DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

2017 REGULATION

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PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	To enable graduates to pursue research, or have a successful career in academia or industries associated with Electronics and Communication Engineering, or as entrepreneurs
PEO 2	To provide students with strong foundational concepts and also advanced techniques and tools in order to enable them to build solutions or systems of varying complexity
PEO 3	To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented methodologies to solve the problems identified

PROGRAM OUTCOME (POs)

PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparationand ability to engage in independent and life-long learning in the broadest context of technological

	change.

PROGRAM SPECIFIC OBJECTIVES (PSOs)

PSO1	To analyze, design and develop solutions by applying foundational concepts of electronics and communication engineering.
PSO2	To apply design principles and best practices for developing quality products for scientific and business applications.
PSO3	To adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/novel problems

LIST OF COURSES

REGULATION 2017

ELECTRONICS AND COMMUNICATION ENGINEERING		
SEMESTER I		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	HS8151	Communicative English
2	MA8151	Engineering Mathematics - I
3	PH8151	Engineering Physics
4	CY8151	Engineering Chemistry
5	GE8151	Problem Solving and Python Programming
6	GE8152	Engineering Graphics
PRACTICALS		
7	GE8161	Problem Solving and Python Programming Laboratory
8	BS8161	Physics and Chemistry Laboratory
SEMESTER II		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	HS8251	Technical English
2	MA8251	Engineering Mathematics - II
3	PH8253	Physics for Electronics Engineering
4	BE8254	Basic Electrical and Instrumentation Engineering
5	EC8251	Circuit Analysis
6	EC8252	Electronic Devices
PRACTICALS		
7	EC8261	Circuits and Devices Laboratory
8	GE8261	Engineering Practices Laboratory
SEMESTER III		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	MA8352	Linear Algebra and Partial Differential Equations
2	EC8393	Fundamentals of Data Structures In C
3	EC8351	Electronic Circuits- I
4	EC8352	Signals and Systems
5	EC8392	Digital Electronics
6	EC8391	Control Systems Engineering
PRACTICALS		
7	EC8381	Fundamentals of Data Structures in C Laboratory
8	EC8361	Analog and Digital Circuits Laboratory
9	HS8381	Interpersonal Skills/Listening &Speaking

SEMESTER IV		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	MA8451	Probability and Random Processes
2	EC8452	Electronic Circuits II
3	EC8491	Communication Theory
4	EC8451	Electromagnetic Fields
5	EC8453	Linear Integrated Circuits
6	GE8291	Environmental Science and Engineering
PRACTICALS		
7	EC8461	Circuits Design and Simulation Laboratory
8	EC8462	Linear Integrated Circuits Laboratory
SEMESTER V		
S. NO.	**COURSE CODE**	**COURSE TITLE**
THEORY		
1	EC8501	Digital Communication
2	EC8553	Discrete-Time Signal Processing
3	EC8552	Computer Architecture and Organization
4	EC8551	Communication Networks
5	EC 8073	Medical Electronics
6	ORO551	Renewable Energy Sources
PRACTICALS		
7	EC8562	Digital Signal Processing Laboratory
8	EC8561	Communication Systems Laboratory
9	EC8563	Communication Networks Laboratory
SEMESTER VI		
S. NO.	**COURSE CODE**	**COURSE TITLE**
1	EC8691	Microprocessors and Microcontrollers
2	EC8095	VLSI Design
3	EC8652	Wireless Communication
4	MG8591	Principles of Management
5	EC8651	Transmission Lines and RF Systems
6	EC8004	Wireless networks
PRACTICALS		
7	EC8681	Microprocessors and Microcontrollers Laboratory
8	EC8661	VLSI Design Laboratory
9	EC8611	Technical Seminar
10	HS8581	Professional Communication
SEMESTER VII		
S. NO.	**COURSE CODE**	**COURSE TITLE**
1	EC8701	Antennas and Microwave Engineering
2	EC8751	Optical Communication
3	EC8791	Embedded and Real Time Systems
4	EC8702	Ad hoc and Wireless Sensor Networks

5	EC 8071	Cognitive Radio
6	OCS752	Introduction of C programming
PRACTICALS		
7	EC8711	Embedded Laboratory
8	EC8761	Advanced Communication Laboratory
SEMESTER VIII		
S. NO.	**COURSE CODE**	**COURSE TITLE**
1	GE8076	Professional Ethics in Engineering
2	EC8094	Satellite Communication
PRACTICALS		
3	EC8811	Project Work

COURSE OUTCOME FOR ELECTRONICS AND COMMUNICATION ENGINEERING

DEGREE	**U.G**
PROGRAMME	**B.E.– ELECTRONICS AND COMMUNICATION ENGINEERING**
ACADEMIC YEAR	**2022-23**
REGULATION	**2017**

SEMESTER 01		
1.Course Code and Name : HS8151- COMMUNICATIVE ENGLISH		
	CO Statements	**Knowledge Level**
At the end of the course, learners will be able to		
1	Read articles of a general kind in magazines and newspapers.	K2
2	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.	K2
3	Comprehend conversations and short talks delivered in English	K2
4	Write short essays of a general kind and personal letters and emails in English. .	K3
2.Course Code and Name : MA8151-ENGINEERING MATHEMATICS - I		
	CO Statements	**Knowledge Level**
After completing this course, students should demonstrate competency in the following skills		
1	Use both the limit definition and rules of differentiation to differentiate Functions.	K3
2	Apply differentiation to solve maxima and minima problems.	K3
3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus, also evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts, in addition to Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.	K3
4	Apply integration to compute multiple integrals, area, volume, integrals in Polar coordinates, in addition to change of order and change of variables.	K3
5	Apply various techniques in solving differential equations.	K3
3.Course Code and Name : PH8151-ENGINEERING PHYSICS		
	CO Statements	**Knowledge Level**
Upon completion of this course		
1	The students will gain knowledge on the basics of properties of matter and its applications	K2
2	The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics	K2
3	The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers	K2

4	The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunnelling microscopes	K2
5	The students will understand the basics of crystals, their structures and different crystal growth techniques	K2
4.Course Code and Name : CY8151-ENGINEERING CHEMISTRY		
	CO Statements	**Knowledge Level**
1	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.	K2
5.Course Code and Name : GE8151-PROBLEM SOLVING AND PYTHON PROGRAMMING		
	CO Statements	**Knowledge Level**
Upon completion of the course, students will be able to		
1	Develop algorithmic solutions to simple computational problems.	K2
2	Read, write and execute simple python programs.	K3
3	Structure simple Python programs for solving problems.	K3
4	Represent compound data using python lists, tuples, and dictionaries.	K3
5	Read and Write data from/to files in python programs.	K3
6.Course Code and Name : GE8152-ENGINEERING GRAPHICS		
	CO Statements	**Knowledge Level**
On successful completion of this course, the student will be able to		
1	Familiarize with the fundamentals and standards of Engineering graphics	K2
2	Perform freehand sketching of basic geometrical constructions and multiple Views of objects.	K3
3	Project orthographic projections of lines and plane surfaces.	K3
4	Draw projections and section of solids and development of surfaces.	K3
5	Visualize and to project isometric and perspective sections of simple solids.	K3
7.Course Code and Name : GE8161 -PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY		
	CO Statements	**Knowledge Level**
Upon completion of the course, students will be able to		
1	Write, test, and debug simple Python programs.	K2
2	Implement Python programs with conditionals and loops.	K3
3	Develop Python programs step-wise by defining functions and calling them.	K3
4	Use Python lists, tuples, and dictionaries for representing compound data.	K3

5	Read and write data from/to files in Python.	K3
8.Course Code and Name : BS8161- PHYSICS AND CHEMISTRY LABORATORY		
	CO Statements	**Knowledge Level**
Upon completion of the course, the students will be able to		
1	Apply principles of elasticity, optics and thermal properties for engineering applications	K2
SEMESTER 02		
1.Course Code and Name : HS8251- TECHNICAL ENGLISH		
	CO Statements	**Knowledge Level**
At the end of the course learners will be able to		
1	Read technical texts and write area specific texts effortlessly.	K2
2	Listen and comprehend lectures and talks in their areas of specialization successfully	K2
3	Speak appropriately and effectively in varied formal and Informal contexts.	K2
4	Write reports and winning job applications.	K3
2.Course Code and Name : MA8251 ENGINEERING MATHEMATICS - II		
	CO Statements	**Knowledge Level**
After successfully completing the course, the student will have a good understanding of the following topics and their applications		
1	Compute the Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.	K3
2	Find Gradient, divergence and curl of a vector point function and related Identities, Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.	K3
3	Solve problems on Analytic functions and conformal mapping.	K3
4	Find Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with Constant coefficients.	K3
3.Course Code and Name : PH8253-PHYSICS FOR ELECTRONICS ENGINEERING		
	CO Statements	**Knowledge Level**
At the end of the course, the students will able to		
1	Gain knowledge on classical and quantum electron theories, and energy band structures	K2
2	Acquire knowledge on basics of semiconductor physics and its applications in various devices,	K2
3	Get knowledge on magnetic and dielectric properties of materials	K2
4	Have the necessary understanding on the functioning of optical materials for optoelectronics	K2

5	Understand the basics of quantum structures and their applications in spintronics and carbon electronics.	K2
4.Course Code and Name : BE8254- BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING		
	CO Statements	**Knowledge Level**
At the end of the course the students will be able to		
1	Understand the concept of three phase power circuits and measurement.	K2
2	Comprehend the concepts in electrical generators, motors and transformers	K3
3	Choose appropriate measuring instruments for given application	K2
5.Course Code and Name : EC8251-CIRCUIT ANALYSIS		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Develop the capacity to analyze electrical circuits, apply the circuit theorems in real time	K2
2	Design and understand and evaluate the AC and DC circuits.	K3
6.Course Code and Name : EC8252- ELECTRONIC DEVICES		
	CO Statements	**Knowledge Level**
At the end of the course the students will be able to		
1	Explain the V-I characteristic of diode, UJT and SCR	K4
2	Describe the equivalence circuits of transistors	K3
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	K4
7.Course Code and Name : EC8261- CIRCUITS AND DEVICES LABORATORY		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Analyze the characteristics of basic electronic devices.	K5
2	Design RL and RC circuits ,Verify Thevinin & Norton theorem KVL & KCL, and Super Position Theorems	K5
8.Course Code and Name : GE8261-ENGINEERING PRACTICES LABORATORY		
	CO Statements	**Knowledge Level**
On successful completion of this course, the student will be able to		
1	Fabricate carpentry components and pipe connections including plumbing works.	K2

2	Use welding equipments to join the structures.	K2
3	Carry out the basic machining operations	K2
4	Make the models using sheet metal works	K6
5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings	K2
6	Carry out basic home electrical works and appliances	K2
7	Measure the electrical quantities.	K2
8	Elaborate on the components, gates, soldering practices.	K2

SEMESTER 03

1.Course Code and Name : MA8352-LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATIONS

	CO Statements	**Knowledge Level**
Upon successful completion of the course, students should be able to		
1	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts	K3
2	Demonstrate accurate and efficient use of advanced algebraic techniques.	K3
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.	K3
4	Able to solve various types of partial differential equations	K3
5	Able to solve engineering problems using Fourier series.	K3

2.Course Code and Name : EC8393-FUNDAMENTALS OF DATA STRUCTURES IN C

	CO Statements	**Knowledge Level**
Upon successful completion of the course, students should be able to		
1	Implement linear and non linear data structures operations using C	K2
2	Suggest appropriate linear and non linear structure for any data given set	K2
3	Apply hashing concepts for a given problems	K2
4	Modify and suggest new data structure for an applications	K2
5	Appropriately choose the sorting algorithm for an algorithm	K2

3.Course Code and Name : EC8351-ELECTRONIC CIRCUITS-I

	CO Statements	**Knowledge Level**
After studying this course, the student should be able to		
1	Acquire knowledge of Working principles, characteristics and applications of BJT and FET	K2
2	Frequency response characteristics of BJT and FET amplifiers	K2
3	Analyze the performance of small signal BJT and FET amplifiers - single stage and multi stage amplifiers	K2

4	Apply the knowledge gained in the design of Electronic circuits	K2
4.Course Code and Name : EC8352-SIGNALS AND SYSTEMS		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	To be able to determine if a given system is linear/causal/stable	K2
2	Capable of determining the frequency components present in a deterministic signal	K2
3	Capable of characterizing LTI systems in the time domain and frequency domain	K2
4	To be able to compute the output of an LTI system in the time and frequency domains	K2
5.Course Code and Name : EC8392-DIGITAL ELECTRONICS		
	CO Statements	**Knowledge Level**
At the end of the course		
1	Use digital electronics in the present contemporary world	K3
2	Design various combinational digital circuits using logic gates	K3
3	Do the analysis and design procedures for synchronous and asynchronous sequential circuits	K3
4	Use the semiconductor memories and related technology	K3
5	Use electronic circuits involved in the design of logic gates	K3
6.Course Code and Name : EC8391-CONTROL SYSTEMS ENGINEERING		
	CO Statements	**Knowledge Level**
Upon completion of the course, the student should be able to		
1	Identify the various control system components and their representations	K3
2	Analyze the various time domain parameters	K3
3	Analysis the various frequency response plots and its system.	K3
4	Apply the concepts of various system stability criterions	K3
5	Design various transfer functions of digital control system using state variable models	K3
7.Course Code and Name : EC8381-FUNDAMENTALS OF DATA STRUCTURES IN C LABORATORY		
	CO Statements	**Knowledge Level**
Upon completion of the course, the students will be able to		
1	Write basic and advanced programs in C	K4
2	Implement functions and recursive functions in C	K4
3	Implement data structures using C	K4

4	Choose appropriate sorting algorithm for an application and implement it in a modularized way	K2
8.Course Code and Name : EC8361-ANALOG AND DIGITAL CIRCUITS LABORATORY		
	CO Statements	**Knowledge Level**
On completion of this laboratory course, the student should be able to		
1	Design and Test rectifiers, filters and regulated power supplies	K6
2	Design and Test BJT/JFET amplifiers.	K6
3	Differentiate cascode and cascade amplifiers.	K6
4	Analyze the limitation in bandwidth of single stage and multi stage amplifier	K6
5	Measure CMRR in differential amplifier	K6
6	Simulate and analyze amplifier circuits using PSpice	K6
7	Design and Test the digital logic circuits	K6
9.Course Code and Name : HS8381 INTERPERSONAL SKILLS/LISTENING & SPEAKING		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Listen and respond appropriately.	K2
2	Participate in group discussions	K2
3	Make effective presentations	K2
4	Participate confidently and appropriately in conversations both formal and informal	K2
SEMESTER 04		
1.Course Code and Name : MA8451-PROBABILITYAND RANDOM PROCESSES		
	CO Statements	**Knowledge Level**
Upon successful completion of the course, students should be able to		
1	Explain the fundamental knowledge of the concepts of probability and have Knowledge of standard distributions which can describe real life phenomenon.	K2
2	Illustrate the basic concepts of one and two dimensional random variables and apply in engineering	K2
3	Apply the concept random processes in engineering disciplines.	K3
4	Apply the concept of correlation and spectral densities.	K3
5	Analyze the response of random inputs to linear time invariant systems.	K4
2.Course Code and Name : EC8452-ELECTRONIC CIRCUITS II		
	CO Statements	**Knowledge Level**

Upon completion of the course, the student should be able to		
1	Analyze the concepts of Feedback Amplifiers in various applications	K3
2	Design different types of Oscillator at different frequencies.	K3
3	Analyze the performance of Tuned amplifiers	K4
4	Design Pulse circuits and Multivibrators	K3
5	Design LC and RC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, power amplifier and DC convertors.	K2
3.Course Code and Name : EC8491-COMMUNICATION THEORY		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Design AM communication systems	K2
2	Design Angle modulated communication systems	K3
3	Apply the concepts of Random Process to the design of Communication systems	K3
4	Analyze the noise performance of AM and FM systems	K3
5	Gain knowledge in sampling and quantization	K2
4.Course Code and Name : EC8451-ELECTROMAGNETIC FIELDS		
	CO Statements	**Knowledge Level**
By the end of this course, the student should be able to		
1	Display an understanding of fundamental electromagnetic laws and concepts	K3
2	Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning	K3
3	Explain electromagnetic wave propagation in lossy and in lossless media	K2
4	Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws	K2
5.Course Code and Name : EC8453-LINEAR INTEGRATED CIRCUITS		
	CO Statements	**Knowledge Level**
Upon completion of the course, the student should be able to		
1	Design linear and non linear applications of OP – AMPS	K2
2	Design applications using analog multiplier and PLL	K3
3	Design ADC and DAC using OP – AMPS	K3
4	Generate waveforms using OP – AMP Circuits	K3
5	Analyze special function ICs	K1
6.Course Code and Name : GE8291 ENVIRONMENTAL SCIENCE AND ENGINEERING		

	CO Statements	Knowledge Level
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	K2
2	Public awareness of environmental is at infant stage.	K2
3	Ignorance and incomplete knowledge has lead to misconceptions	K2
4	Development and improvement in std. of living has lead to serious environmental disasters	K2
7.Course Code and Name :EC8461 CIRCUITS DESIGN AND SIMULATION LABORATORY		
	CO Statements	**Knowledge Level**
On completion of this laboratory course, the student should be able to		
1	Analyze various types of feedback amplifiers	K2
2	Design oscillators, tuned amplifiers, wave-shaping circuits and multi vibrators	K2
3	Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and multi vibrators using SPICE Tool. .	K2
8.Course Code and Name : EC8462- LINEAR INTEGRATED CIRCUITS LABORATORY		
	CO Statements	**Knowledge Level**
On completion of this laboratory course, the student should be able to		
1	Design amplifiers, oscillators, D-A converters using operational amplifiers.	K2
2	Design filters using op-amp and performs an experiment on frequency response.	K2
3	Analyze the working of PLL and describe its application as a frequency multiplier.	K2
4	Design DC power supply using ICs.	K2
5	Analyze the performance of filters, Multi vibrators, A/D converters and Analog multiplier using SPICE.	K2
SEMESTER 05		
1.Course Code and Name : EC8501-DIGITAL COMMUNICATION		
	CO Statements	**Knowledge Level**
Upon completion of the course, the student should be able to		
1	Design PCM systems	K1
2	Design and implement base band transmission schemes	K2
3	Design and implement band pass signalling schemes	K3
4	Analyze the spectral characteristics of band pass signalling schemes and their noise performance	K4
5	Design error control coding schemes	K6

2.Course Code and Name : EC8553-DISCRETE TIME SIGNAL PROCESSING		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Apply DFT for the analysis of digital signals & systems.	K3
2	Design IIR and FIR filters	K3
3	Characterize the effects of finite precision representation on digital filters	K2
4	Design multirate filters	K2
5	Apply adaptive filters appropriately in communication systems	K2
3.Course Code and Name : EC8552-COMPUTER ARCHITECTURE AND ORGANIZATION		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Describe data representation, instruction formats and the operation of a digital computer	K2
2	Illustrate the fixed point and floating-point arithmetic for ALU operation	K2
3	Discuss about implementation schemes of control unit and pipeline performance	K3
4	Explain the concept of various memories, interfacing and organization of multiple processors	K3
5	Discuss parallel processing technique and unconventional architectures	K4
4.Course Code and Name : EC8551-COMMUNICATION NETWORKS		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Identify the components required to build different types of networks	K2
2	Choose the required functionality at each layer for given application	K2
3	Identify solution for each functionality at each layer	K2
4	Trace the flow of information from one node to another node in the network	K2
5.Course Code and Name : EC8073-MEDICAL ELECTRONICS		
	CO Statements	**Knowledge Level**
On successful completion of this course, the student should be able to		
1	Know the human body electro- physiological parameters and recording of bio-potentials	K2
2	Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc.	K2
3	Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators	K3
4	Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave	K3

	surgical diathermies , and bio-telemetry principles and methods	
5	Know about recent trends in medical instrumentation	K2
6.Course Code and Name : ORO551 -RENEWABLE ENERGY SOURCES		
	CO Statements	**Knowledge Level**
1	Understanding the physics of solar radiation.	K3
2	Ability to classify the solar energy collectors and methodologies of storing solar energy.	K2
3	Knowledge in applying solar energy in a useful way.	K5
4	Knowledge in wind energy and biomass with its economic aspects.	K3
5	Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies.	K3
7.Course Code and Name : EC8562 DIGITAL SIGNAL PROCESSING LABORATORY		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Carryout basic signal processing operations	K4
2	Demonstrate their abilities towards MATLAB based implementation of various DSP systems	K4
3	Analyze the architecture of a DSP Processor	K2
4	Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals	K3
5	Design a DSP system for various applications of DSP	K3
8.Course Code and Name : EC8561 COMMUNICATION SYSTEMS LABORATORY		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Simulate & validate the various functional modules of a communication system	K6
2	Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes	K6
3	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system	K6
4	Simulate end-to-end communication Link	K6
5	Implement various Error control coding schemes	K2
9.Course Code and Name : EC8563 COMMUNICATION NETWORKS LABORATORY		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Communicate between two desktop computers	K6
2	Implement the different protocols.	K6

3	Program using sockets	K6
4	Implement and compare the various routing algorithms	K6
5	Use the simulation tool.	K2

SEMESTER 06		
1.Course Code and Name : EC8691-MICROPROCESSORS AND MICROCONTROLLERS		
	CO Statements	**Knowledge Level**
At the end of the course, the students should be able to		
1	Understand and execute programs based on 8086 microprocessor	K2
2	Design Memory Interfacing circuits.	K2
3	Design and interface I/O circuits.	K2
4	Design and implement 8051 microcontroller based systems	K2
2.Course Code and Name : EC8095-VLSI DESIGN		
	CO Statements	**Knowledge Level**
Upon completion of the course, students should be able to		
1	Realize the concepts of digital building blocks using MOS transistor.	K3
2	Design combinational MOS circuits and power strategies.	K3
3	Design and construct Sequential Circuits and Timing systems.	K5
4	Design arithmetic building blocks and memory subsystems.	K2
5	Apply and implement FPGA design flow and testing.	K2
3.Course Code and Name : EC8652-Wireless Communications		
	CO Statements	**Knowledge Level**
The students should be able to		
1	characteristics of a wireless channel and evolve the system design specifications	K3
2	Design a cellular system based on resource availability and traffic demands	K1
3	Identify suitable signalling and multipath mitigation techniques for the wireless channel and system under consideration	K3
4.Course Code and Name : MG8591-PRINCIPLES OF MANAGEMENT		
	CO Statements	**Knowledge Level**
1	Upon completion of the course, students will be able to have clear understanding	K3
2	Managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management	K3

5.Course Code and Name : EC8651-TRANSMISSION LINES AND RF SYSTEMS		
	CO Statements	**Knowledge Level**
Upon completion of the course, the student should be able to		
1	Explain the characteristics of transmission lines and its losses	K2
2	Write about the standing wave ratio and input impedance in high frequency transmission lines	K4
3	Analyze impedance matching by stubs using smith charts.	K3
4	Analyze the characteristics of TE and TM waves in Guided systems.	K5
5	Design a RF transceiver system for wireless communication.	K3

6.Course Code and Name : EC8004-WIRELESS NETWORKS		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Conversant with the latest 3G/4G networks and its architecture	K2
2	Design and implement wireless network environment for any application using latest wireless protocols and standards	K2
3	Ability to select the suitable network depending on the availability and requirement	K2
4	Implement different type of applications for smart phones and mobile devices with latest network strategies	K5

7.Course Code and Name : EC8681 MICROPROCESSORS AND MICROCONTROLLERS LABORATORY		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations.	K2
2	Interface different I/Os with processor	K2
3	Generate waveforms using Microprocessors	K2
4	Execute Programs in 8051	K2
5	Explain the difference between simulator and Emulator	K2

8.Course Code and Name : EC8661-VLSI DESIGN LABORATORY		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Write HDL code for basic as well as advanced digital integrated circuits.	K2
2	Synthesize, Place and Route the digital circuits.	K2
3	Import the logic modules in to FPGA boards.	K2
4	Design, Simulate and Extract the layouts of the digital circuits using EDA platforms.	K6
5	Design and Simulate the analog circuits using EDA platforms.	K6

9.Course Code and Name : HS8581-PROFESSIONAL COMMUNICATION		
	CO Statements	**Knowledge Level**
At the end of the course Learners will be able to		
1	Make effective presentations	K2
2	Participate confidently in Group Discussions.	K2
3	Attend job interviews and be successful in them.	K2
4	Develop adequate Soft Skills required for the workplace	K6
SEMESTER 07		
1.Course Code and Name : EC8701-ANTENNAS AND MICROWAVE ENGINEERING		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply the basic principles and evaluate antenna parameters and link power budgets	K4
2	Design and assess the performance of various antennas	K4
3	Design a microwave system given the application specifications	K2
2.Course Code and Name : EC8751-OPTICAL COMMUNICATION		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Realize basic elements in optical fibres, different modes and configurations. .	K3
2	Analyze the transmission characteristics associated with dispersion and polarization techniques.	K1
3	Design optical sources and detectors with their use in optical communication system.	K6
4	Construct fiber optic receiver systems, measurements and coupling techniques	K6
5	Design optical communication systems and its networks.	K2
3.Course Code and Name : EC8791-EMBEDDED AND REAL TIME SYSTEMS		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Describe the architecture and programming of ARM processor	K4
2	Outline the concepts of embedded systems	K3
3	Explain the basic concepts of real time operating system design	K3
4	Model real-time applications using embedded-system concepts	K3
5	Apply the concepts of scheduling in Real Time Operating System and creating the model for Real Time applications	K4

4.Course Code and Name : EC8702-ADHOC AND WIRELESS SENSOR NETWORKS		
	CO Statements	**Knowledge Level**
At the end of the course, the student would be able to		
1	Know the basics of Ad hoc networks and Wireless Sensor Networks	K4
2	Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement	K4
3	Apply the knowledge to identify appropriate physical and MAC layer protocols	K2
4	Understand the transport layer and security issues possible in Ad hoc and sensor networks.	K1
5	Be familiar with the OS used in Wireless Sensor Networks and build basic modules	K2

5.Course Code and Name : EC8071-COGNITIVE RADIO		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Gain knowledge on the design principles on software defined radio and cognitive radio	K2
2	Develop the ability to design and implement algorithms for cognitive radio spectrum sensing and dynamic spectrum access	K2
3	Build experiments and projects with real time wireless applications	K5
4	Apply the knowledge of advanced features of cognitive radio for real world applications	K3
5	Analyze and improve supply chain processes	K4

6.Course Code and Name : OCS752 INTRODUCTION OF C PROGRAMMING		
	CO Statements	**Knowledge Level**
Upon completion of this course, the students will be able to		
1	Develop simple applications using basic constructs	K2
2	Develop applications using arrays and strings	K6
3	Develop applications using functions and structures	K6

7.Course Code and Name : EC8711 EMBEDDED LABORATORY		
	CO Statements	**Knowledge Level**
At the end of the course, the student should be able to		
1	Write programs in ARM for a specific Application.	K2
2	Interface memory with ARM processor and write a program related to memory Operations.	K6
3	Interface A/D and D/A convertors with ARM system.	K6
4	Analyze the performance of interrupt.	K2
5	Write programs for interfacing keyboard, display, motor and sensor.	K6

8.Course Code and Name : EC8761 ADVANCED COMMUNICATION LABORATORY		
	CO Statements	**Knowledge Level**
On completion of this lab course, the student would be able to		
1	Analyze the performance of simple optical link by measurement of losses and analyzing the mode characteristics of fiber.	K2
2	Analyze the mode characteristics of fiber, eye pattern and the impact on BER	K6
3	Estimate the wireless channel characteristics and analyze the performance of wireless communication system	K6
4	Understand the intricacies in microwave system design.	K2
SEMESTER 08		
1.Course Code and Name : GE8076 PROFESSIONAL ETHICS IN ENGINEERING		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.	K6
2.Course Code and Name:EC8094 -SATELLITE COMMUNICATION		
	CO Statements	**Knowledge Level**
At the end of the course, the student would be able to		
1	Analyze the satellite orbits	K2
2	Analyze the earth segment and space segment	K5
3	Analyze the satellite Link design	K3
4	Design various satellite applications	K4
5	Learn the basics of recognition methods for color models.	K2
3.Course Code and Name : EC8811 PROJECT WORK		
	CO Statements	**Knowledge Level**
1	Apply the fundamental knowledge and skills, which are acquired within the technical area, to a given problem	K2
2	Identify and summarize an appropriate list of literature review, analyze the previous researchers work and relate them to the project	K3
3	Apply research and conduct experiments, as well as to analyze and interpret data that yield the results and answer important applicable research questions.	K4