

**AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING**

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (Regulation 2017)**

**COURSE OUTCOMES**

<b>R2017</b>	<b>HS8151 COMMUNICATIVE ENGLISH</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

**At the end of the course, learners will be able to:**

<b>CO 1</b>	Read articles of a general kind in magazines and newspapers.
<b>CO 2</b>	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English
<b>CO 3</b>	Comprehend conversations and short talks delivered in English
<b>CO 4</b>	Write short essays of a general kind and personal letters and emails in English.

<b>R2017</b>	<b>MA8151 ENGINEERING MATHEMATICS – I</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

**After completing this course, students should demonstrate competency in the following skills:**

<b>CO 1</b>	Use both the limit definition and rules of differentiation to differentiate functions.
<b>CO 2</b>	Apply differentiation to solve maxima and minima problems.
<b>CO 3</b>	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
<b>CO 4</b>	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
<b>CO 5</b>	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
<b>CO 6</b>	Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
<b>CO 7</b>	Apply various techniques in solving differential equations.

<b>R2017</b>	<b>PH8151 ENGINEERING PHYSICS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Upon completion of this course,**

<b>CO 1</b>	The students will gain knowledge on the basics of properties of matter and its applications
<b>CO 2</b>	The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,
<b>CO 3</b>	The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,
<b>CO 4</b>	The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes
<b>CO 5</b>	The students will understand the basics of crystals, their structures and different crystal growth techniques.

<b>R2017</b>	<b>CY8151 ENGINEERING CHEMISTRY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

<b>CO 1</b>	The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
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R2017	<b>GE8151 PROBLEM SOLVING AND PYTHON PROGRAMMING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Upon completion of the course, students will be able to</b>					
<b>CO 1</b>	Develop algorithmic solutions to simple computational problems				
<b>CO 2</b>	Read, write, execute by hand simple Python programs.				
<b>CO 3</b>	Read, write, execute by hand simple Python programs.				
<b>CO 4</b>	Structure simple Python programs for solving problems.				
<b>CO 5</b>	Decompose a Python program into functions				
<b>CO 6</b>	Represent compound data using Python lists, tuples, dictionaries				
<b>CO 7</b>	Read and write data from/to files in Python Programs.				

R2017	<b>GE8152 ENGINEERING GRAPHICS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>0</b>	<b>4</b>	<b>4</b>
<b>On successful completion of this course, the student will be able to:</b>					
<b>CO 1</b>	Familiarize with the fundamentals and standards of Engineering graphics				
<b>CO 2</b>	Perform freehand sketching of basic geometrical constructions and multiple views of objects.				
<b>CO 3</b>	Project orthographic projections of lines and plane surfaces.				
<b>CO 4</b>	Draw projections and solids and development of surfaces.				
<b>CO 5</b>	Visualize and to project isometric and perspective sections of simple solids.				

R2017	<b>GE8161 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>Upon completion of the course, students will be able to:</b>					
<b>CO 1</b>	Write, test, and debug simple Python programs.				
<b>CO 2</b>	Implement Python programs with conditionals and loops.				
<b>CO 3</b>	Develop Python programs step-wise by defining functions and calling them.				
<b>CO 4</b>	Use Python lists, tuples, dictionaries for representing compound data.				
<b>CO 5</b>	Read and write data from/to files in Python.				

R2017	<b>BS8161 PHYSICS AND CHEMISTRY LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>Upon completion of the course, the students will be able to:</b>					
<b>CO 1</b>	Apply principles of elasticity, optics and thermal properties for engineering applications.				
<b>CO 2</b>	The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.				

R2017	HS8251 TECHNICAL ENGLISH	L	T	P	C
		4	0	0	4

**At the end of the course learners will be able to:**

CO 1	Read technical texts and write area- specific texts effortlessly.
CO 2	Listen and comprehend lectures and talks in their area of specialisation successfully.
CO 3	Speak appropriately and effectively in varied formal and informal contexts.
CO 4	Write reports and winning job applications.

R2017	MA8251 ENGINEERING MATHEMATICS – II	L	T	P	C
		4	0	0	4

**After successfully completing the course, the student will have a good understanding of the following topics and their applications:**

CO 1	Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
CO 2	Gradient, divergence and curl of a vector point function and related identities.
CO 3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
CO 4	Analytic functions, conformal mapping and complex integration.
CO 5	Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.

R2017	PH8253 PHYSICS FOR ELECTRONICS ENGINEERING	L	T	P	C
		3	0	0	3

**At the end of the course, the students will able to:**

CO 1	Gain knowledge on classical and quantum electron theories, and energy band structures,
CO 2	Acquire knowledge on basics of semiconductor physics and its applications in various devices,
CO 3	Get knowledge on magnetic and dielectric properties of materials,
CO 4	Have the necessary understanding on the functioning of optical materials for optoelectronics,
CO 5	Understand the basics of quantum structures and their applications in spintronics and carbon electronics.

R2017	BE8254 BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING	L	T	P	C
		3	0	0	3

**At the end of the course the students will be able to:**

CO 1	Understand the concept of three phase power circuits and measurement.
CO 2	Comprehend the concepts in electrical generators, motors and transformers
CO 3	Choose appropriate measuring instruments for given application

R2017	EC8251 CIRCUIT ANALYSIS	L	T	P	C
		4	0	0	4

**At the end of the course, the student should be able to:**

CO 1	Develop the capacity to analyze electrical circuits, apply the circuit theorems in real time
CO 2	Design and understand and evaluate the AC and DC circuits.

R2017	EC8252 ELECTRONIC DEVICES	L	T	P	C
		3	0	0	3
<b>At the end of the course the students will be able to:</b>					
CO 1	Explain the V-I characteristic of diode, UJT and SCR				
CO 2	Describe the equivalence circuits of transistors				
CO 3	Operate the basic electronic devices such as PN junction diode, Bipolar and Field effect Transistors, Power control devices, LED, LCD and other Opto-electronic devices				

R2017	EC8261 CIRCUITS AND DEVICES LABORATORY	L	T	P	C
		0	0	4	2
<b>At the end of the course, the student should be able to:</b>					
CO 1	Analyze the characteristics of basic electronic devices				
CO 2	Design RL and RC circuits				
CO 3	Verify Thevinin & Norton theorem KVL & KCL, and Super Position Theorems				

R2017	GE8261 ENGINEERING PRACTICES LABORATORY	L	T	P	C
		0	0	4	2
<b>On successful completion of this course, the student will be able to:</b>					
CO 1	Fabricate carpentry components and pipe connections including plumbing works.				
CO 2	Use welding equipments to join the structures.				
CO 3	Carry out the basic machining operations				
CO 4	Make the models using sheet metal works				
CO 5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings				
CO 6	Carry out basic home electrical works and appliances				
CO 7	Measure the electrical quantities				
CO 8	Elaborate on the components, gates, soldering practices.				

R2017	MA8352 LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATIONS	L	T	P	C
		4	0	0	4
<b>Upon successful completion of the course, students should be able to:</b>					
CO 1	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.				
CO 2	Demonstrate accurate and efficient use of advanced algebraic techniques.				
CO 3	Demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text				
CO 4	Able to solve various types of partial differential equations.				
CO 5	Able to solve engineering problems using Fourier series.				

R2017	EC8393 FUNDAMENTALS OF DATA STRUCTURES IN C	L	T	P	C
		3	0	0	3

**Upon completion of the course, students will be able to:**

CO 1	Implement linear and non-linear data structure operations using C
CO 2	Suggest appropriate linear / non-linear data structure for any given data set.
CO 3	Apply hashing concepts for a given problem
CO 4	Modify or suggest new data structure for an application
CO 5	Appropriately choose the sorting algorithm for an application

R2017	EC8351 ELECTRONIC CIRCUITS I	L	T	P	C
		3	0	0	3

**After studying this course, the student should be able to:**

CO 1	Acquire knowledge of <ul style="list-style-type: none"> <li>• Working principles, characteristics and applications of BJT and FET</li> <li>• Frequency response characteristics of BJT and FET amplifiers</li> </ul>
CO 2	Analyze the performance of small signal BJT and FET amplifiers - single stage and multi stage amplifiers
CO 3	Apply the knowledge gained in the design of Electronic circuits

R2017	EC8352 SIGNALS AND SYSTEMS	L	T	P	C
		4	0	0	4

**At the end of the course, the student should be able to:**

CO 1	To be able to determine if a given system is linear/causal/stable
CO 2	Capable of determining the frequency components present in a deterministic signal
CO 3	Capable of characterizing LTI systems in the time domain and frequency domain
CO 4	To be able to compute the output of an LTI system in the time and frequency domains

R2017	EC8392 DIGITAL ELECTRONICS	L	T	P	C
		3	0	0	3

**At the end of the course:**

CO 1	Use digital electronics in the present contemporary world
CO 2	Design various combinational digital circuits using logic gates
CO 3	Do the analysis and design procedures for synchronous and asynchronous sequential circuits
CO 4	Use the semiconductor memories and related technology
CO 5	Use electronic circuits involved in the design of logic gates

R2017	EC8391 CONTROL SYSTEMS ENGINEERING	L	T	P	C
		3	0	0	3

**Upon completion of the course, the student should be able to:**

CO 1	Identify the various control system components and their representations.
CO 2	Analyze the various time domain parameters.
CO 3	Analysis the various frequency response plots and its system.
CO 4	Apply the concepts of various system stability criterions.
CO 5	Design various transfer functions of digital control system using state variable models.

R2017	EC8381 FUNDAMENTALS OF DATA STRUCTURES IN C LABORATORY	L	T	P	C
		0	0	4	2

**Upon completion of the course, the students will be able to:**

CO 1	Write basic and advanced programs in C
CO 2	Implement functions and recursive functions in C
CO 3	Implement data structures using C
CO 4	Choose appropriate sorting algorithm for an application and implement it in a modularized way

R2017	EC8361 ANALOG AND DIGITAL CIRCUITS LABORATORY	L	T	P	C
		0	0	4	2

**On completion of this laboratory course, the student should be able to:**

CO 1	Design and Test rectifiers, filters and regulated power supplies.
CO 2	Design and Test BJT/JFET amplifiers.
CO 3	Differentiate cascode and cascade amplifiers
CO 4	Analyze the limitation in bandwidth of single stage and multi stage amplifier
CO 5	Measure CMRR in differential amplifier
CO 6	Simulate and analyze amplifier circuits using PSpice.
CO 7	Design and Test the digital logic circuits.

R2017	HS8381 INTERPERSONAL SKILLS/LISTENING&SPEAKING	L	T	P	C
		0	0	2	1

**At the end of the course Learners will be able to:**

CO 1	Listen and respond appropriately.
CO 2	Participate in group discussions
CO 3	Make effective presentations
CO 4	Participate confidently and appropriately in conversations both formal and informal

R2017	MA8451 PROBABILITY AND RANDOM PROCESSES	L	T	P	C
		4	0	0	4

**Upon successful completion of the course, students should be able to:**

CO 1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
CO 2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications
CO 3	Apply the concept of random processes in engineering disciplines.
CO 4	Understand and apply the concept of correlation and spectral densities.
CO 5	The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems.

R2017	EC8452 ELECTRONIC CIRCUITS II	L	T	P	C
		3	0	0	3

**Upon completion of the course, the student should be able to:**

CO 1	Analyze different types of amplifier, oscillator and multivibrator circuits
CO 2	Design BJT amplifier and oscillator circuits
CO 3	Analyze transistorized amplifier and oscillator circuits
CO 4	Design and analyze feedback amplifiers
CO 5	Design LC and RC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, power amplifier and DC converters.

R2017	EC8491 COMMUNICATION THEORY	L	T	P	C
		3	0	0	3

**At the end of the course, the student should be able to:**

CO 1	Design AM communication systems
CO 2	Design Angle modulated communication systems
CO 3	Apply the concepts of Random Process to the design of Communication systems
CO 4	Analyze the noise performance of AM and FM systems
CO 5	Gain knowledge in sampling and quantization

R2017	EC8451 ELECTROMAGNETIC FIELDS	L	T	P	C
		4	0	0	4

**By the end of this course, the student should be able to:**

CO 1	Display an understanding of fundamental electromagnetic laws and concepts
CO 2	Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning
CO 3	Explain electromagnetic wave propagation in lossy and in lossless media
CO 4	Solve simple problems requiring estimation of electric and magnetic field quantities based on,these concepts and laws

R2017	EC8453 LINEAR INTEGRATED CIRCUITS	L	T	P	C
		3	0	0	3
<b>Upon completion of the course, the student should be able to:</b>					
CO 1	Design linear and non linear applications of OP – AMPS				
CO 2	Design applications using analog multiplier and PLL				
CO 3	Design ADC and DAC using OP – AMPS				
CO 4	Generate waveforms using OP – AMP Circuits				
CO 5	Analyze special function Ics				

R2017	GE8291 ENVIRONMENTAL SCIENCE AND ENGINEERING	L	T	P	C
		3	0	0	3
CO 1	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.				
CO 2	Public awareness of environmental is at infant stage.				
CO 3	Ignorance and incomplete knowledge has lead to misconceptions				
CO 4	Development and improvement in std. of living has lead to serious environmental disasters				

R2017	EC8461 CIRCUITS DESIGN AND SIMULATION LABORATORY	L	T	P	C
		0	0	4	2
<b>On completion of this laboratory course, the student should be able to:</b>					
CO 1	Analyze various types of feedback amplifiers				
CO 2	Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators				
CO 3	Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and multivibrators using SPICE Tool.				

R2017	EC8462 LINEAR INTEGRATED CIRCUITS LABORATORY	L	T	P	C
		0	0	4	2
<b>On completion of this laboratory course, the student should be able to:</b>					
CO 1	Design amplifiers, oscillators, D-A converters using operational amplifiers.				
CO 2	Design filters using op-amp and performs an experiment on frequency response.				
CO 3	Analyze the working of PLL and describe its application as a frequency multiplier.				
CO 4	Design DC power supply using ICs.				
CO 5	Analyze the performance of filters, multivibrators, A/D converter and analog multiplier using SPICE.				



R2017	EC8501 DIGITAL COMMUNICATION	L	T	P	C
		3	0	0	3

**Upon completion of the course, the student should be able to:**

CO 1	Design PCM systems
CO 2	Design and implement base band transmission schemes
CO 3	Design and implement band pass signaling schemes
CO 4	Analyze the spectral characteristics of band pass signaling schemes and their noise performance
CO 5	Design error control coding schemes

R2017	EC8553 DISCRETE-TIME SIGNAL PROCESSING	L	T	P	C
		4	0	0	4

**At the end of the course, the student should be able to:**

CO 1	Apply DFT for the analysis of digital signals and systems
CO 2	Design IIR and FIR filters
CO 3	Characterize the effects of finite precision representation on digital filters
CO 4	Design multirate filters
CO 5	Apply adaptive filters appropriately in communication systems.

R2017	EC8552 COMPUTER ARCHITECTURE AND ORGANIZATION	L	T	P	C
		3	0	0	3

**At the end of the course, the student should be able to:**

CO 1	Describe data representation, instruction formats and the operation of a digital computer
CO 2	Illustrate the fixed point and floating-point arithmetic for ALU operation
CO 3	Discuss about implementation schemes of control unit and pipeline performance
CO 4	Explain the concept of various memories, interfacing and organization of multiple processors
CO 5	Discuss parallel processing technique and unconventional architectures

R2017	EC8551 COMMUNICATION NETWORKS	L	T	P	C
		3	0	0	3

**At the end of the course, the student should be able to:**

CO 1	Identify the components required to build different types of networks
CO 2	Choose the required functionality at each layer for given application
CO 3	Identify solution for each functionality at each layer
CO 4	Trace the flow of information from one node to another node in the network

R2017	TOTAL QUALITY MANAGEMENT	L	T	P	C
		3	0	0	3

CO 1	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
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R2017	<b>BASIC OF BIOMEDICAL INSTRUMENTATION</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>At the end of the course, the student should be able to:</b>					
<b>CO 1</b>	To Learn the different bio potential and its propagation.				
<b>CO 2</b>	To get Familiarize the different electrode placement for various physiological recording				
<b>CO 3</b>	Students will be able design bio amplifier for various physiological recording				
<b>CO 4</b>	Students will understand various technique non electrical physiological measurements				
<b>CO 5</b>	Understand the different biochemical measurements				

R2017	<b>EC8562 DIGITAL SIGNAL PROCESSING LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>At the end of the course, the student should be able to:</b>					
<b>CO 1</b>	Carryout basic signal processing operations				
<b>CO 2</b>	Demonstrate their abilities towards MATLAB based implementation of various DSP systems				
<b>CO 3</b>	Analyze the architecture of a DSP Processor				
<b>CO 4</b>	Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals				
<b>CO 5</b>	Design a DSP system for various applications of DSP				

R2017	<b>EC8561 COMMUNICATION SYSTEMS LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>At the end of the course, the student should be able to:</b>					
<b>CO 1</b>	Simulate & validate the various functional modules of a communication system				
<b>CO 2</b>	Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes				
<b>CO 3</b>	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system				
<b>CO 4</b>	Simulate end-to-end communication Link				

R2017	<b>EC8563 COMMUNICATION NETWORKS LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>At the end of the course, the student should be able to:</b>					
<b>CO 1</b>	Communicate between two desktop computers				
<b>CO 2</b>	Implement the different protocols				
<b>CO 3</b>	Program using sockets.				
<b>CO 4</b>	Implement and compare the various routing algorithms				
<b>CO 5</b>	Use the simulation tool.				

R2017	EC8691 MICROPROCESSORS AND MICROCONTROLLERS	L	T	P	C
		3	0	0	3
<b>At the end of the course, the students should be able to:</b>					
CO 1	Understand and execute programs based on 8086 microprocessor.				
CO 2	Design Memory Interfacing circuits.				
CO 3	Design and interface I/O circuits.				
CO 4	Design and implement 8051 microcontroller based systems.				
R2017	EC8095 VLSI DESIGN	L	T	P	C
		3	0	0	3
<b>Upon completion of the course, the student should be able to:</b>					
CO 1	Realize the concepts of digital building blocks using MOS transistor.				
CO 2	Design combinational MOS circuits and power strategies.				
CO 3	Design and construct Sequential Circuits and Timing systems.				
CO 4	Design arithmetic building blocks and memory subsystems.				
CO 5	Apply and implement FPGA design flow and testing.				
R2017	EC8652 WIRELESS COMMUNICATION	L	T	P	C
		3	0	0	3
<b>The student should be able to:</b>					
CO 1	Characterize a wireless channel and evolve the system design specifications				
CO 2	Design a cellular system based on resource availability and traffic demands				
CO 3	Identify suitable signaling and multipath mitigation techniques for the wireless channel and system under consideration.				
R2017	MG8591 PRINCIPLES OF MANAGEMENT	L	T	P	C
		3	0	0	3
<b>Upon completion of the course, students will be able to have clear understanding of:</b>					
CO 1	Managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management				
R2017	EC8651 TRANSMISSION LINES AND RF SYSTEMS	L	T	P	C
		3	0	0	3
<b>Upon completion of the course, the student should be able to:</b>					
CO 1	Explain the characteristics of transmission lines and its losses				
CO 2	Write about the standing wave ratio and input impedance in high frequency transmission lines				
CO 3	Analyze impedance matching by stubs using smith charts				
CO 4	Analyze the characteristics of TE and TM waves				
CO 5	Design a RF transceiver system for wireless communication				

R2017	EC8681 MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	L	T	P	C
		0	0	4	2
<b>At the end of the course, the student should be able to:</b>					
CO 1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations				
CO 2	Interface different I/Os with processor				
CO 3	Generate waveforms using Microprocessors				
CO 4	Execute Programs in 8051				
CO 5	Explain the difference between simulator and Emulator				

R2017	EC8661 VLSI DESIGN LABORATORY	L	T	P	C
		0	0	4	2
<b>At the end of the course, the student should be able to:</b>					
CO 1	Write HDL code for basic as well as advanced digital integrated circuit				
CO 2	Import the logic modules into FPGA Boards				
CO 3	Synthesize Place and Route the digital Ips				
CO 4	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools				

R2017	EC8701 ANTENNAS AND MICROWAVE ENGINEERING	L	T	P	C
		3	0	0	3
<b>The student should be able to:</b>					
CO 1	Apply the basic principles and evaluate antenna parameters and link power budgets				
CO 2	Design and assess the performance of various antennas				
CO 3	Design a microwave system given the application specifications				

R2017	EC8751 OPTICAL COMMUNICATION	L	T	P	C
		3	0	0	3
<b>At the end of the course, the student should be able to:</b>					
CO 1	Realize basic elements in optical fibers, different modes and configurations.				
CO 2	Analyze the transmission characteristics associated with dispersion and polarization techniques.				
CO 3	Design optical sources and detectors with their use in optical communication system.				
CO 4	Construct fiber optic receiver systems, measurements and coupling techniques.				
CO 5	Design optical communication systems and its networks.				

R2017	EC8791 EMBEDDED AND REAL TIME SYSTEMS	L	T	P	C
		3	0	0	3
<b>At the end of the course, the student should be able to:</b>					
CO 1	Describe the architecture and programming of ARM processor				
CO 2	Outline the concepts of embedded systems				
CO 3	Explain the basic concepts of real time operating system design				
CO 4	Model real-time applications using embedded-system concepts				

<b>R2017</b>	<b>EC8702 AD HOC AND WIRELESS SENSOR NETWORKS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>At the end of the course, the student would be able to:</b>					
<b>CO 1</b>	Know the basics of Ad hoc networks and Wireless Sensor Networks				
<b>CO 2</b>	Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement				
<b>CO 3</b>	Apply the knowledge to identify appropriate physical and MAC layer protocols				
<b>CO 4</b>	Understand the transport layer and security issues possible in Ad hoc and sensor networks.				
<b>CO 5</b>	Be familiar with the OS used in Wireless Sensor Networks and build basic modules				

<b>R2017</b>	<b>EC8711 EMBEDDED LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>At the end of the course, the student would be able to:</b>					
<b>CO 1</b>	Write programs in ARM for a specific Application				
<b>CO 2</b>	Interface memory, A/D and D/A convertors with ARM system				
<b>CO 3</b>	Analyze the performance of interrupt				
<b>CO 4</b>	Write program for interfacing keyboard, display, motor and sensor.				
<b>CO 5</b>	Formulate a mini project using embedded system				

<b>R2017</b>	<b>EC8761 ADVANCED COMMUNICATION LABORATORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>On completion of this lab course, the student would be able to:</b>					
<b>CO 1</b>	Analyze the performance of simple optical link by measurement of losses and Analyzing the mode characteristics of fiber				
<b>CO 2</b>	Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER				
<b>CO 3</b>	Estimate the Wireless Channel Characteristics and Analyze the performance of Wireless Communication System				
<b>CO 4</b>	Understand the intricacies in Microwave System design				