



Department of Electronics & Communication Engineering

Vision of the Department: To be recognized as a Center of Excellence in Electronics and Communication Engineering by providing valuable resources to the students for the purpose of nurturing their knowledge and skills to serve the nation by solving the technological problems of modern society in the field of Electronics and Communication.

NETWORK ANALYSIS & SYNTHESIS (KEC-303): C-202

Year of Study: 2019-20

C-202.1	Understand basics electrical circuits with nodal and mesh analysis.	K2
C-202.2	Appreciate electrical network theorems.	K3
C-202.3	Apply Laplace transform for steady state and transient analysis.	K4
C-202.4	Determine different network functions.	K3
C-202.5	Appreciate the frequency domain techniques.	K3

ELECTRONIC DEVICES (KEC-301): C-203

Year of Study: 2019-20

C-203.1	Understand the principles of semiconductor Physics	K2
C-203.2	Understand and utilize the mathematical models of semiconductor junctions	K2
C-203.3	Understand carrier transport in semiconductors and design resistors.	K2
C-203.4	Utilize the mathematical models of MOS transistors for circuits and systems	K3
C-203.5	Analyze and find application of special purpose diodes.	K4

SIGNAL SYSTEM (KEC-403): C-204

Year of Study: 2019-20

C-204.1	Analyze different types of signals.	K4
C-204.2	Analyze linear shift-invariant (LSI) systems.	K4
C-204.3	Represent continuous and discrete systems in time and frequency domain using Fourier series and transform.	K3
C-204.4	Analyze discrete time signals in z-domain.	K4
C-204.5	Study sampling and reconstruction of a signal.	K2

DIGITAL SYSTEM DESIGN (KEC-302): C-206

Year of Study: 2019-20

C-206.1	Design and analyze combinational logic circuits.	K5
C-206.2	Design and analyze modular combinational circuits with MUX / DEMUX, Decoder & Encoder.	K5
C-206.3	Design & analyze synchronous sequential logic circuits	K5
C-206.4	Analyze various logic families.	K4
C-206.5	Design ADC and DAC and implement in amplifier, integrator, etc.	K5



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UNIVERSAL HUMAN VALUES & PROFESSIONAL ETHICS (KVE-401): C-207 Year of Study: 2019-20

C-207.1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society.	K2
C-207.2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	K3
C-207.3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	K2
C-207.4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	K2
C-207.5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	K3

NETWORK ANALYSIS & SYNTHESIS LAB (KEC-353): C- 209 Year of Study: 2019-20

C-209.1	Understand basics of electrical circuits with nodal and mesh analysis.	K2
C-209.2	Appreciate electrical network theorems.	K3
C-209.3	Analyze RLC circuits.	K4
C-209.4	Determine the stability of an electrical circuit.	K3
C-209.5	Design network filters.	K5

DIGITAL SYSTEM DESIGN LAB (KEC-352): C-211 Year of Study: 2019-20

C-211.1	Design and analyze combinational logic circuits.	K5
C-211.2	Design & analyze modular combinational circuits with MUX/DEMUX, decoder, encoder.	K5
C-211.3	Design & analyze synchronous sequential logic circuits.	K5
C-211.4	Design & build mini project using digital ICs.	K5

ELECTRONICS DEVICES LAB (KEC-351): C-212 Year of Study: 2019-20

C-212.1	Understand working of basic electronics lab equipment.	K2
C-212.2	Understand working of PN junction diode and its applications.	K2
C-212.3	Understand characteristics of Zener diode	K2
C-212.4	Design a voltage regulator using Zener diode	K5
C-212.5	Understand working of BJT, FET, MOSFET and apply the concept in designing of amplifiers.	K3



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MATHEMATICS IV (KAS 402) C-213

Year of Study: 2019-20

C-213.1	Remember the concept of partial differential equation and to solve partial differential equations	K3
C-213.2	Analyze the concept of partial differential equations to evaluate the problems concerned with partial differential equations	K4
C-213.3	Understand the concept of correlation, moments, skewness and kurtosis and curve fitting.	K2
C-213.4	Remember the concept of probability to evaluate probability distributions	K5
C-213.5	Apply the concept of hypothesis testing and statistical quality control to create control charts	K6

MINI PROJECT OR INTERNSHIP ASSESSMENT (KEC 354) C-214

Year of Study: 2019-20

C-214.1	Student should be able to manage project as a member of team to use the technique, skill and modern engineering tools and to collect and disseminate	K3
C-214.2	Students should be able to create solutions to authentic (real world and ill-defined) problems.	K6
C-214.3	Students should be able to design a system, component or process to meet desired need within realistic constraints.	K5
C-214.4	Students should be able to develop an action plan to improve presentation skills and have the confidence to make more of an impact on their audience.	K3
C-214.5	Students will be able to write research-based documents, including journal and conference papers.	K5

SENSOR AND INSTRUMENTATION (KOE-034): C-215

Year of Study: 2019-20

C-215.1	Apply the use of sensors for measurement of displacement, force and pressure.	K3
C-215.2	Employ commonly used sensors in industry for measurement of temperature, Position, accelerometer, vibration sensor, flow and level.	K3
C-215.3	Demonstrate the use of virtual instrumentation in automation industries.	K2
C-215.4	Identify and use data acquisition methods.	K4
C-215.5	Comprehend intelligent instrumentation in industrial automation.	K3



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TECHNICAL COMMUNICATION (KAS 301) C- 216

Year of Study: 2019-20

C-216.1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers.	K2
C-216.2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	K3
C-216.3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	K3
C-216.4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.	K4
C-216.5	It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	K4

PYTHON PROGRAMMING (KNC302) C-217

Year of Study: 2019-20

C-217.1	To read and write simple Python programs	K2
C-217.2	To develop Python programs with conditionals and loops	K5
C-217.3	To define Python functions and to use Python data structures -- lists, tuples, dictionaries	K3
C-217.4	To do input/output with files in Python	K3
C-217.5	To do searching ,sorting and merging in Python	K4

COMMUNICATION ENGINEERING (KEC-401) C-218

Year of Study: 2019-20

C-218.1	Analyze and compare different analog modulation schemes for their efficiency and bandwidth.	K4
C-218.2	Analyze the behavior of a communication system in presence of noise.	K4
C-218.3	Investigate pulsed modulation system and analyze their system performance.	K4
C-218.4	Investigate various multiplexing techniques.	K3
C-218.5	Analyze different digital modulation schemes and compute the bit error performance	K4

ANALOG CIRCUITS (KEC 402) C-220

Year of Study: 2019-20

C-220.1	Understand the characteristics of diodes and transistors.	K2
C-220.2	Design and analyze various rectifier and amplifier circuits.	K5
C-220.3	Design sinusoidal and non-sinusoidal oscillators.	K5
C-220.4	Understand the functioning of OP-AMP and design OP-AMP based circuits.	K5
C-220.5	Design LPF, HPF, BPF, BSF.	K5



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COMMUNICATION ENGINEERING LAB (KEC-451) C-229

Year of Study: 2019-20

C-229.1	Analyze and compare different analog modulation schemes for their modulation factor and power.	K4
C-229.2	Study pulse amplitude modulation.	K2
C-229.3	Analyze different digital modulation schemes and can compute the bit error performance	K4
C-229.4	Study and simulate the Phase shift keying.	K3
C-229.5	Design a front end BPSK modulator and demodulator.	K5

ANALOG CIRCUITS LAB (KEC 452) C-232

Year of Study: 2019-20

C-232.1	Understand the characteristics of transistors.	K2
C-232.2	Design and analyze various configurations of amplifier circuits.	K5
C-232.3	Design sinusoidal and non-sinusoidal oscillators.	K5
C-232.4	Understand the functioning of OP-AMP and design OP-AMP based circuits.	K5
C-232.5	Design ADC and DAC.	K5

SIGNAL SYSTEM LAB (KEC 453) C-233

Year of Study: 2019-20

C-233.1	Understand the basics operation of MATLAB frequency response of the system.	K2
C-233.2	Analysis the time domain and frequency domain signals diagrams and bode diagram.	K4
C-233.3	Implement the concept of Fourier series and Fourier transforms.	K3
C-233.4	Find the stability of system using pole-zero	K4
C-233.5	Design frequency response of the system.	K5

COMPUTER SYSTEM SECURITY (KNC401) C-234

Year of Study: 2019-20

C-234.1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats	K4
C-234.2	To discover cyber-attack scenarios to web browsers and web servers and to explain how to mitigate such threats	K4
C-234.3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques	K4
C-234.4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios	K3
C-234.5	To articulate the well-known cyber-attack incidents, explain the attack scenarios, and explain mitigation techniques	K3



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INTEGRATED CIRCUITS (REC-501): C-301

Year of Study: 2019-20

C-301.1	Able to design the current mirrors using BJT and MOS for a given I_o and perform DC & AC analysis of IC-741 circuit.	K5
C-301.2	Design and analyze the op amp based active filters (Butterworth 1 st , 2 nd order, KHN) for the given parameters.	K5
C-301.3	Able to investigate the static & dynamic characteristics of CMOS inverter & design logic circuits using CMOS.	K4
C-301.4	Able to use Op Amp in non-linear applications (log/antilog amplifier, comparator, multivibrator, Schmitt trigger, precision rectifier and peak detector).	K3
C-301.5	Understand the working of IC-555 timer, PLL and A-D & D-A converters and use the IC 555 in designing of multivibrator.	K3

PRINCIPLES OF COMMUNICATION (REC-502): C-302

Year of Study: 2019-20

C-302.1	Identify the key elements of Communication system and various amplitude modulations techniques involved.	K2
C-302.2	Understand the features of angle Modulation Techniques and their comparative analysis and applications suitability.	K4
C-302.3	Able to understand the digital modulation and multiplexing techniques in the communication system.	K2
C-302.4	Acquire knowledge about pulse modulation, vocoders and mathematical representation of noise.	K3
C-302.5	Evaluate the signal to noise ratio and figure of merit of various modulation techniques.	K4

CONTROL SYSTEM – I (RIC-603): C-304

Year of Study: 2019-20

C-304.1	Able to minimize the use of components in control system.	K3
C-304.2	Able to find Controllability and observability of the given system.	K4
C-304.3	Able to calculate steady state and transient response of the system.	K4
C-304.4	Can compute stability of the system using different techniques.	K3
C-304.5	Able to determine phase and amplitude response for the given system.	K4



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ANTENNA AND WAVE PROPAGATION (REC-051): C-305

Year of Study: 2019-20

C-305.1	Understand the concept of basics Antennas and its parameters (radiation pattern, gain, directivity, efficiency), antenna array, Radio communication link, SNR.	K2
C-305.2	Analyze the point sources, different type of antenna arrays and its radiation Patterns, the electric dipole, working design of Yagi Uda, folded dipole.	K4
C-305.3	Analyze the working principle of loop antenna, slotted antenna Log periodic antenna and micro strip antenna.	K4
C-305.4	Understand the Concepts of Different Types of Antennas.VHF, UH, Microwave Antennas, and frequency independent antennas.	K2
C-305.5	Classify the Different Kinds of Wave Propagation like ground wave, surface wave and space wave propagation. Controlling effect of medium and earth curvature on wave propagations.	K3

MANEGERIAL ECONOMICS (RAS-501): C-306

Year of Study: 2019-20

C-306.1	Describe Economy in general & economics in particular & the role of an Engineering, science & technology in an economy.	K2
C-306.2	Understand the concept of demand and role of engineering process in maintaining and improving demand.	K2
C-306.3	Understand demand forecasting & how the concept of Cost is helpful for an engineer before designing product and production process.	K2
C-306.4	Determine the price of a product under various market conditions which is helpful in analyzing the price of product in future by comparing competitor price for taking pricing decisions.	K3
C-306.5	Understand the concept of various market structures and role of engineering to sustain various types of market.	K3

INTEGRATED CIRCUITS LAB (REC-551): C-307

Year of Study: 2019-20

C-307.1	Able to develop an in-depth understanding of the design principles and applications of integrated analogue circuits.	K2
C-307.2	Able to design and realize analog filter circuits and oscillators for the given frequency and compare with theoretical values.	K5
C-307.3	Able to design and realize the multivibrator for given parameter using 555 timer IC and compare the result with theoretical value.	K5
C-307.4	Able to realize and analyze the comparator and Log/Antilog amplifier using op amp 741 and also design & realize the inverting/noninverting amplifier for given gain using 741.	K5
C-307.5	Able to realize and analyse the function generator using op amp 741 and also perform the experiment to determine capture and lock range of PLL.	K4



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CONTROL SYSTEMS LAB (RIC-653): C-308

Year of Study: 2019-20

C-308.1	Study and analyze dc and ac motor position control system	K4
C-308.2	Able to control the DC speed control system on open and closed loop.	K3
C-308.3	Investigate the input/output characteristic of magnetic amplifier.	K4
C-308.4	Analyze the Synchro Transmitter and Receiver in terms of position phase etc.	K4
C-308.5	Simulate the performance of PID controllers and LEAD LAG compensator and also Simulate the open loop and closed loop response of linear system.	K3

COMMUNICATION LAB- I (REC-552): C-309

Year of Study: 2019-20

C-309.1	Able to understand amplitude & frequency modulation and demodulation and its related terms.	K2
C-309.2	Analyze the modulation and demodulation of PAM, PWM, PPM	K4
C-309.3	Able to understand radiation pattern of various antennas and calculation of its beam width.	K3
C-309.4	Acquire knowledge of Super-heterodyne receiver and measure sensitivity & selectivity.	K2
C-309.5	Acquire knowledge about sampling and reconstruction of analog signals.	K3

MICROWAVE ENGINEERING (REC-601): C-311

Year of Study: 2019-20

C-311.1	Understand the basic concept of Microwaves and transmission lines like waveguides, micro striplines and their different modes of operation.	K2
C-311.2	Compare scattering matrix in microwave system & other 2-port network parameters and find out the scattering matrix of different microwave components like E-plane Tee, H-plane Tee, Magic Tee, Terminators, Attenuators, Phase Shifters, Isolators, Circulators and Directional Couplers as well as understand their applications.	K4
C-311.3	Analyze the limitations of general semiconductor devices at microwave frequencies and also to understand the basic concept of different microwave devices (2-cavity Klystron amplifier, Reflex Klystron amplifiers, Magnetron , TWT & BWO) and their principles of operation and applications	K4
C-311.4	Classify the Solid State amplifiers like microwave bipolar transistors, tunnel diodes, TEDs, Avalanche transit devices and their applications at microwave frequencies.	K2
C-311.5	Understand the limitations of low frequency measuring devices at microwave frequency and to study a microwave bench & its set up, slotted line carriage, VSWR meter, Also to Understand the Measurement of different parameters like power, frequency, wavelength, impedance, reflection coefficient, VSWR, Insertion & Attenuation loss, antenna characteristics at microwave	K2



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DIGITAL COMMUNICATION (REC-602): C-312

Year of Study: 2019-20

C-312.1	Compare the line coding techniques and apply in the generation and detection digital modulation techniques	K3
C-312.2	Understand the basic concepts of probabilities and random variables.	K2
C-312.3	Evaluate the performance of digital communication system.	K4
C-312.4	Apply the concept of spread spectrum for application in wireless communication.	K3
C-312.5	Compute the bandwidth and transmission power and probability of error for various modulation schemes.	K4

DIGITAL SIGNAL PROCESSING (REC-503): C-314

Year of Study: 2019-20

C-314.1	Analyze & create structures of IIR and FIR filters.	K4
C-314.2	Able to design IIR filter using the concept of Butterworth and Chebyshev.	K5
C-314.3	Able to design FIR filter using different types of windows.	K5
C-314.4	Evaluate the benefits of discretization of DTFT through DFT and compare the computation efficiency of FFT and DFT.	K4
C-314.5	Create more efficient filters using multirate signal processing.	K6

INDUSTRIAL MANAGEMENT (RAS-601): C-316

Year of Study: 2019-20

C-316.1	Apply theoretical concepts of management control in different areas of business in various industries.	K3
C-316.2	Understand the principle of management, process chart and flow diagram.	K2
C-316.3	Analyze inventory control and management techniques.	K4
C-316.4	Able to understand of Operational control. Control over time, quality and customer profitability.	K2
C-316.5	Performance measurement, such as balanced scorecards, benchmarks.	K3

MICROWAVE ENGINEERING LAB (REC-651): C-317

Year of Study: 2019-20

C-317.1	Acquire knowledge about Microwave spectrum and wave propagation.	K2
C-317.2	Able to compare and analyze the performance of Wave Guide benches and source	K4
C-317.3	Analyze the performance of Microwave Components.	K4
C-317.4	Measure the impedance of unknown load using smith chart.	K3
C-317.5	Understand and measure the Antenna parameters such as radiation pattern, feeding techniques.	K2



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COMMUNICATION LAB – II (REC-652): C-318

Year of Study: 2019-20

C-318.1	Compare the line coding techniques and apply as per the practical requirement	K3
C-318.2	Compare different modulation schemes and apply as per their advantage in various applications	K4
C-318.3	Apply different techniques in modern digital communications; particularly source coding, channel coding, modulation and detection.	K3
C-318.4	Analyse the waveform generation through harmonics so as to gain the concept of signal processing.	K4
C-318.5	Ability to choose the digital modulation scheme for the practical purpose on the basis of the features of each scheme.	K3

CAD OF ELECTRONICS LAB (REC-554): C-319

Year of Study: 2019-20

C-319.1	Able to implement and simulate analog circuits and digital circuits in PSPICE.	K3
C-319.2	Able to perform ac , dc and transient analysis of analog and digital circuits	K4
C-319.3	Able to correctly analyze a circuit and compare its theoretical performance to actual performance.	K4
C-319.4	Foster ability to identify and code the module using different modeling styles.	K3
C-319.5	Ability to synthesize the VHDL code.	K3

MICROCONTROLLER FOR EMBEDDED SYSTEMS LAB (RIC-651): C-323 Year of Study: 2019-20

C-323.1	Students will have a knowledge about 8051 microcontroller along with its architecture, concept of interrupts, programming and interfacing with external world.	K2
C-323.2	Students will learn about the basics of MSP430 microcontrollers along with GPIO port pin programming to interface with LEDs, push buttons, potentiometer, motors & accelerometer with the use of interrupts also.	K2
C-323.3	Students will have an extensive knowledge about various on-chip peripherals like Watchdog timer, Timer, PWM, ADC and DAC etc.	K4
C-323.4	Students will have an understanding of serial communication programming of USB and SPI with MSP430 having the knowledge of their protocols.	K4
C-323.5	Students will get an exposure with practical applications like Wi-Fi for communication and CC3100 module for setting of IP address.	K4



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SOCIOLOGY (RAS-502): C-324

Year of Study: 2019-20

C-324.1	Understand the nature and scope of industrial sociology with characteristics of the factory system and work environment.	K2
C-324.2	Understand a variety of explanations accounting for human behavior (in evolutionary and/or contemporary contexts)	K2
C-324.3	Identify the role of Motivation and Job satisfaction, stress management. Organizational culture, Leadership & group dynamics.	K3
C-324.4	Understand the applications of psychology in industrial behavior	K3
C-324.5	Engage in innovative and integrative thinking and problem solving. Develop meaningful professional direction for life after graduation	K2

CYBER SECURITY (RUC-601): C-325

Year of Study: 2019-20

C-325.1	Student will be able to discuss the roles played by information technology in today's business and define various technology architectures on which information systems are built.	K2
C-325.2	Student will develop an understanding of security policies (such as authentication, integrity and confidentiality)	K2
C-325.3	Gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath	K3
C-325.4	Student will develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.	K3
C-325.5	Students came to know about the Ethical, social and legal aspects of e-commerce. Students will be able to identify advantages and disadvantages of technology choices such as merchant server software and electronic payment	K4

RADAR ENGINEERING (REC-065) C-326

Year of Study: 2019-20

C-326.1	Understand basic radar operation, equation, block diagram, frequencies and applications	K2
C-326.2	Analyze effect of noise, target cross-section and other system parameters like transmitter power, pulse repetition frequency, antenna parameters and system noise over the radar operation.	K4
C-326.3	Understand and evaluate operation of various types of moving target identification radars and techniques to improve operation and limitations.	K2
C-326.4	Understand and evaluate operation of various types of tracking radars and their comparison.	K2
C-326.5	Understand basic radar measurements of target and techniques to improve target recognition and evaluate effect of clutter on radar performance	K3



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DIGITAL SIGNAL PROCESSING LAB (REC-553): C-327

Year of Study: 2019-20

C-327.1	Understand the DSP Processors Code Composer Studio and architecture of TMS320C6713 DSP processor.	K2
C-327.2	Analyze the basic operations of Signal processing using MATLAB	K4
C-327.3	Analyze the spectral parameter of window functions	K4
C-327.4	Design IIR, and FIR filters for band pass, band stop, low pass and high pass filters.	K5
C-327.5	Design the signal processing algorithm using MATLAB.	K5

MICROCONTROLLER FOR EMBEDDED SYSTEMS (REC-062): C-328

Year of Study: 2019-20

C-328.1	Will acquire knowledge about 8051 Microcontroller and its architecture.	K2
C-328.2	Understand the basics of MSP430 microcontrollers along with GPIO port pin programming to interface with LEDs, push buttons, potentiometer.	K3
C-328.3	Able to interface ADC and DMA with MSP430 and write program to generate waveform and understand the various on-chip peripherals like Watchdog timer, Timer, PWM, ADC and DAC etc.	K3
C-328.4	Understand the serial communication programming (USB, I2C and SPI) and their interfacing with MSP430 and acquire the knowledge of their protocols.	K4
C-328.5	Understand the basics of IoT and its architecture and develop the various wireless connectivity (ZigBee, Bluetooth, WiFi) and build IoT application using CC3100 user API for connecting sensors	K4



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CLOUD COMPUTING (ROE-073): C-401

Year of Study: 2019-20

C-401.1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.	K2
C-401.2	Learn the key and enabling technologies that help in the development of cloud.	K2
C-401.3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.	K3
C-401.4	Explain the core issues of cloud computing such as resource management and security.	K2
C-401.5	To appreciate the emergence of cloud as the next generation computing paradigm.	K2

OPTICAL COMMUNICATION (REC-075): C-404

Year of Study: 2019-20

C-404.1	Familiarize with basic concepts and theory of Optical Communication	K2
C-404.2	Demonstrate OPCOMM components, assemble them and solve problems on Optical Communication system	K2
C-404.3	Able to design, implements, analyses and maintains optical communication system	K5
C-404.4	Gain knowledge of different source of light as well as receiver and their comparative study	K4
C-404.5	To get idea about power budget and ultimately be an engineer with adequate knowledge in optical domain	K3

DATA COMMUNICATION NETWORKS (REC-701): C-405

Year of Study: 2019-20

C-405.1	Identify the issues and challenges in the architecture of a network.	K2
C-405.2	Understand the ISO/OSI seven layers in a network.	K2
C-405.3	Realize protocols at different layers of a network hierarchy	K4
C-405.4	Recognize security issues in a network.	K4

VLSI DESIGN (REC-702): C-406

Year of Study: 2019-20

C-406.1	Model the behavior of a MOS Transistor	K3
C-406.2	Design combinational and sequential circuits using CMOS gates	K5
C-406.3	Identify the sources of power dissipation in a CMOS circuit.	K4
C-406.4	Analyze SRAM cell and memory arrays	K4



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UNDERSTANDING THE HUMAN BEING COMPREHENSIVELY – HUMAN ASPIRATIONS AND ITS FULFILLMENT (ROE-074) C-407

Year of Study: 2019-20

C-407.1	To discuss a holistic vision towards life through Self Exploration and to appreciate the essential complementarities between Values & Skills ensuring sustained happiness and prosperity, the core aspirations of all human beings.	K2
C-407.2	To understand human being as a co-existence of the sentient “I” and the material “Body” and the correct appraisal of Physical Needs and the meaning of prosperity in detail.	K2
C-407.3	To interpret 9 feelings (values) in relationship to ensure justice and to make programs to achieve comprehensive human goals like- Education-Right Understanding, Health-Education, Justice-Preservation, Production-Work and Exchange-Storage, leading towards an Undivided Society (“Akhand Samaj”).	K3
C-407.4	To relate and visualize interconnectedness and mutual fulfillment among the four orders of nature, recyclability and self-regulation in nature.	K3
C-407.5	To acquire competence in professional ethics. Ability to identify and develop more people and eco-friendly appropriate technologies and management patterns.	K2

ELECTRONIC CIRCUIT DESIGN LAB (REC-752): C-408

Year of Study: 2019-20

C-408.1	Understand Universal op-amp based bi-quad.	K2
C-408.2	Identify amplitude control or stabilization applied to any sinusoidal oscillators and Op-amp/ OTA based function generator	K3
C-408.3	Design log/antilog circuits and identify applications of analog multiplier/ divider.	K5
C-408.4	Understand digital system design and its hardware implementation using TTL/ CMOS ICs and any circuit idea (not studied in the course) using 555 Timer in conjunction with any other ICs.	K3
C-408.5	Design the circuit, Make hardware and measure various parameters and Simulation in Spice of the designed circuit.	K5

PROJECT-I (REC-754): C-409

Year of Study: 2019-20

C-409 .1	Student should be able to manage project as a member of team to use the technique, skill and modern engineering tools and to collect and disseminate information related to selected project	K4
C-409 .2	Students should be able to create solutions to authentic (real world and ill-defined) problems.	K6
C-409 .3	Students should be able to design a system, component or process to meet desired need within realistic constraints.	K5
C-409 .4	Students should be able to develop an action plan to improve presentation skills and have the confidence to make more of an impact on their audience.	K4
C-409 .5	Students will be able to write research-based documents, including journal and conference papers.	K4



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INDUSTRIAL TRAINING VIVA-VOCE (REC-753): C-410

Year of Study: 2019-20

C-410 .1	The Industrial interaction is to help students gain first-hand information regarding functioning of the Industry Which presents the students with opportunities to plan, organize and engage in active learning experiences both inside and outside the classroom.	K2
C-410.2	It helps to bridge the gap between classroom and the real field world.	K3
C-410 .3	Students are benefited to learn about “real life” examples of business and engineering management	K2
C-410 .4	Industrial interaction makes students understand the subject to its core and its deeper practical experiences in real field situation.	K3
C-410 .5	Interaction to manufacturing firms are useful for students. To understand the nuances and realities of the shop floor, which in itself is a rare exposure. By visiting the shop floor they get to understand the risky conditions in which workers work, the people management challenges involved in managing workers apart from getting hands-on technical knowledge.	K4

WIRELESS & MOBILE COMMUNICATION (REC-085): C-412

Year of Study: 2019-20

C-412.1	Familiarize with various generations of mobile communications.	K2
C-412.2	Understand the concept of cellular communication.	K2
C-412.3	Understand the basics of wireless communication	K2
C-412.4	Understand GSM mobile communication standard, its architecture, logical channels, advantages and limitations.	K4
C-412.5	Gain knowledge of IS-95 CDMA mobile communication standard, its architecture, logical channels, advantages and limitations	K4
C-412.6	Gain knowledge of 3G mobile standards and their comparison with 2G technologies	K4

PROJECT (REC-852): C-414

Year of Study: 2019-20

C-414.1	Student should be able to manage project as a member of team to use the technique, skill and modern engineering tools and to collect and disseminate information related to selected project	K4
C-414.2	Students should be able to create solutions to authentic (real world and ill-defined) problems.	K6
C-414.3	Students should be able to design a system, component or process to meet desired need within realistic constraints.	K5
C-414.4	Students should be able to develop an action plan to improve presentation skills and have the confidence to make more of an impact on their audience.	K4
C-414.5	Students will be able to write research-based documents, including journal and conference papers.	K4



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INFORMATION THEORY & CODING (REC-071): C-417

Year of Study: 2019-20

C-417.1	Model the Entropy, Joint Entropy and Conditional Entropy, Relative Entropy and Mutual Information, Relationship Between Entropy and Mutual Information	K2
C-417.2	Design Data Compression, Examples of Codes, Kraft Inequality, Optimal Codes, Bounds on the Optimal Code Length	K5
C-417.3	Identify the Examples of Channel Capacity, Symmetric Channels, Properties of Channel Capacity, Preview of the Channel Coding Theorem.	K4
C-417.4	Analyze Introduction to block codes, Single-parity-check codes, Product codes, Repetition codes, Hamming codes	K4
C-417.5	Design Generator matrices for convolutional codes, Generator polynomials for convolutional codes	K5

OPTICAL COMMUNICATION LAB (REC-751): C-418

Year of Study: 2019-20

C-418.1	Ability to identify and study different types of types of cables, connectors and different commands in networking.	K2
C-418.2	Able to make subnet and configure router and DHCP servers.	K4
C-418.3	Able to configure VLAN.	K4
C-418.4	Able to setup fiber optic analog link & able to understand characteristic parameter in fiber and losses in optical fiber.	K4
C-418.5	Understanding of multiplexing, encoding technique	K2

GD & SEMINAR (REC-851): C-421

Year of Study: 2019-20

C-421.1	Able to identified important concepts from the readings and provided depth in coverage of the topic.	K2
C-421.2	Able to work in a group.	K2
C-421.3	Developed effective group communication and presentation skills.	K3
C-421.4	Developed self-management & reflection skills.	K3
C-421.5	Able to write technical documents and give oral presentation.	K4



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SATELLITE & RADAR SYSTEMS (REC-083): C-422

Year of Study: 2019-20

C-422.1	Understand the orbital and functional principles of satellite communication systems	K2
C-422.2	Architect, interpret, and select appropriate technologies for implementation of specified satellite communication systems	K4
C-422.3	Analyse and evaluate a satellite link and suggest enhancements to improve the link performance.	K4
C-422.4	Select an appropriate modulation, multiplexing, coding and multiple access schemes for a given satellite communication link.	K3
C-422.5	Specify, design, prototype and test analog and digital satellite communication systems as per given specifications.	K5

RENEWABLE ENERGY RESOURCES (ROE-086): C-423

Year of Study: 2019-20

C-423.1	Understand the various non-conventional energy resources.	K2
C-423.2	Understand the concept of Solar Thermal Energy.	K2
C-423.3	Compare solar thermal energy with Geothermal Energy.	K3
C-423.4	Understand the basic working Principle behind Thermo-electrical and thermionic Conversions also understand the wind energy concept.	K2
C-423.5	Understand the concept of Bio-mass and its usage.	K2