Sinhgad Technical Education Society's

SINHGAD ACADEMY OF ENGINEERING

(Affiliated to University of Pune and Approved by, AICTE, New Delhi.)
S. No. 40/4 A. Near octroi Post, Kondhwa –Saswad Road, Pune – 411048.
E-mail : saeprincipal@sinhgad .edu, Website : www.sinhgad.edu

Department of Electronics & Telecommunication

Course Outcomes

				SEM-I
Sr. No.	**Class**	**Subject Code**	**Subject Name**	**Course Outcomes**
1	SE	207005	Engineering Mathematics - III	CO1: Solve higher order linear differential equation using appropriate techniques for modeling, analyzing of electrical circuits and control systems. CO2: Apply concept of Fourier transform & Z-transform and its applications to continuous & discrete systems, signal & image processing and communication systems. CO3: Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing. CO4: Perform vector differentiation & integration, analyze the vector fields and apply to electro- magnetic fields & wave theory. CO5: Analyze Complex functions, Conformal mappings, Contour integration applicable to electrostatics, digital filters, signal and image processing.
2	SE	204181	Electronic Circuits	CO1: Assimilate the physics, characteristics and parameters of MOSFET towards its application as amplifier. CO2: Design MOSFET amplifiers, with and without feedback, & MOSFET oscillators, for given specifications. CO3: Analyze and assess the performance of linear and switching regulators, with their variants, towards applications in regulated power supplies. CO4: Explain internal schematic of Op-Amp and define its performance parameters. CO5: Design, Build and test Op-amp based analog signal processing and conditioning circuits towards various real

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					time applications. CO6: Understand and compare the principles of various data conversion techniques and PLL with their applications.
3	SE	204182	Digital Circuits		CO1: Identify and prevent various hazards and timing problems in a digital design. CO2: Use the basic logic gates and various reduction techniques of digital logic circuit. CO3: Analyze, design and implement combinational logic circuits. CO4: Analyze, design and implement sequential circuits. CO5: Differentiate between Mealy and Moore machines. CO6: Analyze digital system design using PLD.
4	SE	204183	Electrical Circuits		CO1: Analyze the simple DC and AC circuit with circuit simplification techniques. CO2: Formulate and analyze driven and source free RL and RC circuits. CO3: Formulate & determine network parameters for given network and analyze the given network using Laplace Transform to find the network transfer function. CO4: Explain construction, working and applications of DC Machines / Single Phase & Three Phase AC Motors. CO5: Explain construction, working and applications of special purpose motors & understand motors used in electrical vehicles. CO6: Analyze and select a suitable motor for different applications.
5	SE	204184	Data Structures		CO1: Solve mathematical problems using C programming language. CO2: Implement sorting and searching algorithms and calculate their complexity. CO3: Develop applications of stack and queue using array. CO4: Demonstrate applicability of Linked List. CO5: Demonstrate applicability of nonlinear data structures - Binary Tree with respect to its time complexity. CO6: Apply the knowledge of graph for solving the problems of spanning tree and shortest path algorithm

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				SEM II
6	SE	204191	Signals & Systems	CO1: Identify, classify basic signals and perform operations on signals. CO2: Identify, Classify the systems based on their properties in terms of input output relation and in terms of impulse response and will be able to determine the convolution between to signals. CO3: Analyze and resolve the signals in frequency domain using Fourier series and Fourier Transform. CO4: Resolve the signals in complex frequency domain using Laplace Transform, and will be able to apply and analyze the LTI systems using Laplace Transforms. CO5: Define and Describe the probability, random variables and random signals. Compute the probability of a given event, model, compute the CDF and PDF. CO6: Compute the mean, mean square, variance and standard deviation for given random variables using PDF.
7	SE	204192	Control Systems	CO1: Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems. CO2: Determine the (absolute) stability of a closed-loop control system. CO3: Perform time domain analysis of control systems required for stability analysis. CO4: Perform frequency domain analysis of control systems required for stability analysis. CO5: Apply root-locus, Frequency Plots technique to analyze control systems. CO6: Express and solve system equations in state variable form. CO7: Differentiate between various digital controllers and understand the role of the controllers in Industrial automation
8	SE	204193	Principles of Communication Systems	CO1: To compute & compare the bandwidth and transmission power requirements by analyzing time and frequency domain spectra of signal required for modulation schemes under study. CO2: Describe and analyze the techniques of

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				generation, transmission and reception of Amplitude Modulation Systems. CO3: Explain generation and detection of FM systems and compare with AM systems. CO4: Exhibit the importance of Sampling Theorem and correlate with Pulse Modulation technique (PAM, PWM, and PPM). CO5: Characterize the quantization process and elaborate digital representation techniques (PCM, DPCM, DM and ADM). CO6: Illustrate waveform coding, multiplexing and synchronization techniques and articulate their importance in baseband digital transmission
9	SE	204194	Object Oriented Programming	CO1: Describe the principles of object oriented programming. CO2: Apply the concepts of data encapsulation, inheritance in C++. CO3: Understand Operator overloading and friend functions in C++. CO4: Apply the concepts of classes, methods inheritance and polymorphism to write programs C++. CO5: Apply Templates, Namespaces and Exception Handling concepts to write programs in C++. CO6: Describe and use of File handling in C++
			SEM I	
10	TE	304181	Digital Communication	1)To understand the building blocks of digital communication system. 2)To prepare mathematical background for communication signal analysis. 3)To understand and analyze the signal flow in a digital communication system 4)To analyze error performance of a digital communication system in presence of noise and other interferences. 5)To understand concept of spread spectrum communication system.

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11	TE	304182	Digital Signal Processing	1) Analyze the discrete time signals and system using different transform domain techniques. 2) Design and implement LTI filters for filtering different real world signals. 3) Develop different signal processing applications using DSP processor
12	TE	304183	Electromagnetics	1) Understand the basic mathematical concepts related to electromagnetic vector fields. 2) Apply the principles of electrostatics to the solutions of problems relating to electric field and electric potential, boundary conditions and electric energy density. 3) Apply the principles of magnetostatics to the solutions of problems relating to magnetic field and magnetic potential, boundary conditions and magnetic energy density. 4) Understand the concepts related to Faraday's law, induced emf and Maxwell's equations. 5) Apply Maxwell's equations to solutions of problems relating to transmission lines and uniform plane wave propagation.
13	TE	304184	Microcontrollers	1) Learn importance of microcontroller in designing embedded application. 2) Learn use of hardware and software tools. 3) Develop interfacing to real world devices
14	TE	304185	Mechatronics	1 Identification of key elements of mechatronics system and its representation in terms of block diagram 2 Understanding basic principal of Sensors and Transducer. 3. Able to prepare case study of the system given.
SEM II				

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15	TE	304186	Power Electronics	1) Design & implement a triggering / gate drive circuit for a power device 2) Understand, perform & analyze different controlled converters. 3) Evaluate battery backup time & design a battery charger. 4) Design & implement over voltage / over current protection circuit.
16	TE	304187	Information Theory Coding Techniques and Communication Networks	1) Perform information theoretic analysis of communication system. 2) Design a data compression scheme using suitable source coding technique. 3) Design a channel coding scheme for a communication system. 4) Understand and apply fundamental principles of data communication and networking. 5) Apply flow and error control techniques in communication networks.
17	TE	304188	Business Management	1) Get overview of Management Science aspects useful in business. 2) Get motivation for Entrepreneurship 3) Get Quality Aspects for Systematically Running the Business 4) To Develop Project Management aspect and Entrepreneurship Skills.
18	TE	304189	Advanced Processors	1) Describe the ARM microprocessor architectures and its feature. 2) Interface the advanced peripherals to ARM based microcontroller 3) Design embedded system with available resources. 4) Use of DSP Processors and resources for signal processing applications.
19	TE	304190	System Programming and Operating System	1) Demonstrate the knowledge of Systems Programming and Operating Systems 2) Formulate the Problem and develop the solution for same. 3) Compare and analyse the different implementation approach of system programming operating system

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				abstractions. 4) Interpret various OS functions used in Linux / Ubuntu
SEM I				
20	BE	404181	VLSI Design & Technology	1. Write effective HDL coding for digital design. 2. Apply knowledge of real time issues in digital design. 3. Model digital circuit with HDL, simulate, synthesis and prototype in PLDs. 4. Design CMOS circuits for specified applications. 5. Analyze various issues and constraints in design of an ASIC 6. Apply knowledge of testability in design and build self test circuit.
21	BE	404182	Computer Networks & Security	1. Understand fundamental underlying principles of computer networking 2. Describe and analyze the hardware, software, components of a network and their interrelations. 3. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies 4. Have a basic knowledge of installing and configuring networking applications. 5. Specify and identify deficiencies in existing protocols, and then go onto select new and better protocols. 6. Have a basic knowledge of the use of cryptography and network security.
22	BE	404183	Radiation and Microwave Techniques	1. Differentiate various performance parameters of radiating elements. 2. Analyze various radiating elements and arrays. 3. Apply the knowledge of waveguide fundamentals in design of transmission lines. 4. Design and set up a system consisting of various passive microwave components. 5. Analyze tube based and sol id state active devices along with their applications. 6. Measure various performance parameters of microwave components.

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23	BE	404184	Digital Image and Video Processing (Elective-I)	1. Develop and implement basic mathematical operations on digital images. 2. Analyze and solve image enhancement and image restoration problems. 3. Identify and design image processing techniques for object segmentation and recognition. 4. Represent objects and region of the image with appropriate method. 5. Apply 2-D data compression techniques for digital images. 6. Explore video signal representation and different algorithm for video processing
24	BE	404185	Electronic Product Design (Elective-II)	1. Understand various stages of hardware, software and PCB design. 2. Importance of product test &test specifications. 3. Special design considerations and importance of documentation.
25	BE	404185	Artificial Intelligence (Elective II)	1. Design and implement key components of intelligent agents and expert systems. 2. To apply knowledge representation techniques and problem solving strategies to common AI applications. 3. Applyand integrate various artificial intelligence techniques in intelligent system development as well as understand the importance of maintaining intelligent systems. 4. Build rule-based and other knowledge-intensive problem solvers.
SEM II				
26	BE	404189	Mobile Communication	1. Apply the concepts of switching technique and traffic engineering to design multistage networks. 2. Explore the architecture of GSM. 3. Differentiate thoroughly the generations of mobile technologies.
27	BE	404190	Broadband Communication Systems	1. Perform Link power budget and Rise Time Budget by proper selection of components and check its viability. 2. Perform Satellite Link design for Up Link and Down Link.

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28	BE	404191	Machine Learning (Elective III)	1. To compare and contrast pros and cons of various machine learning techniques and to get an in sight of when to apply a particular machine learning approach. 2. To mathematically analyze various machine learning approaches and paradigms. 3. To implement convolution neural networks in recognition applications.
29	BE	404191	Audio Video Engineering (Elective III)	1. Apply the fundamentals of Analog Television and Colour Television standards. 2. Explainthe fundamentals of Digital Television, DTV standards and parameters. 3. Study and understand various HDTV standards and Digital TV broadcasting systems and acquainted with different types of analog, digital TV and HDTV systems. 4. Understand acoustic fundamentals and various acoustic systems.
30	BE	404192	ROBOTICS (Elective-IV)	1. Familiar with the history, concept development and key components of robotics technologies. 2. Implement basic mathematics manipulations of spatial coordinate representation and transformation. 3. Solve basic robot forward and inverse kinematic problems 4. Understand and able to solve basic robotic dynamics, path planning and control problems