ESWAR COLLEGE OF ENGINEERING: NARASARAOPET
Approved by AICTE, New Delhi., Affiliated to JNTUK, Kakinada
Kesanupalli Village, Narasaraopet – 522 601,
Palnadu Dist. A.P.

Department of electronics and communication engineering

Course Outcomes

Regulation R20/19

Year/Sem: II B.Tech I SEM

Course Name: **Electronic Devices and Circuits**	
Course Code: **EC2101**	
EC2101.1	Apply the basic concepts of semiconductor physics.
EC2101.2	Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation.
EC2101.3	Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons
EC2101.4	Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations.
EC2101.5	Know the need of transistor biasing, various biasing techniques for BJT and FET and stabilization concepts with necessary expressions.
EC2101.6	Perform the analysis of small signal low frequency transistor amplifier circuits using BJT and FET in different configurations

Course Name: **Switching Theory and Logic Design**	
Course Code: **EC2102**	
EC2102.1	Classify different number systems and apply to generate various codes
EC2102.2	Use the concept of Boolean algebra in minimization of switching functions
EC2102.3	Design different types of combinational logic circuits.
EC2102.4	Apply knowledge of flip-flops in designing of Registers and counters
EC2102.5	The operation and design methodology for synchronous sequential circuits and algorithmic state machines.
EC2102.6	Produce innovative designs by modifying the traditional design techniques.

Course Name: **Signals and Systems**	
Course Code: **EC2103**	
EC2103.1	Differentiate the classification of signals as well as systems operations on signals and signal approximation.
EC2103.2	Analyse the spectral characteristics of continuous-time periodic and aperiodic signals using Fourier series
EC2103.3	Analyse the spectral characteristics of continuous-time periodic and aperiodic signals Using Fourier transform.
EC2103.4	Able to learn sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back

EC2103.5	Define and evaluate the concept of convolution and filters such as LPF,HPF,BPF ,correlation functions.
EC2103.6	Apply laplace-transform to analyze continuous--time signals and systems and z-transform to analyze discrete-time signals and systems.

Course Name: **Mathematics-III (Transforms and Vector Calculus)**	
Course Code: **EC2104**	
EC2104.1	State and prove vector Line, Surface and volume integral Theorems.State and prove Stokes and Green's theorems.
EC2104.2	Derive Laplace transform standard functions. Deduce inverse Laplace transform functions.
EC2104.3	Explain about Periodic functions , even and odd functions.Explain about Half range sine and cosine series. Explain Fourier transforms.State and prove Fourier integral theorem and problems.
EC2104.4	Explain Fourier Transforms. State and prove Fourier integral theorem and problems.
EC2104.5	Explain By eliminating Orbitary constants and Orbitary functions. Derive Legrangies equation and problems.
EC2104.6	Derive solutions of linear P.D.E with constant coefficientsand problems. Explain method of separation of variables and wave & heat equations.

Course Name: **Random Variables and Stochastic Processes**	
Course Code: **EC2105**	
EC2105.1	Able to Identify random variables and Define and manipulate distribution and densityfunctions.
EC2105.2	Able to Compute various operations like expectations, variances, etc. from probability density functions and probability distribution functions.
EC2105.3	Able to Characterize probability density and distribution function for multiple random variables
EC2105.4	Able to perform operations on Multiple random variables
EC2105.5	Explain the concept of random process, differentiate between stochastic and ergodic processes
EC2105.6	Illustrate the concept of random processes and determine covariance and spectral density of stationary random processes, Analyze the LTI systems with random inputs and understand the concept of noise

Course Name: OOPS through Java Lab	
Course Code: **EC2106**	
EC2106.1	Identify classes, objects, members of a class and the relationship among them needed for as pacific problem
EC2106.2	Implement programs to distinguish different forms of inheritance
EC2106.3	Create packages and to reuse them
EC2106.4	Develop programs using Exception Handling mechanism
EC2106.5	Develop multithreaded application using synchronization concept
EC2106.6	Design GUI based applications using Swings and AWT.

Course Name: Electronic Devices and Circuits Lab	
Course Code: **EC2107**	
EC2107.1	Ability to analyze PN junctions in semiconductor devices under various

	conditions.
EC2107.2	Ability to analyzeZener in semiconductor devices under various conditions.
EC2107.3	Ability to design and analyze simple rectifiers and voltage regulators using diodes
EC2107.4	Ability to design and analyze simple BJT and FET circuits.
EC2107.5	Know the CRO and CRO uses
EC2107.6	Ability to design and amplify the BJT and FET

Course Name: Switching Theory and Logic Design–Lab	
Course Code: **EC2108**	
EC2108.1	Test the operation of different logic gates using relevant IC's.
EC2108.2	Examine the operation of different combinational logic circuits.
EC2108.3	Apply the concept of Boolean algebra or k-maps to reduce and Construct logic circuit for given function
EC2108.4	Analyse the Truth tables of different Flip-Flops.
EC2108.5	Design of registers using sequential logic circuits.
EC2108.6	Design of Synchronous and Asynchronous counters using Flip-Flops

Course Name:Python Programming	
Course Code: **EC2109**	
EC2109.1	Know comprehensions in python
EC2109.2	Know generators in python
EC2109.3	Know exception handling in python
EC2109.4	Know file Input/output
EC2109.5	Understand various data types like lists, tuples, strings etc
EC2109.6	Know the usage of various pre-defined functions on the above data types

Year/Sem: II B.Tech II SEM

Course Name: Electronic Circuit Analysis	
Course Code: **EC2201**	
EC2201.1	Design and analysis of small signal high frequency transistor amplifier using BJT and FET.
EC2201.2	Design and analysis of multistage amplifiers using BJT and FET and Differential amplifier using BJT.
EC2201.3	Know the feedback amplifiers and feedback amplifier topologies
EC2201.4	Derive the expressions for feedback amplifiers Gain and impedance of input and output
EC2201.5	Derive the expressions for frequency ofoscillation and condition for oscillation of RC and LC oscillators and their amplitude and frequency stabilityconcept.
EC2201.6	Know the classification of the power and tuned amplifiers and their analysis with performance comparison.

Course Name: Digital IC Design
Course Code: **EC2202**

EC2202.1	Introduction of digital logic families and inter facing concepts for digital design is considered.
EC2202.2	VHDL fundamentals were discussed to modelling the digital system design blocks.
EC2202.3	Design and implementation of combinational and sequential digital logic circuits is explained.
EC2202.4	Model complex digital systems at several levels of abstractions, behavioural, structural, simulation, synthesis and rapid system prototyping.
EC2202.5	Analyze basic digital circuits with combinatorial circuits using VHDL.
EC2202.6	Analyze sequential logic circuits using VHDL Evaluate the basic design steps for Synchronous and Asynchronous Sequential Circuits.

Course Name: Analog Communications	
Course Code: **EC2203**	
EC2203.1	Understand modulation and demodulation Techniques of Amplitude modulation.
EC2203.2	Applying modulation and demodulation Techniques to DSB & SS
EC2203.3	Learn the basic concepts of Frequency modulation and also modulation and demodulation Techniques.
EC2203.4	Able to explain the principles of Radio Transmitters and Receivers.
EC2203.5	Analyse the Noise performance of AM, DSB, SSB and FM and Understand the generation and demodulation of pulse analog modulation techniques.
EC2203.6	Analyse Understand the generation and demodulation of pulse analog modulation techniques.

Course Name: Linear control Systems	
Course Code: **EC2204**	
EC2204.1	Explain the concepts of feedback and its advantages to various control systems
EC2204.2	Analyze the performance metrics to design the control system in time-domain
EC2204.3	Find the stability analysis for control systems
EC2204.4	Draw the root locus for control systems
EC2204.5	Analyze the performance metrics to design the control system in frequency-domain
EC2204.6	Analyze the state space approach for the analysis of control systems

Course Name: Management and Organizational Behaviour	
Course Code: **EC2205**	
EC2205.1	After completion of the Course the student will acquire the knowledge on management, Functions, global leadership and organizational structure.
EC2205.2	Will familiarize with the concepts of functional management that is HRM and Marketing of new product developments
EC2205.3	The learner is able to think in strategically through contemporary management practices.
EC2205.4	The learner may also know about the contemporary practices in concept
EC2205.5	The learner can develop positive attitude through personality development and can equip with motivational theories.
EC2205.6	The student can attain the group performance and grievance handling in managing the organizational culture.

Course Name: Electronic Circuit Analysis Lab	
Course Code: **EC2206**	
EC2204.1	Determination of fT for transistor
EC2204.2	Design different types of Amplifier and Oscillator circuits
EC2204.3	Simulate different types of Amplifier and Oscillator circuits using software tool
EC2204.4	Test different types of Amplifiers and Oscillator circuits using hardware.
EC2204.5	Design the power amplifiers using software and hard ware to
EC2204.6	Design the Tuned amplifiers to find the factor using software and hard ware to

Course Name: Analog Communications Lab	
Course Code: **EC2207**	
EC2207.1	Analyze the concepts, write and simulate the concepts of AM and AM Demodulation process in Communication.
EC2207.2	Know the origin and simulation of FM and FM-Demodulation process in communication
EC2207.3	Acquaint with AM and FM basic functionalities
EC2207.4	Discriminate the AM and FM functionalities
EC2207.5	Interpret with various angle modulation and demodulation systems
EC2207.6	Create the writing and simulation environments in PWM, PPM, Mixer and ring modulation

Course Name: Digital IC Design Lab	
Course Code: **EC2208**	
EC2208.1	Demonstrate a clear Understanding in hardware design language VHDL.
EC2208.2	Verify the logic behaviour of IC gates
EC2208.3	Model a Combinational circuit using VHDL and validate its functionality.
EC2208.4	Model a Sequential circuit using VHDL and validate its functionality
EC2208.5	Model a SHIFT REGISTERS using VHDL and validate its functionality
EC2208.6	Model MAC & ALU using VHDL and validate its functionality

Course Name: Soft Skills	
Course Code: **EC2209**	
EC2209.1	Use language fluently, accurately and appropriately in debates and group discussions
EC2209.2	Exhibit interview skills and develop soft skills
EC2209.3	Understand how to making meeting effective, Negotiation skills
EC2209.4	Use their skills of listening comprehension to communicate effectively in cross-cultural contexts
EC2209.5	Learn and use new vocabulary
EC2209.6	Write resumes, project reports and reviews.

Course Name: Constitution of India

Course Code: **EC2210**	
EC2210.1	Understand historical background of the constitution making and its importance for building a democratic India.
EC2210.2	Understamd the function of Union Government and its Administration Secretariat, LokSabha, RajyaSabha,
EC2210.3	The Supreme Court and High Court: Powers and Functions;
EC2210.4	Understand the structure of state government & Central Government
EC2210.5	Analyze the decentralization of power between central, state and local self-government
EC2210.6	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.

Year/Sem: III B.Tech I SEM

Course Name: Analog ICs and Applications	
Course Code **EC3101**	
EC3104.1	Describe the characteristics of operational amplifiers.
EC3104.2	Design the various linear and non-linear applications of op-amp.
EC3104.3	Design the Active filters using Operational Amplifier
EC3104.4	Describe the Op-Amp and internal Circuitry: 555 Timer, PLL
EC3104.5	Discuss the Applications of Operational amplifier: 555 Timer, PLL
EC3104.6	Use the Op-Amp in A to D & D to A Converters

Course Name: Electromagnetic Waves and Transmission Lines	
Course Code: **EC3102**	
EC3102.1	Acquire knowledge on various types of transmission lines, derive transmission-line equations from a circuit model in terms of primary and secondary constants
EC3102.2	Derive and Calculate the expressions for input impedance of transmission lines, reflection coefficient, VSWR etc. using smith chart
EC3102.3	Determine E and H using various laws and applications of electric & magnetic fields
EC3102.4	Apply the Maxwell equations to analyze the time varying behaviour of EM waves

EC3102.5	Gain the knowledge in uniform plane wave concept and characteristics of uniform plane wave in various media
EC3102.6	. Calculate Brewster angle, critical angle and total internal reflection

Course Name: Digital Communications	
Course Code: **EC3103**	
EC3103.1	Define and Determine the performance of pulse digital modulation techniques such as PCM,DPCM,DM,ADM.
EC3103.2	Elaborate the principles of digital modulation techniques like ASK, FSK, PSK, DPSK, and QPSK.
EC3103.3	Determine the probability of error for digital modulation schemes such as FSK,ASK, BPSK
EC3103.4	Determine the probability of error for digital modulation schemes such as BPSK, BFSK, and QPSK.
EC3103.5	Understand the concept of digital information over the channel, Analyze different source coding techniques Shanon-Fano coding, Huffman coding etc.
EC3103.6	Able to Compute and analyze different error control coding schemes along with different domain approaches.

Course Name: **Open Elective Course-1 (Renewable Energy Sources)**	
Course Code: **EC3104**	
EC3104.1	Analyze solar radiation data, extra-terrestrial radiation, radiation on earth's surface and Solar energy storage
EC3104.2	Illustrate the components of Wind energy systems
EC3104.3	Illustrate the working of bio digesters
EC3104.4	Illustrate the working of geothermal plants
EC3104.5	Demonstrate the principle of energy production from OTEC, Tidal and Waves
EC3104.6	Explain the concept and working of Fuel cells & MHD Power generation

Course Name: **Professional Elective courses -1 (Electronic Measurements and Instrumentation)**	
Course Code: **EC3105**	
EC3105.1	Select the instrument to be used based on the requirements.
EC3105.2	Understand and analyze different signal generators and analyzers.
EC3105.3	Understand the design of oscilloscopes for different applications
EC3105.4	Understand the design of Digital oscilloscopes for different applications
EC3105.5	Design and derive the different bridges
EC3105.6	Design different transducers for measurement of different parameters

Course Name: **Analog ICs and Applications LAB**	
Course Code: **EC3106**	
EC3106.1	Design and analyse the various linear application of op-amp
EC3106.2	Design and analyse the various non-linear application of op-amp
EC3106.3	Design and analyse filter circuits using op-amp
EC3106.4	Design and analyse oscillators and multivibrator circuits using op-amp
EC3106.5	Design and analyse the various application of 555 timer

EC3106.6	Analyse the performance of oscillators and multivibrators using PSPICE.

Course Name: **Digital Communications Lab**	
Course Code: **EC3107**	
EC3107.1	Able to understand basic theories of Digital communication system in practical.
EC3107.2	Able to design and implement different modulation and demodulation techniques.
EC3107.3	Able to analyze digital modulation techniques
EC3107.4	Able to identify and describe different techniques in modern digital communications, in particular in source coding
EC3107.5	Able to perform channel coding.
EC3107.6	Able to detect and correct errors using LBC,Binary Cyclic codes & detect dual bit errors in Convolution codes

Course Name: **Data Structures using Java Lab**	
Course Code: **EC3108**	
EC3108.1	To examine the components that form an abstract data type(ADT),also implement a programmer – defined ADT in Java
EC3108.2	Create to implementations of the Stack ADT and Queue ADT one based on an array representation of stack and the other based on a singly linked list representation.
EC3108.3	Determining and Analyzing the execution times of sorting and searching routines .
EC3108.4	Computation of shortest paths by dfs and bfs for a given graph
EC3108.5	Simulating the flow of tasks in an operating system using priority queue ADT
EC3108.6	Computation of shortest paths by dfs and bfs for a given graph Implementation of KMP pattern matching algorithm using JAVA.

Course Name: **Indian Traditional Knowledge**	
Course Code: **EC3109**	
EC3109.1	Identify the concept of Traditional knowledge and its importance.
EC3109.2	Explain the need for and importance of protecting traditional knowledge
EC3109.3	Illustrate the various enactments related to the protection of traditional knowledge.
EC3109.4	Interpret the concepts of Intellectual property to protect the traditional knowledge.
EC3109.5	Explain the importance of Traditional knowledge in Agriculture and Medicine.
EC3109.6	Explain the importance of Traditional knowledge in Agriculture and Medicine.

Course Name: **Summer Internship 2 Months**	
Course Code: **EC3110:**	
EC3104.1	Understanding the modern tools used in the field of Electronics and Communication engineering for product development
EC3104.2	Work in real time situations in industries through hands on job execution
EC3104.3	Apply theoretical aspects to solve engineering problems in the industries
EC3104.4	Understand the resources requirement and planning to facilitate the

	Internship success.

Year/Sem: III B.Tech II SEM

Course Name: **Microprocessor and Microcontrollers**	
Course Code: **EC3201**	
EC3201.1	To be able to understand the microprocessor capability in general and explore the evaluation of microprocessors
EC3201.2	To be able to understand the addressing modes of microprocessors
EC3201.3	To be able to understand the micro controller capability
EC3201.4	To be able to program MP&MC
EC3201.5	To be able to interface MP & MC with other electronic devices
EC3201.6	To be able to understand the ARM processor architecture

Course Name: **VLSI Design**	
Course Code: **EC3202**	
C3204.1	Demonstrate a clear understanding of CMOS fabrication flow and technology scaling.
C3204.2	Apply the design Rules and draw layout of a given logic circuit
C3204.3	Design MOSFET based logic circuit. Design basic building blocks in Analog IC design.
C3204.4	Analyze the behaviour of amplifier circuits with various loads
C3204.5	Design various CMOS logic circuits for design of Combinational logic circuits.
C3204.6	Design MOSFET based logic circuits using various logic styles like static and dynamic CMOS

Course Name: **Digital Signal Processing**	
Course Code: **EC3203**	
EC3203.1	Apply the difference equations concept in the analyzation of Discrete time systems
EC3203.2	Able to apply the FFT algorithm for solving the DFT of a given signal
EC3203.3	Student can able to design a Digital filter (IIR) from the given specifications and Realize the IIR Structures.
EC3203.4	Design a Digital filter (FIR) from the given specifications and Realize the FIR Structures.
EC3203.5	Use the Multirate Processing concepts in various applications Such as Design of phase shifters, Interfacing of digital systems.
EC3203.6	Able to learn the architecture of DSP Processor and addressing modes.

Course Name: **Professional Elective courses – 2 (Mobile & Cellular Communication)**

Course Code: **EC3204**	
EC3204.1	Introduction to Cellular Mobile System, Cellular Concepts
EC3204.2	Types of interferences, Co-channel Interference Reduction Factor, non-co-channel interference-different types.
EC3204.3	Frequency management And Channel Assignment, Numbering and grouping
EC3204.4	Cell Coverage For Signal , phase difference between direct and reflected paths
EC3204.5	TRAFFIC Concept of Handoff, types of handoff, soft and hard hand offs,
EC3204.6	Digital Cellular Networks, GSM architecture, TDMA, CDMA, OFDMA

Course Name: **Open Elective Course/Job oriented elective -2 (Computer Networks)**	
Course Code: **EC3205**	
EC3205.1	Demonstrate different network topologies, reference models OSI, TCP/IP, methods and protocol standards, Identification and working mechanism of transmission media
EC3205.2	Demonstrate the various services provided by Data link layer, flow and error controlling by HDLC and PPP.
EC3205.3	Compare and Classify medium access control protocols like ALOHA, CSMA, CSMA/CD, CSMA/CA, Polling, Token passing, FDMA, TDMA, CDMA protocols
EC3205.4	Demonstrate the various Wired LAN protocols used for data transmission.
EC3205.5	Able to demonstrate how the packets are routed using network layer protocols, Congestion Control, traffic controlling in network, Addressing and internet routing is demonstrated.
EC3205.6	Demonstrated the User datagram and transport datagram, error and flow control mechanism at high layers. Determine application layer services and client server protocols working with the client server paradigms.

Course Name: **Microprocessor and Microcontrollers - Lab**	
Course Code: **EC3206**	
EC3204.1	The student will learn the internal organization of popular 8086/8051 microprocessors/microcontrollers
EC3204.2	Explain 80x86/80x51instruction set and gain the knowledge how assembly language works
EC3204.3	The student will learn hardware and software interaction and integration.
EC3204.4	To apply the concepts in the design of microprocessor/microcontroller based systems in real time applications
EC3204.5	Make use of standard test and measurement equipment to evaluate digital interfaces.
EC3204.6	To understand the KEIL MDK software

Course Name: **VLSI Design Lab**	
Course Code: **EC3207**	
EC3204.1	Understand the physical design process of Digital Integrated Circuits.
EC3204.2	Describe procedure for designing of programmable circuits.
EC3204.3	Demonstrate the ability to use various EDA tools for digital system

	design
EC3204.4	Demonstrate the ability to use various Mentor Graphics Software for digital system design
EC3204.5	Implement various combinational and sequential circuits using VHDL on FPGA.
EC3204.6	Implement schematic and layout of various digital CMOS logic circuits using EDA tools.

Course Name: Digital Signal Processing Lab	
Course Code: EC3208	
EC3208.1	Carryout basic signal processing operations
EC3208.2	Design and Implement the FIR and IIR Filters using MATLAB
EC3208.3	Demonstrate their abilities towards MATLAB based implementation of various DSP systems
EC3208.4	Analyze the architecture of a DSP Processor
EC3208.5	Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals
EC3208.6	Design a DSP system for various applications of DSP

Course Name: **ARM based/ Aurdino based Programming**	
Course Code: **EC3209**	
EC3209.1	Comprehend Microcontroller-Sensors Interface techniques
EC3209.2	Comprehend Microcontroller-Transducers Interface techniques
EC3209.3	Establish Serial Communication link with Arduino
EC3209.4	Analyze basics of SPI interface
EC3209.5	Interface Stepper Motor with Arduino
EC3209.6	Analyze Accelerometer interface techniques

Course Name: **Research Methodology**	
Course Code: **EC3210**	
EC3210.1	Explain key research concepts and issues
EC3210.2	Read, comprehend, and explain research articles in their academic discipline
EC3210.3	Fundamentals of Research Methodology.
EC3210.4	Quantitative methods
EC3210.5	Decision making on research topics.
EC3210.6	Identifying sources of research problems

Year/Sem: IV B.Tech I SEM

Course Name: **Digital Image and Video Processing**	
Course Code **EC4103**	
EC4103.1	Know the fundamentals of a digital image processing; representation of digital images in transform domain; and various mathematical transforms necessary for image processing.
EC4103.2	Learn and implement various Intensity transformations and spatial filtering methods in image enhancement and image restoration process.
EC4103.3	To know Image Restoration and Reconstruction process by using different mathematical approaches.
EC4103.4	To understand compressing images by using different mathematical approaches.
EC4103.5	To know image segmentation by the detection of point, line and edges in images, edge linking through local/global processing.
EC4103.6	To know Image Restoration process by using different mathematical approaches.

Course Name: **Embedded Systems**	
Course Code: **EC4105**	
EC4105.1	Understand the design process of an embedded system
EC4105.2	Understand typical embedded System & its components
EC4105.3	Understand embedded firmware design approaches
EC4105.4	Learn the basics of OS and RTOS
EC4105.5	Analyze various protocols of Web communication & Message communication for connected devices and Web connectivity for connected-devices
EC4105.6	Analyze various protocols of Web communication & Message communication for connected devices

Course Name: **Smart Sensors**	
Course Code: **EC4104**	
EC4104.1	understand the selection criterions of various sensors for industrial applications
EC4104.2.	Apply the complete understanding of various sensors in development of interfaces for various applications
EC4104.3	Understand Smart sensor architecture and its use in real word applications
EC4104.4	Demonstrate the understanding of miniaturized design of sensors in form of MEMS and NEMS
EC4105.5	Describe the network architectures and communication protocols for sensor networks
EC4105.6	Demonstrate the understanding of miniaturized design of sensors in form of MEMS

Course Name: **Microwave & Optical Communication Engineering**	
Course Code: **EC4101**	
EC4101.1	Understand the significance of microwaves and microwave transmission lines
EC4101.2	Analyze the characteristics of microwave tubes and compare them
EC4101.3	Be able to list and explain the various microwave solid state devices
EC4101.4	Can set up a microwave bench for measuring microwave parameters

EC4101.5	Verify frequency range of Radar
EC4101.6	Analyze the characteristics of microwave tubes

Course Name:	**Data Communications & Computer Networks**
Course Code: EC4102	**Course Outcomes**
EC4102.1	Know the Categories and functions of various Data communication Networks
EC4102.2	Design and analyze various error detection techniques.
EC4102.3	Know the Functioning of various Network layer Protocols
EC4102.4	Demonstrate the mechanism of routing the data in network layer
EC4102.5	Know the significance of various Flow control and Congestion control Mechanisms
EC4102.6	Know about the various Network layer Protocols

Course Name: **Internet Of Things Lab**	
Course Code: **EC4106**	
EC4106.1	Interface various input and output devices with Raspberry pi.
EC4106.2	Design the minimum system for sensor-based application.
EC4106.3	Solve the problems related to the primitive needs using IoT.
EC4106.4	Develop full-fledged IoT application for distributed environment.
EC4106.5	Devolop and Design sensor based application
EC4106.6	Solve the problems

Course Name: **Project Part-I**	
Course Code: **EC4108**	
EC4108.1	Work on proposed engineering solution as per industry need
EC4108.2	Customize various tools and techniques needed for project development.
EC4108.3	Understand significance of safe and ethical practices during project.

Course Name: **Microwave & Optical Communications Lab**	
Course Code: **EC4107**	
EC4107.1	Able to handle microwave equipment

EC4107.2	Able to understand microwave measurements
EC4107.3	Able to understand Wave guide and antenna measurements
EC4107.4	Able to understand Wave guide and klystron measurements
EC4107.5	Able to understand Wave guide and measurements
EC4107.6	Able to understand klystron measurements

Year/Sem: IV B.Tech II SEM

Course Name: **Project Part-II**	
Course Code: **EC4201**	
EC4201.1	Work on proposed engineering solution as per industry need
EC4201.2	Customize various tools and techniques needed for project development.
EC4201.3	Understand significance of safe and ethical practices during project.
EC4201.4	Work in a team with healthy working environment
EC4201.5	Develop skill to present project related activities effectively to peers and mentors.
EC4201.6	Develop skill to innovate the developed project and convert it in form of product for industrial / societal need.

Course Name: **CS&CG**	
Course Code: **EC4202**	
EC4202.1	Students will be able to describe the fundamental algorithms used in computer graphics and to some extent be able to compare and evaluate them
EC4202.2	Students will be able to work and interact, through hands-on experiences, to design, develop, and modify electronically generated imaginary using a wide range of sophisticated graphical tools and techniques.
EC4202.3	Students will be able to summarize different hidden surface elimination algorithms and shading techniques used in computer graphics and digital media production.
EC4202.4	Students will be able to explain about the technology necessary for creating multimedia content for the web, video, DVD, 2D and 3D graphics, Sound and programming
EC4202.5	Students can apply the knowledge, techniques, skills and modern tools to become successful professionals in communication and media industries
EC4202.6	Students will be able to explain about the technology necessary for creating multimedia content for the web, video, DVD, 2D and 3D graphics

Course Name: **Wireless Communication**	
Course Code: **EC4201**	
EC4201.1	Describe the principles of wireless communications networking and cellular system design concepts
EC4201.2	Distinguish various multiple access schemes used in wireless communications
EC4201.3	Explain wireless wide area network and their performance analysis
EC4201.4	Define equalizer and classify the various diversity techniques
EC4201.5	Compare existing and emerging wireless standards
EC4201.6	Explain wireless wide area network