

**SWAMI VIVEKANAND UNIVERSITY, SIRONJA,
SAGAR (M.P.)**



SYLLABUS

For

***B.TECH INSTRUMENTATION
4TH SEM***

**Swami Vivekanand University, Sironja Sagar
2013-2014**

SCHEME B.TECH INSTRUMENTATION SEM-IV

SUBJECT CODE	SUBJECT
BT-401	MATHEMATICS - 3
IC-402	CONTROL THEORY
IC-403	MICROPROCESSOR AND INTERFACING
IC-404	ADVANCE ELECTRONICS
IC-405	MANAGEMENT - I
IC-406	JAVA TECHNOLOGY
IC-407	SELF STUDY (INTERNAL ASSESMENT)
IC-408	SEMINAR / GROUP DISCUSSION (INTERNAL ASSESSMENT)

SCHEME OF EXAMINATION

SUBJECT CODE	THEORY				PRACTICAL			CREDIT		TOTAL	TH- THEORY MS- MID SEM TQ- THEORY QUIZ TW- THEORY TERM WORK PR- PRACTICAL LW- LAB WORK PQ- PRACTICAL QUIZ G - GRADE GP- GRADE POINT F\$-ABSENT #-GRACE	
	TH	MS	TQ	TW	PR	LW	LQ	TH	PR	MAX		
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN		
BT-401	70	22	20	-	10	-	-	-	-	4	-	100
IC-402	70	22	20	-	10	-	-	-	-	4	-	100
IC-403	70	22	20	-	10	-	-	30	9	20	-	150
IC-404	70	22	20	-	10	-	-	30	9	20	-	150
IC-405	70	22	20	-	10	-	-	30	9	20	-	150
IC-406	-	-	-	-	-	-	-	30	9	20	-	50
IC-407	-	-	-	-	-	-	-	-	-	50	-	50
IC-408	-	-	-	-	-	-	-	-	-	50	-	50

Total-800

Subject Name Mathematics-III

Sr.No	Course content
1.	Complex numbers and functions: Limits of Functions, Continuity, Differentiability, Analytic functions, Cauchy-Riemann Equations, Necessary and Sufficient condition for analyticity, Properties of Analytic Functions, Laplace Equation, Harmonic Functions, Finding Harmonic Conjugate functions Exponential, Trigonometric, Hyperbolic functions and its properties. Multiple valued function and its branches: Logarithmic function and Complex Exponent function.
2.	Complex Integration: Curves, Line Integrals (contour integral) and its properties. Line integrals of single valued functions, Line integrals of multiple valued functions (by choosing suitable branches). Cauchy-Goursat Theorem, Cauchy Integral Formula, Liouville Theorem, Fundamental Theorem of Algebra, Maximum Modulus Theorems.
3.	Power Series: Convergence (Ordinary, Uniform, Absolute) of power series, Taylor and Laurent Theorems, Laurent series expansions. Zeros of analytic functions. Singularities of analytic functions and their classification Residues: Residue Theorem, Rouché's Theorem, Argument Principle.
4.	Applications of Contour Integration: Evaluating various type of definite real integrals using contour integration method.
5.	Conformal Mapping and its applications: Mappings by elementary functions, Mobius transformations, Schwarz-Christoffel transformation.
6.	Interpolation: Interpolation by polynomials, divided differences, error of the interpolating polynomial.
7.	Numerical integration: Composite rules, error formulae, Gaussian integration.
8.	Linear algebraic equation: Solution of a system of linear equations: implementation of Gaussian elimination and Gauss-Seidel methods, partial pivoting.

9.	Roots of equation: Solution of a nonlinear equation: Bisection and Secant methods, Newton's method, rate of convergence, Power method for computation of Eigen values.
10.	Ordinary differential equations: Numerical solution of ordinary differential equations, Euler and Runge-Kutta methods.

Reference Books:

- 1) R. V. Churchill and J. W. Brown, Complex variables and applicati (7th Edition), McGraw-Hill (2003).
- 2) J. M. Howie, Complex analysis, Springer-Verlag (2004).
- 3) M. J. Ablowitz and A. S. Fokas, Complex Variables- Introduction and Applications, Cambridge University Press, 1998 (Indian Edition).
- 4) E. Kreyszig, Advanced engineering mathematics (8th Edition), John Wiley (1999).
- 5) S. D. Conte and Carl de Boor, Elementary Numerical Analysis- An Algorithmic Approach (3rd Edition), McGraw-Hill, 1980.
- 6) C. E. Froberg, Introduction to Numerical Analysis (2nd Edition), Addison-Wesley, 1981.

Subject Name Control Theory

Sr.No	Course Content
1	Introduction to Control Systems: Introduction, Examples of Control Systems, Closed-loop Control versus Open-Loop Control
2	Mathematical Modeling of Dynamic Systems: Introduction, Transfer Function and Impulse-Response Function, Automatic Control Systems, Modeling in state Space, State-Space Representation of Dynamic Systems, Transformation of Mathematical Models with MATLAB, Mechanical Systems, Electrical and Electronic Systems, Signal Flow Graphs, Linearization of Nonlinear Mathematical Models
3	Mathematical Modeling of Fluid Systems and Thermal systems: Introduction, Liquid-Level Systems, Thermal Systems
4	Transient and Steady-State Response Analyses: Introduction, First-Order Systems, Second-Order Systems, Higher-Order Systems, Transient-Response Analysis with MATLAB, Routh's Stability Criterion, Effects of Integral and Derivative Control Actions on System Performance, Steady-State Errors in Unity-Feedback Control Systems
5	Root-Locus Analysis: Introduction, Root-Locus Plots, General Rules for Constructing Root Loci, Root-Locus Plots with MATLAB, Positive Feedback Systems, Conditionally Stable Systems, Root Loci for Systems with Transport Lag
6	Frequency-Response Analysis: Introduction, Bode Diagrams, Plotting Bode Diagrams with MATLAB, Polar Plots, Drawing Nyquist Plots with MATLAB, Log-Magnitude-versus-Phase Plots, Nyquist Stability Criterion, Stability Analysis, Relative Stability, Closed-Loop Frequency Response of Unity-Feedback Systems

Reference Books:

1. Modern Control Engineering by Katsuhiko Ogata, 4th Edition, Prentice Hall of India.
2. Automatic Control Systems by Benjamin C.Kuo, 8th Edition, Farid Golnaraghi, John Wiley & Sons.

Sr.No	Course content
1.	Introduction to Microprocessor, Microprocessor systems with bus organization, Microprocessor Architecture & Operations, Memory, I/O Device, Memory and I/O Operations
2.	8085 Microprocessor Architecture, Address, Data And Control Buses, Pin Functions, Demultiplexing Of Buses, Generation Of Control Signals, Instruction Cycle, Machine Cycles, T-States, Memory Interfacing.
3.	Assembly Language Programming Basics, Classification of Instructions, Addressing Modes, 8085 Instruction Set, Instruction And Data Formats, Writing, Assembling & Executing A Program, Debugging The Programs, Decision Making, Looping, Stack & Subroutines, Developing Counters And Time Delay Routines, Code Conversion, BCD Arithmetic And 16-Bit Data Operations.
4.	Interfacing Concepts, Ports, Interfacing Of I/O Devices, Interrupts In 8085, Interfacing of Data Converters (D-To-A And A-To-D), Programmable Interfacing Devices Like 8279 Keyboard/Display Interface, 8255A PPI, 8253/8254 Timer, 8259A PIT, 8237 DMA Controller, Serial I/O Concepts, SID And SOD, 8251A USART. Interfacing of above chips With 8085, Programming them In Deferent Modes, Practical Applications

Reference Books:

1. Microprocessor Architecture, Programming, and Applications with the 8085 - Ramesh S. Gaonkar Pub: Penram International.
2. Microcomputers and Microprocessors: The 8080,8085 and Z-80 Programming, Interfacing and Troubleshooting by John E. Uffenbeck.
3. Microprocessor and Microcontroller fundamentals. The 8085 and 8051 Hardware and Software by William Kleitz.

Subject Name Advance Electronics

Sr.No	Course content
1.	<p>Transistor at High Frequencies: Hybrid π CE Transistor Model, Hybrid π Conductances, Hybrid π Capacitances, Validity of Hybrid π Model, Variation of Hybrid π Parameters, CE Short-Circuit Current Gain, Current Gain with Resistive Load, Single-Stage CE Transistor Amplifier Response, Gain-Bandwidth Product, Emitter Follower at High Frequencies</p>
2.	<p>Multistage Amplifiers: Classification of Amplifiers, Distortion in Amplifiers, Frequency Response of an Amplifier, Bode Plots, Step Response of an Amplifier, Bandpass of Cascaded Stages, RC Coupled Amplifier, Low Frequency Response of an RC Coupled Stage, Effect of an Emitter Bypass Capacitor on Low-Frequency Response, High-Frequency Response of Two Cascaded CE Transistor Stages, Multistage CE Amplifier Cascade at High Frequencies</p>
3.	<p>Feedback Amplifiers: Classification of Amplifiers, Feedback Concept, Transfer Gain with Feedback, General Characteristics of Negative Feedback Amplifiers, Input Resistance, Output Resistance, Method of Analysis of a Feedback Amplifier, Voltage Series Feedback, A Voltage Series Feedback Pair, Current Series Feedback, Current Shunt Feedback, Voltage Shunt Feedback</p>
4.	<p>Stability and Oscillators: Effect of Feedback on Amplifier Bandwidth, Double-Pole Transfer Function with Feedback, Three π-Pole Transfer Function with Feedback, Approximate Analysis of a Multipole Feedback Amplifier, Stability, Gain and Phase Margins, Compensation, Dominant-Pole Compensation, Pole-Zero Compensation, Compensation by Modification of the β Network, Sinusoidal Oscillators, Phase-Shift Oscillator, Resonant Circuit Oscillators, A General Form of Oscillator Circuit, Wien Bridge Oscillator, Crystal Oscillators, Frequency Stability</p>
5.	<p>Operational Amplifiers: Basic Operational Amplifier, Differential Amplifier, Emitter-Coupled Differential Amplifier, Transfer Characteristics of a Differential Amplifier, An Example of an IC Operational Amplifier, Offset Error Voltages and Currents, Temperature Drift of Input Offset Voltage and Current, Measurement of Operational Amplifier Parameters, Frequency Response of Operational Amplifiers, Dominant π-Pole Compensation, Pole-Zero Compensation, Lead Compensation, Step Response of Operational Amplifiers</p>

6.	Logic Families : Diode Transistor Logic, High Threshold Logic, Transistor Transistor Logic, Resistor Transistor Logic, Direct Coupled Transistor Logic, Comparison of Logic families.
7.	Analog To Digital And Digital To Analog Converters: Digital to Analog Conversion, R-2R ladder type DAC, Weighted resistor type DAC, Switched current source type DAC, Switched capacitor type DAC, Analog to Digital Conversion, Counter type A/D converter, , Flash-type A/D converter, Dual slope A/D converter, Successive approximation ADC.

Reference Books:

1. Integrated Electronics By Jacob Millman and Christos C. Halkias, Tata McGraw Hill Publication
2. Electronic Devices and Circuit Theory by Robert Boylestad and Louis Nashelsky [Ninth Edition]

Subject Name: Management – I

Sr. No	Course content
1.	Introduction to Management and Organizations Innovative management for Turbulent times Functions of management Planning, Organizing, Controlling and Leading Types of Managers Managerial Roles
2.	Management history Schools of Management Scientific management The Behavioral Approach The Systems approach The contingency approach
3.	Organizational Structure and Design Types of structures Work specialization Departmentalization Chain of Command Span of Control Centralization and Decentralization Formalization
4.	Organizational Culture and Environment Concept of culture and its importance Attributes of culture How does culture affect managers and employees
5.	Social responsibility and Managerial ethics Concept of corporate social responsibility and ethics Stakeholders and its management Ethical issues in management

Reference Books:

- 1 'Management' – Stephen P. Robbins, Mary Coulter, Neharika Vohra – Pearson Prentice Hall of India, New Delhi, Tenth edition
- 2 'Essentials of Management', Koontz and Weihrich, Tata McGraw Hill, 2004, 6th Edition
- 3 Essentials of management – Adrew J. Durbrin, India edition, 7th Edition, Thomson – South Western
- 4 Principles of Management, Charles WL Hill and Steven L McSane, The McGraw Hill Companies, 2008
- 5 Principles of Management, Richard L. Daft, Cengage Learning, 2009