REGULATION: R15

Code	COURSE OUTCOMES	K.Level
	I B.TECH I SEM	
C111	**Functional English**	**K.Level**
C111.1	Practise conversational skills for effective communication in both social and academic contexts.	**K3**
C111.2	Apply the correct structure in written expressions required for their professional prospects.	**K3**
C111.3	Develop e-communication skills, listening skills and also writing skills required to prepare projects.	**K3**
C111.4	Take part in group discussions, writing reviews and develop critical thinking skills.	**K4**
C111.5	Develop communicative competence with emphasis on professional skills	**K3**
C112	**Mathematics - I**	**K.Level**
C112.1	Analyze the mathematical knowledge to solve differential equations in engineering applications.	**K4**
C112.2	Apply the linear D.E's Mechanical and Electrical Oscillatory circuits and Deflection of Beams	**K3**
C112.3	Apply multiple integration and curve tracing to solve the real time problems in engineering.	**K3**
C112.4	Apply Laplace Transformations to solve engineering problems related to Mathematics.	**K3**
C112.5	Convert the real time problems into vector calculus and then find its solution.	**K2**
C113	**Computer Programming**	**K.Level**
C113.1	Illustrate basics of computers, concepts of algorithm , flowchart, programming terminology andapply various C-tokens & Input and Output statements to solve simple problems.	**K3**
C113.2	Apply selection,loop,branch control statements and arrays to solve different applications.	**K3**
C113.3	Examine pointers for implementing direct access of memory locations and the necessity of modularity in programming.	**K4**
C113.4	Solve various data base related problems by using non-homogeneous data structures.	**K3**
C113.5	Utilize the concepts and need of files in programming and implement file operations.	**K3**

Code	COURSE OUTCOMES	K.Level
C115	**Environmental Science**	**K.Level**
C115.1	Comprehend the concepts of environment and its importance in our daily life and develop and apply various water conservation methods and conservation of other natural resources also.	**K2**
C115.2	Categorize an ability to reflect on their personal impacts on biodiversity in global perspective.	**K2**
C115.3	Develop new innovative methods for controlling of environmental pollution which may affecte the human health.	**K3**
C115.4	Analyze environmental issues related to society and find solutions for environmental problems.	**K4**
C115.5	Determine the effects of increasing human population as well as health associated problems and develop measures to be taken to protect human health.	**K4**
C116	**English Language Communication Skills Lab**	**K.Level**
C116.1	Distinguish the speech sounds and acquire better pronunciation	**K4**
C116.2	Develop oral fluency and neutralize mother tongue influence.	**K3**
C116.3	Take part actively in the learning process and become expertise in Presentation Skills like Oral, Poster, Power Point and other necessary speaking skills	**K4**
C116.4	Apply language skills appropriately and effectively in interviews, group discussions and public speaking activities	**K3**
C116.5	Take part in group activites with more confidence thereby enhancing the employability skills	**K4**
C117	**Engineering Chemistry Lab**	**K.Level**
C117.1	Develop skills in determining the effects of hard water in water	**K3**
C117.2	Distinguish different types of titrations in the volumetric analysis	**K4**
C117.3	Apply Conductometry instrumental method in volumetric analysis to determine the concentration of a given HCL solution by titration against a Standard NaOH solution	**K3**
C117.4	Correlate the purity of water samples by doing D.O, Acidity and alkalinity estimations	**K4**
C117.5	Analyze the effect of temperature on viscosity by using Redwood viscometer	**K4**
C118	**Computer Programming Lab**	**K.Level**
C118.1	Demonstrate DOS and Linux Commands	**K2**
C118.2	Illustrate the syntax and semantics of C language for simple problem statements.	**K2**
C118.3	Develop the programs using arrays, strings operations	**K3**
C118.4	Write programs that perform operations using derived data types.	**K3**
C118.5	Develope C programming for a given application uing file operations.	**K3**

Code	COURSE OUTCOMES	K.Level
	I B.TECH II SEM	
C121	**English for Professional Communication**	**K.Level**
C121.1	Take part effectively in group discussions and debates.	**K4**
C121.2	Develop writing skills required in various professional contexts.	**K3**
C121.3	Employ presentation skills and creative writing skills effectively.	**K3**
C121.4	Analyse a variety of technical writing formats and styles.	**K4**
C121.5	Develop a proper level of language competence for employability.	**K3**
C122	**Mathmatics II**	**K.Level**
C122.1	Apply the Laplace Transform to solve the ordinary of first and second order	**K3**
C122.2	Find the fourie series representation of a one variablefunction	**K4**
C122.3	Demonstate their understanding of the dirichlet conditions by using them to evaluate infinite series	**K2**
C122.4	Attain the knowledge od partial differrential equation and aplying in Mechanical problems	**K4**
C122.5	Apply Fourier and Z-transformers to find the solutions for engineering poblems	**K3**
C123	**Network Analysis**	**K.Level**
C123.1	Apply the various Circuit Analysis Techniques to the electrical circuits	**K3**
C123.2	Analyse the DC Transients in electrical networks	**K4**
C123.3	Analyse the Steady State sinsoidal quantities in electrical networks	**K4**
C123.4	Analyze series and parallel resonant circuits	**K4**
C123.5	Apply the various basics of filter techniques and two-port network principles	**K3**
C124	**Engineering Physics**	**K.Level**
C124.1	Apply the basic fundamentals of physics and their applications in both scientific and technological systems.	**K3**
C124.2	Describe the properties of crystals along with Ultrasonic non destrictive technique.	**K2**
C124.3	Analyze the physical properties of materials through Quantum mechanics along with band theory.	**K4**
C124.4	Apply the concepts of Semiconducting and magnetic materials to Engineering fields.	**K3**
C124.5	Discuss the importance of Superconducting and Nano materials in various fileds.	**K2**

Code	COURSE OUTCOMES	K.Level
C125	**Engineering Drawing**	**K.Level**
C125.1	Apply the geometrical constructions and classify the engineering /mathematical curves used in engineering applications	**K3**
C125.2	Explain various kinds of scales and their practical usage and basics of orthographic projections.	**K3**
C125.3	Analyze the geometrical objects in two dimensional objects.	**K4**
C125.4	Analyze the visualization of geometrical solids in three dimensional through exercise in orthographic projections.	**K4**
C125.5	Analyze the detailed views of the isometric and orthographic views of different objects.	**K4**
C126	**Network Analysis Lab**	**K.Level**
C126.1	Analyze the various network theorems	**K4**
C126.2	Evaluate the frequency response of series and parallel resonance circuits	**K5**
C126.3	Analyze the Transient response of series DC Circuits	**K4**
C126.4	Design the frequency response of various filters	**K5**
C127	**Engineering Physics Lab**	**K.Level**
C127.1	Analyze the importance of Interference & Diffraction of light	**K4**
C127.2	Apply Lasers & Fiber optics to measure various parameters	**K3**
C127.3	Calculate the Energy gap of Semiconductor laser diode	**K3**
C127.4	Apply the applications of magnetic materials in day to day science	**K3**
C128	**Engineering and IT Workshop**	**K.Level**
C128.1	Design the sheet metal objects by surface development and join the metals for obtaining desired shape.	**K5**
C128.2	Identify the internal parts of computer and its pheripheral	**K2**
C128.3	Demonstrate Assemble and disassemble a Personal Computer and prepare the computer ready to use.	**K2**
C128.4	Develop skills in installation of Linux and Windows XP OS and to connect network for information sharing.	**K3**
C128.5	Illustrate how to Access the Internet and Browse it to obtain the required information.	**K2**

Code	COURSE OUTCOMES	K.Level
	II B.TECH I SEM	
C211	**Mathematics – III**	**K.Level**
C211.1	Solve engineering problems by applying the concept of matrices	K3
C211.2	Interpret and solve non- linear equations with a single variable.	K2
C211.3	Apply numerical methods for various mathematical operations such as Interpolation , Differentiation , Integration.	K3
C211.4	Apply curve-fitting techniques for data representations and computation in engineering analysis.	K3
C211.5	Compare numerical solutions of ordinary differential equations with the method of successive approximations.	K4
C212	**Electronic Devices and Circuits**	**K.Level**
C212.1	Construct electronic circuits using various diodes.	K3
C212.2	Develope LMPS(Linear Mode Power Supply) units using rectifiers,filters & regulators.	K3
C212.3	Demonstrate the construction, working and characteristics of BJT, JFET and MOSFET in various modes	K4
C212.4	Analyze DC bias circuits for BJT and FET Amplifiers.	K4
C212.5	Analyse transistor amplifier circuits using BJT & FET	K4
C213	**Switching Theory & Logic Design**	**K.Level**
C213.1	Utilize Boolean algebra, Number systems and logic gates in the development of logic circuits.	K3
C213.2	Apply K-Map & Tabular Methods to minimize logic functions.	K3
C213.3	Design different combinational Logic circuits.	K5
C213.4	Design different Sequential Logic circuits and their Applications.	K5
C213.5	Design different combinational logic circuits using PLDs.	K5
C214	**Signals and Systems**	**K.Level**
C214.1	Apply Fourier series to analyze periodic signals and their spectra.	K3
C214.2	Analyze continuous time signals using Fourier transform	K4
C214.3	Examine signal transmission through linear systems	K4
C214.4	Analyze discrete time signals using discrete time Fourier transform	K4
C214.5	Apply Laplace and z transform to analyze continuous & discrete time systems	K3

Code	COURSE OUTCOMES	K.Level
C215	**Probability Theory & Stochastic Processes**	**K.Level**
C215.1	Analyze various probability density functions of random variables.	**K4**
C215.2	Apply the concepts of Multiple random variables in communication systems.	**K3**
C215.3	Solve the engineering problems involving random processes.	**K3**
C215.4	Analyze the spectral characteristics of random process	**K4**
C215.5	Analyze the response of Linear system with random inputs and also compare different spectral band random process	**K4**
C216	**Electrical Technology**	**K.Level**
C216.1	Explain the operation and construction of DC generators using EMF equation	**K3**
C216.2	Explain the operation and construction of DC motor using torque equation.	**K3**
C216.3	Analyze the Operating Principle and design aspects of Single phase transformers.	**K4**
C216.4	Analyze the Operating Principle and design aspects of Three phase induction motors.	**K4**
C216.5	Interpret the principle, constructional features of different synchronous machines.	**K2**
C217	**Electronic Devices & Circuits Lab**	**K.Level**
C217.1	Compute the parameters of Diodes and transitors from the characteristics	**K3**
C217.2	Demonstrate the rectifier and voltage regulator circuits using diodes.	**K3**
C217.3	Construct various amplifiers using BJTs and FETs .	**K3**
C217.4	Analyze the characterstics of SCR and UJT.	**K4**
C218	**Electrical Technology and Basic Simulation Laboratory**	**K.Level**
C218.1	Explain the magnetization characteristics of DC generator & motor and find critical field resistance & efficiency	**K3**
C218.2	Demonstrate the OC & SC test of single phase transformer & find the efficiency	**K3**
C218.3	Apply the various operations on Continuous and Discrte time signals	**K3**
C218.4	Analyze the LTI systems using transforms	**K4**

Code	COURSE OUTCOMES	K.Level
II B.TECH II SEM	
C221	**Mathematics-IV**	**K.Level**
C221.1	Apply the Frobenius method to obtain a series solution for the given linear second order Ordinary Differential equations.	**K3**
C221.2	Solve the engineering problems using Bessel functions and Legendre's polynomials.	**K3**
C221.3	Analyze the complex functions with reference to their analyticity.	**K4**
C221.4	Apply Taylor's & Laurent's series to solve complex functions.	**K3**
C221.5	Solve improper integrals by using residue method	**K3**
C222	**Electronic Circuit Analysis**	**K.Level**
C222.1	Analyze the various feedback Amplifiers & Oscillators.	**K4**
C222.2	Analyze the Small signal high frequency transistor Amplifier model for CE Configuration.	**K4**
C222.3	Apply the concepts of h-parameter to analyze the Multi stage amplifiers and differential amplifiers	**K3**
C222.4	Examine the design aspects of different power amplifiers	**K3**
C222.5	Examine the design aspects of different tuned amplifiers	**K3**
C223	**Analog Communication Systems**	**K.Level**
C223.1	Analyze the Amplitude modulation & demodulation systems in time & frequency domains	**K4**
C223.2	Analyze the Angle modulation & demodulation systems in time & frequency domains	**K4**
C223.3	Analyze the performance of anaolg communication system in the presence of noise.	**K4**
C223.4	Analyze different discrete modulation & demodulation techniques	**K4**
C223.5	Solve basic coomunication problems & calculate information rate and channel capacity of discrete communication channel.	**K3**
C224	**Electromagnetic Theory &Transmission Lines**	**K.Level**
C224.1	Analyze and solve the problems of electric and magnetic fields that vary with time and space	**K4**
C224.2	Apply Maxwell's equations in solving electromagnetic field equations.	**K3**
C224.3	Analyze electromagnetic wave propagation in different media.	**K4**
C224.4	Explain the concept of transmission lines and their applications.	**K3**
C224.5	Analyze and design various impedance matching techniques	**K4**

Code	COURSE OUTCOMES	K.Level
C225	**Data Structures**	**K.Level**
C225.1	Apply the concept of arrays with asymptotic notations in building linear and non linear data structures.	**K3**
C225.2	Analyze stacks, queues and linked list using dynamic memory allocation.	**K4**
C225.3	Develope algorithms for trees and graphs	**K3**
C225.4	Compare and implement different sorting techniques	**K4**
C225.5	Build different searching techniques and hashing methods.	**K3**
C226	**Control Systems Engineering**	**K.Level**
C226.1	Apply mathematical models , signalflow graph & Block diagram representation to determine transfer function of control systems .	**K3**
C226.2	Analyse the time domain responses of first and second-order systems.	**K4**
C226.3	Analyse control systems by applying Routh-Hurwitz and root-locus techniques.	**K4**
C226.4	Apply Bode plot, Polar & Nyquist plot concepts to analyze the control systems in frequency domain	**K3**
C226.5	Apply state space model for a given physical system and solve the state equations	**K3**
C227	**Electronic Circuit Analysis Laboratory**	**K.Level**
C227.1	Analyze the single and multistage amplifiers at low, mid and high frequencies using simulation software and Hardware.	**K4**
C227.2	Analyze the transistor oscillators using simulation software and Hardware.	**K4**
C227.3	Determine the efficiencies of power amplifiers using simulation software.	**K3**
C227.4	Analyze Frequency response of tuned amplifiers using hardware and multisim soft ware.	**K4**
C228	**Analog Communication Systems Laboratory**	**K.Level**
C228.1	Analyze behaviour of analog modulations systems in the time domain	**K4**
C228.2	Analyze behaviour of pulse modulations systems in the time domain	**K4**
C228.3	Illustrate the characteristics of radio receiver and antenna measurements	**K3**
C229	**Comprehensive Online Exam I**	**K.Level**
C229.1	Acquire fundamental engineering knowledge	**K2**
C229.2	Demonstrate the ability to navigate skills and online learning	**K2**
C229.3	Apply the concept of problem solving ability in competitive exams	**K3**

Code	COURSE OUTCOMES	K.Level
III BTECH I SEM		
C311	**Computer Organization**	**K.Level**
C311.1	Analyze different functional units, bus structure and addressing modes in computer.	K4
C311.2	Explain the functional units of the processor such as register file and ALU	K3
C311.3	Differentiate the use of main memory, cache memory and virtual memory in the computer system.	K4
C311.4	Explain the input/output interfaces & memory organization	K3
C311.5	Apply the concepts of the pipelining and basic characteristics of multiprocessors.	K3
C312	**Antennas and Wave Propagation**	**K.Level**
C312.1	Explain the basics of antenna parameters & radiation pattern	K3
C312.2	Design VHF,UHF and Microwave antennas	K5
C312.3	Analyze the construction of micro strip, flat sheets, corner and parabolic reflector antennas.	K4
C312.4	Design the antenna arrays & Make use of antenna measurements to assess antenna's performance	K5
C312.5	Explain different modes of wave propagation in free space & mechanism of the atmospheric effects on radio wave propagation.	K3
C313	**Digital Communication Systems**	**K.Level**
C313.1	Apply the fundamentals concepts of sampling theorem along with different coding and modulation techniques in communication systems.	K3
C313.2	Differentiate the basic principles of baseband and passband digital modulation schemes.	K4
C313.3	Employ the Geometric Representation of Signals in Signal Space.	K3
C313.4	Analyze the different modulation & demodulation for band pass data transmission and their probability of error	K4
C313.5	apply different channel encoding techniques for error detection and correction.	K3
C314	**Linear Integrated Circuits and Applications**	**K.Level**
C314.1	Explain the construction and characteritics of the operational-amplifiers	K3
C314.2	Analyze the feedback and its effect on the performance of op-amp.	K4
C314.3	Develop knowledge on some linear applications of Op-amp and on the design of active filters using Op-amps	K3
C314.4	Design various waveform generators using Op-amp, 555 Timer and PLL	K5
C314.5	Analyze data converter (ADC and DAC) Circuits using Op amps.	K4

Code	COURSE OUTCOMES	K.Level
C315	**Digital System Design**	**K.Level**
C315.1	Construct the logic circuits using different types of logic familes	**K3**
C315.2	Develope VHDL programs for digital circuits.	**K3**
C315.3	Design and implement various combinational circuits using basic IC structures and VHDL.	**K5**
C315.4	Design and implement various sequential circuits using using basic IC structures and VHDL.	**K5**
C315.5	Develop VHDL programs for various complex combinational and Sequential circuits using VHDL	**K3**
C316	**Linux Programming & Scripting**	**K.Level**
C316.1	Apply LINUX utilities to manage simple file processing operations & organize directory structures with appropriate security.	**K3**
C316.2	Explain LINUX networking commands for establishing computer network communication.	**K2**
C316.3	Develop robust scripts in Perl Scripting Language.	**K3**
C316.4	Develop and run scripts using TCL	**K3**
C316.5	Develop and run scripts using Python.	**K3**
C317	**IC Applications Laboratory**	**K.Level**
C317.1	Design negative feedback amplifiers and analyze their characteristics using Op-amp.	**K5**
C317.2	Design multivibrator, integrator, differentiator using Op-amp	**K5**
C317.3	Design active filters and function generators and using Op-amp	**K5**
C317.4	Design VCO, AGC, PLL, AVC and regulators using linear ICs	**K5**
C318	**Digital Communication Systems Laboratory**	**K.Level**
C318.1	Analyze Time division multiplexing and demultiplexing techniques.	**K4**
C318.2	Analyze the PCM, DPCM,DM,ADCM using hardware &software	**K4**
C318.3	Analyze the different shift keying techniques using hardware &software	**K4**
C318.4	Analyze the QAM using signal space analysis	**K4**
C319.1	**Audit course – Social Values & Ethics**	**K.Level**
C319.1	Develop the capability of shaping themselves in the society & develop the roles and responsibility of NSS activity	**K3**
C319.2	Explain the features of constitution of India	**K2**
C319.3	Contribute to the development of the society around them and organization they work	**K3**
C319.4	Develop themselves into professionals & follow professional ethics	**K3**

Code	COURSE OUTCOMES	K.Level
	III BTECH II SEM	
C321	**Managerial Economics &Financial Analysis**	**K.Level**
C321.1	Analyze the consumer behaviour with regard to their product or services and measure demand of a particular product or services by applying various methods in given situation.	**K4**
C321.2	Compare concept of production & cost analysis	**K4**
C321.3	Determine the price of a product or services in given market condition.	**K4**
C321.4	Interpret the financial accounting and the financial ratios	**K2**
C321.5	Summarize Capital and its types and budget techniques.	**K2**
C322	**Microprocessors & Microcontrollers**	**K.Level**
C322.1	Explain the concepts of Intel x86 series of processors.	**K2**
C322.2	Apply the concept of addresing modes, instruction set and assember directives for programming the 8086 microprocessor	**K3**
C322.3	Explain the concepts of MSP 430 low power microcontroller.	**K3**
C322.4	Analyze the concepts of interrupts, low power modes and RTC of MSP 430	**K4**
C322.5	Apply the different interfacing protocols to implement real time applications using MSP430	**K3**
C323	**Electronic Measurements and Instrumentation**	**K.Level**
C323.1	Explain the performance characteristics of AC & Dc meters used in instrumentation.	**K3**
C323.2	Explain the construction, principle and working of CRO and time period &voltage measurements.	**K3**
C323.3	Explain function generators, wave analyzers, logic analyzers and spectrum analyzers.	**K3**
C323.4	Analyze different DC & AC bridges for their application in measurement and also explain Q meter, EMI and EMC.	**K4**
C323.5	Explain the principles involved in sensors & transducers.	**K3**
C324	**Digital Signal Processing**	**K.Level**
C324.1	Analyze discrete time signals and systems in time domain and frequency domain	**K4**
C324.2	Calculate Fourier transform for discrete time signals by using various transformation techniques	**K4**
C324.3	Develop structures for realization of discrete time FIR and IIR systems	**K3**
C324.4	Design of linear phase FIR and IIR filters by various techniques	**K5**
C324.5	Explain basic concepts of interpolation and decimation	**K3**

Code	COURSE OUTCOMES	K.Level
C325	**VLSI Design**	**K.Level**
C325.1	Explain about IC fabrication and relation between different parameters of MOSFET showing its characteristics	**K3**
C325.2	Apply lamda based rules to develop layouts, stick diagrams of logic circuits and estimate sheet resistance , area capacitance and delays	**K3**
C325.3	Design digital system at gate level and physical level.	**K5**
C325.4	Design different sub systems using various VLSI design styles.	**K5**
C325.5	Explain about EDA tools & testing of logic circuits	**K3**
C326	**Industrial Electronics**	**K.Level**
C326.1	Construct electronic circuits using various diodes.	**K3**
C326.2	Construct and classify of different configurations of a transistor.	**K3**
C326.3	Explain the importance of filters in converters with necessary parameters along with regulators.	**K3**
C326.4	Illustrate various methods used in heating and welding process.	**K3**
C326.5	Illustrate the concept of ultrasonics	**K3**
C327	**Microprocessors & Microcontrollers LAB**	**K.Level**
C327.1	Write 8086 assembly language programs	**K3**
C327.2	Make use of programmable peripheral devices and their interfacing in assembly programming	**K3**
C327.3	Make use of MSP 430 and their Interfacing devices in CC Studio and simulate programs using embedded C for MSP 430	**K3**
C328	**Digital Signal Processing Laboratory**	**K.Level**
C328.1	Analyze discrete time signals & systems using MATLAB	**K4**
C328.2	Design & implement IIR & FIR filters for different specifications using MATLAB	**K5**
C328.3	Analyze discrete time signals & systems using floating point DSP processor kit with code composer studio(CCS)	**K4**
C328.4	Design & implement IIR & FIR filters using DSP processor kit with code composer studio(CCS)	**K5**

Code	COURSE OUTCOMES	K.Level
C329	**Advanced English Language Communication Skills (AELCS) Laboratory (Audit Course)**	**K.Level**
C329.1	Develop communication skills through comprehensive and vocabulary	K3
C329.2	Apply writing skills in preparing resume, email and technical reports	K3
C329.3	Bulid presentation skills through poster and oral	K3
C329.4	Analyze the students for job skills and professional development activities	K4
C329.5	Develop management skills and analyze problem solving techniques	K3
C3210	**Comprehensive Online Exam II**	**K.Level**
C3210.1	Acquire fundamental engineering knowledge	K2
C3210.2	Demonstrate the ability to navigate skills and online learning	K2
C3210.3	Apply the concept of problem solving ability in competitive exams	K3
	IV BTECH I SEM	
C411	**Optical Fiber Communication**	**K.Level**
C411.1	Explain the elements of optical fiber link and modes of optical fibers	K3
C411.2	Calculate the different types of losses and types of dispersions in the fibres	K3
C411.3	Discuss the principle of operation of various optical sources and their power launching into optical fibers	K3
C411.4	Calculate the SNR & BER of optical fiber Receiver	K4
C411.5	Construct analog and digital optical links	K4
C412	**Embedded Systems**	**K.Level**
C412.1	Explain fundamental concepts of embedded systems architecture and design process	K2
C412.2	Explain the architecture of ARM CORTEX -TM4C microcontrollers and addressing modes	K4
C412.3	Explain concept for interfacing of processor, memory and I/O Devices and design metrics, tools.	K4
C412.4	Illustrate various modules(peripherals) of TM4C microcontroller	K3
C412.5	Design an IOT application using CC3100 network processor and serial communication protocols (SPI, UART , I2C)	K6

Code	COURSE OUTCOMES	K.Level
C413	**Microwave Engineering**	**K.Level**
C413.1	Analyze the waveguides using wave equations.	**K4**
C413.2	Illustrate the characteristics of microwave circuits through S- Parameters.	**K3**
C413.3	Analyse various microwave oscillators & amplifiers.	**K4**
C413.4	Analyze about M-type tubes & microwave solid state devices	**K4**
C413.5	Explain various methods of microwave measurements.	**K3**
C414	**Data Communications and Networking**	**K.Level**
C414.1	Explain about network hardware, software and reference models	**K3**
C414.2	Explain various transmission medium , switchings used in data communication networks	**K3**
C414.3	Analyze various Multiple Access Techniques & Wired LANs	**K4**
C414.4	Apply routing algorithms in network layer.	**K3**
C414.5	Analyze the various types of cryptography & network security techniques	**K4**
C415	**Radar Systems (Elc)**	**K.Level**
C415.1	Analyze the RADAR range equation	**K4**
C415.2	Summarize the principle of CW,FM-CW RADAR and describe its use in FM-CW altimeter.	**K2**
C415.3	Show the importance of delay line canceller in MTI and Pulse Dopller RADAR & its performance parameters.	**K2**
C415.4	Discriminate different tracking RADARS	**K4**
C415.5	Determine the importance of Matched Filter in RADAR receivers & analyse different beam formers & RADAR displays.	**K4**
C416	**Digital Image Processing**	**K.Level**
C416.1	Explain imaging techniques and basic concepts of digital image processing	**K4**
C416.2	Analyze the different image transformation techniques	**K4**
C416.3	Explain image enhancement for gray scale and color images in spatial and frequency domain	**K4**
C416.4	Apply various restoration and segmentation methods on images	**K3**
C416.5	Analyze the different compression methods and implement for better compression performance.	**K4**

Code	COURSE OUTCOMES	K.Level
C417	**Microwave and Optical Communication Laboratory**	**K.Level**
C417.1	Analyze the various parameters and characteristics of the various waveguide components.	**K4**
C417.2	Analyze working of the various tubes or sources for the transmission of the microwave.	**K4**
C417.3	Measure signal parameters at microwave frequencies	**K5**
C417.4	Analyze an optical fiber analog and digital communication link.	**K4**
C417.5	Illustrate the characteristics of LED, LASER.	**K3**
C418	**VLSI & Embedded Systems Laboratory**	**K.Level**
C418.1	Design and simulate combinational and sequential logic circuits using VHDL.	**K5**
C418.2	Design and Implement combinational and sequential logic circuits in FPGA kit	**K5**
C418.3	Analysis of simulation results and schematic diagram of combinational and sequential logic circuits	**K4**
C418.4	Develop programs for configuration of GPIO ports using TM4C 123GH6PM microcontroller	**K5**
C418.5	Design and develop programs for interface modules with TM4C 123GH6PM microcontroller	**K5**
	IV B.TECH II SEM	
C421	**Low Power VLSI Circuits & Systems**	**K.Level**
C421.1	Explain low power design methodologie,structure and electrical characteristics	**K2**
C421.2	Analyze the MOS inverter configurations and MOS combinational circuits	**K4**
C421.3	Explain sources of power dissipation and voltage scaling approaches for lowpower design	**K3**
C421.4	Explain the minimizing of switched capacitance using various approaches	**K3**
C421.5	Analyze various approaches to minimize the leakage power	**K4**
C422	**RF Integrated Circuits**	**K.Level**
C422.1	Explain the individual blocks of basic architecture of RF IC, matching networks,passive RLC networks, interconnects, and passive IC components.	**K3**
C422.2	Analyze the High frequency Amplifiers and Bandwidth Estimation Techniques,Shunt-series amplifiers, tuned amplifiers, and Cascaded amplifiers sing MOS devices.	**K4**
C422.3	Explain the Noise present in the Active and Passive Elements, LNA and Mixers.	**K3**
C422.4	Analyze RF power amplifiers, Negative Resistance Oscillators and PLL.	**K4**
C422.5	Explain various frequency synthesizers and radio architectures.	**K4**

Code	COURSE OUTCOMES	K.Level
C423	**Technical Seminar**	**K.Level**
C423.1	Develop interest towards research oriented field with ability to search the literature and brief report preparation.	**K6**
C423.2	Develop the skills, competencies and points of view needed by professionals in the field most closely related to the course	**K6**
C423.3	Develop the discussion and critical thinking about topics of current intellectual importance.	**K6**
C423.4	Develop the interpersonal & communication skills and awareness.	**K3**
C423.5	Develop presentation skills.	**K3**
C424	**Comprehensive Viva Voce**	**K.Level**
C424.1	Recall the fundamentals of mathematics, science and Engineering	**K1**
C424.2	Relate comprehensive understanding of techniques applicable to their own area of professional practice	**K2**
C424.3	Develop their Communication skills and Build confidence to face the interviews	**K6**
C425	**Project**	**K.Level**
C425.1	Identify problems, formulate literature survey and analyze engineering problems.	**K4**
C425.2	Apply the theoretical concepts to solve industrial problems with teamwork and multidisciplinary approach	**K3**
C425.3	Design system component that acquire the needs for public health and environment consideration.	**K6**
C426.4	Form a team for carrying the project and perform documentation effectively.	**K4**