

# COMPUTER SCIENCE & ENGINEERING

## THIRD YEAR

COURSE SL. No.	SUBJECTS	MARKS DISTRIBUTION	
		THEORY	PRACTICAL/SESSIONAL
321	INTRODUCTION TO MICROPROCESSOR	100	100
322	INSTRUMENTATION – I	100	050
353	SYSTEM PROGRAMMING & COMPILER DESIGN	100	050
324	ANALOG ELECTRONICS	100	100
355	DESCRETE MATHEMATICS & AUTOMATA THEORY	100	-
356	COMPUTER GRAPHICS	100	050
327	SIGNALS AND SYSTEMS	100	050
358	COMPUTER HARDWARE ( I/O DEVICES & M/C HARDWARE)	100	-
		----- 800	----- 400

## 321. INTRODUCTION TO MICROPROCESSOR

### FIRST TERM:

- 8085 Architecture
- Introduction, Pin function, Internal organization
- 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. Mathur.

### Reference Book:

Microprocessor Architecture, programming and Applications with the 8085/8080A  
By R. S. gao.

## 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. Co-ordinate 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 convertors. 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.
2. Electronic Instrumentation and Measurement Technique –  
W.D. Cooper 7 A.D. Helfrick, Prentice Hall, India.

**353. SYSTEM PROGRAMMING AND COMPILER DESIGN.**

**FIRST TERM:**

Assembly language programming, design of assemblers and micro-processors, linkage editors and loaders, I/O programming:

Re-entrant programming, Recursion implementation, Text edition and word processors.

**SECOND TERM:**

Phase of a compiler, languages, Grammars-their classifications, Finite automata and Lexical analyzer and bottom-up passers, parser generator, elements of error handling and error recovery, symbol table-its structure and management, code generation, code optimization.

**TEXT BOOKS:**

1. System programming- by Donovan.

## 324. ANALOG ELECTRONICS

### FIRST TERM

1. Low Frequency Amplifiers:  
Self bias, Stabilization against variations in  $I_{CO}$ ,  $V_{BE}$  and  $\beta$ . 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)

## 358. DISCRETE MATHEMATICS AND AUTOMATA THEORY

### FIRST TERM:

Sets, operation on sets, basic laws of set operation. Relation cartesian product, domain and range, equivalence relation, partial ordering relation, lattices. Functions, function as a relation, Injection, surjection, and bijection Identity and inverse function. Composition of functions Theory of group. Axioms, Properties, sub-group, cyclic group, co-sets etc.

### SECOND TERM:

Phase of compiler, Languages, Grammars- their classifications, Finite automata and Lexical analyzer top-down and bottom-up passers, parser generator, elements of error handling and error recovery, symbol table- its structure and management, code generation, code optimization.

### Text Books:

1. System Programming - By Donovan.
2. Principles of compiler Design - By Aho. & Ulman.

## 359. COMPUTER GRAPHICS

### **FIRST TERM:**

1. Introduction, Baster 7 Random Scan Graphics : built in graphics functions. Procedure & functions, constants & variables, program, data structure for computer graphics.

### **SECOND TERM:**

Interactive graphics: two-dimensional graphics, d-dimensional graphics, applications to engineering problems.

### **Text books:**

Computer Graphics for Engineers. by RSS Asthana & N. K. Sinha Wiley Eastern, 1993

## 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).

**358. COMPUTER HARDWARE (I/O Devices and M/C Hardware)**

**FIRST TERM:**

Computer system organization, Difference Input/Output devices and controllers Hard disc, Floppy disc. Winchester, drives, Optical disc ( Read only and R/W) Tape drive, cartridge / canette drive, printers-line dotmatrix, laser, VDU & Graphics terminal Keyboard.

**SECOND TERM:**

Interfacing Input/Output devices, A/D, D/A. converters and interfacing analog devices-transducers, Sensors. Data communication and network-bus tandards, asynchronous and synchronous data communication and protocols, data acquisition subsystems. Real time and process control systems.

**Test Books:**

1. Digital computer organization by Moris Mano.