H-Form ECE 260

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communication Engineering Program		
Course Name	Digital Logic Circuit Design		
Course Code	ECE 260		
Year / Level	3/5		
Credit Hours	4		
Contact Hours	Lecture: 2	Lab/Tutorial: 2	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	MATH 103		
Co-Requests	-		
Course Description	Number systems & codes. Logic gates. Boolean algebra. Karnaugh maps. Analysis and synthesis of combinational systems. Decoders, multiplexers, adders and subtractors, PLA's. Types of flip-flops. Memory concept. Counters. Registers. Sequential circuit design. System level digital design. HDL (Verilog) use in the design and synthesis of digital systems. Field- programmable gate array (FPGAs).		

H-Form ECE 202

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communication + Electronics Engineering		
Course Name	Engineering Mathematics		
Course Code	ECE 202		
Year / Level	3/5		
Credit Hours	3		
Contact Hours	Lecture: 3	Lab/Tutorial: 0	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	MATH 221		
Co-Requests	-		
Course Description	Special functions. Bessel's functions and Legendre polynomials. Vector analysis including vector fields, divergence, curl, line and surface integrals, Green's, Gauss' and Stokes' theorems. Sturm-Liouville theory. Complex Numbers, Functions of a complex variable, differential complex calculus. Complex integration, Cauchy's theorem. Complex series, Taylor and Laurent series. Residue theorem. Introduction to partial differential equations and boundary value problems in rectangular, cylindrical and spherical coordinates.		

H-Form ECE 220

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communication + Electronics Engineering		
Course Name	Electromagnetics		
Course Code	ECE 220		
Year / Level	3/6		
Credit Hours	4		
Contact Hours	Lecture: 3	Lab/Tutorial: 2	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	ECE 210 / ECE 202		
Co-Requests	-		
Course Description	Review of vector algebra and vector Calculus. Electrostatics: Coulomb's law, Gauss's law, electric potential, Poisson's and Laplace's equation, image method, resistance and capacitance. Magnetostatics: Biot-Savart law, Ampere's law, Magnetic forces, magnetic boundary conditions and inductance.		

H-Form ECE 204

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communication Engineering Program		
Course Name	Probability and Random Processes		
Course Code	ECE 204		
Year / Level	3/6		
Credit Hours	3		
Contact Hours	Lecture: 3	Lab/Tutorial: 0	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	MATH 265-2		
Co-Requests	-		
Course Description	Review of basics of probability, moment generating and characteristic function, bivariate RVs, joint and marginal distributions, multiple RVs, transformations of multiple RVs, general discrete- and continuous random processes, stationarity and ergodicity, Gaussian and Poisson random processes, auto- and cross- correlation functions, power spectral densities, and linear systems with random inputs.		

H-Form ECE 371

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communication Engineering Program		
Course Name	Communications Systems		
Course Code	ECE 371		
Year / Level	4/ 7		
Credit Hours	4		
Contact Hours	Lecture: 3	Lab/Tutorial: 2	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	ECE 270		
Co-Requests	-		
Course Description	Review of Fourier series, Fourier transform and Amplitude modulation. Phase and frequency modulation. Sampling and quantization, Pulse code modulation, Line coding and spectra, Signaling over band-limited channels and inter-symbol interference, Digital modulation schemes. Introduction to current and emerging communication systems.		

H-Form ECE 373

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Wireless Communications		
Course Code	ECE 373		
Year / Level	4/8		
Credit Hours	3		
Contact Hours	Lecture: 3	Lab/Tutorial: 0	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	ECE 371, ECE304		
Co-Requests	-		
Course Description	Review of basics of communications systems. Introduction to wireless communications, Channel modeling and propagation. The cellular concept. Modulation schemes for wireless systems. Fading mitigation techniques. Spread spectrum and OFDM. Multiple access schemes, Wireless standards.		

H-Form ECE 380

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Communication Networks		
Course Code	ECE 380		
Year / Level	4/8		
Credit Hours	4		
Contact Hours	Lecture: 3	Lab/Tutorial: 2	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	ECE 371, ECE304		
Co-Requests	-		
Course Description	Review of basic digital communications and probability theory. Network architectures. OSI Model and TCP/IP model. Physical layer protocols and digital transmission fundamentals. Data link layer protocols. Network layer protocols. Medium access control protocols.Packet switching and circuit switching. Routing techniques in packet switching networks. Security protocols. Emerging high-speed networks.		

H-Form ECE 374

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Digital Signal Processing		
Course Code	ECE 374		
Year / Level	3/7		
Credit Hours	3		
Contact Hours	Lecture: 3	Lab/Tutorial: 2	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	ECE 270		
Co-Requests	-		
Course Description	Review of signals and systems. Discrete-time systems classification. Linear shift-invariant system response, difference equations, convolution, and frequency response. Discrete Fourier transform. z-transform and its application to system analysis. Realization forms. Sampling and aliasing. Finite-impulse response (FIR). Design windowing technique. Introduction to infinite impulse response (IIR). Filter design techniques.		

H-Form ECE 372

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Digital Communications Systems		
Course Code	ECE 372		
Year / Level	4/8		
Credit Hours	3		
Contact Hours	Lecture: 3	Lab/Tutorial: 0	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	ECE 371, ECE304		
Co-Requests	-		
Course Description	Review of basic digital modulation and random processes. Baseband transmission of digital signals. Matched filter. Band-pass transmission of digital signals. Optimum Receivers and BER Analysis over AWGN channels. Introduction to information theory. Channel coding: Block codes and convolutional codes.		

H-Form ECE 475

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Advanced Communications Lab		
Course Code	ECE 475		
Year / Level	5/9		
Credit Hours	2		
Contact Hours	Lecture:1	Lab/Tutorial: 2	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☒Required ☐ Elective		
Pre-requisites Course	ECE 372, ECE 373		
Co-Requests	-		
Course Description	This lab is mainly intended to strengthen the students' experience with digital and wireless communication systems. It provides practical hands-on experience with communication system building blocks and enables students to study the effects of noise and fading on the various digital communication schemes and wireless standards. The course instructor may design/select the proper set of experiments that satisfy the course objectives and outcomes.		

H-Form ECE 421

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Antenna Theory and Design		
Course Code	ECE 421		
Year / Level	4/8		
Credit Hours	4		
Contact Hours	Lecture: 3	Lab/Tutorial: 2	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☐Required ☒ Elective		
Pre-requisites Course	ECE 220		
Co-Requests	-		
Course Description	Review of Maxwell's equations and antenna basics. Radiation patterns and Friis equation. Radiation integrals. Linear wire antennas. Antenna arrays. Synthesis of far field patterns by array factors. Broadband antennas and matching techniques. Microstrip antennas. Introduction to antennas in wireless systems. Methods of antenna measurements. Antenna design using commercial software.		

H-Form ECE 476

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Optical Communications		
Course Code	ECE 476		
Year / Level	4/8		
Credit Hours	4		
Contact Hours	Lecture:3	Lab/Tutorial: 2	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☐Required ☒ Elective		
Pre-requisites Course	ECE 371, ECE 220		
Co-Requests	-		
Course Description	The course covers underlying and fundamental light characteristics concepts and demonstrates components, types, and communication of fiber optics which support modern wireless communication systems and networks. Some of the basic knowledge of some networks (SONET/SDH) has been described in this course. The focus for optical networking fundamentals is on the physical layer of the network protocol stack. The optical line terminal and optical line amplifier of WDM networks is studied in this course.		

H-Form ECE 477

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Introduction to Information Theory and Coding		
Course Code	ECE 477		
Year / Level	5/9		
Credit Hours	3		
Contact Hours	Lecture:3	Lab/Tutorial: 0	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☐Required ☒ Elective		
Pre-requisites Course	ECE 304, ECE 371		
Co-Requests	-		
Course Description	Review of probability theory. Entropy, Mutual information. Data compression. Huffman coding. Universal source coding. Channel capacity. Block codes and hard-decision decoding. Convolutional codes and soft-decision decoding.		

H-Form ECE 478

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Satellite Communications Systems		
Course Code	ECE 478		
Year / Level	5/9		
Credit Hours	3		
Contact Hours	Lecture:3	Lab/Tutorial: 0	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☐Required ☒ Elective		
Pre-requisites Course	ECE 371, ECE 220		
Co-Requests	-		
Course Description	The course is intending to cover the fundamental concepts of satellite communications and orbital concepts. The student is expected to understand the basics of satellite communications, satellite system elements, key issues of satellite, handle error control for digital satellites, and grasp the propagation effects on satellite-earth links.		

H-Form ECE 481

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Wireless Sensor Networks		
Course Code	ECE 481		
Year / Level	5/9		
Credit Hours	3		
Contact Hours	Lecture:3	Lab/Tutorial: 0	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☐Required ☒ Elective		
Pre-requisites Course	ECE 304, ECE 371		
Co-Requests	-		
Course Description	This course provides an overview of basic networking concepts, including network architecture, design, the layering concept in networking and how data transferring between devices.		

H-Form ECE 496

A Brief Course Description			
College	Engineering		
Department/ Program	Electrical Engineering – Communications Engineering Program		
Course Name	Special Topics in Communications		
Course Code	ECE 496		
Year / Level	5/9		
Credit Hours	3		
Contact Hours	Lecture:3	Lab/Tutorial: 0	Training: 0
Language	English		
Track	☐University ☐College ☐Department ☒Program		
	☐Required ☒ Elective		
Pre-requisites Course	Pass 136 CR		
Co-Requests	-		
Course Description	In this course the students will study a special topic in the various sub-areas of Communications Engineering reflecting current theory and practice. In addition, the special topics in Communications Engineering could be selected to suit research interests of the faculty. The specific topic will be shown in the course title when it is offered and scheduled. The special topics course may be repeated as topics change.		