**KVCET**

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

**REGULATIONS – 2013**

**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 |

**Course Outcome:**

**SEM III**

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| Co | MA 6351-Transforms And Partial Differential Equations |
| 1 | Forming the Fourier series for a given function |
| 2 | Forming and solving partial differential equation |
| 3 | Transforming the function using Fourier transform |
| 4 | Solution of One dimensional wave , heat equation |
| 5 | Transforming the function using Z- transform |
| Co | EE 6352-Electrical Engineering |
| 1 | Understands the concepts of various types of electrical machines such as starters and DC machines and functionalities. |
| 2 | Understands the concepts of transformers. |
| 3 | Understands the concepts of induction motors. |
| 4 | Understands the concepts of alternators and special machines. |
| 5 | Understands the power system transmission and distribution. |
| Co | EC6301-Data Structures & Object Oriented Programming in C++ |
| 1 | Identify the key principles in object-oriented programming (OOP). |
| 2 | Build an object-oriented model by applying object-oriented analysis techniques. |
| 3 | Apply core OOP principles and techniques as well as advanced features provided by modern programming languages to computer programming. |
| 4 | Apply practical knowledge of OOP design and implementation to application development |
| 5 | Demonstrate knowledge of the basic principles of data structures, algorithms, programming language concepts and theory and operating systems |
| Co | EC 6302-Digital Electronics |
| 1 | Design combinational and digital circuits. |
| 2 | Design simple synchronous circuits including counters and shift registers |
| 3 | Use Verilog to produce digital designs suitable for implementation on PLDs. |
| 4 | Use PLDs to implement digital logic designs |
| 5 | Write simple HDL codes for the circuits. |
| Co | EC 6303-Signals & Systems |
| 1 | An ability to analyze characteristics of continuous, discrete signals and systems. |
| 2 | An ability to analysis and synthesis continuous & discrete systems |
| 3 | An ability to realize various structures of digital filter. |
| 4 | An ability to realize the Fourier Transforms |
| 5 | An ability to understand the Z Transform |
| Co | EC 6304-Electronic Circuits – I |
| 1 | The student familiarized with the analysis and design of basic transistor Amplifier circuits. |
| 2 | The student familiarized with the analysis and design of basic power supplies. |
| 3 | The student will be able to do mini projects using basic semiconductor devices. |
| 4 | The students able to design power amplifier circuits. |
| 5 | Design and analyze large signal amplifiers. |
| Co | EC 6311-Digital Electronics Lab |
| 1 | To know the Combinational & Sequential Circuits |
| 2 | Get an ability to write codes for logical circuits |
| 3 | The student familiarized with the analysis and design of basic transistor Amplifier circuits. |
| 4 | The student familiarized with the analysis and design of basic power supplies. |
| 5 | The student will be able to do mini projects using basic semiconductor devices. |
| Co | EC 6312-Data Structures And Object Oriented Programming Lab |
| 1 | Design array implementation of List Abstract Data Type (ADT) |
| 2 | Design Linked list implementation of List ADT |
| 3 | Design Search Tree ADT - Binary Search |
| 4 | Design stack ADT - Array and linked list implementations |
| 5 | Design of sorting |
| **Course Outcome:**  **SEM IV** | |
|  | MA 6451 - Probability and Random Processes |
| 1 | This course aims at providing the necessary basic concepts in random processes. |
| 2 | Knowledge of fundamentals and applications of random phenomena will greatly help in the understanding of topics such as signals & systems, |
| 3 | Pattern recognition, voice and image processing and filtering theory |
| 4 | students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. |
| 5 | Able to analyze the response of random inputs to linear time invariant systems. |
|  | EC 6401- Electronic Circuits II |
| 1 | The method of analyzing of feedback amplifiers |
| 2 | To analyze and design LC and RC oscillators, tuned amplifiers |
| 3 | The concept and working of wave shaping circuits |
| 4 | To design and analyze the functions of multi-vibrators |
| 5 | The fundamentals of blocking oscillators and time base generators |
|  | EC 6402 - Communication Theory |
| 1 | An ability to compare various Amplitude modulation and demodulation systems. |
| 2 | An ability to compare various Angle modulation and demodulation systems. |
| 3 | An ability to analyze noise performance of various receivers. |
| 4 | An ability to understand the basics of information theory. |
| 5 | Apply the concepts of Random Process to the design of Communication systems |
|  | EC 6403- Electromagnetic Fields |
| 1 | An ability to apply knowledge of mathematics, science, and engineering to the analysis |
| 2 | Design of electrical systems involving electric and magnetic fields as well as electromagnetic waves. |
| 3 | An ability to identify, formulates, and solves engineering problems in the area of electric and magnetic fields and waves. |
| 4 | Analyze the relation between the fields under time varying situations. |
| 5 | Discuss the principles of propagation of uniform plane waves. |
|  | EC 6404- Linear Integrated Circuits |
| 1 | Design simple circuits like amplifiers using Opamps. |
| 2 | Design waveform generating circuits |
| 3 | Design simple filters circuits for particular application. |
| 4 | Gain knowledge in designing stable voltage regulators |
| 5 | Analyze special function ICs. |
|  | EC 6405- Control Systems |
| 1 | The students understand the concepts of open loop & closed loop system and compensation techniques |
| 2 | The students also able to design a compensator for a uncompensated systems. |
| 3 | The students experimentally find out the system is stable or not by using MATLAB programs. |
| 4 | Perform time domain and frequency domain analysis of control systems required for stability analysis. |
| 5 | Design the compensation technique that can be used to stabilize control systems. |
|  | EC 6411 - Circuit and simulation lab |
| 1 | The method of analyzing of feedback amplifiers |
| 2 | To analyze and design LC and RC oscillators, tuned amplifiers |
| 3 | The concept and working of waveshaping circuits |
| 4 | Design Bias Circuit for BJT |
| 5 | Differentiate Class A and Class B Amplifiers |
|  | EC 6412- Linear Integrated Circuit Lab |
| 1 | To design and analyze the functions of multivibrators |
| 2 | The fundamentals of blocking oscillators and time base generators |
| 3 | To simulate and verify the functionalities of amplifiers, filters, multivibrators, A/D, D/A converters, |
| 4 | CMOS digital circuits using PSpice. |
| 5 | Able to experiment the basic concepts in the design of electronic circuits using operational amplifiers and their applications in the processing of analog signals |
| **SEM V**  **Course Outcome:** | |
|  | EE6461- Electrical Engineering and Control System Lab |
| 1 | This lab will enable the students to understand the concepts of working principle & application of DC machine. |
| 2 | Perform experiments to study the load characteristics of DC motors / generators. |
| 3 | Design bridge network circuit to measure the values of passive component. |
| 4 | Analyse the stability of linear system through simulation software. |
| 5 | Obtain transfer function of DC generators. |
|  | EC6501- Digital Communication |
| 1 | On successful completion of the module students will get an ability to know the basic concepts of Digital Communication in baseband |
| 2 | On successful completion of the module students will get an ability to know the basic concepts of Digital Communication in pass band domains and to give an exposure to error control coding techniques. |
| 3 | Design and implement band pass signaling schemes |
| 4 | Analyze the spectral characteristics of band pass signaling schemes and their noise performance |
| 5 | Design error control coding schemes |
|  | EC6502 – Principles of Digital Signal Processing |
| 1 | Ability to perform time and frequency domain analysis using the concept of DFT and FFT. |
| 2 | Ability to design and analysis of IIR digital filters. |
| 3 | Ability to design and analysis of FIR digital filters. |
| 4 | Knowledge about various problems due to finite word length effects. |
| 5 | An understanding of sampling conversion technique in signal processing and its applications. |
|  | EC6503 -Transmission Lines and Wave guides |
| 1 | Students will be able to design various types of filters which are used in communication systems |
| 2 | Students understand about the signal propagation at radio frequencies and the propagation of signals through lines |
| 3 | Students understand about the radio propagation in guided systems. |
| 4 | Explain radio propagation in guided systems. |
| 5 | Utilize cavity resonators. |
|  | GE6351- Environmental Science and Engineering |
| 1 | Students understood and gained knowledge on environment and various types of eco-systems, pollution, resources. |
| 2 | Students got an awareness and sensitivity about the environment and environmental challenges. |
| 3 | Students also got an idea to mitigate the environmental problems |
| 4 | They analyzed about various environmental policies and how to maintain it |
| 5 | Development and improvement in standard of living has lead to serious environmental disasters. |
|  | EC6504 -Microprocessors and Microcontrollers |
| 1 | Students learnt the instruction set of 8086 and 8051. |
| 2 | Students learnt the 8255, 8279 interfacing devices. |
| 3 | Students learnt the Assembly language programming of 8086 and 8051. |
| 4 | Design I/O circuits. |
| 5 | Design Memory Interfacing circuits. |
|  | EC6511- Digital Signal Processing Lab |
| 1 | Students will able to implement the processing techniques using the instructions of TMS320C5X |
| 2 | Students will able to implement IIR and FIR filter using MATLAB. |
| 3 | Analyze Finite word length effect on DSP systems |
| 4 | Demonstrate the applications of FFT to DSP |
| 5 | Implement adaptive filters for various applications of DSP |
|  | EC6513 Microprocessors and Microcontrollers Lab |
| 1 | Students learn the instruction set of 8086 microprocessor and 8051 microcontroller. |
| 2 | Students can do programming in the 8086 and 8051 |
| 3 | Generate waveforms using Microprocessors |
| 4 | Execute Programs in 8051 |
| 5 | Explain the difference between simulator and Emulator |
|  | EC6512 Communication System Lab |
| 1 | On successful completion of the module students will be able to know the basic concepts of Digital Communication in baseband |
| 2 | On successful completion of the module students will be able to know the basic concepts of Digital Communication in pass band domains |
| 3 | Give an exposure to error control coding techniques. |
| 4 | Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system |
| 5 | Simulate & validate the various functional modules of a communication system |
| **SEM VI**  **Course Outcome:** | |
|  | MG6851- Principles of Management |
| 1 | Students able to analyze the management concepts. |
| 2 | Students able to create a new planning for any work. |
| 3 | Students able to create an organizational structure. |
| 4 | Students will familiarize with various theories and styles of leadership. |
| 5 | Students had an ability to develop controlling process. |
|  | CS 6303 Computer Architecture |
| 1 | Understand how to apply quantitative trade-off analysis in the design of a computer system. |
| 2 | Use a modern hardware description language to model and analyze computer system design tradeoffs. |
| 3 | Understand modern memory system design techniques including single and multi-level cache and virtual memory |
| 4 | Evaluate performance of memory systems. |
| 5 | Understand parallel processing architectures. |
|  | CS 6551- Computer Networks |
| 1 | Apply current industry standards, protocols, and techniques; and keep up with evolving technology to maintain professional proficiency. |
| 2 | Gets thorough knowledge in basics of computer communication and networking. |
| 3 | Utilize the concepts in higher studies |
| 4 | Identify solution for each functionality at each layer |
| 5 | Trace the flow of information from one node to another node in the network |
|  | EC6602- Antenna and Wave Propagation |
| 1 | An ability to design and compare various types of dipole antennas suitable for arrays. |
| 2 | An ability to understand aperture type problems in aperture antennas |
| 3 | An ability to analyze the applications of special antennas. |
| 4 | An ability to analyze and apply various antenna arrays to solve modern engineering problems |
| 5 | An ability to understand various factors that influence the propagation of radio waves. |
|  | EC6601- VLSI Design |
| 1 | Students will understand the concepts of CMOS process technology and chip design using programmable devices. |
| 2 | Students will understand the concepts of Verilog HDL. |
| 3 | Explain the basic CMOS circuits and the CMOS process technology. |
| 4 | Discuss the techniques of chip design using programmable devices. |
| 5 | Model the digital system using Hardware Description Language. |
|  | EC6001 - Medical Electronics |
| 1 | At the end of the syllabus completion the students will able to understand the applications of electronics in diagnostic |
| 2 | At the end of the syllabus completion the students will able to understand the applications of electronics in therapeutic area. |
| 3 | Discuss the application of electronics in diagnostic and therapeutic area. |
| 4 | Measure biochemical and various physiological information. |
| 5 | Describe the working of units which will help to restore normal functioning |
|  | EC6611- Computer Networks Lab |
| 1 | Students get practical knowledge about Stop and wait, go-back n and selective repeat protocols, serial and parallel communication. |
| 2 | Students get knowledge about implementation of routing algorithms |
| 3 | Program using sockets. |
| 4 | Implement and compare the various routing algorithms |
| 5 | Use simulation tool. |
|  | EC6612- VLSI Design Lab |
| 1 | Students gained knowledge in Verilog HDL tool. |
| 2 | Students will be able to use techniques, skills and modern engineering tools necessary for engineering practice |
| 3 | Students were able write a source code for any circuits and do synthesis for it. |
| 4 | Students were able to get knowledge the factors to be considered in layout design and estimation of corresponding parameters. |
| 5 | Design, Simulate and Extract the layouts of Analog IC Blocks using EDA tools. |
|  | GE6674- Communication Skills Lab |
| 1 | Apply knowledge of English language in attending higher studies and interviews. |
| 2 | Apply knowledge of soft skills in their working environments. |
| 3 | Take international examination such as IELTS and TOEFL |
| 4 | Make presentations and Participate in Group Discussions. |
| 5 | Successfully answer questions in interviews. |
| **SEM VII**  **Course Outcome:** | |
|  | EC6702- Optical Communication and Networks |
| 1 | Be able to apply knowledge of mathematics, and engineering to calculate the characteristics of optical signals and fibers. |
| 2 | Be able to identify, formulate, and solve engineering problems related to the transmission characteristics of optical fibers |
| 3 | Learn about the Optical sources and detectors structures and characteristics. |
| 4 | Learn about the Optical receivers and to apply the knowledge of mathematics and engineering to measure calculate the characteristics of optical signals. |
| 5 | Learn about the optical networks systems. |
|  | EC6701- RF and Microwave Engineering |
| 1 | Student will become familiar with active & passive microwave devices & components used in Microwave communication systems. |
| 2 | Students become familiar with passive microwave components |
| 3 | Students gain knowledge about the Microwave semiconductor devices and circuits. |
| 4 | Generate Microwave signals and design microwave amplifiers. |
| 5 | Measure and analyze Microwave signal and parameters. |
|  | EC6703- EMBEDDED AND REAL TIME SYSTEMS |
| 1 | Learn the architecture and programming of ARM processor. |
| 2 | Be familiar with the embedded computing platform design and analysis. |
| 3 | Be exposed to the basic concepts of real time Operating system. |
| 4 | Learn the system design techniques and networks for embedded systems |
| 5 | Model real-time applications using embedded-system concepts |
|  | IT 6005-Digital Image Processing |
| 1 | Able to understand the image processing fundamentals. |
| 2 | Able to analyze image enhancement techniques. |
| 3 | Able to comprehend the image restoration techniques |
| 4 | Able to elucidate image segmentation. |
| 5 | Represent features of images. |
|  | EC6703- EMBEDDED AND REAL TIME SYSTEMS |
| 1 | Learn the architecture and programming of ARM processor. |
| 2 | Be familiar with the embedded computing platform design and analysis. |
| 3 | Be exposed to the basic concepts of real time Operating system. |
| 4 | Learn the system design techniques and networks for embedded systems |
| 5 | Model real-time applications using embedded-system concepts |
| **SEM VIII**  **Course Outcome:** | |
|  | EC6712- Optical & Microwave Lab |
| 1 | Graduate will demonstrate and design and conduct experiments, analyze and interpret data. |
| 2 | Graduates will demonstrate and design a system, component or process as per needs and specifications. |
| 3 | Test microwave and optical components. |
| 4 | Analyse the mode characteristics of fiber |
| 5 | Analyse the radiation of pattern of antenna. |
|  | EC 6009- Advanced Computer Architecture |
| 1 | 1.      Understand the micro-architectural design of processors |
| 2 | 2.      Learn about the various techniques used to obtain performance improvement and power savings in current processors |
| 3 | 3.    Evaluate performance of different architectures with respect to various parameters |
| 4 | 4.    Analyze performance of different ILP techniques |
| 5 | 5.    Identify cache and memory related issues in multi-processors |
|  | GE6757- Total Quality Management |
| 1 | 1.      Create constancy of purpose for improving products and services. |
| 2 | 2.      Adopt the new philosophy. |
| 3 | 3.      Cease dependence on inspection to achieve quality |
| 4 | 4.      End the practice of awarding business on price alone; instead, minimize total cost by working with a single supplier. |
| 5 | 5.    The student would be able to apply the tools and techniques of quality management to manufacturing and services processes. |
|  | EC6801 - Wireless Communication |
| 1 | 1.      An ability to compare various services and technical challenges. |
| 2 | 2.      An ability to compare various wireless propagation channels |
| 3 | 3.      An ability to analyze noise performance of wireless transceivers. |
| 4 | 4.      An ability to understand signal processing in wireless systems. |
| 5 | 5.      An ability to know about advanced transceiver schemes |
|  | EC 6802- Wireless Networks |
| 1 | 1.      To study about fundamentals of 3G Services, its protocols and applications. |
| 2 | 2.      To study about evolution of 4G Networks, its architecture and applications. |
| 3 | 3.    Conversant with the latest 3G/4G and WiMAX networks and its architecture. |
| 4 | 4.    Design and implement wireless network environment for any application using latest wireless protocols and standards. |
| 5 | 5.    Implement different type of applications for smart phones and mobile devices with latest network strategies |
|  | GE6075- Professional Ethics in Engineering |
| 1 | 1.      To enable the students to create an awareness on Engineering Ethics and Human Values |
| 2 | 2.      To instill Moral and Social Values and Loyalty and to appreciate the rights of others. |
| 3 | 3.    Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering |
| 4 | 4.    Realize the responsibilities and rights in the society |
| 5 | 5.      Understand the global issues |
|  | EC6811 Project Work |
| 1 | An ability to design, analyze and interpret the data. |
| 2 | An ability to use modern engineering tools necessary for the experimental work. |
| 3 | Have the ability to apply the concept studied |
| 4 | Students are capable to implement real time projects |
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| 5 | An ability to design, analyze and interpret the data on electronics domain |