Samrat Ashok Technological Institute (Engineering College) Vidisha, Madhya Pradesh
(An Autonomous Institute Affiliated to RGPV, Bhopal)
Syllabus for III and IV Semester B. Tech.

(Effective from 2018-2019 Admitted Batches)

Subject Code	Subject Name/ Title	L	T	P	Allotment of Marks			Total Marks	End Sem. Exam Time	Credits
					Mid Sem.	Assignment/ Quiz	End Sem.			
EC-1831	**Managerial Economics**	**3**	**0**	**1**	**20**	**10**	**70**	**100**	**3hrs.**	**4**

Introduction:
The purpose of this course is to provide students with a basic understanding of the Economic theories and analytical tools that can be used in decision making process. Identifying problems and formulating them into a managerial model, price determination in alternative market structure, demand theory and production and cost function.

Course Objectives:

1. To understand the basic principles of economics for an efficient decision making.
2. To gain knowledge of management principles in order to manage businesses and institutions efficiently.
3. To acquire the basics of entrepreneurship to establish industrial and economic activities.

Course Outcomes:

1. To understand the fundamentals of Economics in view of its nature, demand, Profit and Firm. Consumption, markets and business ownership aspects and how they are helpful in decision making process in order to sustain the economic activities.
2. To be aware of the significant role of an entrepreneur in the establishment, Development and achievement of organizational goals and objectives and also to learn importance of team work in demand forecasting and other functions of the organization.
3. To understand the fundamentals of management and business practices with respect to pricing and competition, cost analysis, business cycle and organization.

COURSE CONTENT

Unit-I

Introduction: Wealth, Welfare and Scarce Definitions of Economics; Micro and Macro Economics. Meaning of Managerial Economics and its scope in engineering perspective, Relationship with other areas in Economics, Basic economic principles – Opportunity cost, Incremental concept, Marginalize, Equi-marginal, Time perspective, Discounting principle, Objectives of Firms, Theories of profit, Measurement of profit.

Unit-II

Analysis of Demand: Meaning of Demand, Demand Analysis, Law of Demand, Determinates of Demand, Demand function, Indifference curve, Elasticity of Demand, Types of Elasticity, and Uses of concept of Elasticity of demand in managerial decision. Law of supply, Elasticity of supply, Consumer Behaviour theory. Utility Law of Diminishing Marginal Utility and its limitations.

P.T.O

Unit-III

Demand Forecasting and Entrepreneurship: Meaning, Significance, Methods of Forecasting, Forecasting of a new product, Production function, Production function with one/two variables, Laws of returns to scale, Law of Diminishing returns scale. Entrepreneurship: Entrepreneurial Functions, Entrepreneurial Development: Objectives, Training, Benefits; Phases of Installing a Project.

Unit-IV

Cost Analysis: Theory of cost, Accounting Cost Concepts, Analytical Cost Concepts, Short Run and Long Run Cost-output Relations, Break even analysis, Cost reduction and control. Meaning of Inflation, Types, Causes & Prevention methods, Business Cycles, Phases of business cycle.

Unit-V

Market Structure and Pricing Theory: Features and Types of different competitive situations, Price-Output determination in Perfect competition, Monopoly, Monopolistic competition and Oligopoly both the long run and short run sorbent features of price determination and Price discrimination. **Forms of Business Organizations**: Sole Proprietorship, Partnership, Joint Stock Company- Private limited and public limited companies, Public enterprises and their types.

Reference Books

1. **Managerial Economics**, Cauvery, U.K. Sudha Nayak
2. **Managerial Economics for Engineering**, Prof. D.N. Kakkar
3. **Managerial Economics** D.N. Dwivedi . Vikas Publishing House Pvt. Ltd.
4. **Principles of Economics** Robert H. Frank, Ben .S. Bernanke Tata McGraw Hill.
5. Mehta, P.L., **Managerial Economics Analysis, Problems**, Cases, Sultan Chand and Sons, New Delhi, 2001.
6. James L. Pappas and Engene F. Brigham, **Managerial Economics**, Pearson Education, New Delhi, 2006.
7. K.K. DEWETT, **Modern Economic Theory**, S. Chand and Company, New Delhi.-55.
8. S. C. Sharma and Banga T. R., **Industrial Organization & Engineering Economics,** Khanna Publications, Delhi -6.

4/6/19 04.06.19 4/6/19 04/06/2019

EC – 1832 Electronic Devices

Course Title	Course Code	Credits - 4		
		L	T	P
Electronic Devices	EC– 1832	3	-	2

COURSE OBJECTIVE

The purpose of the course is to teach the fundamental principle of electronics. The material covers a variety of topics including various types of diodes, transistor, amplifiers and applications

PRE-REQUISITES

- Basic knowledge of electronic components and laws such as KCL, KVL, etc.

COURSE CONTENTS

Unit I: Semiconductor Diodes: Basics of semiconductor theory, Introduction to PN junction diode, Special function diode-Zener diode, PIN, Varactor, Tunnel & Schottky diode and its applications. Design circuits using diodes. Optoelectronics- LED, LCD, Photo diode, Photo voltaic cell or solar cell. Drift of carrier in electric and magnetic field and Hall effect, Introduction to analog IC's.

Unit II: Bipolar Junction Transistors (BJTs): Physical structure and operation modes, Active region operation of transistor, D.C. and A.C. analysis of transistor circuits, Transistor as an amplifier. Biasing the BJT: fixed bias, emitter feedback bias, collector feedback bias and voltage divider. Basic BJT amplifier configuration: common emitter, common base and common collector amplifiers Transistor as a switch: cut-off and saturation modes. h and π model of BJT amplifier, Low and high frequency analysis of BJT.

Unit III: Field Effect Transistor (FET): Junction Field-Effect Transistor (JFET) - Construction, Operation and Biasing, Depletion-type MOSFET, Enhancement-type MOSFET: structure and physical operation, current-voltage characteristics, D.C. operation of MOSFET circuits MOSFET as an amplifier, Biasing in MOSFET amplifiers, Basic MOSFET amplifier configuration: common source, common gate and common drain types. High frequency model of MOSFET amplifier

Unit IV: Multistage Amplifiers: Multistage or Cascade amplifier: classification of multi-stage amplifier, coupling and frequency response of cascaded systems, effect of cascading on voltage gain, current gain, phase, input and output impedances and bandwidth of cascaded or multistage amplifiers. Types of coupling, cascade and cascode circuits, Miller theorem, Darlington pair, bootstrap circuit.

Unit V: Tuned Amplifiers: Tuned amplifier: single tuned, double tuned and stagger tuned amplifiers characteristics and their frequency response, Power amplifier- Class A large signal amplifiers, second-harmonic distortion. Transformer coupled audio power amplifier- Class B amplifier, Class AB operation push pull and Class C power amplifiers. Comparison of their efficiencies, types of distortion.

COURSE OUTCOMES:

On successful completion of this course student should be able to:

CO1: Understand the fundamental principle of electronics devices and various types of diodes.
CO2: Analyze & Design of diode based circuits and subsystems.
CO3: Analyze & Design of BJT based electronic circuit
CO4: Analyze & Design of FET & MOSFET based electronic circuit
CO5: Understand the fundamental principle of multistage tuned & Power amplifier

TEXT BOOKS& REFERENCES:

- Electronics Circuits and Systems- Owen Bishop
- Intuitive Analog Circuit Design- Marc T. Thompson
- Electronic Devices & circuits – Boyelstad&Neshelsky – PHI
- A Text of electronic" 2nd edition S.Chand-R.S Sedha
- Integrated Electronics. - MillmanHalkias
- Electronic Devices & Circuits – David A.Bell – PHI
- Principles of Electronic Devices – Malvino
- Starting Electronics (Fourth Edition)-Keith Brindley
- Microelectronics & circuit 5th edition - Sandra & Smith.

LABORATORY EXPERIMENTS

1. Analysis & Design of Zener diode as a voltage regulator and verify its characteristics.
2. To observe the output waveform of Full wave rectifier. Calculate PIV, Ripple Factor, Form Factor and Efficiency.
3. Analysis of common base PNP bipolar junction transistor and verify input and output characteristics.
4. Analysis of common emitter NPN bipolar junction transistor and verify input and output characteristics.
5. To draw the static characteristics of JFET and find out its parameters.
6. To design the power supply of +5V and -5V using IC regulator.
7. To design a positive clipper circuit using a 1 kHz square wave with a 10 volt peak-to-peak magnitude as the input signal.
8. To design a negative clamper circuit using a 1 kHz square wave with a 10-volt peak-to-peak magnitude as the input signal.
9. To draw the frequency response of two stage RC coupled class A amplifier using transistor.
10. To draw the frequency response of two stage Direct coupled class A amplifier using transistor.

EC – 1833 Digital Logic Design

Course Title	Course Code	Credits - 4		
		L	T	P
Digital Logic Design	EC– 1833	3	-	2

COURSE OBJECTIVE

Digital Logic is the basis of all electronic systems, such as computers and cell phones. The objective of this course is to introduce the students to Digital Components and Circuits Analysis & Design.

PRE-REQUISITES

- Basics of Electronics

COURSE CONTENTS

UNIT I: Introduction to Digital Electronics & Binary Codes: Application of Digital Circuits, Advantages & limitations compared to analog circuit. Binary codes, designing of code convertors – BCD to gray code converter; Error detection and correction codes - parity check codes and Hamming code.

UNIT II: Combinatorial Logic Systems - Definition and specification; Truth table; Basic logic operation and logic gates.
Boolean Algebra and Switching Functions - Basic postulates and fundamental theorems of Boolean algebra; Standard representation of logic functions - SOP and POS forms; Simplification of switching functions - K-map and Quine-McCluskey tabular methods.
Combinational Logic Modules and their applications, Arithmetic modules- adders, subtractors, Decoders, encoders, multiplexers, demultiplexers and their applications; Parity generators and comparators. Design examples.

UNIT III: Flip-Flop and Timing circuits: Introduction, SR Latch, Gated Latches, Edge Triggered Flip-Flops, Asynchronus Inputs, Flip-Flop Operating Characteristics, Master Slave Flip Flops, Conversion of flip-flops. Sequential Machines: Introduction, The finite state model, Memory elements. Design examples. Shift Registers: Introduction, Buffer register and its types, Data transmission in shift registers, Types of shift registers and their applications.

UNIT IV: Logic families: Introduction to different logic families; IC specification terminology, TTL, Open Collector Gate, TTL Sub Families, IIL, ECL, MOS & CMOS Logic, Dynamic MOS Logic.

UNIT V: Introduction to A/D and D/A converters, Various types of Analog to Digital converters & Digital to Analog converters, sample & hold circuit.Memory and Programmable Logic Devices: Read-only memory, read/write memory - SRAM and DRAM, ROM & PROM, PLAs, PALs and their applications; Sequential PLDs and their applications.

COURSE OUTCOMES:

On completion of this course students should be able to:
CO1: Design code converter and error detection & correction. Learn advantage & disadvantage of digital logic design.
CO2: Demonstrate the knowledge of: Operation of logic gates, Boolean algebra, application of DeMorgan's theorems, Karnaugh map and QM reduction method.
CO3: Students will be able to analyze and design all sequential digital circuits.
CO4: Differentiate between logic families and their comparison in terms of power dissipation, speed, noise margin fan in and fan out.
CO5: Demonstrate knowledge of the nomenclature and technology in the area of memory devices: PLD, FPGAs, etc.

TEXT BOOKS & REFERENCES:

- W.H. Gothman, "Digital Electronics" (PHI).
- R.J. Tocci, "Digital Systems Principles &: Applications".
- Z. Kohavi (TMH), "Switching & Automata Theory".
- M. Mano (PHI), "Digital Logic & Computer Design".
- M. Mano, "Digital Design".
- H.V. Malmstadt& C.G. Euke (W.A. Benjamin IOC), "Digital Electronics for Scientists".
- B.S. Sonde (New Age International),"Introduction to System Design using Integrated Circuits".
- Millman&Taub (McGraw Hill). "Pulse, Digital & Switching Waveforms".
- Digital Fundamentals by B. Basavaraj
- Switching Theory and Logic Design by A. Anand Kumar PHI Learning Private Limited.

LABORATORY EXPERIMENTS (USING C)

1. Study, Design and Verification of truth table of logic gates.
2. To design 4-bit two input adder using 7483 IC and verify truth table.
3. To convert the binary code to Gray Code using 7486 IC.
4. Study and Testing of different Digital IC's in term of their Technical Specifications (Pin Diagram, applications etc.)
5. To study and verify the De Morgans' Theorem.
6. To design the Half Adder and Full Adder Using Universal Gate
7. Study of Digital to Analog Converter.
8. To design a 4- bit 2-input Binary Subtraction using IC's 7483 and 7486
9. Implementation of the given Boolean function using logic gates in both SOP and POS forms.
10. Implementation of multiplexer and de-multiplexer using logic gates.
11. Verification of state tables of RS, JK, T and D flip-flops using NAND & NOR gates.
12. Design and verify the 4-bit synchronous and asynchronous counter.

EC – 1834 Network Analysis

Course Title	Course Code	Credits - 4		
		L	T	P
Network Analysis	EC 1834	3	-	2

COURSE OBJECTIVES

1. TO MAKE THE STUDENTS CAPABLE OF ANALYZING ANY GIVEN ELECTRICAL NETWORK.
2. TO MAKE THE STUDENTS LEARN HOW TO SYNTHESIZE AN ELECTRICAL NETWORK.

PRE-REQUISITES

- Mathematics I & II
- Fundamentals of Electrical Engineering

COURSE CONTENTS

Unit I: Introduction to circuit elements R,L,C and their characteristics in terms of linearity & time dependent nature, KCL and KVL analysis, voltage & current sources controlled & uncontrolled sources, Nodal & mesh analysis, supermesh and supernode, analysis of magnetically coupled circuits, Mutual and self-Inductance, Dot convention, Linear transformer replacement by T and Pi equivalent circuits. Star - Delta Conversion

Unit II: Network Theorems for AC & DC circuits- Thevenins & Norton's, Superpositions, Reciprocity, Compensation, Substitution, Maximum power transfer, and Millman's theorem, Tellegen's theorem, problems with dependent & independent sources.

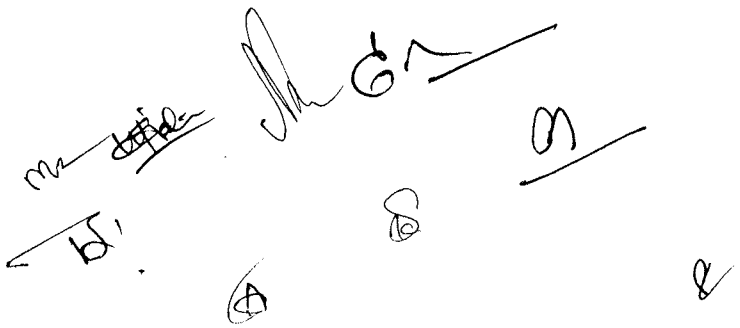
Unit III: Transient analysis: Transients in RL, RC & RLC Circuits, initial conditions, time constants. Network driven by constant driving sources & their solutions. Steady state analysis: Concept of phasor & vector, impedance & admittance. Network topology, concept of Network graph, Tree, Tree branch & link, Incidence matrix, cut set and tie set matrices.

Unit IV: Frequency domain analysis – Review of Laplace transform and its properties, Application of Laplace transform on electrical circuits.

Unit V: Network function & Two port networks – concept of complex frequency, Network & Transfer functions for one port & two ports, poles and zeros, Necessary condition for driving point & transfer function. Two port parameters – Z,Y, ABCD, Hybrid parameters, their inverse & image parameters, relationship between parameters, Interconnection of two ports networks, Terminated two port network.

COURSE OUTCOMES

On successful completion of this course student should be able to:
CO1: Analyze small RLC circuits.
CO2: Use network techniques to write equations for large linear circuits.
CO3: Apply Network theorems and associated technique to analyze and design the circuit
CO4: Infer and evaluate transient response, Steady state response, and network functions.
CO5: Evaluate two-port network parameters.



TEXT BOOKS& REFERENCES:

- Circuits & Systems, Sudhakar, TMH.
- S Ghosh, A. Chakraborty, Network Analysis and Synthesis, TMH
- M.E. Van Valkenburg, Network Analysis, (PHI)
- F. F. Kuo, Network Analysis

LABORATORY EXPERIMENTS

1. To verify Thevenin Theorem.
2. To verify Superposition Theorem.
3. To verify Reciprocity Theorem.
4. To verify Maximum Power Transfer Theorem.
5. To verify Millman's Theorem.
6. To determine Open Circuit parameters of a Two Port Network.
7. To determine Short Circuit parameters of a Two Port Network.
8. To determine A, B, C, D parameters of a Two Port Network
9. To determine h parameters of a Two Port Network
10. To find frequency response of RLC Series Circuit.
11. To find frequency response of RLC parallel Circuit.

EC – 1835 Signal & Systems

Course Title	Course Code	Credits - 3		
		L	T	P
Signal & Systems	EC 1835	3	-	-

COURSE OBJECTIVES

1. When a student completes this course, s/he should be able to:
2. Understand the fundamentals of the Signals and systems.
3. Understand linear time invariant systems and able to obtain mathematical modeling of the system.
4. Apply the concepts of frequency domain representations to analyze continuous and discrete time signals/systems
5. Understand and apply the Z-Transform, to the analysis and description of LTI discrete-time systems.
6. Able to apply the knowledge to model a system

PRE-REQUISITES

- Differential equations
- Linear algebra.

COURSE CONTENTS

Unit I: **An** Introduction to Signals and Systems: Definition of signal and systems, communication and control systems as examples. Classification of signals: continuous time and discrete time signal even and odd, periodic and non-periodic, deterministic and non-deterministic, energy and power. Elementary signals/Functions: exponential, sine, unit impulse, unit step and its properties, ramp, rectangular, triangular, signum. Operations on signals: Amplitude scaling, addition, multiplication, differentiation, integration, time scaling, time shifting, and time folding.System properties: linearity, additively and homogeneity, causality, stability, reliability. Introduction to different types of systems like causal & non causal systems, static& dynamic, stable &unstable, linear& nonlinear, time variant &time invariant systems.

Unit-II: Linear Time- Invariant Systems: Introduction, Convolution: impulse response representation for LTI systems, properties of the impulse response representation for LTI systems, differential and difference equation for LTI Systems, block diagram representations (direct form-I, direct form-II, transpose, cascade and parallel), state variable descriptions for LTI systems.

Unit-III: Periodic and semi-periodic inputs to an LSI system, the notion of frequency response and its relation to impulse response, Fourier series representation, the Fourier transform convolution/multiplication and their effect in frequency domain, magnitude and phase response, Fourier domain duality.

Unit-IV: The idea of signal space and orthogonal basis of signals. Representation of continuous time signals by its samples, Sampling Theorem, reconstruction of a signal from its samples, aliasing, discrete time processing of continuous time signals, Sampling of band pass signals, discrete time Fourier transform (DTFT) and the discrete Fourier transform (DFT). Parseval's theorem.

Unit-V: The z transform for discrete time signals and systems: Basic principle of z-transform, z-transform definition, region of convergence, system functions, poles and zeros of systems and sequences, properties of ROC, properties of z-transform, inverse z-transform using, contour integration, residue theorem, power series expansion, and partial fraction expansion, relationship between z transform and Fourier transform.

COURSE OUTCOMES:

On successful completion of this course student should be able to:
CO1: learn basics and fundamentals of signals and systems (Knowledge)
CO2: identify the basic processes involved in signals and systems interaction (knowledge, Understanding and application)
CO3: analyze the signals and systems in frequency domain and extract the necessary information. (Analysis and Application)
CO4: apply the basic concepts of signals and systems in system modeling and transform domain analysis. (Knowledge, Understanding and Application)
CO5: model, analyze and synthesize the systems and performance of systems. (Analysis, Synthesis and Evaluation).

TEXT BOOKS& REFERENCES:

- A.V. Oppenheim, A.S. Willsky and I.T. Young, "Signals and Systems", Prentice Hall, 1983.
- B.P. Lathi, "Signal Processing and Linear Systems", Oxford University Press, c1998.
- Douglas K. Lindner, "Introduction to Signals and Systems", Mc-Graw Hill International Edition: c1999.
- J. Nagrath, S. N. Sharan, R. Ranjan, S. Kumar, "Signals and Systems", Tata Mc Graw Hill Publishing Company Ltd., New Delhi
- R.F. Ziemer, W.H. Tranter and D.R. Fannin, "Signals and Systems - Continuous and Discrete", 4th edition, Prentice Hall, 1998.
- Papoulis, "Circuits and Systems: A Modern Approach", HRW, 1980.
- Robert A. Gabel, Richard A. Roberts, "Signals and Linear Systems", John Wiley and Sons (SEA) Private Limited, c1995.
- M. J. Roberts, "Signals and Systems - Analysis using Transform methods and MATLAB", Tata Mc Graw Hill Edition, 2003.
- Simon Haykin, Barry van Veen, "Signals and Systems", John Wiley and Sons (Asia) Private Limited, c1998.

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Syllabus for III Semester B. Tech. (Common for all branches)

(Effective from 2018-2019 Admitted Batches)

Subject Code	Subject Name/ Title	L	T	P	Allotment of Marks		Total Marks	Credits
					Internal Examination	External Examination		
EC-1836	Language lab	0	0	2	20	30	50	1

Introduction

The Language Lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English Language in everyday situations and contexts.

Course Objectives

- To make students recognize the sounds of English through Audio-Visual aids.
- To help students build their confidence and help them to overcome their inhibitions and self- consciousness while speaking in English. The focus would be on fluency.
- To familiarize the students with stress and intonation and enable them to speak English effectively.

Course Outcomes

- Students will be sensitized towards recognition of unique English sound patterns and their fluency in speech will be enhanced.
- The communicative activities in the laboratory will help the students become successful in the competitive world.
- Students will be able to express themselves fluently and accurately in social as well professional context.

UNIT-I

Developing Listening and speaking skills: Pronunciation: The Sounds of English (Phonetics), Stress, Intonation, and Rhythm. **Speaking Skills**: Conversational Skills, Role Plays, Debate and Just a minute session.

UNIT-II

Developing Employability Skills: Presentation skills: Definition, Key Elements, Body Language, Dos and Don'ts. **Interview Skills**: Definition, Types of Interviews, Required key skills, Non verbal communication during Interviews. Do's and Don'ts. **Group Discussions**: Definition, Skills tested in GD, Its Do's and Don'ts.

UNIT-III

Developing Soft Skills: Goal Setting and Time Management: Immediate, Short term, Long term, Smart Goals, Strategies to Achieve goals, Types of Time, Identifying Time Wasters, Time Management Skills, Stress Busters. **Leadership and Team Management:** Qualities of a Good Leader, Team Dynamics, Leadership Styles, Decision Making, Problem Solving.

P.T.O

DISTRIBUTION AND WEIGHTAGE OF MARKS

The practical examinations for the English Language Lab shall be conducted as per the University norms prescribed for the core Engineering practical sessions.

For the Language lab sessions, there shall be a continuous evaluation during the semester for 20 sessional marks and 30 semester-end Examination marks.

For the 20 sessional marks, 10 marks shall be awarded for day-to-day performance, 10 marks to be awarded by conducting Internal Lab Test(s).

Out of 30 semester- end (External) marks, 10 marks shall be awarded for written examination (dialogues, the sounds of English and stress) and 20 marks on the basis of viva-voce by an External Examiner.

Prescribed Textbook:

Speak Well. Board of Editors, Orient Black Swan Publishers, Hyderabad, India.

Reference Books:

1. Cambridge English Pronouncing Dictionary, Cambridge University Press, India, 2012. Rs 360/-
2. A Textbook of English Phonetics for Indian Students by T. Balasubramanian, Macmillan Publisher, 1981. Rs 186/-
3. English for Careers (ISBN: 9788131768846), Rs 150/-
4. Communication Skills and Soft Skills (ISBN: 9788131734537), Rs 160/-
5. Communicative English for Engineers and Professionals (ISBN: 9788131732045), Rs 190/-
6. Effective Communication and Soft Skills (ISBN: 9788131760345), Rs 245/-

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