SYLLABUS OF III SEMESTER B.E. COMPUTER SCIENCE (SEMESTER PATTERN)

33CS1: Applied Mathematics

Unit 1: Integral Transforms
Fourier integral theorem, Fourier and Laplace transforms and their simple properties. Simple applications of Laplace transforms to-solve ordinary differential equations including simultaneous equation Application to one dimensional partial differential equations. The z-transform definition and properties, inversion, relation with Laplace transform, Application of z-transform to solve difference equations with constant coefficients.

Unit 2: Complex variables
Analytic function, Cauchy-Riemann conditions, conjugate, functions, singularities, Cauchy's integral theorem and integral formula (Statement only) Taylor's and Laurent's theorem(statement only) Residue theorem, contour integration.

Unit 3: Calculus of Variations
Maxima and Minima of functional, variation and its properties Euler's-equation, functional dependent on first and second order derivatives, simple applications.

Unit 4: Fourier Series
Periodic function and their Fourier expansion. Even and odd function, change of interval half range expansion. Partial Differential Equation: Partial-Differential Equation of first order first degree, i.e Langrange's form, Linear Homogeneous P.D.E. of Nth order with constant coeffient method of separation of variables.

Unit 5: Matrices
Inverse of matrix by partitioning method, Inverse of a matrix by adjoint method and its use solving - simultaneous equation, Rank of matrix, Consistency of a system of equation, Linear dependence, linear and orthogonal transformations.

Unit 6: Matrices
Characteristic equation, Eigenvalues, Eigenvectors, Reduction of a diagonal form, Statement and verification of Cayley-Hamilton theorem; Sylvester's theorem, Association of matrices with linear differential equation of second order with a constant coefficient, Determination of largest eigenvalue by iteration method

Text Books:
- Advanced Engineering Mathematics, kreyzig
- Higher Engineering Mathematics, B.S. Grewal

Reference Books:
- Mathematics of Engineers, Chandrika Prasad
- Advance Mathematics for Engineers, Chandrika Prasad
- Applied Mathematics for Engineers, L.A. Pipes & Harville
- A Text Book of Applied Mathematics, P.N. Wartikar & J. N. Wartikar

33CS2: Programming Fundamentals In "C"

UNIT-I
Introduction to programming, programming languages, algorithms, flowcharts. C: Data types, Identifiers, Storage class, Constant, Operators, expression, Statements, console I/O statements, Selection statements: if-else, switch, Iteration Statements: for, while, do-while, Jump statements: return, go to, break, continue, comments.

UNIT-II
Function, Call by value, Call by reference, calling functions with arrays, arguments to main(), return statements, recursion, function prototypes, inline keyword, preprocessor directives. Pointers: pointer variables, pointer operator, pointer expression, array of pointers, multiple indirection, pointers to functions, dynamic allocation functions.

UNIT-III
Arrays : single dimensional arrays, two dimensional arrays, multidimensional arrays, variable length arrays. Strings, array of strings.

UNIT-IV
Structures : array of structures, passing structure to function, structure pointers, structure within structures. Unions, bit-fields, enumerations, size of, type def.

UNIT-V
File I/O : Streams and files, file system basics, fread, fwrite, fseek, random access I/O, fprintf(), fscanf(), standard streams.

UNIT – VI
Advanced Concepts in C: Different types of pointers, ROM-BIOS functions, Elementary TSRs.

Text Books:
- The Complete Reference C (4th Edition) : Herbert Schildt [TMH]
- C How to Program, 4th Edition by H. M. Deitel & P. J. Deitel, Pearson Education.
- Writing TSRs through C : Yashwant Kanetkar (BPB)

Reference Books :
- The C Programming Language : Dennis Ritchie & Brain Kernighan [Pearson]
- Programming with C : K.R.Venugopal & S.R.Prasad [TMH]
- Let Us C : Yashwant Kanetkar [BPB]

33CS3: Digital Circuits & Fundamental of Microprocessor:

UNIT-I:
Motivation for digital systems – Logic and Boolean algebra, Number System: Binary ,Hexadecimal ,Octal ,Gray. Gates & truth tables, propositions, Demorgan's law minimization of combinational circuits using Karnaugh maps.
UNIT-II:
Multiplexers, Demultiplexer , Encoders ,Decoders ,Code Converters, Adders , Subtractor (Half ,Full),BCD Adder/ Subtractor , ripple and carry look-ahead addition.
UNIT-III:
Storage elements, Flip-flops and latches: D, T, J/K, S/R flip-flops. Master Slave Conversion of one of type of F/F to another.
UNIT-IV:
Counters, asynchronous and synchronous-design using state and excitation tables.
UNIT-V:
Introduction to μp 8085, Addressing modes, Instruction Set of μp 8085
UNIT-VI:
Interrupts of 8085, Programming of μp 8085.

Text books :
- Digital Design 3rd Edition by M. Morris Mano, Pearson Education
- Digital logic and Computer Design by M. Morris Mano, Pearson Education
- Digital Cicuit & Design –R.P.Jain
- Digital circuit & design- A.P.Godse
- Fundamental Of Digital Electronics- A.Anand Kumar
- 8 bit microprocessor & controller –V.J.Vibhute
- 8 bit Microprocessor – Gaonkar.

33CS4: Combinatorial Theories

UNIT 1:
Combinatorics: Basic counting techniques, pigeon-hole principle, recurrence relations, generating functions.
Examples using ordinary power series and exponential generating functions, general properties of such functions.
Dirichlet Series as generating functions.
A general family of problems described in terms of "cards, decks and handa" with solution methods using generating functions.
UNIT II:
Generating function proofs of the sieve formula and of various combinatorial identities. Certifying combinatorial identities.
Some analytical methods and asymptotic results.
Polya's counting theorem.
Basics of graph theory.
Introduction to probabilistic method in combinatorics.
UNIT III:
Number Theory
Examples of continued fractions.
The study of the continued fractions.
Alpha has infinite continued fraction if alpha is irrational.
Formal logic: Propositional logic: proof system, semantics, completeness, compactness.
Length of proofs, polynomial size proofs, efficiency of proof systems.
UNIT IV:
Alpha has periodic continued fraction if alpha is quadratic irrational.
Application to approximation of irrationals by rationals. Hurwitz's Theorem.
First order logic: models, proof system, compactness, Examples of formal proofs in say, number theory or group theory. Some advanced topics.
UNIT V:
Application to solutions of Pell's equation. Proof that means $\cos\{(p \times pi)/q\}$,for natural numbers p and q,are irrational(apart from obvious exceptions).
Example : CS application of logic, introduction to modal and temporal logics, Or formal number theory including incompleteness theorem.
UNIT VI:
Liouville's Theoram on algebraic numbers.Construction of transcendental numbers.
Elements of proof theory including cut elimination, Or zero-one law for first order logic.

Text Book:

- Niven, Zuckerman and Montgomery, An Introduction to the Theory of Numbers, (5th edition),1991,Wiley.

33CS5: Principles Of Management

UNIT I
Nature and Functions of Management, Management yesterday and today, Planning and Decision making.
UNIT II

Management Information System: Introduction, Conceptual Foundations, Information System Requirement
UNIT III
Marketing Management: Marketing concept, Indian Marketing Environment, Market segmentation, Market Planning, International Marketting.
UNIT IV
Financial Management :
UNIT V
Human Resource Management: Human Resource Planning, Recruitment, Selection, Training and development, Security, Safety and Health
UNIT VI
Organization Behavior: Organization Structure and design. Designing Effective Organization, Managing Job Stress, Organization Development

Textbooks :

- Principles of management , P C Tripathi and P N Reddy
- Management Information System,Gordan Davis and H. Olison McGraw Hill Pub.
- Human Resources and Personal Management, William Werther and Keith Davis
- Marketing Management, V S Ramaswamy and S Namakumari
- Organization Behavior, High Arnold and Daniel Feldman McGraw Hill
- Financial Management, Khanna

33CS6: Computer Workshop

Practical to be based on following topics:
- Study of PC Hardware:
- Basic computer Organization
- PC construction
- Study of BIOS and CMOS
- Working under DOS and WINDOWS operating systems:
- Internal and External DOS commands.
- Basics required for working under Windows operating System
- Study of control panel.

3. Working under UNIX /LINUX Operating Systems:
- Structure: Unix Architecture
- Features of UNIX operating system
- Layered model of UNIX operating system (study of kernel and Shell)
- General file commands and Directory commands
- File structure and Directory structure

Introduction to Networking Accessories:
- Study of user connections.
- Study of communication channels.
- Study of network architecture (topologies)
- Study of Network Types.

Books:
- Computer Fundamentals – Pradeep K.Sinha
- Introduction to Computer Science by ITL ESL, Pearson Education.
- Introdution to UNIX and shell programming by M.G. Venkateshmurthy, Pearson Education
- Unix Shell programming –Yeshwant Kanetkar