

COMPUTER SCIENCE & ENGINEERING

FOURTH YEAR

	Theory	Pract. & Sessional
1. Engineering Economics & Management	100	-
2. Software Engineering	100	050
3. Operating System	100	050
4. Principles of Programming Languages	100	050
5. Database Management System	100	050
6. Computer Communication & Network	100	050
7. Computer Architecture	100	-
8. Elective	100	050
a. Artificial Intelligence		
b. Advanced Microprocessor system		
c. CAD/CAM and ROBOTICS		
9. Project		100

	800	400

421. ENGINEERING ECONOMICS & MANAGEMENT

FIRST TERM

1. Engineering economy: (a) Simple and compound interest, Annuities. (b) Depreciation, Causes and Method. (c) Comparison of alternative and replacement method.: (i) Equivalent annual cost method. (ii) Present worth method. (iii) Rate of return method. 5 Lects.
2. Accounting (a) Double entry book keeping. (b) Journal (c) Ledgers. (d) Manufacturing Account: Profit and loss Accounts. (e) Balance sheet. 7 Lects.
3. Costing (a) Cost and cost accounting. Elements of cost (b) Break Even analysis, determining selling price and profitability. (c) Overhead cost allocation. (d) Costing system, Job costing, Unit costing process costing, operating cost, departmental cost (e) Cost control: Actual and standard cost, Budget and budgetary control. 7 Lects.
4. Entrepreneurship development: (a) Introduction to entrepreneurship. (b) Motivation (c) Psychological factors, Risk taking behaviour. (d) Rural entrepreneurship (e) Self employment. 5 Lects.

SECOND TERM

1. Management and organization: (a) Principle of management (b) Elements of management, planning organizing direction and control (c) Organisation structure and charts, line, staff functional and committee organization. 4 Lects.
2. Industrial management: (a) Industrial ownership: Proprietorship, partnership joint stock company and cooperative societies. (b) Site selection. (c) Plant layout: Process oriented, product oriented layouts, line balancing. 4 Lects.
3. Production materials Management: (a) Production types: Job orde, Batchand mass production. (b) Inspection and equality control. (c) Inventory control, economic order quantity. 4 Lects.
4. Optimisation techniques: (a) Linear programming; Graphical method, Analytical method of solution. (two variables) (b) CPM and PERT.
5. Personal Management: (a) Function: Manpower planning recruitment, selection training, promotion, discipline, welfare. (b) Job evaluation. (c) Merit Rating. (d) Wages and incentives. 4 Lects.
6. Marketing Management (a) Market research and sales force casting (b) Sales management (c) Advertisement and sales promotion. 4 Lects.

Books Recommended

1. engineering economy by De Carmo, Sallion and Canada (Mac Millan) Publ. Co. New York, and Collier Mac Millan Publishers, London.
2. Industrial Organisation and management by bethal, Atwater, Smith and Stackman (McGraw Hill Book Co.)
3. Industrial Organisaition and Engg. Economics by Banga and Sharma (Khanna Publishers Delhi)
4. Industrial Engg. And Management by O.P. Khanna Dhanpal Rai and Sons, Delhi.
5. Management Accounting by Anthony Robert N.
6. Development Entrepreneurship by Undai Pareek and T. Vankateshwara Rao (Sanjiv Printery, Ahmedabad.)

452. SOFTWARE ENGINEERING

Introduction, Software project Management. Requirement analysis principles and methodologies. Reusable software and proto-typing. Software design-architecture design and detailed design techniques and tools. Program verification and validation. Reliability and software quality assurance, quality matrix and models. Maintenance and configuration management.

Text Books:

- a. Software engineering Environments
- b. Software Engineering

By R. N. Charelli.
By Shooman.

443. COMPUTER COMMUNICATION & NETWORKING

FIRST TERM:

-Data transmission principle, transmission components, modern Error control and line control procedures, Role of computer for data communication, Computer communication-point to point multidrop, Concept of circuit message and packet switching Computer networking their structure (centralized, hierarchical distributed, multistar, ring etc.).

SECOND TERM:

-Components of computer network: hosts, FEP, communication channel, terminals, multiplexers, concentrators etc. Routing and flow control, Network software, security, reliability, statistics and accountability case study of computer communication network.

454. PRINCIPLES OF PROGRAMMING LANGUAGES

Block structured languages-design principles-abstractions-control and data structures-binding, environment-parameter passing mechanisms-aromatic semantics-introduction to applicative languages-study of LISP-programming style-lambda calculus-property lists and macro expansion in LISP-data types-types and parameters-data abstraction-abstract data types-innovative features, design philosophies and comparative look at snobol, APL, Prolog, Smalltak, Backus, F.P. communicating sequential process etc.

Practical:

Programming in LISP, suitable programming examples to illustrate lecture material.

References:

1. R.D. Tennent, Principles of Programming Languages, Prentice Hall, 1981.
2. P.H. Winston and B.K.P. Horn, LISP, Addison-Wesley, 1981.
3. E.Charniak, C.K. Riesbeck and D.V. McDermott, Artificial Intelligence Programming, Lawrence Earlbaum Associates, Hillside, NJ, 1980.
4. P. Henderson, Functional Programming, Prentice Hall, 1980.

455. OPERATING SYSTEMS

Historical perspective-hatch processing. Time sharing-functions and component of an operating system review of device drivers-file system, directory structure, gaining access to files-interrupt mechanisms concurrent process. Mutual exclusion. Synchronization process management, switching, scheduling and space allocation policies-segmented paging, dynamic linking coaching of secondary storage information-I/O scheduling policies terminal I/O handling-deadlocks-protection -case study.

Practical:

Programs should be written for parts of operating systems. Implementation of a “toy” operating system will be desirable.

References:

1. J.I. Peterson and A. Silberachitz, Operating systems concepts, Addison-Wesley 1983.
2. P.Drinch Hansen. Operating system principles, Prentice Hall of India 1973.
3. A.C. Shaw, the Logical Design of Operating Systems, Prentice-Hall, 1974.
4. H.M. Deitel, Operating Systems Principles, Addison-Wesley 1983.
5. S.Medrick and J.J. Donovan. Operating systems, McGraw-Hill International Student Edition, Kogakusha, Tokyo, 1977.

456. DATA BASE MANAGEMENT SYSTEMS

Introduction-data independence, data models-brief review of file organization technique-network model, DETC proposal-implementation-data definition and manipulation languages-hierarchical model-relational model-storage organization for relations-relational algebra and calculus-relational query languages-query processor and optimizer-functional dependencies, normal forms, multivalued dependencies-decomposition of relation schemes-integrity constraints-protection, security, concurrent operation on data bases-recovery-comparison of available data base systems.

Practicals:

Use of data base systems. Implementation of parts of a data-base system.

References:

1. J.D. Ullman, Principles of Database systems, Galgotia Publishers, New Delhi-1983.
2. S. Atre, Data base: Structured Techniques for Design, Performance & Management, John-Wiley, International Edition, 1980.
3. C.J. Date, An Introduction to Database Systems, vols 1&2, Addison-Wesley, Third Edition, 1981.

457. COMPUTER ARCHITECTURE

Lectures:

Basic computer organization-CPU design-memory system-bus structure-processing-exceptions language features that influence architecture memory management-computer arithmetic, floating point processor-micro programming-microprocessors-bit slice architecture-multiprocessor Architectures-shared memory, loosely coupled-associative

ELECTIVES

(a) ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

FIRST TERM:

1. **INTRODUCTION TO A. I.** :Overview, Concept of knowledge, A.I. Programming and languages (LISP and Prolog).
2. **KNOWLEDE REPRESENTATION:** Symbolic logic, dealing with in-consistancies and uncertainties, structured knowledge, object oriented representation.

SECOND TERM:

3. **KNOWLEDGE ORGANISATION AND MANIPULATION:** Searching and Matching Techniques, Knowledge organization and management.
4. **Perception, Communication and expert system:** (Very basic) Natural languages processing, pattern recognition, visual image understanding, Expert system architecture.
5. **KNOWLEDGE ACQUISITION** (only basic): General concept in knowledge acquisition, Learning by induction, Examples of inductive learners, Analogical and explanation basic learning.

Text Books:

1. Introduction to Artificial Intelligence and Expert System
By D. W. Patterson, University of Texas, E1 Paso
Published by Prentice Hall India Pvt. Ltd. New Delhi-1992
2. Artificial Intelligence
By Elaine Rich & KalvinKnight (2nd Edition)
Published by Tata McGraw Hill

Reference Book:

Artificial Intelligence By E.Charwak & D.Mc Dormill Addison-Wesley publishing company.

(b) ADVANCED MICROPROCESSOR SYSTEM

FIRST TERM :

8086 Architecture, 8086 Programming, 8086 Interfacing with memory and peripherals.

Introduction to 186/286/386/486 (with an emphasis on architectural features).

SECOND TERM :

Bit sliced microprocessors, RISC Processor, Troubleshooting and development aids, Application of microprocessors.

(C) CAD/CAM AND ROBOTICS

Introduction concept of CAD/CAM

Computer System, computer aided Design system, hardware, Computer Aided design system, software transformation systems Geometric modeling, draughting Applications of CAD/CAM techniques to finite element data preparation.

-Computer Aided manufacture The APT system CNC DNC system, the use of micro-computers in CAD/CAM system.

-Industrial Robotics.

-Automated guided vehicles, Process planning Materials management planning Implications of CAD/CAM for industry.

Books:

1. Computer Aided Design and Manufacture by C.B. Besant & C.W.K.Lw.
2. Principles of computer-aided Design by Joe Rooney & Philip Steamnan
3. Computer Aided Design and manufacture CAD/CAM by Groover & Jinner

POWER ELECTRONICS

FIRST TERM:

Power diodes, Thyristors, G.T.O.-Their characteristics, rating, protection and cooling. Series and parallel operation of SCRs. SCR Firing typical controls circuit, Phase controlled converter: Single phase, 3-Phase and polyphase, semi/full, circuits with & without free-wheeling diode. Analysis and performance. AC power control: Phase control, full wave control circuit, Half controlled Bridge circuits. Application: D.C. Motor control, speed control of slip-ring Induction Motors: Stator Phase Control, Slip power recovery scheme.

SECOND TERM:

Voltage Controllers – 1-phase/3-phase., Typical control for integral cycle control/phase control, Application such as heater control, light dimmer. Line Commutated Converters: Forced commutation circuits, Introduction to Choppers, classification control Strategies, Multi-phase choppers, Application of choppers for DC motor control.

DC/AC Inverters: Classification, Configuration, Parallel, Serial & Bridge suuerters, 1-phase/3-phase, Inverters, VSI, PWM, CSI, Frequency and voltage control, Typical control circuits, High frequency inverters, Application to AC motor control, UPS induction heating.

Text Books:

1. Thyristor and power Controllers Dubey, Daradia, Joshi, Sinha, Wilcy Eastern Limited.
2. Power Electronics and controls, Samir K.Data, Prentic Hall of India.

References:

3. Thyristors and their application, M. Ramamurthy.
4. Power Electronis, D. A. Bradley, R.N.R. (U.K.) Co. Ltd.

