**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA**

**KAKINADA – 533 003, Andhra Pradesh, India**

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

## II Year – ISemester

| S. No. | Course | Category | L | T | P | Credits |
|--------|--------|----------|---|---|---|---------|
| 1 | Electronic Devices and Circuits | PC | 3 | 0 | 0 | 3 |
| 2 | Switching Theory and Logic Design | PC | 3 | 0 | 0 | 3 |
| 3 | Signals and Systems | PC | 3 | 0 | 0 | 3 |
| 4 | Random Variables and Stochastic Processes | PC | 3 | 0 | 0 | 3 |
| 5 | Object Oriented Programming through Java | ES | 3 | 0 | 0 | 3 |
| 6 | Managerial Economics & Financial Analysis | HS | 3 | 0 | 0 | 3 |
| 7 | Electronic Devices and Circuits - Lab | LC | 0 | 0 | 3 | 1.5 |
| 8 | Switching Theory and Logic Design - Lab | LC | 0 | 0 | 3 | 1.5 |
| 9 | Constitution of India | MC | 3 | 0 | 0 | 0 |
| | | | Sub-Total | | | **21** |

## II Year – IISemester

| S. No. | Course | Category | L | T | P | Credits |
|--------|--------|----------|---|---|---|---------|
| 1 | Electronic Circuit Analysis | PC | 3 | 0 | 0 | 3 |
| 2 | Linear Control Systems | PC | 3 | 0 | 0 | 3 |
| 3 | Electromagnetic Waves and Transmission Lines | PC | 3 | 0 | 0 | 3 |
| 4 | Analog Communications | PC | 3 | 0 | 0 | 3 |
| 5 | Computer Architecture and Organization | ES | 3 | 0 | 0 | 3 |
| 6 | Management and Organizational Behavior | HS | 3 | 0 | 0 | 3 |
| 7 | Electronic Circuit Analysis - Lab | LC | 0 | 0 | 3 | 1.5 |
| 8 | Analog Communications - Lab | LC | 0 | 0 | 3 | 1.5 |
| | | | Sub-Total | | | **21** |

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| II Year - I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 |
| | **ELECTRONIC DEVICES AND CIRCUITS** | | | | |

**Course Objectives:**

The main objectives of this course are

- To learn and understand the basic concepts of semiconductor physics.
- Study the physical phenomena such as conduction, transport mechanism and electrical characteristics of different diodes.
- To learn and understandthe application of diodes as rectifiers with their operation and characteristics with and without filters arediscussed.
- Acquire knowledge about the principle of working and operation of Bipolar Junction Transistor and Field Effect Transistor and theircharacteristics.
- To learn and understandthe purpose of transistor biasing and itssignificance.
- Small signal equivalent circuit analysis of BJT and FET transistor amplifiers and compare differentconfigurations.

**UNIT-I:Review of Semi Conductor Physics:** Hall effect, continuity equation, law of junction, Fermi Dirac function, Fermi level in intrinsic and extrinsic Semiconductors

**Junction Diode Characteristics :** energy band diagram of PN junction Diode, Open circuited p-n junction, Biased p-n junction, p-n junction diode,current components in PN junction Diode, diode equation, V-I Characteristics, temperature dependence on V-I characteristics, Diode resistance, Diode capacitance.

**UNIT-II:**

**Special Semiconductor Devices**: Zener Diode, Breakdown mechanisms, Zener diode applications, LED, Varactor Diode, Photodiode, Tunnel Diode, UJT, PN-PN Diode, SCR. Construction, operation and V-I characteristics.

**Rectifiers and Filters:** Basic Rectifier setup**,** half wave rectifier, full wave rectifier, bridge rectifier,derivations of characteristics of rectifiers, rectifier circuits-operation, input and output waveforms, Filters, Inductor filter(Series inductor), Capacitor filter(Stunt inductor), π-Filter,comparison of various filter circuits in terms of ripple factors.

**UNIT- III: Transistor Characteristics:**

**BJT:** Junction transistor, transistor current components, transistor equation, transistor configurations, transistor asan amplifier, characteristics of transistor in Common Base, Common Emitter and Common Collector configurations, Ebers-Moll model of a transistor, punch through/ reach through, Photo transistor, typical transistor junction voltage values.

**FET:** FET types, construction, operation, characteristicsμ, $g_m$, $r_d$parameters, MOSFET-types, construction, operation,characteristics, comparison between JFET and MOSFET.

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**UNIT- IV: Transistor Biasing and Thermal Stabilization :** Need for biasing, operating point, load line analysis,BJT biasing- methods, basic stability, fixed bias, collector to base bias, self bias, Stabilization against variations in $V_{BE}$, Ic, and β, Stability factors, $(S, S^{'}, S^{''})$, Bias compensation, Thermal runaway, Thermalstability.

FET Biasing- methods and stabilization.

**UNIT- V: Small Signal Low Frequency Transistor Amplifier Models:**
**BJT:** Two port network, Transistor hybrid model, determination of h-parameters, conversion of h-parameters,generalized analysis of transistor amplifier model using h-parameters, Analysis of CB, CE and CC amplifiers using exact and approximate analysis, Comparison of transistor amplifiers.
**FET:** Generalized analysis of small signal model, Analysis of CG, CS and CD amplifiers, comparison of FETamplifiers.

**Text Books:**
1. Electronic Devices and Circuits- J. Millman, C. Halkias, Tata Mc-Graw Hill, SecondEdition,2007
2. Electronic Devices and Circuits-K. Lal Kishore, BS Publications, FourthEdition,2016.
3. Electronics devices & circuit theory- Robert L.Boylestad andLouiNashelsky, Pearson/Prentice hall, tenth edition,2009

**References:**
1. Integrated Electronics-J. Millman, C. Halkias,Tata Mc-Graw Hill, SecondEdition,2009
2. Electronic Devices and Integrated Circuits – B.P. Singh,Rekha , Pearson publications,
3. Electronic Devices and Circuits-Salivahanan, Kumar, Vallavaraj, Tata Mc-Graw Hill, 4thEdition,2008.

**Course Outcomes:**
At the end of this course the student will be able to
- Apply the basic concepts of semiconductor physics.
- Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation.
- Know the construction, working principle of rectifiers with and without filters with relevant expressions and  necessary comparisons.
- Understand the construction, principle of operation of transistors, BJT and FET withtheir V-I characteristics in different configurations.
- Know the need of transistor biasing, various biasing techniques for BJT and FET and stabilization concepts with necessary expressions.
- Perform the analysis of small signal low frequency transistor amplifier circuits using BJT and FET in different configurations.

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| II Year  - I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 |
| | **SWITCHING THEORY and LOGIC DESIGN** | | | | |

**Course Objectives:**
- To solve a typical number base conversion and analyze new error coding techniques.
- Theorems and functions of Boolean algebra and behavior of logic gates.
- To optimize logic gates for digital circuits using various techniques.
- Boolean function simplification using Karnaugh maps and Quine-McCluskey methods.
- To understand concepts of combinational circuits.
- To develop advanced sequential circuits.

**UNIT – I**

**REVIEW OF NUMBER SYSTEMS & CODES:**

Representation of numbers of different radix, conversation from one radix to another radix, r-1's compliments and r's compliments of signed members.Gray code ,4 bit codes; BCD, Excess-3, 2421, 84-2-1 code etc. Error detection & correction codes: parity checking, even parity, odd parity, Hamming code.

**BOOLEAN THEOREMS AND LOGIC OPERATIONS:**

Boolean theorems, principle of complementation & duality, De-morgan theorems.Logic operations ; Basic logic operations -NOT, OR, AND, Universal Logic operations, EX-OR, EX-NOR operations.Standard SOP and POS Forms, NAND-NAND and NOR-NOR realizations, Realization of three level logic circuits. Study the pin diagram and obtain truth table for the following relevant ICs 7400,7402,7404,7408,7432,7486.

**UNIT – II**

**MINIMIZATION TECHNIQUES:**

Minimization and realization of switching functions usingBoolean theorems, K-Map (up to 6 variables)and tabular method(Quine-mccluskey method) with only four variables and single function.

**COMBINATIONAL LOGIC CIRCUITS DESIGN:**

Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders; 4-bit adder-subtractor circuit, BCD adder circuit, Excess 3 adder circuit and carry look-a-head adder circuit, Design code converts using Karnaugh method and draw the complete circuit diagrams.

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## UNIT – III
### COMBINATIONAL LOGIC CIRCUITS DESIGN USING MSI &LSI :
Design of encoder ,decoder, multiplexer and de-multiplexers, Implementation of higher order circuits using lower order circuits . Realization of Boolean functions using decoders and multiplexers.Design of Priority encoder, 4-bit digital comparator and seven segment decoder. . Study the relevant ICs pin diagrams and their functions 7442,7447,7485,74154.

### INTRODUCTION OF PLD's :
PLDs:PROM, PAL, PLA -Basics structures, realization of Boolean functions, Programming table.

## UNIT – IV
### SEQUENTIAL CIRCUITS I:
Classification of sequential circuits (synchronous and asynchronous) , operation of NAND & NOR Latches and flip-flops; truth tables and excitation tables of RS flip-flop, JK flip-flop, T flip-flop, D flip-flop with reset and clear terminals. Conversion from one flip-flop toanother flip-flop. Design of 5ripple counters, design of synchronous counters, Johnson counter, ring counter. Design of registers - Buffer register, control buffer register, shift register, bi-directional shift register, universal shift, register.
Study the following relevant ICs and their relevant functions 7474,7475,7476,7490,7493,74121.

## UNIT – V
### SEQUENTIAL CIRCUITS II :
Finite state machine; state diagrams, state tables, reduction of state tables.Analysis of clocked sequential circuits Mealy to Moore conversion and vice-versa.Realization of sequence generator,Design of Clocked Sequential Circuit to detect the given sequence (with overlapping or withoutoverlapping).

### TEXT BOOKS:
1. Switching and finite automata theory Zvi.KOHAVI,Niraj.K.Jha 3$^{rd}$Edition,Cambridge UniversityPress,2009
2. Digital Design by M.MorrisMano,Michael D Ciletti,4$^{th}$ edition PHIpublication,2008
3. Switching theory and logic design by Hill and Peterson**,**Mc-Graw Hill TMH edition, 2012.

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**REFERENCES:**
1. Fundamentalsof Logic Design by Charles H. Roth Jr, JaicoPublishers,2006
2. Digital electronics by R S Sedha.S.Chand & companylimited,2010
3. Switching Theory and Logic Design by A. AnandKumar,PHI Learning pvtltd,2016.
4. Digital logic applications and design by John M Yarbough, Cengage learning,2006.
5. TTL 74-Series databook.

**Course Outcomes:**

- Classify different number systems and apply to generate variouscodes.
- Use the concept of Boolean algebra in minimization of switchingfunctions
- Design different types of combinational logiccircuits.
- Apply knowledge of flip-flops in designing of Registers andcounters
- The operation and design methodology for synchronous sequential circuits and algorithmic statemachines.
- Produce innovative designs by modifying the traditional designtechniques.

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| II Year - I Semester | | **L** | **T** | **P** | **C** |
|---|---|---|---|---|---|
| | | **3** | **0** | **0** | **3** |
| | **SIGNALS and SYSTEMS** | | | | |

**Course Objectives:**

The main objectives of this course are given below:

- To study about signals andsystems.
- To analyze the spectral characteristics of signal using Fourier series and Fouriertransforms.
- To understand the characteristics ofsystems.
- To introduce the concept of samplingprocess
- To know various transform techniques to analyze the signals andsystems.

**UNIT- I: INTRODUCTION:** Definition of Signals and Systems, Classification of Signals, Classification of Systems, Operations on signals: time-shifting, time-scaling, amplitude-shifting, amplitude-scaling. Problems on classification and characteristics of Signals and Systems. Complex exponential and sinusoidal signals, Singularity functions and related functions: impulse function, step function signum function and ramp function. Analogy between vectors and signals, orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, closed or complete set of orthogonal functions, Orthogonality in complex functions. Related Problems.

**UNIT –II: FOURIER SERIES AND FOURIER TRANSFORM:**

Fourier series representation of continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Relation between Trigonometric and Exponential Fourier series, Complex Fourier spectrum. Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.RelatedProblems.

**UNIT-III: ANALYSIS OF LINEAR SYSTEMS:** Introduction**,** Linear system, impulse response, Response of a linear system, Linear time invariant (LTI) system, Linear time variant (LTV) system, Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Transfer function of a LTI system, Related problems. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

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**UNIT –IV:**
**CORRELATION:** Auto-correlation and cross-correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between Convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.
**SAMPLING THEOREM :** Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling, Related problems.

**UNIT –V:**
**LAPLACE TRANSFORMS:** Introduction**,** Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's, Inverse Laplace transform, Relation between L.T's, and F.T. of a signal. Laplace transform of certain signals using waveformsynthesis.
**Z–TRANSFORMS:** Concept of Z- Transform of a discrete sequence. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, properties of Z-transforms. Distinction between Laplace, Fourier and Z transforms.

**TEXT BOOKS:**
1. Signals, Systems & Communications - B.P. Lathi, BS Publications,2003.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI,2nd Edn,1997
3. Signals & Systems - Simon Haykin and Van Veen, Wiley, 2ndEdition,2007

**REFERENCE BOOKS:**
1. Principles of Linear Systems and Signals – BP Lathi, Oxford University Press,2015
2. Signals and Systems – T K Rawat , Oxford University press,2011

**Course Outcomes:**At the end of this course the student will able to:
- Differentiate the various classifications of signals andsystems
- Analyze the frequency domain representation of signals using Fourierconcepts
- Classify the systems based on their properties and determine the response ofLTI Systems.
- Know the sampling process and various types of samplingtechniques.
- Apply Laplace and z-transforms to analyze signals and Systems (continuous &discrete).

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| II Year - I Semester | | **L** | **T** | **P** | **C** |
|---|---|---|---|---|---|
| | | **3** | **0** | **0** | **3** |
| | **RANDOM VARIABLES and STOCHASTIC PROCESSES** | | | | |

**Course Objectives:**
- To give students an introduction to elementary probability theory, in preparation to learn the concepts of statistical analysis, random variables and stochasticprocesses.
- To mathematically model the random phenomena with the help of probabilitytheory Concepts.
- To introduce the important concepts of random variables and stochasticprocesses.
- To analyze the LTI systems with stationary random process asinput.

**UNIT I**
**THE RANDOM VARIABLE:** Introduction, Review of Probability Theory, Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete, Continuous and Mixed Random Variables, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh, Conditional Distribution, Conditional Density, Properties.

**UNIT II**
**OPERATION ON ONE RANDOM VARIABLE - EXPECTATIONS:** Introduction,
Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function, Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable, Non-monotonic Transformations of Continuous Random Variable.

**UNIT III**
**MULTIPLE RANDOM VARIABLES:** Vector Random Variables, Joint   Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem: Unequal Distribution, EqualDistributions.
**OPERATIONS ON MULTIPLE RANDOM VARIABLES**: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variables case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

**UNIT IV**
**RANDOM PROCESSES – TEMPORAL CHARACTERISTICS:** The RandomProcess Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, Concept of Stationarity and Statistical Independence. First-Order Stationary Processes, Second-order and Wide-Sense Stationarity, $N^{th}$-order and Strict-Sense

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Stationarity, Time Averages and Ergodicity, Autocorrelation Function and its Properties, Cross-Correlation Function and its Properties, Covariance Functions, Gaussian Random Processes, Poisson Random Process.

**UNIT V**

**RANDOM PROCESSES - SPECTRAL CHARACTERISTICS:** The PowerDensity Spectrum: Properties, Relationship between Power Density Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Density Spectrum and Cross-Correlation Function.

**LINEAR SYSTEMS WITH RANDOM INPUTS:** Random Signal Response of Linear Systems: System Response – Convolution, Mean and Mean-squared Value of System Response, Autocorrelation Function of Response, Cross-Correlation Functions of Input and Output, Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Density Spectra of Input and Output, Band pass, Band-Limited and Narrowband Processes,Properties.

**TEXT BOOKS:**
1. Probability, Random Variables & Random Signal Principles, Peyton Z. Peebles,TMH, 4$^{th}$ Edition,2001.
2. Probability, Random Variables and Stochastic Processes, Athanasios Papoulisand S.Unnikrisha, PHI, 4$^{th}$ Edition,2002.
3. Probability and Random Processes with Applications to Signal Processing, HenryStark and John W. Woods, Pearson Education, 3$^{rd}$Edition,2001.

**REFERANCE BOOKS:**
1. Schaum's Outline of Probability, Random Variables, and Random Processes,1997.
2. An Introduction to Random Signals and Communication Theory, B.P. Lathi, International Textbook,1968.
3. Probability Theory and Random Processes, P. Ramesh Babu, McGrawHill,2015.

**Course Outcomes:**
   After completion of the course, the student will be able to
- Mathematically model the random phenomena and solve simple probabilisticproblems.
- Identify different types of random variables and compute statistical averages ofthese randomvariables.
- Characterize the random processes in the time and frequencydomains.
- Analyze the LTI systems with randominputs.

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| II Year - I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 |
| | **OBJECT ORIENTED PROGRAMMING THROUGH JAVA** | | | | |

**Course Objectives:**
This subject will help to improve
- the analytical skills of object oriented programming
- Overall development of problem solving and critical analysis.
- Formal introduction to Java programming language

**Course Outcomes:**
On successful completion of this course, the student should be able to:
- Show competence in the use of the Java programming language in the development of small to medium-sized application programs that demonstrate professionally acceptable coding and performance standard
- Illustrate the basic principles of the object-oriented programming
- Demonstrate an introductory understanding of graphical user interfaces, multithreaded programming, and event-driven programming.

**Unit I**
**Introduction to Java :** Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, Math class, Arrays in java.
Objects and Classes : Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, StringBuffer, File, this reference.

**Unit II**
**Inheritance and Polymorphism :** Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.

**Unit III**

**Event and GUI programming :** Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing, Creating a swing applet, swing controls and components.

**Unit IV**
**I/O programming:** Text and Binary I/O, Binary I/O classes, Object I/O, Random Access Files.
Event driven model, handling events

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## Unit V

**Multithreading in java:** Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try-catch-finally, Collections in java, Introduction to JavaBeans and Network Programming.

**Text Books:**
1) Introduction to Java Programming (Comprehensive Version), Daniel Liang, Seventh Edition, Pearson.
2) Programming in Java, Sachin Malhotra & Saurabh Chaudhary, Oxford University Press.

**Reference Books:**
1) Murach's Beginning Java 2, Doug Lowe, Joel Murach and Andrea Steelman, SPD.
2) Core Java Volume-I Fundamentals, Eight Edition, Horstmann & Cornell, Pearson Education.
3) The Complete Reference, Java 2 (Fourth Edition), Herbert Schild, TMH.
4) Java Programming, D. S. Malik, Cengage Learning.

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| II Year - I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 |

# MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

**Course Objectives:**
- The Learning objectives of this paper are to understand the concept and nature of Managerial Economics and its relationship with other disciplines and also to understand the Concept of Demand and Demandforecasting.
- To familiarize about the Production function, Input Output relationship, Cost-Output relationship and Cost-Volume-ProfitAnalysis.
- To understand the nature of markets, Methods of Pricing in the different market structures and to know the different forms ofBusiness organization and the concept of Business Cycles.
- To learn different Accounting Systems, preparation of Financial Statement and uses of different tools for performanceevaluation.
- Finally, it is also to understand the concept of Capital, Capital Budgeting and the techniques used to evaluate Capital Budgetingproposals.

**Unit-I**
**Introduction to Managerial Economics and demand Analysis:**
Definition of Managerial Economics –Scope of Managerial Economics and its relationship with other subjects –Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting, Concept of Supply and Law of Supply.

**Unit – II:**
**Theories of Production and Cost Analyses:**
Theories of Production function- Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs-Fixed costs, Variable Costs and Total costs –Cost –Volume-Profit analysis-Determination of Breakeven point(problems)-Managerial significance and limitations of Breakeven point.

**Unit – III:**
**Introduction to Markets, Theories of the Firm & Pricing Policies:**
Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price and Output Determination – Managerial Theories of firm: Marris and Williamson's models – other Methods of Pricing: Average cost pricing, Limit Pricing, Market Skimming Pricing, Internet Pricing: (Flat Rate Pricing, Usage sensitive pricing) and Priority Pricing, Business Cycles : Meaning andFeatures
– PhasesofaBusinessCycle.FeaturesandEvaluationofSoleTrader,Partnership,JointStockCompany
– State/Public Enterprises and theirforms.

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**Unit – IV:**
**Introduction to Accounting & Financing Analysis:**
Introduction to Double Entry System, Journal, Ledger, Trail Balance and Preparation of Final Accounts with adjustments – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis – Preparation of Funds flow and cash flow analysis (Problems)

**Unit – V:**
**Capital and Capital Budgeting:** Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Time value of money- Methods of appraising Project profitability: Traditional Methods(pay back period, accounting rate of return) and modern methods(Discounted cash flow method, Net Present Value method, Internal Rate of Return Method and Profitability Index)

**TEXT BOOKS:**
1. A R Aryasri, Managerial Economics and Financial Analysis, The McGraw – Hill companies.

**REFERENCES:**
1. Varshney R.L, K.L Maheswari, Managerial Economics, S. Chand & CompanyLtd,
2. JL Pappas and EF Brigham, Managerial Economics, Holt, R & W; New editionedition
3. N.P Srinivasn and M. SakthivelMurugan, Accounting for Management, S. Chand & CompanyLtd,
4. MaheswariS.N,AnIntroduction to Accountancy, Vikas Publishing House PvtLtd
5. I.M Pandey, Financial Management , Vikas Publishing House PvtLtd
6. V. Maheswari, Managerial Economics, S. Chand & CompanyLtd.

**Course Outcomes:**
- The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for aproduct.
- The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination ofinputs.
- The pupil is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different BusinessUnits.
- The Learner is able to prepare Financial Statements and the usage of various Accounting tools forAnalysis.
- The Learner can able to evaluate various investment project proposals with the help of capital budgeting techniques for decisionmaking.

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| II Year - I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 3 | 1.5 |

| **ELECTRONIC DEVICES AND CIRCUITS LAB** |
|---|

**Note:** The students are required to perform the experiment to obtain the V-I characteristics and to determine the relevant parameters from the obtained graphs.

**Electronic Workshop Practice:**
1. Identification, Specifications, Testing of R, L, C Components (ColourCodes), Potentiometers, Coils, Gang Condensers, Relays, BreadBoards.
2. Identification, Specifications and Testing of active devices, Diodes, BJTs, JFETs,LEDs, LCDs, SCR,UJT.
3. Soldering Practice- Simple circuits using active and passivecomponents.
4. Study and operation of Ammeters, Voltmeters, Transformers, Analog andDigital Multimeter, Function Generator, Regulated Power Supply andCRO.

**List of Experiments: (Minimum of Ten Experiments has to be performed)**

1. P-N Junction DiodeCharacteristics
   Part A: Germanium Diode (Forward bias& Reverse bias)
   Part B: Silicon Diode (Forward Bias only)
2. Zener DiodeCharacteristics
   Part A: V-ICharacteristics
   Part B: Zener Diode as Voltage Regulator
3. Rectifiers (without and withc-filter)
   Part A: Half-waveRectifier
   Part B: Full-wave Rectifier
4. BJT Characteristics(CEConfiguration)
   Part A: InputCharacteristics
   Part B: Output Characteristics
5. FET Characteristics(CSConfiguration)
   Part A: DrainCharacteristics
   Part B: Transfer Characteristics
6. SCRCharacteristics
7. UJTCharacteristics
8. TransistorBiasing
9. CRO Operation and itsMeasurements
10. BJT-CEAmplifier
11. Emitter Follower-CCAmplifier
12. FET-CSAmplifier

**Equipment required:**
1. Regulated Powersupplies

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2.  Analog/Digital StorageOscilloscopes
3.  Analog/Digital FunctionGenerators
4.  DigitalMulti-meters
5.  Decade RésistanceBoxes/Rheostats
6.  Decade CapacitanceBoxes
7.  Ammeters (Analog orDigital)
8.  Voltmeters (Analog orDigital)
9.  Active & Passive ElectronicComponents

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| II Year - I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 3 | 1.5 |

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### SWITCHING THEORY and LOGIC DESIGN LAB

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**List of Experiments:** (Minimum of Twelve Experiments has to be performed)

1. Verification of truth tables of Logicgates
   Two input (i) OR (ii) AND (iii) NOR (iv) NAND (v) Exclusive OR (vi) Exclusive NOR
2. Design a simple combinational circuit with four variables and obtain minimal SOP expression and verify the truth table using Digital TrainerKit
3. Verification of functional table of 3 to 8 line Decoder /De-multiplexer
4. 4 variable logic function verification using 8 to 1multiplexer.
5. Design full adder circuit and verify its functionaltable.
6. Verification of functional tablesof
   (i) J K Edge triggered Flip –Flop
   (ii) J K Master Slave Flip – Flop
   (iii)D Flip -Flop
7. Design a four bit ring counter using D Flip – Flops / JK Flip Flop and verifyoutput
8. Design a four bit Johnson's counter using D Flip-Flops / JK Flip Flops and verifyoutput
9. Verify the operation of 4-bit Universal Shift Register for different Modes ofoperation.
10. Draw the circuit diagram of MOD-8 ripple counter and construct a circuit using T-Flip-Flops and Test it with a low frequency clock and Sketch the outputwaveforms.
11. Design MOD – 8 synchronous counter using T Flip-Flop and verify the result and Sketch the outputwaveforms.
12. (a) Draw the circuit diagram of a single bit comparator and test theoutput
    (b) Construct 7 Segment Display Circuit Using Decoder and 7 Segment LED and testit.

**ADD on Experiments:**
1. Design BCD Adder Circuit and Test the Same using RelevantIC
2. Design Excess-3 to 9-Complement convertor using only four Full Adders and test the Circuit.
3. Design an Experimental model to demonstrate the operation of74154 De-Multiplexer using LEDs foroutputs.

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| II Year-I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 0 |

## CONSTITUTION OF INDIA

**Course Objectives:**

- To Enable the student to understand the importance ofconstitution
- To understand the structure of executive, legislature andjudiciary
- To understand philosophy of fundamental rights andduties
- To understand the autonomous nature of constitutional bodies like Supreme Court and high court controller and auditor general of India and election commission ofIndia.
- To understand the central and state relation financial andadministrative.

**UNIT-I**

Introduction to Indian Constitution: Constitution meaning of the term, Indian Constitution - Sources and constitutional history, Features - Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy.

**Learning outcomes:**

After completion of this unit student will

- Understand the concept of Indianconstitution
- Apply the knowledge on directive principle of statepolicy
- Analyze the History, features of Indianconstitution
- Evaluate Preamble Fundamental Rights andDuties

**UNIT-II**

Union Government and its Administration Structure of the Indian Union: Federalism, Centre-State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, LokSabha, RajyaSabha, The Supreme Court and High Court: Powers andFunctions;

**Learning outcomes:-**After completion of this unit student will

- Understand the structure of Indiangovernment
- Differentiate between the state and centralgovernment
- Explain the role of President and PrimeMinister
- Know the Structure of supreme court and Highcourt

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## UNIT-III

State Government and its Administration Governor - Role and Position - CM and Council of ministers, State Secretariat: Organization, Structure and Functions

**Learning outcomes:-**After completion of this unit student will
- Understand the structure of stategovernment
- Analyze the role Governor and ChiefMinister
- Explain the role of stateSecretariat
- Differentiate between structure and functions of statesecretariat

## UNIT-IV

A.Local Administration - District's Administration Head - Role and Importance, Municipalities - Mayor and role of Elected Representative - CEO of Municipal Corporation PachayatiRaj: Functions PRI: ZilaPanchayat, Elected officials and their roles, CEO ZilaPanchayat: Block level Organizational Hierarchy - (Different departments), Village level - Role of Elected and Appointed officials - Importance of grass root democracy

**Learning outcomes:-**After completion of this unit student will

- Understand the localAdministration
- Compare and contrast district administration role andimportance
- Analyze the role of Myer and elected representatives ofMunicipalities
- Evaluate Zillapanchayat block levelorganisation

## UNIT-V

Election Commission: Election Commission- Role of Chief Election Commissioner and Election Commissionerate State Election Commission:, Functions of Commissions for the welfare of SC/ST/OBC and women

**Learning outcomes:-**After completion of this unit student will

- Know the role of Election Commission applyknowledge
- Contrast and compare the role of Chief Election commissioner andCommissiononerate
- Analyze role of state electioncommission
- Evaluate various commissions of viz SC/ST/OBC andwomen

**References:**

1. Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt. Ltd.. NewDelhi
2. SubashKashyap, Indian Constitution, National BookTrust
3. J.A. Siwach, Dynamics of Indian Government &Politics
4. D.C. Gupta, Indian Government andPolitics

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5. H.M.Sreevai, Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication)
6. J.C. Johari, Indian Government andPoliticsHans
7. J. Raj IndianGovernment andPolitics
8. M.V. Pylee, Indian Constitution Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd.. NewDelhi
9. Noorani, A.G., (South Asia Human Rights Documentation Centre), Challenges to Civil Right), Challenges to Civil Rights Guarantees in India, Oxford University Press2012

**resources**:

1. nptel.ac.in/courses/109104074/8
2. nptel.ac.in/courses/109104045/
3. nptel.ac.in/courses/101104065/
4. www.hss.iitb.ac.in/en/lecture-details
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution

**Course Outcomes**:

At the end of the semester/course, the student will be able to have a clear knowledge on the following:

➢ Understand historical background of the constitution making and its importance for building a democraticIndia.
➢ Understand the functioning of three wings of the government ie.,executive, legislative andjudiciary.
➢ Understand the value of the fundamental rights and duties for becoming good citizen of India.
➢ Analyze the decentralization of power between central, state and localself-government.
➢ Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustainingdemocracy.
  1. Know the sources, features and principles of IndianConstitution.
  2. Learn about Union Government, State government and itsadministration.
  3. Get acquainted with Local administration and PachayatiRaj.
  4. Be aware of basic concepts and developments of HumanRights.
  5. Gain knowledge on roles and functioning of ElectionCommission