

ELECTORNICS & COMMUNICATION ENGINEERING**THIRD YEAR**

COURSE SL. No.	SUBJECTS	MARKS DISTRIBUTION	
		THEORY	PRACTICAL/SESSIONAL
321	INTRODUCTION TO MICROPROCESSOR	100	100
322	INSTRUMENTATION – I	100	050
323	COMMUNICATION SYSTEM	100	100
324	ANALOG ELECTRONICS	100	100
345	PROGRAMMING METHODOLOGY & DATA STRUCTURE	100	-
346	COMPUTER SYSTEM ORGANISATION	100	-
327	SIGNAL & SYSTEM	100	-
328	ELECTIVE	100	050
(a)	ELECTRO MAGNETIC FIELD		
(b)	COMPUTER PROGRAMMING (C-LANGUAGE)		
		----- 800	----- 400

321 INTRODUCTION TO MICROPROCESSOR

FIRST TERM

- 8085 Architecture
- Introduction, Pin function, Internal Organisation
- 8085 Programming
- Introduction, Programming model, Instructional timings.
- 8085 Interrupts:
- 8085 interfacing with memory

SECOND TERM

- 8085 interfacing with I/O
- I/O ports, Data transfer schemes, supporting chips.
- 8085 applications:
- Introduction, system Design examples, Development aid.
- Introduction to 8086
- Architecture, Instruction set.

Text Books:

Introduction to Microprocessors, By A.P. matirur.

Reference Books:

Microprocessor Architecture, Programming and Applications with the 8085/8080A, By R.S. gaonkar.

322 INSTRUMENTATION – I

FIRST TERM

1. System of units; fundamental and derived units, system International (S.I.) units, Dimension.
2. Potentiometers:- D.C. Potentiometer; Crompton and vernier types and their applications. Self-balancing (automatic) potentiometers. A.C. potentiometers. Coordinate and polar types and their applications.
3. Measuring Instruments: Operation and construction of galvanometer. (d.c and a.c.) Ammeters and voltmeters (Moving iron coil and thermal) and wattmeters (Dynamometer and induction types) induction type energymeters, testing and compensation, Frequency-meters (Electrical resonance type), single phase and power factor meters, Megger and multimeters.
4. Instrument transformers: Current and potential transformers, Ratio and phase angle errors.
5. Measurement of resistances: Measurement of low resistance by Kelvin double bridge and potentiometer method, Measurement of high resistance by loss of charge method.
6. High voltage measurement: Surge and impulse test and oil testing set.

SECOND TERM

7. Measurement of Inductance and Capacitance: A.C. bridges; Maxwell, Wien Anderson and shearing bridges. General equations and vector diagram under balanced conditions. Errors and precaution in bridge measurement. Wagner's earth connection and shielding of bridge measurement. Wagner's earth connection and shielding of bridge elements.
8. Magnetic measurement: Ballistic galvanometers and fluxmeter. Measurement of flux by Ballistic galvanometers and fluxmeter. Determination of B-H curve and hysteresis loop Separation of hysteresis and eddy current losses by using Lloyd Fisher square.
9. Electronic Instruments: C.R.O. and its uses in Measurement of frequency and phase angle, determination, B-H curve and measurement of dielectric loss D.C. & A.C. voltmeters, Differential voltmeters, A/D and D/A converters. Digital voltmeters and multimeters.
10. Measurement of Non-electrical quantities: Primary sensing elements, classification and selection of transducers. Displacement transducers, strain gauges, Temperature transducers and photo-electric transducers, Measurement of strain, temperature and pressure.

Text Books:

1. Electrical Measurement and Measuring Instruments – Rajendra Prasad, Khanna publisher, Delhi.
Electronic Instrumentation and Measurement Technique – W.D. Cooper 7 A.D. Helfrick, Prentice Hall, India.

323 COMMUNICAITON SYSTEM

FIRST TERM:

- Review of signals and systems. Fourier Transforms.
- Introduction to communication system.
- Generation & Demodulation of AM signals including DSB-SC SSB.VSB.
- Frequency Division Multiplexing (FDM)
- Super-heterodyne & Communication receivers.
- Generation 7 Demodulation of FM/PM signals
- Noise in AM/FM systems (briefly).

SECOND TERM:

- Pulse modulation system, sampling theory
- Generation & Demodulation of PAM,PWM & PPM.
- Time Division Multiplexing (TDM)
- Antenna, Transmission line & wave propagation (a introduction)
- Applications:- (System description in brief)
- *AM/FM Radio broadcasting & reception system.
- *TV Broadcasting & reception system including colour TV.
- *Line Communication (Telegraphy)
- *Telephony system including PBX & electronic exchanges.
- *Microwave communication links.
- *Satellite communication systems.
- *Radar, Navigational & Civil aviation communication systems
- *Power on line carrier communication system.

Text books:-

Communication system by simon Haykin(Wiley Eastern Ltd.,New Delhi).

FIRST TERM

1. Low Frequency Amplifiers:
Self bias, Stabilization against variations in I_{CO} , V_{BE} and β . Small signal model of BJT models. Comparison of BJT amplifier configurations. Cascading Transistor amplifiers Biasing the JFET. Small signal model of JFET and MOSFET low frequency common source and common drain amplifiers.
2. Feedback Amplifiers:
General characteristic of negative feedback amplifiers. Analysis of a feedback amplifiers series and shunt feed back. Frequency response of voltage and current (series and shunt) feed back amplifier. Bode plots.
3. Frequency Response of Amplifiers:
Step response of amplifiers effect of coupling and emitter bypass capacitors on low frequency response. The R.C. coupled amplifier. BJT and FET transistor models at high frequency. C-E and emitter follower at H.F. C-S. and common Drain amplifier (FET) at H.F.
4. Power Amplifiers
Large signal amplifiers. Class A.B. and A-B power amplifiers. Power field effect Transistor (VMOS).

SECOND TERM

5. Operational Amplifiers:
The operational amplifier. The virtual ground. Input and output impedances of practical OP-AMP in inverting and non-inverting modes. Practical considerations of different parameters (slew rate, CMRR etc.) of OP-AMP. The comparator, Electronics of OP-AMP, the Schmitt trigger.
6. Oscillators:
Principles of oscillators. Positive-feedback square wave, Triangular wave pulse generators step ((staircase) generators. Sinusoidal and phase shift oscillators. Wien bridge and crystal oscillators.
7. Modulation and Demodulation:
Elementary idea about AM and FM.

Text Book:

Microelectronics (Digital and Analog circuits and system) by J. Millman (McGraw-Hill)

Reference Book:

Solid State Electronic Circuits by A.S. Manera (McGraw Hill)

345 PROGRAMMING METHODOLOGY & DATA STRUCTURES

FIRST TERM:

Problem analysis, Algorithm & Flow-chart specifications

Introduction to PASCAL: Constants, variables, Expressions, logical operations and expressions, Looping and branching statements, iteration and recursion, program, procedure and function structure, Array, record & pointer, File processing.

SECOND TERM:

Elementary notions of analysis of algorithms-time space tradeoff.

Sorting and searching algorithms

Data structures:

Arrays & Ordered list

Stack & Queue

Linked list

Tree

Text Books:

1. Fundamentals of Data Structures -
2. Computer Algorithms -
3. PASCAL

By Horwity & Sahni

By Horowity & Sahni

By Wirth.

346 COMPUTER SYSTEM & ORGANISATION

FIRST TERM:

Introduction

*Introduction to computer organization.

*History of computer development, the 1st, 2nd, 3rd and 4th generation computers and their characteristics

-Processor design

*Processor organization, information types and their representation, error detection and correction.

*Instruction types, format, and addressing modes for modern digital computers and their effect on speed and performance.

Fixed point arithmetic, ALU design, bit sliced, ALU.

Control Unit design

* Instruction sequencing and interpretation

* Hardwired control: design methods, multiplier control unit, CPU Control unit.

SECOND TERM:

*Microprogrammed control: CPU control unit, multiplier control unit, Nonprogramming.

-Memory

*Memory Device characteristics, RAM: flop-flops and charge storage devices, 1D and 2D organization ferrite core, Serial access memories: magnetic disk, magnetic disk, magnetic tape, magnetic bubble, CCD memories.

*Virtual memory: memory hierarchies and design objective, address mapping, relocation, main memory allocation, segments and pages.

Input/Output

*I/O devices:Punched tape/cards, keyboard, terminals, printers, CRI:I/O bus, programming and interrupt I/O DMA, I/O processors.

Case study

Text books:

1. Computer architecture and organization
2. Digital computer Fundamentals

By J.P. Hayes

By T.C. Bartee.

327 SIGNALS AND SYSTEMS

FIRST TERM

1. Introduction to (i) Mathematical models of dynamical physical systems (ii) Linear systems (iii) Analysis.
2. Step, ramp, parabolic, Impulse and sinusoidal signals, discrete time signals.
3. Analysis by Fourier method.
4. Laplace transformation and its applications
5. Additional concepts and Theorems.

SECOND TERM

6. The Z – Transformation, Solution of difference equations, The modified Z – Transformation.
7. Concepts of State, State variables and State model State model for linear and continuous systems Diagonalisation, characteristic equation eigenvalues and eigenvectors.
8. State Transition matrix, solution of state equations, concepts of controllability and absorbability.

TEXT BOOKS

1. Analysis of linear systems by David K Cheng (Addition Wesley)
2. Control systems Engineering (Second Edition) by I.J. Nagrath and M. Gopal (Wiley)
3. Automatic Control Systems (Sixth edition) by B. C. Kuo (Prentice Hall).

ELECTIVE

328 (a) ELECTOMAGNETIC FIELD THEORY

FIRST TERM

Concept of gradient, divergence and curl, integral theorems; Coulomb's law, Gauss' Law, equipotential surface Divergence theorem, Poisson's and Laplace's equation, solution of boundary value problems, evaluation of capacitance, Electrostatic energy, electrostatic uniqueness theorem; Faraday's law Magnetostatic energy, Ampere's laws, Magnetic vector and scalar potentials; Maxwell's equation of continuity, Boundary conditions, Propagation of uniform plane wave, conductors and Dielectrics, Polarization.

SECOND TERM

Reflection and refraction of plane waves, Brewster angle, surface impedance; Poynting theorem, Power loss in a plane conductor; Transmission line equations, standing waves, Impedance matching, Transmission charts; Smith chart; guided waves, Rectangular wave guides, wave impedances, and characteristic impedance; Reflected potentials, Radiation from elementary dipole and half wave dipole, Radiation pattern.

Text Books:

Electromagnetic waves and Radiating Systems – By E. C. Jordan & K.G. Balmain (Prentice Hall of India Pvt. Ltd.)

328 (b) COMPUTER PROGRAMMING (C - LANGUAGE)

Variable names. Data types and sizes, constants, Declarations, Arithmetic Operators, Relation and Logical operators. Type conversions, Increment and decrement operators, bitwise operators, Assignment operators and Expressions, Conditional Expressions, Procedure and order of Evaluation, Statements and Blocks, if-Else- If with, Loops-while and For, Loops- Do-while, Break and continue, GOTO and Labels, Basics of function, Functions returnir non- integers, External variables, Scope rules, Header Files, Static Variables, Register variables, Block Structure, Initialization, Recursion, Pointers and Addresses, Pointers and function arguments, Pointer and Arrays, Address Arithmetic, Character Pointer and Functions, Pointer, Arrays, Pointer to Pointers, Multidimensional Arrays, Initialization of Pointer Arrays, Pointer vs multidimensional Arrays, Command line Arguments, Pointers to Function, Complicated declarations, Basic of structures, Structures, and Functions Arrays of Structures, Pointers of Structures, Self-referential structures, Table Lookup, Typedef, Unions, Bit-fields, Standard Input and output, Formatted Output-Scanf, File Access, Line Input and output, Miscellaneous Functions.

Text Books:

1. B. W. kernighem & D.M. Ritchie –“The C Programming Language” Prentice Hall of India, New Delhi.
2. V. Krishnamoorthy & K. R. Radhakrishnan – “Programming in C” Tata Mc Graw-Hill, New Delhi.