DEVI AHILYA VISHWAVIDYALAYA, INDORE

FACULTY OF ENGINEERING

SCHEME OF EXAMINATION
&
COURSE OF CONTENTS

BE II Year Program
(ELECTRONICS & INSTRUMENTATION ENGINEERING)

INSTITUTE OF ENGINEERING & TECHNOLOGY
(www.iet.dauniv.ac.in)

DEVI AHILYA VISHWAVIDYALAYA, INDORE
INSTITUTE OF ENGINEERING & TECHNOLOGY

SCHEMES OF EXAMINATION FOR BE PROGRAMME
(Subject to Revision)

B. E. II YEAR ELECTRONICS & INSTRUMENTATION ENGINEERING
Th- Theory, CW – Class Work, SW – Sessional Work, Pr – Practical

Semester III

				Maximum Marks						
SNo	**Sub Code**	**Subject**	**L**	**T**	**P**	**Th**	**CW**	**SW**	**Pr**	**TOTAL**
1.	2AM301	Applied Mathematics-III	4	-	-	100	50	-	-	150
2.	2EI302	Digital Electronics	4	-	2	100	50	50	50	250
3.	2EI303	Electrical and Electronic Measurement	4	-	2	100	50	50	50	250
4.	2EI304	Circuit analysis and Synthesis	4	-	2	100	50	50	50	250
2.	2EI305	Microelectronics	4	-	2	100	50	50	50	250
6.	2SS007	Effective Communication Skills	2	-	-	-	50	-	-	50
	TOTAL		**22**		**8**	**500**	**300**	**200**	**200**	**1200**

Semester IV

SNo	**Sub Code**	**Subject**	**L**	**T**	**P**	**Th**	**CW**	**SW**	**Pr**	**TOTAL**
1.	2AM351	Applied Mathematics-IV	4	-	-	100	50	-	-	150
2.	2CO352	Digital Computer Organization	4	-	-	100	50	-	-	150
3.	2EI353	Microprocessors & Assembly Language Programming	4	-	2	100	50	50	50	250
4.	2EI354	Sensors and Transducers	4	-	2	100	50	50	50	250
5.	2CO355	Data Structure	4	-	2	100	50	50	50	250
6.	2EI356	Electronic Workshop		-	2	-	-	50	50	100
7.	2SS057	Engineering Economics	2	-	-	-	50	-	-	50
	TOTAL		**22**		**8**	**500**	**300**	**200**	**200**	**1200**

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester III					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2AM301 **Applied Mathematics- III**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**-**	**Max**	**100**	**50**	**-**	**-**	**150**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**-**	**-**	**60**

Course Objectives: The course aims at making the students familiar about some Special Functions, useful in particle physics, Spectral and Pseudo spectral approximations, Quantum optics etc., Markov Chains, useful in the field of statistics, physics, bioinformatics etc., Reliability, useful in quality control and material testing and the most basic numerical methods and concepts like error estimation, order of convergence, stability etc. helpful in various fields of engineering and science. Software like Matlab, MathCAD, Mathematica etc. can be used to simulate the results of various numerical methods.

Prerequisite(s): Basic knowledge of determinants, matrices, differentiation and integration of functions and probability theory.

COURSE OF CONTENTS

Unit –I

Series solution of ordinary differential equations: Method of Frobenius. Series solution of Bessel and Legendre's differential equations.

Special function: Bessel's functions and Legendre's polynomials, their recurrence relations, generating functions and orthogonal properties.

Unit-II

Markov chain and stochastic process: Definition of Markov chain, Transition matrix, probability distribution in Markov chain, Multi-step in Markov chain.

Reliability: Basic concepts. Failure law, components in series and in parallel, Redundancy.

Unit-III

Bivariate distributions: Bivariate frequency distributions, Correlation coefficient of bivariate frequency distributions, Regression lines.

Multivariate distributions: Multiple and partial correlation. Equation of regression planes.

Unit-IV

Numerical solutions of algebraic and transcendental equations: Bisection method, Regula-Falsi method, Newton-Raphson method, Direct iterative method, Graffe's root squaring method.

Solution of system of linear algebraic equation: Matrix inversion method, Gauss- elimination Method, Jordan's method, Crout's method. Gauss-Seidel iterative method.

Unit-V

Interpolation: Finite difference operator, Interpolation formula with equal and unequal intervals. Divided differences and central differences.

Numerical differentiation and integration: Nu Diff using Newton forward Backwrd& Divided diff formula & sterling Newton-Cote's formula, Gaussian quadrature formula, Trapezoidal rule, Simpson's $1/3^{rd}$ rule, Simpson's $3/8^{th}$ rule, Weddle's rule.

BOOKS RECOMMENDED

[1] Francis J. Scheid, *Schaum's Outline of Numerical Analysis*, McGraw-Hill, New York, 1989.

[2] Murray R. Spiegel and Larry J. Stephens, *Schaum's Outline of Statistics*, McGraw-Hill, New York: 1999.

[3] Hwei P. Hsu, *Schaum's Outline of Probability, Random Variables, and Random Processes*, McGraw-Hill, New York: 1997.

[4] Gupta P.P. & Malik G.S., *Calculus of Finite Differences and Numerical Analysis*, Krishna Prakashan Mandir, Meerut, 21/e, 2006.

[5] B.S.Grewal, *Engineering Mathematics*, Khanna Publishers, 12/e, 2006.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester III					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2EI302 **Digital Electronics**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objective: Get acquainted with different number systems, their Interconversion and operations. Familiarized with different logic families & relative performance Ability to design various combinational circuits by solving & reducing Boolean equations Ability to synthesis, design and analysis of sequential circuits using Xilinx tools. Understandability of converting analog signal to digital and vice versa. Synchronization and frequency division circuits. Ability to test digital circuits and estimating reliability.

Prerequisite(s): Knowledge of Transistor, Diodes, Switching property, Boolean algebra.

COURSE OF CONTENTS

Unit –I

Introduction to Binary System: Number System, Number base conversion, Binary Arithmetic, Various Binary codes, Logic Families: - RTL, DTL, ECL, IIL, TTL & CMOS families

Unit-II

Combinational Circuits: Combinations Logic, Design principles, Analysis and Synthesis Tools & Techniques,Combinational logic design practices like, combinational PLDs,Decoders,Encoders,3-state Devices, Arithmetic Circuits like Adder, Subtractor, Multiplier, Divider, Comparators for signed and unsigned numbers Practical Designing of combinations circuits design using EDA Software

Unit-III

Sequential Circuits: Sequential Logic Design Practices: Latches and Flip-Flops, Sequential PLDs, Counters, Shift Registers. Sequential Design Methodology, Impediments to Synchronous Design, Synchronizer Failure and Metastability. Sequential Circuit Design Examples Using EDA Software

Unit-IV

Registers: Shift Registers, Universal Shift Registers, Shift-Register Counter, Sequence Generators. Memory Devices: Classifications, Static and Dynamic RAM, ROM, Memory Decoding & Expansion CPLDs and FPGAs: Xilinx family, function-block architecture, programmable interconnects.

Unit-V

Digital Circuits:

Digital to Analog Conversions: using Pulse width Modulator, Over sampling DAC, Binary Weighted DAC,R-2R Ladder, Thermometer Coded DAC, Segmented DAC, Hybrid DAC.

Analog to Digital Conversions: using Direct Conversions, Successive Approximations, Delta Encoded, Ramp Compare, Pipeline Method, Sigma Delta methods.

Counting and Timing Circuits: Using decade counters with & without feedback, vernier counting

Synchronization and Frequency division circuits: using sweep circuits, stable & Monostable Relaxation circuits, study of sine wave synchronization.

Monostable, Bistable & Astable multivibrators: using 555, transistor Testing of Digital Circuits: Tools, Design of Testability, Estimating Digital system Reliability, Transmission lines, reflections and termination.

BOOKS RECOMMENDED

[1] John F. Wakerly, *Digital Design: Principles & Practices*, Low Price Edtion, Pearson Education.2003

[2] Richard F.Tinder, *Engineering Digital Design*, 2/e, Harcourt India Private Ltd., 2001

[3] William I. Fletcher, *An Engineering Approach to Digital Design*, Pearson Education

[4] William H.Gothmann,*Digital Electronics: An Introduction to Theory and Practice*, Eastern Economy Edition , Prentice-Hall of India Private Limited,NewDelhi.,2001

[5] Jacob Millman & Herbert Taub,*Pulse,Digitaland Switching Waveforms*,13th Reprint,Tata McGraw Hill Publishing Company Ltd.,NewDelhi, 1999

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester III					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2EI303 **Electrical and Electronic Measurements**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objective: The objective of the course is to learn about design of various measuring instruments. Basic of R,L & C measurement. Concepts of measurement of voltage, current & power. Study & working of CRO and its type. Principles of AC bridges. High Frequency measurement Working of Digital instrument.

Prerequisite: Basic course in Electronics & Electrical

COURSE OF CONTENTS

Unit –I

Basic concept of Measurements and Instruments, Measurement Methods, Generalized measurement System, Classification of Instruments, Static & Dynamic Characteristics, Errors & Uncertainty measurement of system, Linear & Non-linear Systems.

Unit-II

Operation principles of Analog Instruments - Moving coil, Moving iron, PMMC, Dynamometer and Induction type instruments, Measurement of Voltage, Current, Power, Power Factor, Energy, Instrument Transformer - current and potential transformer, Measurement of Phase & Frequency.

Unit-III

Measurement of Resistance- low, medium and high resistance measurement, A.C. Bridges- general equation, Maxwell's bridge, Maxwell's capacitance bridge, Anderson bridge, Hay's bridge, Owen's bridge, De Sauty's bridge, Schering bridge, Potentiometer- DC potentiometer, Multi-range potentiometer, AC potentiometer and their applications, High Frequency Measurement- measurement of R,L,C at high frequency , Twin T & Bridge Networks, Q-meter and its applications.

Unit-IV

Analog & Digital Comparison- Voltmeters, Digital Voltmeters, Construction & working of Basic CRO, its Components, Types of CRO, Special types of CRO, Types of CRO Probes.

Unit-V

Signal Generator, Function Generator, Wave Analyzer, Distortion Analyzer, Spectrum Analyzer, Frequency Counter, Display Devices & Recorders.

BOOKS RECOMMENDED

[1] A.K.Sawhney & Puneet Sawhney, *A Course in Electrical And Electronic measurements and Instrumentation*, 7/e, Dhanpat Rai & Co.(P) Ltd.,2005

[2] Albert D.Helfrick & William D.Cooper, *Modern Electronic Instrumentation and measurement Technique*, Low Price Edition, Pearson Education, 2005

[3] Ernest O.Doebelin, *Measurement Systems Application and Design*, 5/e, Tata McGraw –Hill Publishing Company Ltd., 2004

[4] H.S.Kalsi,*Electronic Instrumentaion*, Technical Education Series, Tata McGraw –Hill Publishing Company Ltd.,2001

[5] Alan S.Morris,*The Essence of Measurement*, Eastern Economic Edition, Prentice Hall of India Private Limited.,1997

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester III					
Subject Code & Name **2EI304**	**Instructions Hours per Week**			**Marks**					
Circuit Analysis & Synthesis	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objectives: The objective of the course is to learn techniques of solving circuits with R, L & C elements .Circuits with independent & dependent sources. Dynamics of I and II order networks. Application of Laplace and Fourier transform in solving the circuits. Synthesis of RL, RC, RLC circuits.

Prerequisite(s): Basic course in Electrical.

COURSE OF CONTENTS

Unit-I

Circuit concept and Network Equation: Elements, Sources, their characteristics, source transformations, Kirchhoff's law, node and loop analysis, D-Y transformation

Unit-II

Time domain analysis of circuits and Network Theorems: Transient and steady state analysis of first order and second order systems, initial conditions in networks, Superposition, Reciprocity, Thevenin's, Norton's and Maximum Power Transfer Theorem.

Unit-III

Two Port Networks: Various network parameters, their relationships interpretation of poles and zero, effect of their location in the complex plane, two port parameters – z-parameter, y-parameter, transmission parameter and hybrid parameter.

Unit-IV

Laplace Transforms and Fourier analysis: Basic theorems for Laplace transform, solution of circuit problems using Laplace transform, Fourier analysis of complex waves, symmetries, introduction to Fourier transforms.

Unit-V

Network Synthesis: Synthesis of one port network, properties of LC immittances, foster realization of LC circuits, ladder development and Cauer forms, properties of RC immittances and synthesis of RC circuits.

BOOKS RECOMMENDED

[1] M.E.Van Valkenburg, *Network Analysis*, 3/e, Pearson Education.

[2] Franklin F.Kuo, *Network Analysis and Synthesis*, 2/e, John Wiley & Sons, 2003

[3] Donald Scott, *An Introduction to Circuit Analysis: A System Approaches*, Electrical Engineering Series, McGraw-Hill International Editions.,1987

[4] T.S.K.V. Iyer,*Theory and Problem in Circuit Analysis*, TMH Outline Series, Tata McGraw-Hill Publishing Company Ltd, New Delhi.,2000

[5] Gyanendra K.Mithal & Ravi Mithal,*Netwrok Analysis including Transmission Line*, 14/e, Khanna Publishers, New Delhi.,2001

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester III					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2EI305 **Microelectronics**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objectives: To understand the fundamental laws behind the material preparations of semiconductors. To Develop & Analysis of laws behind the successful design of semiconductor devices. Understand fundamentals of Diodes, Special Diodes their functioning & behaviors. Explain the theory behind the integrated circuit fabrication to understand the design & working principles for Power Diodes.

Prerequisites: Knowledge of Basic Electronics, Concept of Physics as per syllabus studied at Higher Secondary Level.

COURSE OF CONTENTS

Unit-I

Crystal Properties and Growth of Semiconductors: Semiconductor material, Crystal Lattices, Bulk Crystal Growth, Epitaxial Growth etc.

Quantum Mechanics: Physical models, Photoelectric Effect, Atomic Spectra, Bohr model. Probability and uncertainty principles, Schrödinger Wave equations, Potential Well problem, Tunneling.

Energy Bands and Charge carriers in semiconductors: Bonding forces and energy bands in Solids, Charge Carriers in semiconductors, Carrier Concentrations, Drift of Carrier in Electric and magnetic Fields, Invariance of the Fermi level at equilibrium.

Unit-II

Excess carriers in semiconductors: Optical Absorption, Luminescence, Carrier Lifetime and Photoconductivity, Diffusion of Carriers.

Junctions: Fabrications of p-n junctions,Equillibrium conditions, Forward and reverse-biased junctions; steady state conditions, Reverse Bias-Breakdown, Transient and AC conditions, Deviations from traditional theory, Metal Semiconductor junctions, Heterojunctions.

PN Junction Diodes: Junction Diode, Tunnel Diode, Photodiodes, Light-emitting diodes and lasers.

Unit-III

Bipolar junction Transistors : Amplification and switching, fundamentals of BJT operation,BJT fabrication, Minority carrier distributions and Terminal currents, Generalized Biasing, Switching, Important effects like Drift, base narrowing, avalanche breakdown, injection level ;Base resistance and emitter crowding.

Field effect transistors: Junction FET, Metal-Semiconductor FET, Metal Insulator-Semiconductor FET.

Unit-IV

Integrated Circuits: Advantages of integration, types of integrated circuits, monolith and hybrid circuits, fabrication of monolithic circuits, monolithic device elements, and charge transfer devices, VLSI, Testing Bonding and Packaging.

Lasers: Stimulated Emission, The Ruby laser, other laser system like rare earth systems, gas lasers etc. Semiconductor laser

Unit-V

PNPN switching devices: Switching mechanism, semiconductor Controlled rectifier.

Negative conductance microwave devices: Transit time devices, Gunn Effect and related devices

BOOKS RECOMMENDED

[1] Ben G. Streetman& Sanjay Banerjee, *Solid State Electronic Devices*, 5/e, Prentice-Hall of India Private Limited, New Delhi

[2] R.C.Jaeger & T.N.Blalock *Microelectronic Circuit Design* , 2/e, Tata-Mcgraw Hill publishing company Ltd,New Delhi.2001

[3] Allen Mottershed *Electronic Devices and circuits*, Prentice-Hall of India Private Limited, New Delhi.1997

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Common to All Branches) Semester III					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2SS007 **Effective Communication Skills**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	2	**-**	**-**	**Max**	**-**	**50**	**-**	**-**	**50**
Duration of Theory Paper: **Only Internal Tests**				**Min**	**-**	**25**	**-**	**-**	**25**

Objective: To develop effective communication skills in engineers for expressing the technical ideas and for discussing the technical issues with confidence.

Prerequisite: Technical English

COURSE OF CONTENTS

Unit-I
Fundamentals of Communication: The Importance of Communication; the Basic forms of Communication; The Process of Communication; Why Communication is necessary?; Art of Communication.

Unit-II
Inter-personal skills: Building Positive Relationships; Giving Praise; Dealing with Criticism; Managing Conflicts; Telephone speaking skills and Cross-cultural communication skills

Unit-III
Listening- The importance of listening; Barriers to Effective Listening; Approaches to Listening; How to be a Better Listener; What speakers can do to ensure better listening.

Unit-IV
Interviews: Points to be remembered as an interviewer or an interviewee; Commonly asked questions; Types of interviews; Do's and Don'ts.

Unit-V
Making Presentations: Speech Purpose- General and Specific; Methods of Speaking; Analyzing the Audience; Non-verbal Dimensions of Presentation, Group Discussions: Importance; Process; Points to be kept in mind while participating; Do's and don'ts.

Note: There shall be seminars and practice sessions by students.

BOOKS RECOMMENDED

[1] P D Chaturvedi, P.D. & M Chaturvedi, *Business Communication: Concepts, Cases and Applications*, Pearson Education, Singapore Pvt. Ltd, 2004.
[2] ICMR, *Business Communication*, Feb 2001.
[3] J Davies, *Communication Skills: A Guide for Engineering and Applied Science Students*, 2/e Pearson Education, 2006.
[4] Lecture material given by the course teacher.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester IV					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2AM351 **Applied Mathematics- IV**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**-**	**Max**	**100**	**50**	**-**	**-**	**150**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**-**	**-**	**60**

Objective: To develop an understanding of the underlying mathematics as a preparation for a specialist study of applications areas in various branches of engineering like electromagnetic and electrostatic field theory, fluid dynamics, control, communication and signal processing, design of discrete-(time) systems, circuit analysis etc.

Prerequisites: Algebra of complex numbers, integration, basic properties of functions.

COURSE OF CONTENTS

Unit-I

Function of Complex variables: Analytic functions, Cauchy-Riemann conditions, Harmonic functions, Conjugate functions and their applications.

Complex integral: Integration of complex functions, simply and multiply connected regions, Cauchy's integral theorem, Cauchy's integral formula, Singularities, Zeroes, Residues and Residue theorem.

Unit-II

Difference equation: Definition of difference equations, formation of difference equation.

Solution of difference equations: Solution of Homogeneous and non-homogeneous difference equation with constant and variable coefficients using operator method and generating functions. Simultaneous difference equation.

Unit-III

Laplace transform: Definition and properties of Laplace transform, Inverse Laplace Transforms. Convolution theorem.

Application of Laplace transform in solution of ordinary differential equations:

Solution of ordinary differential equations with constant and variable coefficients, Simultaneous differential equations with constant coefficients.

Unit-IV

Z-transform: Definition and properties of Z-transform, Convergence of Z-transforms, Evaluation of inverse Z-transforms. Convolution theorem.

Application of Z-transform in solution of difference equations: Solution of difference equations with constant coefficients.

Unit-V

Fourier transform: Fourier Integral and Fourier transforms, Fourier sine and cosine transforms, Finite Fourier sine and cosine transform.

Application of Fourier transform in solution of partial differential equations:

Solution of partial differential equations with constant and variable coefficients.

RECOMMENDED BOOKS:

[1] Murray R. Spiegel, *Schaum's Outline of Complex Variables*, McGraw-Hill, New York, 1968.

[2] Murray Spiegel*, Schaum's Outline of Theory and Problems of Advanced Mathematics for Engineers and Scientists,* McGraw-Hill, New York, 2002.

[3] A. R. Vasishtha & Dr. R. K. Gupta, *Integral Transform*, Krishna Prakashan Mandir, Meerut, 21/e, 2003.

[4] Murray R. Spiegel, *Schaum's Outline of Fourier Analysis*, McGraw-Hill, New York, 2004.

[5] B.S.Grewal, *Engineering Mathematics*, Khanna Publishers, 12/e, 2006.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester IV					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2CO352 **Digital Computer Organization**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**-**	**Max**	**100**	**50**	**-**	**-**	**150**
Duration of paper: 3 Hours				**Min**	**35**	**25**	**-**	**-**	**60**

Course Objectives: Designing an ALU, instruction format, analyzing addressing methods and performance. Understanding control unit designing and ability to represent and operate on numbers. Understanding I/O device handling and bus arbitration issue. Ability to analyze performance issues of different memories. Enhancing and analyzing computer performance by pipelining and multiprocessor concept.

Prerequisites: Fundamental knowledge of computer system and peripherals, number system, digital electronics

COURSE OF CONTENTS:

Unit-I
Computer Structure Overview, Addressing Methods & Program Sequencing
Overview, Operational Concepts, hardware- Software, Performance, Addressing Methods – Memory locations, Addresses & Encoding of Information, Main Memory Operations. Instruction Sequencing – Straight line Sequencing, Branching. Addressing Modes, Basic I/O Operations, Stack and Queues, Subroutines etc.

Unit-II
The Processing Unit and arithmetic operations
Processor Organization, Operational Concepts, Instruction Execution, Hardwired Control, Microprogram Control- Microinstructions, Microprogram Sequencing ,RISC and CISC, integer and floating point representation ,signed-unsigned numbers and operations

Unit-III
Input-Output Organization and bus structure
I/O Device Access Methods, Interrupt Handling, Device Handling, Exception Handling, Direct Memory Access, interrupt controller, daisy chaining, parallel, priority interrupt, I/O Interfaces Bus structure, bus design issues, Synchronous –Asynchronous bus, bus arbitration

Unit-IV
Memory System
Memory hierarchy, primary-secondary memory operational Concepts and different types as RAM-ROM and their variations, hard disk, floppy, RAID, CD, DVD etc. Cache Memory - Mapping, Replacement Algorithms, Types. Performance Considerations etc.

Unit-V
Pipelining and Parallel computer architecture
Pipelining –Operational Concepts, Data Dependency etc., design issues for parallel computer, classification, array processor, vector processor, shared memory processors, UMA,NUMA,COMA, interprocessor arbitration

BOOKS RECOMMENDED
[1] V. Hamacher, S. Zaky, *Computer Organization*, Mcgraw Hill International, Fifth Edition.
[2] William Stallings, *Computer Organization and Architecture*, Pearson Education, Sixth Edition.
[3] A. Tannenbaum, *Structured Computer Organization*, Pearson Education, 2002.
[4] Patterson & Hennessy, *Computer Organization and Design*, Morgan Kaufmann, Third Edition

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester IV					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2EI353 **Microprocessor & Assembly Language Programming**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objective: To provide the fundamentals of microprocessor 8085, its assembly language programming and the concept of Interfacing, peripheral chips.

Prerequisite(s): Knowledge of following concepts is required, Number Systems (binary, octal, and hexadecimal) and their conversions. Boolean algebra, logic gates, flip-flops, and registers. Concepts in combinational and sequential logic.

COURSE OF CONTENTS

Unit-I
Comparison among microprocessor microcontroller and computer. Introduction to 8085 microprocessor: Pin diagram, architecture , programming model , instruction set , classification of instruction set , instruction and data format , timing diagram of instructions. Basic concept of programming

Unit-II
Addressing modes. Counters and time delay. Stack and subroutine. Code conversion, BCD arithmetic , and 16 bit data operation. Programming Techniques. Basic interfacing concept, memory interfacing. Memory mapped and peripheral mapped I/O techniques.

Unit-III
The 8085 Interrupts, Input /output interfacing, interfacing data converters, 8259 interrupt controller.

Unit-IV
Programmable interfacing devices, The8155 multipurpose programmable device , The8255 programmable peripheral interface ,The 8253/8254 programmable interval timer.

Unit-V
8237/8257 DMA controller. 8279 keyboard/display interface. Serial I/O and data communication using RS-232C serial I/O standard. The 8251 (USART) programmable communication interface.

BOOKS RECOMMENDED

[1] Ramesh S. Gaonkar*, Microprocessor, Architecture, Programming, and Applications with the 8085*, Penram International Publication, 5/e
[2] P.K. Ghosh and P. R. Sridhar, *0000 to 8085 Introduction to microprocessor for Engineers and Scientists*, PHI, 2/e
[3] Douglas v. hall, *Microprocessor and interfacing programming and Hardware*, Tata McGraw Hall, 2/e
[4] N.K. Srinath *, 8085 Microprocessor Programming and Interface*, PHI, 2005.
[5] M. Rafiauzzaman *, Microprocessor Theory and application :Intel and Motorola,* PHI, Revised Edition.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester IV					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2EI354 **Sensors and Transducer**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objective: To develop good understanding on the principle of operation and the important characteristics of Sensor & Transducers commonly used in industry. Knowledge of recent developments in the field of Sensor & Transducers. Criterion for selection, installation of suitable sensing elements and to design the appropriate signal conditioning circuit for their specific measurement applications.

Prerequisite(s): Knowledge of Basic Electronics

COURSE OF CONTENTS

Unit-I

Basic concept of Sensors and transducer, their comparisons, Classification of Transducer, Working of transducers used for measurement of Displacement- resistive, inductive and capacitive method, Linear and Angular Velocity- moving coil and moving magnet method, various tachometers and stroboscope, Acceleration- seismic and peizo electric accelerometer, Working principle of Capacitive Transducer, Piezo-Electric Transducer, and LVDT.

Unit-II

Strain Gauges- strain measurement technique, resistance strain gauge and its types, Signal conditioning of strain gauges, Transducers for Temperature Measurement- non- electrical and electrical method, Bimetallic Thermometer, Resistance Thermometer like RTD, Thermistor and Thermocouple, Radiation and Optical Pyrometer.

Unit-III

Transducers for Measurement of Pressure: - Manometers types, Mechanical Types, Elastic Types transducers, Low Pressure measurement gauges.

Unit-IV

Transducers for Measurement of Flow: - Types of flow meters, Theory of variable head constant area meter and its types, theory of constant head variable area meter and its types, theory of variable head variable area meter and its types, Special flow meters- Electromagnetic, Hot wire Anemometer, Turbine meter and Ultrasonic flow meter.

Unit-V

Transducer for Level Measurement:- direct and indirect method, resistive method, Ultrasonic, Capacitive and Gamma Ray level Gauges. Measurement of Humidity and Moisture- basic definitions, psychometric method.

BOOKS RECOMMENDED

[1] A.K.Sawhney & Puneet Sawhney, *A Course in Mechanical Measurements and Instrumentation*, 12/e, Dhanpat Rai & Co. (P) Ltd., 2004

[2] B.C.Nakra & K.K.Chaudhary, *Instrumentation Measurement and Analysis*, 2/e, TATA McGraw-Hill Publishing Company Ltd, New Delhi., 2003

[3] D.Patranabis, *Principles of Industrial Instrumentation,* 2/e, Tata McGraw-Hill Publishing Company Ltd, New Delhi., 1998

[4] John P.Bentley, *Principles of Measurement Systems*, Low Price Edition, Pearson Education Asia, 2000

[5] Dr.D.S.Kumar, *Mechanical Measurements and Control*, 3/e, Reprint-2004, Metropolitan Book Co. Private Ltd., 2004

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester IV					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2CO355 **Data Structures**	**L**	**T**	**P**		**TH**	**CW**	**S W**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objective: Use a different algorithm for proper representation of Data to achieve efficiency. To understand an arrangement of memory elements in one or more planes. Way of selection of section of memory and its associated registers used for temporary storage of information in which the item most recently stored is the first to be retrieved. To understand how to sequenced stored data or programs awaiting processing. Development of structure for organizing or classifying data in which every item can be traced to a single origin through a unique path. A Development of diagrams that exhibits a relationship, often functional, between two sets of numbers or procedures.

Prerequisite(s): Knowledge of language 'C' used for programming

COURSE OF CONTENTS

Unit-I

Array and Link list: Array: Definition, Representation, Address Calculations; Searching: Linear search, Binary search, Hash Search; Sorting: Bubble sort, Insertion sort, Selection sort, Heap sort, Quick sort, Merge sort, Link List: Introduction, Single Link list, Single Circular link List, Doubly link list, Doubly Circular link list.

Unit-II

Stack: Definition, Representations: static and dynamic, Infix, Prefix, and Postfix expressions, Conversion of Infix to Postfix, Evaluation of Postfix expression, Implementation of recursion, removal of recursion.

Unit-III

Queue: Definition, Representations: Static and dynamic, Circular Queue, Double ended Queue, Priority Queue, and Implementation of Priority Queue using Heap data structure, applications of queues.

Unit-IV

Tree: Definition, Basic terminology, Binary tree, Complete Binary Tree, Full Binary Tree ; representations: Static and dynamic, Traversing in binary tree, Heap tree, Binary Search tree, AVL tree, M-way search trees, B-tree, B^+tree, B*tree.

Unit-V

Graph: Definition, Basic terminology, Directed and Undirected graph, Connected and Disconnected Graph, Weighted graph, Representations: static, dynamic and mix; Searching in graphs, finding shortest path in a weighted graph, Applications of graph.

BOOKS RECOMMENDED

[1] E Horowitz & Sahni, *Fundamental Data Structure*, Galgotia Book Source, 1983.
[2] A Tannenbaum, *Data Structure Using C*, Pearson Education.
[3] Kruz, *Data Strusture and Programming Design*, 1987.
[4] N. Wirth, *Algorithms +Data Structure = Program*, Prentice Hall of India, 1979.
[5] A V Aho, J E Hopcroft & J D Ullman, *the Design and Analysis of Computer Algorithms*, Addison Wesley, 1974.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Electronics & Instrumentation) Semester IV					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2EI356 **Electronics Workshop**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	-	**-**	**2**	**Max**	**-**	**-**	**50**	**50**	**100**
Duration of Theory Paper: Nil				**Min**	**-**	**-**	**25**	**25**	**50**

Course Objectives: To understand the criterion selection of component for electronics design. Explain the theory behind the integrated Analog circuit fabrication. To understand the design & working principles for Power supplies To Develop & Analysis of successful design of Electronics circuit

Prerequisite(s): Knowledge of Basic Electronics,

COURSE OF CONTENTS

Unit-I
Study of various types of components like Resistors, Capacitors, Diodes, Transistor, Inductors, Power Component like Power diode, Power Transistor. Study of different types of cables, coble sockets, connectors, switches & relays. From this study student will develop the familiarity of the component, their selection criterion, how to read the data tables etc.

Unit-II:
Selection of solder, Soldering wires and fluxes. Techniques of Soldering

Unit-III
Types of PCBs, & selection of PCB, techniques of making PCB for projects and mass manufacturing, layout of components and precaution, electrical wiring diagrams elements of grounding and shielding PCB layout practice.

Unit-IV
Fabrication of power supplies. Study of various type of power supplies techniques

Unit-V
Student will develop the minor electronic project for the practices of above theory. During development of the project familiarity of different EDA tools will develop.

BOOKS RECOMMENDED

[1] John R. Barnes, *Robust Electronic Design* Reference Book Volumes 1 and 2, Kluwer Academic Publishers, 2004
[2] James W Nilsson, Susan Riedel, *Introduction to PSpice Manual: Electric Circuits: Using Orcad Release 9.1*, Oxford University Press 2006

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE II Year (Common to All Branches) Semester IV					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
2SS057 **Engineering Economics**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	2	**-**	**-**	**Max**	**-**	**50**	**-**	**-**	**50**
Duration of Theory Paper: **Only Internal Tests**				**Min**	**-**	**25**	**-**	**-**	**25**

Course Objective: To make fundamentally strong base for decision making skills by applying the concepts of economics and accounting to cope up with the current dynamic business environment

Prerequisites: Nil

COURSE OF CONTENTS

Unit-I
Engineering Economics
Economic Decision: Role of Engineering in Business; Concept, Nature and Scope of Economics & Business Economics; Types of Business Organizations.
Cost, Revenue and Profit Analysis: Cost Classifications for Predicting Cost Behavior; Concept of Profit, Gross Profit and Net Profit; Break Even Point (BEP).

Unit-II
National Income
Meaning and Concept of National Income: GNP/GNI, NNP/NNI, Personal Income and Disposable Income; Methods of Computing National Income -Production Method, Income Method, Expenditure Method.

Unit-III
Consumer Demand
Consumer Demand Analysis: Meaning, Features and Determinants of demand; Law of Demand and its Exceptions; Reasons for Law of Demand; Importance of Law of Demand; Elasticity of Demand.

Unit-IV
Production Supply
Production Supply Analysis: Meaning, Supply Function, Law of Supply, Determinants of Supply, Fluctuation of supply; Elasticity of supply and its measurement.

Unit-V
Liberalization
Liberalization, Globalization & Privatization: Concept & Characteristics; Evaluation of New Liberal Economic, Policy of India; Economy through Globalization.

BOOKS RECOMMENDED
[1] C S Park, *Contemporary Engineering Economics*, Pearson Education, 2002
[2] J S Chandan, *Statistics for Business and Economics,*
[3] C Dislis, JH Dick, I D Dear & AP Ambler, *Test Economics and Design for Testability,*
[4] S Damodaran, *Managerial Economics*,