Savitribai Phule Pune University

Faculty of Science and Technology

Syllabus for

S.E (Electronics / Electronics & Telecommunication Engineering)

(Course 2019)

(w.e.f. June 2020)

Savitribai Phule Pune University		
Second Year of Electronics / E & Tc Engineering (2019 Course)		
207005: Engineering Mathematics - III		
Teaching Scheme:	**Credit**	**Examination Scheme:**
Theory: 04 hrs. / week **Tutorial: 01 hr. / week**	**04 + 01 = 05**	**In-Sem (Theory): 30 Marks** **End Sem (Theory): 70 Marks** **Term Work: 25 Marks**

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.

Savitribai Phule Pune University		
Second Year of Electronics / E & Tc Engineering (2019 Course)		
204181: Electronic Circuits		
Teaching Scheme:	**Credit**	**Examination Scheme:**
Theory: 03 hrs. / week	**03**	**In-Sem (Theory): 30 Marks** **End Sem (Theory): 70 Marks**

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 circuits towards various real time applications.

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

Savitribai Phule Pune University		
Second Year of Electronics / E & Tc Engineering (2019 Course) **204182: Digital Circuits**		
Teaching Scheme:	**Credit**	**Examination Scheme:**
Theory: 03 hrs. / week	**03**	**In-Sem (Theory): 30 Marks** **End Sem (Theory): 70 Marks**

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.

Savitribai Phule Pune University		
Second Year of Electronics / E & Tc Engineering (2019 Course)		
204183: Electrical Circuits		
Teaching Scheme:	**Credit**	**Examination Scheme:**
Theory: 03 hrs. / week	**03**	**In-Sem (Theory): 30 Marks** **End Sem (Theory): 70 Marks**

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.

Savitribai Phule Pune University		
Second Year of Electronics / E & Tc Engineering (2019 Course)		
204184: Data Structures		
Teaching Scheme:	**Credit**	**Examination Scheme:**
Theory: 03 hrs. / week	**03**	**In-Sem (Theory): 30 Marks** **End Sem (Theory): 70 Marks**

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.

Savitribai Phule Pune University

Second Year of Electronics / E & Tc Engineering (2019 Course)

204191: Signals & Systems

Teaching Scheme:	Credit	Examination Scheme:
Theory: 03 hrs. / week Tutorial: 01 hr. / week	03 + 01 = 04	In-Sem (Theory): 30 Marks End Sem (Theory): 70 Marks Term Work: 25 Marks

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.

Savitribai Phule Pune University		
Second Year of Electronics / E & Tc Engineering (2019 Course)		
204192: Control Systems		
Teaching Scheme:	**Credit**	**Examination Scheme:**
Theory: 03 hrs. / week	**03**	**In-Sem (Theory): 30 Marks** **End Sem (Theory): 70 Marks**

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.

Savitribai Phule Pune University
Second Year of Electronics / E & Tc Engineering (2019 Course)
204193: Principles of Communication Systems

Teaching Scheme:	Credit	Examination Scheme:
Theory: 03 hrs. / week	**03**	**In-Sem (Theory): 30 Marks** **End Sem (Theory): 70 Marks**

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.

Savitribai Phule Pune University		
Second Year of Electronics / E & Tc Engineering (2019 Course)		
204194: Object Oriented Programming		
Teaching Scheme:	**Credit**	**Examination Scheme:**
Theory: 03 hrs. / week	**03**	**In-Sem (Theory): 30 Marks** **End Sem (Theory): 70 Marks**

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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