# J.P. COLLEGE OF ENGINEERING

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

## COURSE OUTCOME

## Regulation : 2021

| S. No | Sem | Course Code | Course Name | Course Outcome |
|---|---|---|---|---|
| 1 | I Sem | HS3152 | Professional English - I | To use appropriate words in a professional context |
| | | | | To gain understanding of basic grammatic structures and use them in right context |
| | | | | To read and infer the denotative and connotative meanings of technical texts |
| | | | | To write definitions, descriptions, narrations and essays on various topics |
| | | | | To communicate effectively and appropriately in real life |
| 2 | | MA3151 | Matrices and Calculus | Use the matrix algebra methods for solving practical problems. |
| | | | | Apply differential calculus tools in solving various application problems |
| | | | | Able to use differential calculus ideas on several variable functions |
| | | | | Apply different methods of integration in solving practical problems |
| | | | | Apply multiple integral ideas in solving areas, volumes and other practical problems |
| 3 | | PH3151 | Enngineering Physics | Understand the importance of mechanics |
| | | | | Express their knowledge in electromagnetic waves. |
| | | | | Demonstrate a strong foundational knowledge in oscillations, optics and lasers. |
| | | | | Understand the importance of quantum physics. |
| | | | | Comprehend and apply quantum mechanical principles towards the formation of energy bands. |
| 4 | | CY3151 | Engineering Chemistry | To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water |
| | | | | To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications |
| | | | | To apply the knowledge of phase rule and composites for material selection requirements. |
| | | | | To recommend suitable fuels for engineering processes and applications |
| | | | | To recognize different forms of energy resources and apply them for suitable applications in energy sectors. |
| 5 | | GE3151 | Problem Solving and Python Programming | Develop algorithmic solutions to simple computational problems |
| | | | | Develop and execute simple Python programs. |
| | | | | Write simple Python programs using conditionals and loops for solving problems. |

| | | | | |
|---|---|---|---|---|
| | | | **Programming** | Decompose a Python program into functions. |
| | | | | Represent compound data using Python lists, tuples, dictionaries etc. |
| **6** | | **GE3152** | **Heritage of Tamils** | NIL |
| **7** | **II Sem** | **HS3252** | **Professional English-II** | To compare and contrast products and ideas in technical texts. |
| | | | | To identify and report cause and effects in events, industrial processes through technical texts |
| | | | | To analyse problems in order to arrive at feasible solutions and communicate them in the written format. |
| | | | | To present their ideas and opinions in a planned and logical manner |
| | | | | To draft effective resumes in the context of job search. |
| **8** | | **MA3251** | **Statistics and Numerical Methods** | Apply the concept of testing of hypothesis for small and large samples in real life problems. |
| | | | | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| | | | | Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. |
| | | | | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| | | | | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications |
| **9** | | **GE3251** | **Engineering Graphics** | Use BIS conventions and specifications for engineering drawing. |
| | | | | Construct the conic curves, involutes and cycloid. |
| | | | | Solve practical problems involving projection of lines. |
| | | | | Draw the orthographic, isometric and perspective projections of simple solids. |
| | | | | Draw the development of simple solids. |
| **10** | | **PH3254** | **ysics for Electronics Engineer** | Know basics of crystallography and its importance for varied materials properties |
| | | | | Gain knowledge on the electrical and magnetic properties of materials and their applications |
| | | | | Understand clearly of semiconductor physics and functioning of semiconductor devices |
| | | | | Understand the optical properties of materials and working principles of various optical devices |
| | | | | Appreciate the importance of nanotechnology and nanodevices. |
| **11** | | **BE3254** | **Electrical and Instrumentation Engineering** | Explain the working principle of electrical machines |
| | | | | Analyze the output characterizes of electrical machines |
| | | | | Choose the appropriate electrical machines for various applications |
| | | | | Explain the types and operating principles of measuring instruments |
| | | | | Explain the basic power system structure and protection schemes |

| | | | | |
|---|---|---|---|---|
| **12** | | **EC3251** | **Citcuit Analysis** | Apply the basic concepts of circuit analysis such as Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits. |
| | | | | Apply suitable network theorems and analyze AC and DC circuits |
| | | | | Analyze steady state response of any R, L and C circuits |
| | | | | Analyze the transient response for any RC, RL and RLC circuits and frequency response of parallel and series resonance circuits. |
| | | | | Analyze the coupled circuits and network topologies |
| **13** | **III Sem** | **EC3351** | **Control Systems** | Compute the transfer function of different physical systems. |
| | | | | Analyse the time domain specification and calculate the steady state error. |
| | | | | Illustrate the frequency response characteristics of open loop and closed loop system response. |
| | | | | Analyse the stability using Routh and root locus techniques. |
| | | | | Illustrate the state space model of a physical system and discuss the concepts of sampled datacontrol system. |
| **14** | | **EC3352** | **Digital Systems Design** | Use Boolean algebra and simplification procedures relevant to digital logic. |
| | | | | Design various combinational digital circuits using logic gates. |
| | | | | Analyse and design synchronous sequential circuits. |
| | | | | Analyse and design asynchronous sequential circuits. |
| | | | | Build logic gates and use programmable devices. |
| **15** | | **EC3353** | **Electronic Devices and Circuits** | Characteristics of PN Junction Diode and Zener diode. |
| | | | | Design and Testing of BJT and MOSFET amplifiers. |
| | | | | Operation of power amplifiers |
| | | | | To study about feedback amplifiers and oscillators principles |
| | | | | To understand the analysis and design of multi vibrators |
| **16** | | **CS3353** | **C Programming and Data Structures** | Use different constructs of C and develop applications |
| | | | | Write functions to implement linear and non-linear data structure operations |
| | | | | Suggest and use the appropriate linear / non-linear data structure operations for a given problem |
| | | | | Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval |
| | | | | Implement Sorting and searching algorithms for a given application |
| **17** | | **EC3354** | **Signals and Systems** | Determine if a given system is linear/causal/stable |
| | | | | Determine the frequency components present in a deterministic signal |
| | | | | characterize continuous LTI systems in the time domain and frequency domain |
| | | | | characterize discrete LTI systems in the time domain and frequency domain |
| | | | | compute the output of an LTI system in the time and frequency domains |
| | | | | Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts. |
| | | | | Demonstrate accurate and efficient use of advanced algebraic techniques. |

| | | | | |
|---|---|---|---|---|
| **18** | | **MA3355** | **Rando Process and Linear Algebra** | Apply the concept of random processes in engineering disciplines. |
| | | | | Understand the fundamental concepts of probability with a thorough knowledge of standard distributions that can describe certain real-life phenomenon. |
| | | | | Understand the basic concepts of one and two dimensional random variables and apply them to model engineering problems. |
| **19** | **IV Sem** | **EC3451** | **Linear Integrated Circuits** | Design linear and nonlinear applications of OP – AMPS |
| | | | | Design applications using analog multiplier and PLL |
| | | | | Design ADC and DAC using OP – AMPS |
| | | | | Generate waveforms using OP – AMP Circuits |
| | | | | Analyze special function ICs |
| **20** | | **EC3452** | **Electromagnetic Fields** | Relate the fundamentals of vector, coordinate system to electromagnetic concepts |
| | | | | Analyze the characteristics of Electrostatic field |
| | | | | Interpret the concepts of Electric field in material space and solve the boundary conditions |
| | | | | Explain the concepts and characteristics of Magneto Static field in material space and solve boundary conditions. |
| | | | | Determine the significance of time varying fields |
| **21** | | **EC3401** | **Networks and Security** | Explain the Network Models, layers and functions. |
| | | | | Categorize and classify the routing protocols. |
| | | | | List the functions of the transport and application layer. |
| | | | | Evaluate and choose the network security mechanisms. |
| | | | | Discuss the hardware security attacks and countermeasures. |
| **22** | | **EC3491** | **Communication Systems** | Gain knowledge in amplitude modulation techniques |
| | | | | Understand the concepts of Random Process to the design of communication systems |
| | | | | Gain knowledge in digital techniques |
| | | | | Gain knowledge in sampling and quantization |
| | | | | Understand the importance of demodulation techniques |
| **23** | | **EC3492** | **Digital Signal Processing** | Apply DFT for the analysis of digital signals and systems |
| | | | | Design IIR and FIR filters |
| | | | | Characterize the effects of finite precision representation on digital filters |
| | | | | Design multirate filters |
| | | | | Apply adaptive filters appropriately in communication systems |
| | | | | To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. |
| | | | | To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. |

| | | | | |
|---|---|---|---|---|
| **24** | | **GE3451** | **Environmental Sciences and Sustainability** | To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. |
| | | | | To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development. |
| | | | | To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization. |
| **25** | **V Sem** | **EC3501** | **Wireless Communication** | Understand The Concept And Design Of A Cellular System. |
| | | | | Understand Mobile Radio Propagation And Various Digital Modulation Techniques. |
| | | | | Understand The Concepts Of Multiple Access Techniques And Wireless Networks |
| | | | | Characterize a wireless channel and evolve the system design specifications |
| | | | | Design a cellular system based on resource availability and traffic demands. |
| **26** | | **EC3552** | **VLSI and Chip Design** | In depth knowledge of MOS technology |
| | | | | Understand Combinational Logic Circuits and Design Principles |
| | | | | Understand Sequential Logic Circuits and Clocking Strategies |
| | | | | Understand Memory architecture and building blocks |
| | | | | Understand the ASIC Design Process and Testing. |
| **27** | | **EC3551** | **Transmission Lines and RF** | Explain the characteristics of transmission lines and its losses. |
| | | | | Calculate the standing wave ratio and input impedance in high frequency transmission lines. |
| | | | | Analyze impedance matching by stubs using Smith Charts. |
| | | | | Comprehend the characteristics of TE and TM waves. |
| | | | | Design a RF transceiver system for wireless communication |
| **28** | | **CEC334** | **Analog IC Design** | Design amplifiers to meet user specifications. |
| | | | | Analyse the frequency and noise performance of amplifiers. |
| | | | | Design and analyse feedback amplifiers and one stage op amps . |
| | | | | Analyse stability of op amp. |
| | | | | Testing experience of logic circuits |
| **29** | | **CEC332** | **Advanced Digital Signal Processing** | Comprehend multirate signal processing and demonstrate its applications |
| | | | | Demonstrate an understanding of the power spectral density and apply to discrete random signals and systems |
| | | | | Apply linear prediction and filtering techniques to discrete random signals for signal detection and estimation. |
| | | | | Analyze adaptive filtering problems and demonstrate its application |
| | | | | Apply power spectrum estimation techniques to random signals. |
| | | | | Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms. |
| | | | | Operate on images using the techniques of smoothing, sharpening and enhancement. |

| | | | | |
|---|---|---|---|---|
| **30** | | **CEC366** | **Image Processing** | Understand the restoration concepts and filtering techniques. |
| | | | | Learn the basics of segmentation, features extraction, compression and recognition methods for color models. |
| | | | | Comprehend image compression concepts. |
| **31** | | **MX3084** | **Disaster Risk Reduction and Management** | To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR) |
| | | | | To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction |
| | | | | To develop disaster response skills by adopting relevant tools and technology |
| | | | | Enhance awareness of institutional processes for Disaster response in the country and |
| | | | | Develop rudimentary ability to respond to their surroundings with potential |
| **32** | **VI Sem** | **ET3491** | **Embedded Systems and IOT Designs** | Explain the architecture and features of 8051. |
| | | | | Develop a model of an embedded system. |
| | | | | List the concepts of real time operating systems. |
| | | | | Learn the architecture and protocols of IoT. |
| | | | | Design an IoT based system for any application. |
| **33** | | **CEC370** | **Low Power IC Design** | Understand the fundamentals of Low power circuit design. |
| | | | | Attain the knowledge of architectural approaches. |
| | | | | Analyze and design Low-Voltage Low-Power combinational circuits. |
| | | | | Learn the design of Low-Voltage Low-Power Memories |
| | | | | Design and develop Low Power, Low Voltage Circuits |
| **34** | | **CS3491** | **Artificial Intelligence and Machine Learning** | Use appropriate search algorithms for problem solving |
| | | | | Apply reasoning under uncertainty |
| | | | | Build supervised learning models |
| | | | | Build ensembling and unsupervised models |
| | | | | Build deep learning neural network models |
| **35** | | **CEC341** | **MIC's and RF System Design** | Apply knowledge of S parameter theory to any RF active component design circuit for obtaining performance measure. |
| | | | | Analyze microwave circuits for filters design. |
| | | | | Evaluate the performance of any practical Microwave integrated circuits |
| | | | | Create communication circuits and subsystems with practical design parameters fornon- reciprocal components in MICs. |
| | | | | Design microwave integrated antenna design circuit for the required Performance using professional software tools. |
| **36** | | **CEC337** | **DSP Architecture and Programming** | Understand the architectural features of DSP Processors. |
| | | | | Comprehend the organization of TMS320C54xx DSP processors |
| | | | | Build solutions using TMS320C6x DSP Processor |

| | | | | |
|---|---|---|---|---|
| | | | **Programming** | Implement DSP Algorithms |
| | | | | Study the applications of DSP Processors. |