**KVCET**

**B.E. ELECTRONICS AND COMMUNICATION ENGINEERING**

**REGULATIONS – 2017**

**Program Outcome:**

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| PO1 | An ability to apply knowledge of mathematics, science and Engineering |
| PO2 | An ability to design and conduct experiments, as well as to analyze and interpret data |
| PO3 | An ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability |
| PO4 | An ability to conduct research based knowledge and research methods which includes the design of an experiments ,analysis and interpretation of data |
| PO5 | An ability to identify ,formulate, research literature and analyse complex engineering problems |
| PO6 | An ability to apply ethical principles and professional ethics responsibility |
| PO7 | An ability to communicate effectively, and being able to write effective reports and design documentation and make effective presentation |
| PO8 | An ability to demonstrate knowledge and understanding of project management principles and broad education necessary to understand the impact of engineering solutions in a global, environmental and social context |
| PO9 | An ability to engage in independent and life-long learning |
| PO10 | A knowledge of contemporary issues |
| PO11 | An ability to apply appropriate Modern Tool Techniques including prediction and modelling to complex engineering activities |
| PO12 | An ability to recognize, adapt and to apply the knowledge of electronics to optimize embedded electronics system in different application and for the processing of information in communication |

**SEM III**

**Course outcome:**

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| **CO** | **MA8352 Linear Algebra and Partial Differential Equations** |
| CO 1 | Vector Spaces |
| CO 2 | Linear Transformation and Diagonalization |
| CO 3 | Inner Product Spaces Students will be able to |
| CO 4 | Solve various types of partial differential equations. |
| CO 5 | Solve engineering problems using Fourier series |

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| **CO** | **EC8393 Fundamentals of Data Structures In C** |
| CO 1 | Develop the programs in C using basic constructs. |
| CO 2 | Develop and write the programs in C using functions, pointers, structures, and unions |
| CO 3 | Construct data structure operations for any given data sets in C |
| CO 4 | Implement appropriate non-linear data structure operations for any given data sets in C. |
| CO 5 | Examine sorting algorithms and also apply hashing concepts for a given problem |

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| **CO** | **EC8351 Electronic Circuits- I** |
| CO 1 | Design the various biasing circuits of BJT, JFET and MOSFET. |
| CO 2 | Analyze the small signal equivalent and design BJT amplifier circuits. |
| CO 3 | Analyze the small signal equivalent and design JFET and MOSFET amplifier circuits. |
| CO 4 | Plot the frequency response of all amplifiers |
| CO 5 | Design the regulated power supply, troubleshoot and analyze the faults in power supplies |

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| **CO** | **EC8352 Signals and Systems** |
| CO 1 | Analyze the various properties of signals and systems. |
| CO 2 | Apply Laplace transform and Fourier transform in signal analysis. |
| CO 3 | Analyze linear time invariant continuous time systems using Laplace and Fourier Transforms. |
| CO 4 | Analyze discrete time signals using Z transform and DTFT. |
| CO 5 | Interpret the linear time invariant discrete time systems using Z transform and DTFT. |

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| **CO** | **EC8392 Digital Electronics** |
| CO 1 | Basics of digital electronics in the present contemporary world. |
| CO 2 | Design various combinational digital circuits using logic gates. |
| CO 3 | Determine the analysis and design procedures for synchronous and asynchronous sequential circuits. |
| CO 4 | Study the semiconductor memories and related technology. |
| CO 5 | Use electronic circuits involved in the design of logic gates. |

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| **CO** | **EC8391 Control Systems Engineering** |
| CO 1 | Perform modeling of control system using various techniques |
| CO 2 | Obtain the time response and steady state error of control systems. |
| CO 3 | Design compensators and to plot the frequency response using various techniques. |
| CO 4 | Determine the stability of control systems. |
| CO 5 | Analyze and obtain state space model using state variables. |

**SEM IV**

**Course outcome:**

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| **CO** | **MA8451 Probability and Random Processes** |
| CO 1 | Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. |
| CO 2 | Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. |
| CO 3 | Apply the concept random processes in engineering disciplines. |
| CO 4 | Understand and apply the concept of correlation and spectral densities |
| CO 5 | Able to analyze the response of random inputs to linear time invariant systems |

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| **CO** | **EC8452 Electronic Circuits II** |
| CO 1 | Analyze the concepts of Feedback Amplifiers in various applications |
| CO 2 | Design different types of Oscillator at different frequencies |
| CO 3 | Analyze the performance of Tuned amplifiers |
| CO 4 | Design Pulse circuits and Multivibrators |
| CO 5 | Apply the various design techniques to analyze Power Amplifiers and DC convertors |

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| **CO** | **EC8491 Communication Theory** |
| CO 1 | Analyze the various modulation techniques used for communication. |
| CO 2 | Elaborate the angle modulation and demodulation techniques. |
| CO 3 | Apply the concepts of Random Process |
| CO 4 | Analyze the noise performance of AM and FM systems. |
| CO 5 | Implement the basic concepts of source and channel coding in design of communication system. |

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| **CO** | **EC8451 Electromagnetic Fields** |
| CO 1 | Apply the basic mathematical concepts of vector analysis. |
| CO 2 | Describe the laws associated to static electric field and the properties of conductors and dielectrics |
| CO 3 | Analyze the field potentials due to static magnetic fields and explain how materials affect electric and magnetic fields |
| CO 4 | Analyze the relation between the fields under time varying situations and apply Maxwell’s equations to electric and magnetic fields. |
| CO 5 | Explain electromagnetic wave propagation in lossy and in lossless media |

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| **CO** | **EC8453 Linear Integrated Circuits** |
| CO 1 | Design linear and non-linear applications of op-amps. |
| CO 2 | Design applications using Analog multipliers and PLL. |
| CO 3 | Design ADC and DAC using opamps. |
| CO 4 | Design waveform Generators using op-amps. |
| CO 5 | Analyze special function ICs. |

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| **CO** | **GE8291 Environmental Science and Engineering** |
| CO 1 | Understand the importance of Environment, biodiversity, ecosystem and how to solve environmental related problems. |
| CO 2 | Identify and explain about the causes, effect and control measures of various types of pollution. |
| CO 3 | Discuss the various renewable and non-renewable resources and energy conservation processes. |
| CO 4 | Explain the social issues and solutions for sustainable environment with relevant Act and case studies |
| CO 5 | Summarize the impact of human population in the environment and its remedial measures. |

**SEM V**

**Course outcome:**

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| **CO** | **EC8501 DIGITAL COMMUNICATION** |
| CO 1 | Design PCM systems and codes |
| CO 2 | Design and implement base band transmission schemes |
| CO 3 | Design and implement band pass signaling schemes |
| CO 4 | Analyze the spectral characteristics of band pass signaling schemes and their noise performance |
| CO 5 | Design error control coding schemes |

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| **CO** | **EC8553 DISCRETE-TIME SIGNAL PROCESSING** |
| CO 1 | Apply DFT for the analysis of digital signals and systems |
| CO 2 | Design IIR and FIR filters |
| CO 3 | Characterize the effects of finite precision representation on digital filters |
| CO 4 | Design multirate filters |
| CO 5 | Apply adaptive filters appropriately in communication systems |

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| **CO** | **EC8552 COMPUTER ARCHITECTURE AND ORGANIZATION** |
| CO 1 | Describe data representation, instruction formats and the operation of a digital computer |
| CO 2 | Illustrate the fixed point and floating-point arithmetic for ALU operation |
| CO 3 | Discuss about implementation schemes of control unit and pipeline performance |
| CO 4 | Explain the concept of various memories, interfacing and organization of multiple processors |
| CO 5 | Discuss parallel processing technique and unconventional architectures |

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| **CO** | **EC8551 COMMUNICATION NETWORKS** |
| CO 1 | Identify the components required to build different types of networks |
| CO 2 | Choose the required functionality at each layer for given application |
| CO 3 | Identify solution for each functionality at each layer |
| CO 4 | Trace the flow of information from one node to another node in the network |
| CO 5 | Explain the various operations of application Layer. |

**SEM VI**

**Course outcome:**

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| **CO** | **EC8691 MICROPROCESSORS AND MICROCONTROLLERS** |
| CO 1 | Understand the Architecture of 8086 microprocessor. |
| CO 2 | Learn the design aspects of I/O and Memory Interfacing circuits. |
| CO 3 | Design and Interface microprocessors with supporting chips. |
| CO 4 | Study the Architecture of 8051 microcontroller |
| CO 5 | Design and implement 8051 microcontroller based systems. |

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| **CO** | |  |  | | --- | --- | | **EC8095** | **VLSI DESIGN** | |
| CO 1 | Study the fundamentals of CMOS circuits and its characteristics. |
| CO 2 | Learn the design and realization of combinational & sequential digital circuits. |
| CO 3 | Design and construct Sequential Circuits and Timing systems. |
| CO 4 | Design arithmetic building blocks and memory subsystems. |
| CO 5 | Apply and implement FPGA design flow and testing |

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| **CO** | **EC8652 WIRELESS COMMUNICATION** |
| CO 1 | Characterize a wireless channel and evolve the system design specifications |
| CO 2 | Design a cellular system based on resource availability and traffic demands |
| CO 3 | Design and construct Sequential Circuits and Timing systems. |
| CO 4 | Identify suitable signaling and multipath mitigation techniques for the wireless channel and system under consideration. |
| CO 5 | Study the Multiple antenna techniques |

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| **CO** | **MG8591 PRINCIPLES OF MANAGEMENT** |
| CO 1 | Understand the concepts of Management and organizations |
| CO 2 | Identify the concept of planning |
| CO 3 | **Understand the Purpose of organizing** |
| CO 4 | Identify Managerial functions directing ,staffing and leading |
| CO 5 | Understand the controlling and have same basic knowledge on international aspect of management |

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| **CO** | **EC8651 TRANSMISSION LINES AND RF SYSTEMS** |
| CO 1 | Introduce the various types of transmission lines and its characteristics |
| CO 2 | Understanding about high frequency line, power and impedance measurements |
| CO 3 | Impart technical knowledge in impedance matching using smith chart |
| CO 4 | Introduce passive filters and basic knowledge of active RF components |
| CO 5 | Understand acquaintance with RF system transceiver design |

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| **CO** | **EC8004 WIRELESS NETWORKS** |
| CO 1 | Understand the concept about Wireless networks, protocol stack and standards |
| CO 2 | Implement and analyse the network layer solutions for Wireless networks |
| CO 3 | Ability to know about fundamentals of 3G Services, its protocols and applications |
| CO 4 | Identify the depth knowledge on internetworking of WLAN and WWAN |
| CO 5 | Implement different type of applications for smart phones and mobile devices with latest network strategies |

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| **CO** | **EC8661 VLSI DESIGN LABORATORY** |
| CO 1 | Learn Hardware Descriptive Language(Verilog/VHDL) |
| CO 2 | Learn the fundamental principles of VLSI circuit design in digital and analog domain |
| CO 3 | Understand the VLSI circuit design |
| CO 4 | familiarize fusing of logical modules on FPGAs |
| CO 5 | provide hands on design experience with professional design (EDA) platforms |

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| **CO** | **EC8681 MICROPROCESSORS AND MICROCONTROLLERS LABORATORY** |
| CO 1 | introduce ALP concepts, features and Coding methods |
| CO 2 | Write ALP for arithmetic and logical operations in 8086 and 8051 |
| CO 3 | Differentiate Serial and Parallel Interface |
| CO 4 | Interface different I/Os with Microprocessors |
| CO 5 | Be familiar with MASM |

**SEM VII**

**Course outcome:**

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| **CO** | **EC8701 ANTENNAS AND MICROWAVE ENGINEERING** |
| CO 1 | Apply the basic principles and evaluate antenna parameters and link power budgets |
| CO 2 | Implement and analyse the various radiation mechanism and design aspects. |
| CO 3 | Identify the antenna array and applications. |
| CO 4 | Understand the concept of Passive and Active Microwave Devices |
| CO 5 | Design a microwave system given the application specifications |

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| **CO** | **EC8751 OPTICAL COMMUNICATION** |
| CO 1 | Realize basic elements in optical fibers, different modes and configurations. |
| CO 2 | Analyze the transmission characteristics associated with dispersion and polarization techniques. |
| CO 3 | Design optical sources and detectors with their use in optical communication system. |
| CO 4 | Construct fiber optic receiver systems, measurements and coupling techniques. |
| CO 5 | Design optical communication systems and its networks. |

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| **CO** | **EC8791 EMBEDDED AND REAL TIME SYSTEMS** |
| CO 1 | Understand the concepts of embedded system design and analysis |
| CO 2 | Learn the architecture and programming of ARM processor |
| CO 3 | Understand the basic concepts of embedded programming |
| CO 4 | Explain the basic concepts of real time operating system design |
| CO 5 | Model real-time applications using embedded-system concepts |

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| **CO** | **EC8702 AD HOC AND WIRELESS SENSOR NETWORKS** |
| CO 1 | Know the basics of Ad hoc networks and Wireless Sensor Networks |
| CO 2 | Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement |
| CO 3 | Apply the knowledge to identify appropriate physical and MAC layer protocols |
| CO 4 | Understand the transport layer and security issues possible in Ad hoc and sensor networks. |
| CO 5 | Be familiar with the OS used in Wireless Sensor Networks and build basic modules |

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| **CO** | **EC8711 EMBEDDED LABORATORY** |
| CO 1 | Learn the working of ARM processor Understand the Building Blocks of Embedded Systems |
| CO 2 | Understand the Building Blocks of Embedded Systems |
| CO 3 | Learn the concept of memory map and memory interface |
| CO 4 | Write programs to interface memory, I/Os with processor |
| CO 5 | Study the interrupt performance |

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| **CO** | **EC8761 ADVANCED COMMUNICATION LABORATORY** |
| CO 1 | Understand the working principle of optical sources, detector, fibers |
| CO 2 | Develop understanding of simple optical communication link |
| CO 3 | Understand the measurement of BER, Pulse broadening |
| CO 4 | Understand and capture an experimental approach to digital wireless communication |
| CO 5 | Understand actual communication waveforms that will be sent and received across wireless channel |

**SEM VIII**

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| **CO** | **EC8811 Project Work** |
| CO 1 | An ability to design, analyze and interpret the data. |
| CO 2 | An ability to use modern engineering tools necessary for the experimental work. |
| CO 3 | Have the ability to apply the concept studied |
| CO 4 | Students are capable to implement real time projects |
| CO 5 | An ability to design, analyze and interpret the data on electronics domain |