



" TSSM'S "

PADAMBHOOSHAN VASANTDADA PATIL INSTITUTE OF TECHNOLOGY

S.N. 33/22 , Near. ChandniChowk ,Opp. Athashree Project, Pirangut Road,
Bavdhan , Pune 411 021.



Approved By AICTE and Affiliated To SPPU Pune DTE Code : 6122

Accredited By NAAC With "A" Grade

Tel :+918530134040 | +9188305658165 Website :

www.pvpittssm.edu.in

Savitribai Phule Pune University, Pune
S.E. (Electronics / E&TC Engineering) 2019 Course
(With effect from Academic Year 2020-21)

Course Name -Engineering Mathematics III

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Solve higher order linear differential equation using appropriate techniques for modelling, 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.

Course Name - Electronic Circuits

Course Outcomes: On completion of the course, learner will be able to –

- 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 circuitstowards various real time applications.
- CO6: Understand and compare the principles of various data conversion techniques and PLL with their applications.



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Course Name - Digital Circuits

Course Outcomes: On completion of the course, learner will be able to –

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.

Course Name - Electrical Circuits

Course Outcomes: On completion of the course, learner will be able to –

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.

Course Name - Data Structures

Course Outcomes: On completion of the course, learner will be able to –

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. Course



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Course Name - Signals & Systems

Course Outcomes: On completion of the course, learner will be able to –

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.

Course Name - Control Systems

Course Outcomes: On completion of the course, learner will be able to –

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.



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Course Name - Principles of Communication Systems

Course Outcomes: On completion of the course, learner will be able to –

- 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 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.

Course Name - Object Oriented Programming

Course Outcomes: On completion of the course, learner will be able to –

- 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++.



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Course Name - Employability Skills Development

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Define personal and career goals using introspective skills and SWOC assessment. Outline and evaluate short-term and long-term goals.
- CO2: Develop effective communication skills (listening, reading, writing, and speaking), self-management attributes, problem solving abilities and team working & building capabilities in order to fetch employment opportunities and further succeed in the workplace.
- CO3: Be a part of a multi-cultural professional environment and work effectively by enhancing inter-personal relationships, conflict management and leadership skills.
- CO4: Comprehend the importance of professional ethics, etiquettes & morals and demonstrate sensitivity towards it throughout certified career.
- CO5: Develop practically deployable skill set involving critical thinking, effective presentations and leadership qualities to hone the opportunities of employability and excel in the professional environment.

Course Name - Project Based Learning

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Identify the real-world problem (possibly of interdisciplinary nature) through a rigorous literature survey and formulate / set relevant aim and objectives.
- CO2: Contribute to society through proposed solution by strictly following professional ethics and safety measures.
- CO3: Propose a suitable solution based on the fundamentals of electronics and communication engineering by possibly the integration of previously acquired knowledge.
- CO4: Analyze the results and arrive at valid conclusion.
- CO5: Use of technology in proposed work and demonstrate learning in oral and written form.
- CO6: Develop ability to work as an individual and as a team member.



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Course Name - Digital Communication

Course Outcomes: On completion of the course, learner will be able to –

CO1: Apply the statistical theory for describing various signals in a communication system.

CO2: Understand and explain various digital modulation techniques used in digital communication systems and analyze their performance in presence of AWGN noise.

CO3: Describe and analyze the digital communication system with spread spectrum modulation.

CO4: Analyze a communication system using information theoretic approach.

CO5: Use error control coding techniques to improve performance of a digital communication system.

Course Name - Electromagnetic Field Theory

Course Outcomes: On completion of the course, learner will be able to –

CO1: Apply the basic electromagnetic principles and determine the fields (E & H) due to the given source.

CO2: Apply boundary conditions to the boundaries between various media to interpret behavior of the fields on either sides.

CO3: State, Identify and Apply Maxwell's equations (integral and differential forms) in both the forms (Static, time-varying or Time-harmonic field) for various sources, Calculate the time average power density using Poynting Theorem, Retarded magnetic vector potential.

CO4: Formulate, Interpret and solve simple uniform plane wave (Helmholtz Equations) equations, and analyze the incident/reflected/transmitted waves at normal incidence.

CO5: Interpret and Apply the transmission line equation to transmission line problems with load impedance to determine input and output voltage/current at any point on the Transmission line, Find input/load impedance, input/load admittance, reflection coefficient, SWR, V_{max}/V_{min} , length of transmission line using Smith Chart.

CO6: Carry out a detailed study, interpret the relevance and applications of Electromagnetics.



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Course Name - Database Management

Course Outcomes: On completion of the course, learner will be able to –

CO1: Ability to implement the underlying concepts of a database system.

CO2: Design and implement a database schema for a given problem-domain using data model.

CO3: Formulate, using SQL/DML/DDDL commands, solutions to a wide range of query and update problems.

CO4: Implement transactions, concurrency control, and be able to do Database recovery.

CO5: Able to understand various Parallel Database Architectures and its applications.

CO6: Able to understand various Distributed Databases and its applications.

Course Name - Microcontroller

Course Outcomes: On completion of the course, learner will be able to –

CO1: Understand the fundamentals of microcontroller and programming.

CO2: Interface various electronic components with microcontrollers.

CO3: Analyze the features of PIC 18F XXXX.

CO4: Describe the programming details in peripheral support.

CO5: Develop interfacing models according to applications.

CO6: Evaluate the serial communication details and interfaces

Course Name - Cellular Networks

Course Outcomes: On completion of the course, learner will be able to –

CO1: Understand fundamentals of wireless communications.

CO2: Discuss and study OFDM and MIMO concepts.

CO3: Elaborate fundamentals mobile communication.

CO4: Describes aspects of wireless system planning.

CO5: Understand of modern and futuristic wireless networks architecture.

CO6: Summarize different issues in performance analysis.



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Course Name- Project Management

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Apply the fundamental knowledge of project management for effectively handling the projects.
- CO2: Identify and select the appropriate project based on feasibility study and undertake its effective planning.
- CO3: Assimilate effectively within the organizational structure of project and handle project management related issues in an efficient manner.
- CO4: Apply the project scheduling techniques to create a Project Schedule Plan and accordingly utilize the resources to meet the project deadline.
- CO5: Identify and assess the project risks and manage finances in line with Project Financial Management Process.
- CO6: Develop new products assessing their commercial viability and develop skillsets for becoming successful entrepreneurs while being fully aware of the legal issues related to Product development and Entrepreneurship.

Course Name- Power Devices & Circuits

Course Outcomes: On completion of the course, learner will be able to –

- CO1: To differentiate based on the characteristic parameters among SCR, GTO, MOSFET & IGBT and identify suitability of the power device for certain applications and understand the significance of device ratings.
- CO2: To design triggering / driver circuits for various power devices.
- CO3: To evaluate and analyze various performance parameters of the different converters and its topologies.
- CO4: To understand significance and design of various protection circuits for power devices.
- CO5: To evaluate the performance of uninterruptible power supplies, switch mode power supplies and battery.
- CO6: To understand case studies of power electronics in applications like electric vehicles, solar systems etc



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Course Name- Digital Image Processing (Elective - II)

Course Outcomes: On completion of the course, learner will be able to –

CO1: Apply knowledge of mathematics for image understanding and analysis.

CO2: Implement spatial domain image operations.

CO3: Design and realize various algorithms for image segmentation.

CO4: Design and realize various algorithms for image Compression.

CO5: Apply restoration to remove noise in the image.

CO6: Describe the object recognition system.

Course Name- Mini Project

Course Outcomes: On completion of the course, learner will be able to –

CO1: Understand, plan and execute a Mini Project with team.

CO2: Implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting etc.

CO3: Prepare a technical report based on the Mini project.

CO 4: Deliver technical seminar based on the Mini Project work carried out.



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B.E. (Electronics / E&TC Engineering) 2019 Course
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Course Name- Radiation & Microwave Theory

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Apply the fundamentals of electromagnetic to derive free space propagation equation and distinguish various performance parameters of antenna.
- CO2: Identify various modes in the waveguide. Compare: coaxial line, rectangular waveguides & striplines and identify applications of the same.
- CO3: Explore construction and working of principles passive microwave devices/components.
- CO4: Explore construction and working of principles active microwave devices/components.
- CO5: Analyze the structure, characteristics, operation, equivalent circuits and applications of various microwave solid state active devices.
- CO6: Know the various microwave systems, device set ups of microwave measurement devices and Identify the effect of radiations on environmental sustainability.

Course Name- VLSI Design and Technology

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Develop effective HDL codes for digital design.
- CO2: Apply knowledge of real time issues in digital design.
- CO3: Model digital circuit with HDL, simulate, synthesis and prototype in PLDs.
- CO4: Design CMOS circuits for specified applications.
- CO5: Analyze various issues and constraints in design of an ASIC.
- CO6: Apply knowledge of testability in design and Build In Self Test (BIST) circuit.



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Course Name- Cloud Computing

Course Outcomes: On completion of the course, learner will be able to –

CO1: Understand the basic concepts of Cloud Computing.

CO2: Describe the underlying principles of different Cloud Service Models.

CO3: Classify the types of Virtualization.

CO4: Examine the Cloud Architecture and understand the importance of Cloud Security.

CO5: Develop applications on Cloud Platforms.

CO6: Evaluate distributed computing and the Internet of Things.

Course Name-Modernized IoT (Elective - III)

Course Outcomes: On completion of the course, learner will be able to –

CO1: Comprehend and analyze concepts of sensors, actuators, IoT and IoE.

CO2: Interpret IoT Architecture Design Aspects.

CO3: Comprehend the operation of IoT protocols.

CO4: Describe various IoT boards, interfacing, and programming for IoT.

CO5: Illustrate the technologies, Catalysts, and precursors of IIoT using suitable use cases.

CO6: Provide suitable solution for domain specific applications of IoT.

Course Name - Deep Learning (Elective - IV)

Course Outcomes: On completion of the course, learner will be able to –

CO1: Classify machine learning algorithms and its types.

CO2: Discuss the concepts of deep learning and its Frameworks.

CO3: Identify the deep learning architectures with respect to the applications.

CO4: Demonstrate different architectures of Convolutional neural networks.

CO5: Discuss natural language processing architectures.

CO6: Make use of various case studies and deep learning applications.



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Course Name - Fiber Optic Communication

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Explain the working of components and measurement equipments in optical fiber networks.
- CO2: Calculate the important parameters associated with optical components used in fiber optic telecommunication systems.
- CO3: Compare and contrast the performance of major components in optical links.
- CO4: Evaluate the performance viability of optical links using the power and rise time budget analysis.
- CO5: Design digital optical link by proper selection of components and check its viability using simulation tools.
- CO6: Compile technical information related to state of art components, standards, simulation tools and current technological trends by accessing the online resources to update their domain knowledge.

Course Name - Mobile Computing (Elective - V)

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Understand concepts of Mobile Communication.
- CO2: Analyse next generation Mobile Communication System.
- CO3: Understand network layers of Mobile Communication.
- CO4: Understand IP and Transport layers of Mobile Communication.
- CO5: Study of different mathematical models.
- CO6: Understand different mobile applications.

Course Name - Digital Marketing (Elective - VI)

Course Outcomes: On completion of the course, learner will be able to –

- CO1: Design websites using free tools like Wordpress and explore it for digital marketing.
- CO2: Apply various keywords for a website & to perform SEO.
- CO3: Understand the various SEM Tools and implement the Digital Marketing Tools.
- CO4: Illustrate the use of Facebook, Instagram and Youtube for Digital Marketing in real life.
- CO5: Use Linked in platform for various campaigning. CO6: Understand the importance of recent trends in digital marketing.
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