

Shanmuganathan Engineering College

**(Approved by AICTE, Affiliated by
Anna University Chennai)**

**Department
Of
Computer Science and Engineering**

Regulation-2017

Course Outcomes

COURSE OUTCOMES	
I Year – Semester-I	
Course Code & Title : HS8151 Communicative English	
Course Index : C101	
Couse Index	Course Outcomes
C101.1	Communicate clearly both in the written form and orally using appropriate vocabulary and comprehend written texts to make inferences.
C101.2	Speak persuasively in different social contexts and write biographical details and technical documents cohesively, coherently and flawlessly using appropriate words.
C101.3	Speak, read and write effectively for a variety of professional and social settings.
C101.4	Read descriptive, narrative, expository and interpretive texts and write using creative, critical, analytical and evaluative methods.
C101.5	Listen, comprehend and respond to different spoken and written discourses/excerpts in different accents and write different genres of texts adopting various writing strategies.
Course Code & Title : MA8151 Engineering Mathematics - I	
Course Index : C102	
Couse Index	Course Outcomes
C102.1	Use both the limit definition and rules of differentiation to differentiate functions.
C102.2	Apply differentiation to solve maxima and minima problems.
C102.3	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.
C102.4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
C102.5	Apply various techniques in solving differential equations.
Course Code & Title : PH8151 Engineering Physics	
Course Index : C103	
Couse Index	Course Outcomes
C103.1	Analyze the elastic nature of materials and be able to choose the materials depending upon the modulus of elasticity for different applications.
C103.2	Illustrate the advantages of optical communication using LASER.

C103.3	Explain the conducting properties of solids, liquids, good thermal conductor and bad thermal conductors
C103.4	Apply the knowledge of quantum mechanics and classical mechanics in addressing the problems related to science and technology
C103.5	Describe the crystal structures, crystal defects and various crystal growth techniques.
Course Code & Title : CY8151 Engineering Chemistry	
Course Index : C104	
Course Index	Course Outcomes
C104.1	Describe the importance of water technology in the purification of water and its domestic and industrial applications.
C104.2	Illustrate the concept of absorption in surface chemistry and catalysis and its applications.
C104.3	Review use of the phase rule in identifying its application in metallurgy and manufacture of alloys.
C104.4	Compare the different types of industrial techniques of petroleum processing and the determination of caloric values and combustion parameters.
C104.5	Explain the fundamentals of different alternative source of energy, the generation process and batteries.
Course Code & Title : GE8151 Problem Solving and Python Programming	
Course Index : C105	
Course Index	Course Outcomes
C105.1	Develop algorithmic solutions to simple computational problems.
C105.2	Read, write and execute simple python programs.
C105.3	Apply control, looping structures and functions to solve problems.
C105.4	Represent compound data using python lists, tuples, and dictionaries.
C105.5	Read and Write data from/to files in python programs.
Course Code & Title : GE8152 Engineering Graphics	
Course Index : C106	
Course Index	Course Outcomes
C106.1	Familiarize with the fundamentals and standards of Engineering graphics
C106.2	Perform freehand sketching of basic geometrical constructions and multiple views of objects.

C106.3	Project orthographic projections of lines and plane surfaces.
C106.4	Draw projections and section of solids and development of surfaces.
C106.5	Visualize and to project isometric and perspective sections of simple solids.
Course Code & Title : GE8161 Problem Solving and Python Programming Laboratory	
Course Index : C107	
Course Index	Course Outcomes
C107.1	Write, test, and debug simple Python programs.
C107.2	Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.
C107.4	Demonstrate the use Python lists, tuples, and dictionaries for representing compound data.
C107.5	Illustrate the concepts of read and write data from/to files in Python.
Course Code & Title : BS8161 Physics and Chemistry Laboratory	
Course Index : C108	
Course Index	Course Outcomes
C108.1	Test materials by using their knowledge of applied physics principles in optics and properties of matter.
C108.2	Perform the quantitative chemical analysis of chloride, dissolved oxygen, hardness, alkalinity and copper ions by titration methods.
C108.3	Demonstrate basic concepts in the determination of acids, sodium, potassium and iron by the instrumental methods of analysis.
I Year – Semester-II	
Course Code & Title : HS8251 Technical English	
Course Index : C109	
Course Index	Course Outcomes
C109.1	Read technical texts and write area specific texts effortlessly.
C109.2	Listen and comprehend lectures and talks in their areas of specialization and write effectively for a variety of professional and social settings.
C109.3	Speak and write appropriately and effectively in varied formal and informal contexts.
C109.4	Write effectively and persuasively and produce different types of writing such as letters, minutes, reports and winning job applications.

C109.5	Communicate clearly using technical vocabulary in their professional correspondences.
Course Code & Title : MA8251 Engineering Mathematics - II	
Course Index : C110	
Course Index	Course Outcomes
C110.1	Compute the Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
C110.2	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.
C110.3	Solve problems on Analytic functions and conformal mapping.
C110.4	Evaluate complex integrals.
C110.5	Find Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
Course Code & Title : PH8253 Physics for Electronics Engineering	
Course Index : C111	
Course Index	Course Outcomes
C111.1	Explain the properties of conducting materials using classical and quantum concepts.
C111.2	Apply the fundamental knowledge about the semiconductors and able to differentiate different types of semiconductors.
C111.3	Explain the properties of Magnetic, Dielectric materials and devices for modern day to day applications.
C111.4	Explain the properties and applications of Optical materials and devices.
C111.5	Apply the knowledge about the nano-electronic materials and devices for various applications.
Course Code & Title : BE8254 Basic Electrical and Instrumentation Engineering	
Course Index : C112	
Course Index	Course Outcomes
C112.1	Explain the operation of three phase electrical circuits and power system.
C112.2	Determine the regulation and efficiency of transformers.
C112.3	Describe the characteristics of DC Generator and Motor.
C112.4	Analyze the performance of AC and DC machines.

C112.5	Apply the concepts of measurements and instruments for real time applications.
Course Code & Title : EC8251 Circuit Analysis	
Course Index : C113	
Course Index	Course Outcomes
C113.1	Determine current and voltage in circuits using Ohm's Law, Kirchhoff's laws, mesh current method, node voltage method and network topology.
C113.2	Apply the Network theorems to the analysis of AC and DC circuits.
C113.3	Calculate the response of the series and parallel resonance circuits, coupled circuits and tuned circuits.
C113.4	Solve first and second order AC and DC circuits for steady-state and transient response in the time domain using Laplace transforms.
C113.5	Understand the concept of two port network, its various parameters and symmetrical
Course Code & Title : EC8252 Electronic Devices	
Course Index : C114	
Course Index	Course Outcomes
C114.1	Explain the structure, operations and characteristics of PN Junction diode.
C114.2	Describe the basic geometry, operation and various configuration of Bipolar Junction Transistor.
C114.3	Analyze the operation of various Field Effect Transistors.
C114.4	Describe the operations of Special Semiconductor Devices.
C114.5	Explain the basic concepts of Power and Display devices.
Course Code & Title : EC8261 Circuits and Devices Laboratory	
Course Index : C115	
Course Index	Course Outcomes
C115.1	Analyze the characteristics of basic electronic devices.
C115.2	Determine the transient response of RL and RC circuits.
C115.3	Perform Kirchhoff's Current Law and Kirchhoff's Voltage Law.

C115.4	Verify Thevinin, Norton, Superposition, Maximum Power Transfer and Reciprocity Theorems.
C115.5	Determine the Resonant frequency of RLC circuits.
Course Code & Title : GE8261 Engineering Practices Laboratory	
Course Index : C116	
Couse Index	Course Outcomes
C116.1	Construct carpentry components and pipe connections including plumbing works.
C116.2	Use welding equipment's to join the structures
C116.3	Illustrate the basic machining operations
C116.4	Construct the models using sheet metal works
C116.5	Describe centrifugal pump, Air conditioner, operations of smithy, foundry and fittings.
C116.6	Construct the basic Electrical and Electronics circuits.
C116.7	Examine the different types of electronic circuits and components.
C116.8	Explain the electrical safety rules, grounding, general house wiring.
C116.9	Perform soldering in various electronic circuits.
C116.10	Illustrate the basic operation of domestic electrical appliances.
II Year – Semester-III	
Course Code & Title : MA8352 Linear Algebra and Partial Differential Equations	
Course Index : C201	
Couse Index	Course Outcomes
C201.1	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts, to demonstrate accurate and efficient use of advanced algebraic techniques and to demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text on the topic Vector Spaces.
C201.2	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts, to demonstrate accurate and efficient use of advanced algebraic techniques and to demonstrate their mastery by solving non -

	trivial problems related to the concepts and by proving simple theorems about the statements proven by the text on the topic Linear Transformation and Diagonalization.
C201.3	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts, to demonstrate accurate and efficient use of advanced algebraic techniques and to demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text on the topic Inner Product Spaces.
C201.4	Solve various types of partial differential equations.
C201.5	Solve engineering problems using Fourier series.
Course Code & Title : EC8393 Fundamentals of Data Structures In C Course Index : C202	
Course Index	Course Outcomes
C202.1	Develop the programs in C using basic constructs.
C202.2	Develop the programs in C using function, pointers, structures and unions.
C202.3	Suggest and Implement appropriate linear data structure operations for any given data set in C.
C202.4	Suggest and Implement appropriate non-linear data structure operations for a given application in C.
C202.5	Appropriately choose the sorting algorithms and also apply hashing concepts for a given problem.
Course Code & Title : EC8351 Electronic Circuits-I Course Index : C203	
Course Index	Course Outcomes
C203.1	Design the various biasing circuits of BJT, JFET and MOSFET.
C203.2	Analyze the small signal equivalent and design BJT amplifier circuits.
C203.3	Analyze the small signal equivalent and design JFET and MOSFET amplifier circuits.
C203.4	Plot the frequency response of all amplifiers.
C203.5	Design the regulated power supply, troubleshoot and analyze the faults in power supplies.

Course Code & Title : EC8352 Signals and Systems	
Course Index : C204	
Course Index	Course Outcomes
C204.1	Analyze the various properties of signals and systems.
C204.2	Apply Laplace transform and Fourier transform in signal analysis.
C204.3	Analyze linear time invariant continuous time systems using Laplace and Fourier Transforms.
C204.4	Analyze discrete time signals using Z transform and DTFT.
C204.5	Interpret the linear time invariant discrete time systems using Z transform and DTFT.
Course Code & Title : EC8392 Digital Electronics	
Course Index : C205	
Course Index	Course Outcomes
C205.1	Apply the concepts of digital electronics in the present contemporary world.
C205.2	Design and implement various combinational digital circuits using logic gates.
C205.3	Analysis and design synchronous sequential circuits.
C205.4	Design and implement asynchronous sequential circuits.
C205.5	Apply the concepts of memory devices and programmable logic devices in Integrated Circuits
Course Code & Title : EC8391 Control Systems Engineering	
Course Index : C206	
Course Index	Course Outcomes
C206.1	Perform modeling of control system using various techniques.
C206.2	Obtain the time response and steady state error of control systems.
C206.3	Design various compensators and to analyse the frequency response of the system using various plots.
C206.4	Determine the stability of control systems.
C206.5	Analyse and obtain state space model using state variables.

Course Code & Title : EC8381 Fundamentals of Data Structures in C Laboratory	
Course Index : C207	
Course Index	Course Outcomes
C207.1	Develop C programs for simple applications making use of basic constructs.
C207.2	Apply basic data structures for a given problem using C.
C207.3	Implement linear and non-linear data structures using C.
C207.4	Implement functions and recursive functions in C.
C207.5	Choose appropriate searching, sorting and hashing algorithm for an application and implement it in a modularized way.
Course Code & Title : EC8361 Analog and Digital Circuits Laboratory	
Course Index : C208	
Course Index	Course Outcomes
C208.1	Plot the frequency response of CE, CB, CC & CS amplifiers.
C208.2	Measure CMRR in differential amplifier.
C208.3	Analyze the limitation in bandwidth of single stage and multistage amplifiers.
C208.4	Simulate the amplifiers using SPICE tool.
C208.5	Design and implement combinational and sequential logic circuits.
Course Code & Title : HS8381 Interpersonal Skills/Listening & Speaking	
Course Index : C209	
Course Index	Course Outcomes
C209.1	Speak effectively on various academic topics and respond to questions.
C209.2	Converse effectively with the use of conversation starters and discourse markers.
C209.3	Listen and respond to various academic dialogues and discussions.
C209.4	Participate confidently and appropriately in informal and formal conversations and group discussions.
C209.5	Use a range of presentation tools like PPT, Videos, and Charts etc. to make an engaging presentation.

II Year – Semester-IV**Course Code & Title : MA8451 Probability and Random Processes**
Course Index : C210**Course Index****Course Outcomes**

C210.1	Use the fundamental knowledge of the concepts of probability and standard distributions which can describe real life phenomenon.
C210.2	Apply the basic concepts of one and two dimensional random variables in engineering applications.
C210.3	Apply the concept random processes in engineering disciplines.
C210.4	Apply the concept of correlation and spectral densities.
C210.5	Analyse the response of random inputs to linear time invariant systems.

Course Code & Title : EC8452 Electronic Circuits II
Course Index : C211**Course Index****Course Outcomes**

C211.1	Analyze the concepts of Feedback Amplifiers in various applications
C211.2	Design different types of Oscillator at different frequencies.
C211.3	Analyze the performance of Tuned amplifiers
C211.4	Design Pulse circuits and Multivibrators
C211.5	Apply the various design techniques to analyze Power Amplifiers and DC convertors

Course Code & Title : EC8491 Communication Theory
Course Index : C212**Course Index****Course Outcomes**

C212.1	Analyze the various modulation techniques used for communication.
C212.2	Elaborate the angle modulation and demodulation techniques.
C212.3	Apply the concepts of Random Process.
C212.4	Analyze the noise performance of AM and FM systems.
C212.5	Design applications using the various types of sampling and quantization

Course Code & Title : EC8451 Electromagnetic Fields	
Course Index : C213	
Course Index	Course Outcomes
C213.1	Apply the basic mathematical concepts of vector analysis.
C213.2	Describe the laws associated to static electric field and the properties of conductors and dielectrics.
C213.3	Analyze the field potentials due to static magnetic fields and explain how materials affect electric and magnetic fields.
C213.4	Analyze the relation between the fields under time varying situations and apply Maxwell's equations to electric and magnetic fields.
C213.5	Explain electromagnetic wave propagation in lossy and in lossless media.
Course Code & Title : EC8453 Linear Integrated Circuits	
Course Index : C214	
Course Index	Course Outcomes
C214.1	Design linear and non-linear applications of op-amps.
C214.2	Design applications using Analog multipliers and PLL.
C214.3	Design ADC and DAC using op-amps.
C214.4	Design waveform Generators using op-amps.
C214.5	Analyze special function ICs.
Course Code & Title : GE8291 Environmental Science and Engineering	
Course Index : C215	
Course Index	Course Outcomes
C215.1	Summarize the importance of environment, biodiversity, ecosystem and how to solve environmental related problems.
C215.2	Describe the causes, effect and control measures of air pollution, water pollution, soil pollution, noise pollution, radioactive pollution and thermal pollution with their relevant case studies.
C215.3	Discuss the various renewable and non-renewable resources and energy conservation processes.
C215.4	Explain the social issues and solutions for sustainable environment with relevant Acts and case studies.
C215.5	Review the impact of human population in the environment and its remedial measures.

Course Code & Title : EC8461 Circuits Design and Simulation Laboratory	
Course Index : C216	
Course Index	Course Outcomes
C216.1	Differentiate feedback amplifiers with oscillators
C216.2	Calculate the frequency response & the output impedance for various types of feedback amplifiers
C216.3	Design different types of RC, LC oscillators and tuned amplifiers.
C216.4	Analyze the various types of wave-shaping circuits and multivibrators.
C216.5	Simulate oscillators, tuned amplifiers and power amplifiers using SPICE tool
Course Code & Title : EC8462 Linear Integrated Circuits Laboratory	
Course Index : C217	
Course Index	Course Outcomes
C217.1	Analyze the basics of linear integrated circuits and available ICs.
C217.2	Design the oscillators, amplifiers and filters using operational amplifiers.
C217.3	Analyze and implement the frequency multiplier using PLL.
C217.4	Design DC power supply using ICs.
C217.5	Analyze the performance of filters, Multivibrators, A/D converters and analog multiplier using SPICE.
III Year – Semester-V	
Course Code & Title : EC8501 Digital Communication	
Course Index : C301	
Course Index	Course Outcomes
C301.1	Design applications using the various source coding techniques.
C301.2	Interpret the various waveform coding schemes and their representation.
C301.3	Analyze the various baseband transmission schemes.
C301.4	Develop applications using the various band pass signalling schemes.

C301.5	Apply the basic concepts of channel coding techniques.
Course Code & Title : EC8553 Discrete Time Signal Processing	
Course Index : C302	
Course Index	Course Outcomes
C302.1	Apply DFT for the analysis of digital signals & systems.
C302.2	Design Infinite Impulse response (IIR) digital filters.
C302.3	Design Finite Impulse response (FIR) digital filters.
C302.4	Analyze the finite Word length effects in digital filters.
C302.5	Explain the functionalities and architecture of DSP processors.
Course Code & Title : EC8552 Computer Architecture and Organization	
Course Index : C303	
Course Index	Course Outcomes
C303.1	Analyze the performance of the computer system and understand the different instructions formats in MIPS architecture.
C303.2	Illustrate the internals of arithmetic and logic units for fixed point and floating point operations.
C303.3	Describe the purposes of data path and control path, pipeline for execution of instructions and its hazards.
C303.4	Explain the various memory organizations with its performances, internal communications methodologies for I/O devices.
C303.5	Interpret the various parallel processing architectures, principles and their challenges.
Course Code & Title : EC8551 Communication Networks	
Course Index : C304	
Course Index	Course Outcomes
C304.1	Describe the concepts of the network fundamentals and different layers.
C304.2	Identify the components required to build different types of networks and internetworking protocols.
C304.3	Apply the concept of various protocols in routing and multicasting.

C304.4	Explain the flow of information from one node to another in the networks.
C304.5	Analyze the operations of various application layer protocols such as WWW, HTTP, and DNS.
Course Code & Title : EC6504 Medical Electronics	
Course Index : C305	
Couse Index	Course Outcomes
C305.1	Explain about the physiological parameters and recording methods.
C305.2	Analyze the bio-chemicals and various physiological information.
C305.3	Describe various assist devices used in hospitals.
C305.4	Explain the equipment used for physical medicine and the various recently developed diagnostic and therapeutic techniques.
C305.5	Apply the concepts of medical Instrumentation in recent technology (Radio pill, Telemedicine, Endomicroscopy unit).
Course Code & Title : OMD551- Basic of Bio Medical Instrumentation	
Course Index : C306	
Couse Index	Course Outcomes
C306.1	Study about the different bio potential and its propagation
C306.2	Understand the different types of electrodes and its placement for various recording
C306.3	Study about the different bio signal characteristics and electrode configuration
C306.4	Study the design of bio amplifier for various physiological recording
C306.5	Learn the different measurement techniques for non-physiological parameters.

Course Code & Title : EC8562 Digital Signal Processing Laboratory	
Course Index : C307	
Course Index	Course Outcomes
C307.1	Generate various signals using MATLAB and DSP processor
C307.2	Implement Linear and circular convolution programs and Frequency Analysis using DFT in MATLAB
C307.3	Implement Auto correlation and Cross Correlation using MATLAB
C307.4	Design FIR and IIR Filters using MATLAB and DSP Processor
C307.5	Analyze the architecture of a DSP Processor and to implement Up-sampling and Down-sampling operation in DSP Processor
Course Code & Title : EC8561 Communication Systems Laboratory	
Course Index : C308	
Course Index	Course Outcomes
C308.1	Analyze the effects of sampling and TDM
C308.2	Design AM & FM modulation and demodulation
C308.3	Implement Pulse Code Modulation and Delta Modulation
C308.4	Implement the signal constellations of Digital Modulation schemes
C308.5	Implement various Error control coding schemes
Course Code & Title : EC8563 Communication Networks Laboratory	
Course Index : C309	
Course Index	Course Outcomes
C309.1	Perform client-server communication between two desktop computers using Socket Programming.
C309.2	Implement the different protocols.
C309.3	Simulate various network topologies like Star, Bus and Ring.
C309.4	Implement and compare the different routing algorithms.
C309.5	Simulate the algorithms with the help of Network Simulator tool.

III Year – Semester-VI**Course Code & Title : EC8691 Microprocessors and Microcontrollers**
Course Index : C310**Couse
Index****Course Outcomes**

C310.1	Describe the architecture of microprocessor 8086 and execute programs based on 8086 microprocessor.
C310.2	Explain about design aspects of I/O and Memory Interfacing circuits.
C310.3	Interface 8086 microprocessors with supporting chips.
C310.4	Describe the architecture of microcontroller 8051.
C310.5	Implement 8051 microcontroller based systems.

Course Code & Title : EC8095 VLSI Design
Course Index : C311**Couse
Index****Course Outcomes**

C311.1	Realize the concepts of digital building blocks using MOS transistor.
C311.2	Design combinational MOS circuits and power strategies.
C311.3	Design and construct Sequential Circuits and Timing systems.
C311.4	Design arithmetic building blocks and memory subsystems.
C311.5	Apply and implement FPGA design flow and testing.

Course Code & Title : EC8652 Wireless Communications
Course Index : C312**Couse
Index****Course Outcomes**

C312.1	Elaborate the characteristics of a wireless channel and evolve the system design specifications
C312.2	Apply the various cellular concepts like frequency reuse, channel assignments, handoff strategies etc., in mobile communication.
C312.3	Analyze the performance of various digital signalling schemes of fading channels.
C312.4	Apply the multipath mitigation techniques based on the application.
C312.5	Implement the concept of transmit/receive diversity in MIMO systems.

Course Code & Title : MG8591 Principles of Management	
Course Index : C313	
Course Index	Course Outcomes
C313.1	Discuss the evolution of management, functions and roles of managers.
C313.2	Explain the different types of planning process and tools used for planning.
C313.3	Elaborate different organization structures and functions of human resources manager.
C313.4	Interpret the concepts in motivation techniques, leadership and communication processes
C313.5	Describe the control techniques and the role of technology in management.
Course Code & Title : EC8651 Transmission Lines and RF Systems	
Course Index : C314	
Course Index	Course Outcomes
C314.1	Analyze the various types of transmission lines and the losses associated.
C314.2	Analyze different parameters and constraints in high frequency transmission of information.
C314.3	Analyze impedance matching by stubs using smith charts.
C314.4	Analyze the characteristics of TE and TM waves in Guided systems.
C314.5	Design a RF transceiver system for wireless communication.
Course Code & Title : EC8002- Multimedia Compression & Communication	
Course Index : C315	
Course Index	Course Outcomes
C315.1	Design audio compression techniques
C315.2	Configure image compression techniques
C315.3	Configure video compression techniques
C315.4	Configure text compression techniques
C315.5	Select suitable service model for specific application

Course Code & Title : EC8681 Microprocessors and Microcontrollers Laboratory	
Course Index : C316	
Couse Index	Course Outcomes
C316.1	Write ALP programmes for arithmetic operation, logical operations and data movement using 8086 microprocessor instructions.
C316.2	Implement ALP programmes for code conversion, decimal arithmetic and matrix operations using 8086 instructions.
C316.3	Generate result for floating point operations, string manipulations, sorting, Searching, Password checking, Print RAM size, System Date, Counters and Time Delay using 8086 microprocessor and MASM software.
C316.4	Design 8086/8051 based systems using peripherals and interfaces.
C316.5	Calculate outputs for arithmetic operation, logical operation, square of a number and cube of a number using 8051 microcontroller/MASAM software.
Course Code & Title : EC8661 VLSI Design Laboratory	
Course Index : C317	
Couse Index	Course Outcomes
C317.1	Write HDL code for basic as well as advanced digital integrated circuits.
C317.2	Synthesize, Place and Route the digital circuits.
C317.3	Import the logic modules in to FPGA boards.
C317.4	Design, Simulate and Extract the layouts of the digital circuits using EDA platforms.
C317.5	Design and Simulate the analog circuits using EDA platforms.
Course Code & Title : EC8611 Technical Seminar	
Course Index : C318	
Couse Index	Course Outcomes
C318.1	Explain the significance of learning recent advancement in electrical and electronics engineering discipline.
C318.2	Review and prepare the State-of-art technologies in the present technological developments.

C318.3	Organize the presentation using the concepts of ordering and determining the central, main and supporting ideas.
C318.4	Present any topic in any recent advancement with good communicative skill in front of peers and faculty members.
C318.5	Perform well in placement recruitment drive with good technical skills and communication skills.
Course Code & Title : HS8581 Professional Communication	
Course Index : C319	
Course Index	Course Outcomes
C319.1	Exhibit soft skills and awareness of different cultures in varied contexts.
C319.2	Make effective presentations.
C319.3	Participate confidently in Group Discussions.
C319.4	Attend job interviews and be successful in them.
C319.5	Set short-term and long-term career goals.
IV Year – Semester-VII	
Course Code & Title : EC8701 Antennas and Microwave Engineering	
Course Index : C401	
Course Index	Course Outcomes
C401.1	Analyze the basic antenna parameters and link power budget.
C401.2	Describe the design and radiation mechanism of various types of antennas.
C401.3	Explain about the various kinds of antenna arrays.
C401.4	Explain the basic concept of various microwave devices
C401.5	Design a microwave system for the given application.
Course Code & Title : EC8751 Optical Communication	
Course Index : C402	
Course Index	Course Outcomes
C402.1	Apply the fundamental concept of optical fiber modes and their configurations.
C402.2	Analyze the various signal degradation factors associated with optical fiber.

C402.3	Explain the Various optical sources and optical detectors and their use in the optical communication system.
C402.4	Apply the techniques required to measure the optical fiber systems based on the applications.
C402.5	Analyze the Digital Transmission and its associated parameters on system performance
Course Code & Title : EC8791 Embedded and Real Time Systems	
Course Index : C403	
Course Index	Course Outcomes
C403.1	Explain the fundamental concepts of designing and the computing required for Embedded Systems.
C403.2	Describe the architecture and programming of ARM processor.
C403.3	Apply the programming concepts in embedded system.
C403.4	Analyze the techniques required for creating Real Time Embedded Systems.
C403.5	Apply the concepts of scheduling in Real Time Operating System and creating the model for Real Time applications.
Course Code & Title : EC8702 Adhoc and Wireless Sensor Networks	
Course Index : C404	
Course Index	Course Outcomes
C404.1	Explain the Basics of Adhoc networks and Wireless Sensor Networks
C404.2	Apply suitable routing algorithm based on network and user requirement
C404.3	Identify appropriate physical and MAC Layer protocols
C404.4	Describe the transport layer and security issues possible in wireless sensor networks
C404.5	Apply sensor network platforms and tools for various applications.
Course Code & Title : EC8071 Cognitive Radio	
Course Index : C405	
Course Index	Course Outcomes
C405.1	Analyze the design principles on software defined radio and cognitive radio.
C405.2	Analyze basic architecture and standards for cognitive radio.

C405.3	Develop the ability to design and implement algorithms for cognitive radio spectrum sensing and dynamic spectrum access.
C405.4	Analyze the MAC and Network layer design for cognitive radio.
C405.5	Apply the knowledge of advanced features of cognitive radio for real world applications.
Course Code & Title : OBM751 Basics of Human Anatomy and Physiology	
Course Index : C406	
Course Index	Course Outcomes
C406.1	Learn the basic components of formation of systems
C406.2	Identify all the organelles of an animal cell and their function.
C406.3	Understand structure and functions of the various types of systems of human body.
C406.4	Demonstrate their knowledge of importance of anatomical features and physiology of human systems
C406.5	Demonstrate their knowledge of importance of physiology of human systems
Course Code & Title : EC8711 Embedded Laboratory	
Course Index : C407	
Course Index	Course Outcomes
C407.1	Write programs in ARM for a specific Application.
C407.2	Interface memory with ARM processor and write a program related to memory operations.
C407.3	Interface A/D and D/A convertors with ARM system.
C407.4	Analyze the performance of interrupt.
C407.5	Write programs for interfacing keyboard, display, motor and sensor.
Course Code & Title : EC8761 Advanced Communication Laboratory	
Course Index : C408	
Course Index	Course Outcomes
C408.1	Analyze the performance of simple optical link by measurement of losses
C408.2	Analyze the mode characteristics of fiber, eye pattern and the impact on BER
C408.3	Estimate the wireless channel characteristics and analyze the performance of wireless communication system

C408.4	Understand the intricacies in microwave system design and analyze the characteristics of Directional Couplers, Isolators, Circulators
C408.5	Understand the characteristics of Gunn diode and Microwave IC filter

IV Year – Semester-VIII

Course Code & Title : GE8076 Professional Ethics in Engineering
Course Index : C409

Course Index	Course Outcomes
C409.1	Apply ethics, morals and human values in society
C409.2	Explain about engineering ethics
C409.3	Describe the responsibilities of engineers as experimenters
C409.4	Analyze the safety, risks, risk benefit analysis and rights of an engineer
C409.5	Discuss the importance of the global issues, moral leadership and code of conduct

Course Code & Title : EC8094 Satellite Communication
Course Index : C410

Course Index	Course Outcomes
C410.1	Determine the azimuth and elevation angles and visibility of a geostationary satellite from an earth station.
C410.2	Explain the concept of signal propagation of space segment components and create link budgets for an uplink and a downlink
C410.3	Analyze the effect of rain attenuation in a satellite link and the availability of the link based on geographic location of the earth terminals.
C410.4	Design satellite communication system to carry voice, video or data signals using analog or digital modulation.
C410.5	Analyze the various types of satellite services according to its applications.

Course Code & Title : EC8811 Project Work
Course Index : C411

Course Index	Course Outcomes
C411.1	Apply the fundamental knowledge and skills, which are acquired within the technical area, to a given problem
C411.2	Identify and summarize an appropriate list of literature review, analyze previous researchers work and relate them to the project Within given constraints, even with limited information, the students will be able to independently analyze and discuss complex inquiries/problems and handle larger problems on the advanced level within the technical area.

C411.3	Design engineering solutions to complex problems in a systematic approach. Identify and apply appropriate parameters, assumptions and design criteria in consideration of health and safety (example: the use of codes of practice), ethics, economics, environment, sustainability
C411.4	Apply research and conduct experiments, as well as to analyze and interpret data that yield the results and answer important applicable research questions.
C411.5	Utilize technology tools for communication, collaboration, information management, and decision support.
C411.6	Demonstrate the knowledge, skills and attitudes of a professional engineer.
C411.7	Interact with team members in a professional manner, respecting differences, to ensure a collaborative project environment.
C411.8	Demonstrate a strong working knowledge of ethics and professional responsibility.
C411.9	Document and present one's own work, for a given target group, with strict requirements on structure, format, and language usage.
C411.10	Present the project outlining the approach and expected results using good oral and written presentation skills.
C411.11	Demonstrate effective organizational leadership and change skills for managing projects and project teams.
C411.12	Recognize the need for life-long learning by undergoing the project work.