442 or instructor consent
ELEN 502	Advanced Linear Systems	3	ELEN 415 or instructor consent
ELEN 503	Solid State Electronics	3	ELEN 431 or instructor consent
ELEN 505	Probability and Random Processes	3	ELEN 360 or instructor consent

Course Code	Course Title	Credits	Prerequisites
Departmental Electives (continued)			
ELEN 510	Advanced Power System Analysis	3	ELEN 480 or instructor consent
ELEN 511	Power System Dynamics and Control	3	ELEN 480 or instructor consent
ELEN 520	Digital Control Systems	3	ELEN 415 or instructor consent
ELEN 550	Digital Filters	3	ELEN 415 or instructor consent
Non-Departmental and Non-Engineering Electives			
ENGI 210	Engineering Economy	3	[MATH 221] Co-Req.
ENTR 360	Entrepreneurship	3	Dean's permission
ENTR 401	Identification and Evaluation of Entrepreneurial Opportunities	3	Dean's permission
IMEN 341	Accounting and Finance for Engineers	3	[MATH 221] Co-Req.
IMEN 406	Operations Research	3	MATH 350 or IME Head's permission
TCOM 503	Introduction to TCP/IP	3	
TCOM 513	IT Project Management	3	
TCOM 521	Introduction to Networking	3	
Cybersecurity Option (Select a minimum of 9 credits from this list if pursuing this option; select all courses to earn a Certificate in Cybersecurity.)			
CYBR 501	Network Security I	3	Fourth Year Status
CYBR 502	Computer Security I	3	Fourth Year Status
CYBR 521*	Network Security II	3	CYBR 501
CYBR 522*	Computer Security II	3	CYBR 502
CYBR 600	Cyber Forensics	3	CYBR 502
* If pursuing the Certificate in Cybersecurity, CYBR 521 and CYBR 522 can only be taken after obtaining a B.S. degree.			
Quality Assurance and Experimental Design Option (Select a minimum of 9 credits from this list if pursuing this option; select all courses to earn a minor.)			
IMEN 205*	Principles of Engineering Management	3	MATH 152
IMEN 395	Inferential Statistics for Engineers	3	IMEN 390 or ELEN 360
IMEN 402	Work Measurement	3	IMEN 390 or ELEN 360
IMEN 405	Statistical Quality Control	3	IMEN 390 / [IMEN 395] Co-Req.
IMEN 416	Design of Industrial Experiments	3	IMEN 395
* Accepted only if upgrading to a minor.			
Engineering Management Option (Select a minimum of 9 credits from this list if pursuing this option. These courses count toward the M.S. degree in Engineering Management.)			
IMEN 510	Engineering Management	3	Fourth Year Status
IMEN 551*	Advanced Engineering Project Management*	3	Fourth Year Status
IMEN 610	Statistics for Decision Modeling	3	Fourth Year Status
IMEN 620	Advanced Enterprise Continuous Improvement	3	Fourth Year Status
IMEN 630	Supply Chain Management for Engineers	3	Fourth Year Status
IMEN 635	Logistics Methods and Strategies	3	Fourth Year Status
IMEN 640	Design and Operation of Logistics Networks	3	IMEN 635
IMEN 645	Analytics for Decision Making	3	IMEN 610
* TCOM 513 Information Technology Project Management may be used as a substitute for IMEN 551.			
Entrepreneurship and Innovation Minor (Including CPEN 494, select from the list below until a minimum of 12 credits is completed.)¹			
INNO 300	Sustainable Innovation (or ENTR 360)	3	Third Year Status

Course Code	Course Title	Credits	Prerequisites
INNO 303	Product Development, Prototyping, and Idea Validation (or ENTR 401)	3	INNO 300
INNO 400	Startup Internship	3	School's permission
MANA 204	Mercantile Law and Corporate Ethics (or IMEN 341)	3	

¹Students pursuing the minor in Entrepreneurship and Innovation must take at least one course of the minor sequence outside the School of Engineering as a free elective course.

Minimum grade required: All courses in the program must be passed with a minimum grade of C.

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SCHOOL OF ENGINEERING			
Degree: BACHELOR OF SCIENCE		PLAN OF STUDY	
Credits: 128		Since: August 2018 (201901)	
Program: COMPUTER ENGINEERING			
Course Code	Course Title	Credits	Prerequisites
FIRST YEAR – FIRST SEMESTER			
FSEN 105	Introduction to Engineering	3	
MATH 152	Pre-Calculus II	4	Placement Exam
SOSC 111	Individual, Community, Government and Social Responsibility I	3	
ENGL 152	Fundamentals of Reading and Writing	3	Placement Exam
SPAN 152	Fundamentals of Reading and Writing	3	Placement Exam
		16	
FIRST YEAR – SECOND SEMESTER			
ENGI 122	Introduction to Computer Programming	3	MATH 152
MATH 221	Calculus I	4	MATH 152
CHEM 203	General Chemistry I	4	MATH 151
ENGL 153	Advanced Communicative English	3	ENGL 152
SPAN 250	Writing Techniques	3	SPAN 152
		17	
SECOND YEAR – FIRST SEMESTER			
ENGI 223	Intermediate Programming	3	ENGI 122 / MATH 221
MATH 222	Calculus II	4	MATH 221
PHSC 215	Physics for Engineering I (includes Lab)	4	MATH 221
ENGL 231	Research and Writing	3	ENGL 153
HUMA 111	Universal Culture and Civilization I	3	
		17	
SECOND YEAR - SECOND SEMESTER			
COMP 315	Analysis & Design of Data Structures and Algorithms	3	ENGI 223
COMP 315L	Analysis & Design of Data Structures and Algorithms Laboratory	1	ENGI 223
CPEN 358	Object Oriented Programming	3	ENGI 223
CPEN 358L	Object Oriented Programming Laboratory	1	ENGI 223
ELEN 301	Electrical Networks I	3	MATH 221
ELEN 302	Electrical Networks I Laboratory	1	MATH 221
MATH 395	Differential Equations	3	MATH 222
		15	
THIRD YEAR – FIRST SEMESTER			
COMP 311	Discrete Mathematics for Engineers	3	ENGI 223
CPEN 410	Mobile Web and Internet Programming	3	CPEN 358
CPEN 455	Introduction to Databases	3	COMP 315 / CPEN 358
ELEN 330	Electronics I	3	ELEN 301 & ELEN 302
ELEN 332	Electronics I Laboratory	1	ELEN 302
ELEN 360	Random Signals and Systems	3	MATH 222 / ELEN 301
		16	
THIRD YEAR – SECOND SEMESTER			
COMP 411	Numerical Methods with Programming	3	COMP 311
CPEN 425	Software Engineering	3	CPEN 455
ELEN 312	Digital Logic Design I	3	ELEN 301 / ENGI 122
ELEN 313	Digital Logic Design I Laboratory	1	ELEN 302 / ENGI 122
ENGI 398	Engineering Mathematics	3	MATH 222 / ENGI 122
	Selected Elective I	3	Depends on Elective
		16	

Course Code	Course Title	Credits	Prerequisites
FOURTH YEAR – FIRST SEMESTER			
CPEN 452	Operating Systems	3	ENGI 223
CPEN 481	Telecommunication Networks and Security	3	ELEN 312
CPEN 491	Senior Design Project I	3	CPEN 425 / ELEN 330
ELEN 442	Microprocessors I	3	ELEN 312
ELEN 447	Microprocessors Laboratory	1	ELEN 313
	Selected Elective II	3	Depends on Elective
		16	
FOURTH YEAR - SECOND SEMESTER			
CPEN 444	Computer Architecture and Organization	3	ELEN 312
CPEN 492	Senior Design Project II	3	CPEN 452 & 491 / ELEN 442 / Last semester status
SOSC 112	Individual, Community, Government and Social Responsibility II	3	SOSC 111
	Selected Elective III	3	Depends on Elective
	Free Elective	3	Depends on Elective
		15	

Minimum grade required: All courses in the program must be passed with a minimum grade of C.

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