DEPARTMENT OF COMPUTER SCIENCE & I.T.
SYLLABUS FOR COURSE STRUCTURE
B.SC. COMPUTER SCIENCE

SEMESTER 1 (July 2013 Batch)

S.No	Course Code	Course Name	Credits (L T P)
1	LNG 302	Professional Communication 1	3 (2+1+0)
2	MAS 322	Differential and Integral Calculus	3 (3+0+0)
3	GPT 301	Moral & Value Education	2 (2+1+2)
4	ENV 415	Environmental Studies-I	2 (2+0+0)
5	PHY 309	Basic Physics	3(3+0+0)
6	ECE 301	Basic Electronics	4(3-0-2)
7	CSIT 404	Problem Solving and Programming in C	5 (2+1+2)
8	CSIT 405	Fundamentals of Computer Science	5 (3+1+2)
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SEMESTER II

S.No	Course Code	Course Name	Credits (L T P)
1	LNG 303	Professional Communication 2	3 (3+0+0)
2	MAS 461	Numerical and statistical Computing	4(3+0+2)
3	ENV 416	Environmental Studies-II	2 (2+0+0)
4	PHY 336	Electromagnetism	3(3-0-0)
5	CSIT 406	Fundamentals of Computer Organization	4 (3+1+0)
6	CSIT 407	Algorithms and Data Structure Through C	5 (3+1+2)
7	CSIT 418	Information Security	2 (2+0+0)
8	CSIT 504	Internet & Web Technologies	5(3+0+4)
			28

SEMESTER III

S.No	Course Code	Course Name	Credits (L T P)
1	MAS 321	Differential Equation and Vector Calculus	3 (3+0+0)
2	MAS 621	Discrete Mathematics	3 (3+0+0)
3	CSIT 408	Fundamentals of Database management System	4 (3+1+0)
4	CSIT 409	Principles of Programming Languages	4(3+1+0)
5	CSIT 414	Principles of Operating System	5 (3+1+2)
6	CSIT 416	System Analysis and Design	4 (3+1+0)
7	CSIT 503	Object Oriented Systems	5 (3+1+2)
			28

SEMESTER IV

S.No	Course Code	Course Name	Credits (L T P)
1	ECE 506	Digital Communication Systems	5 (3+1+2)
2	CSIT423	Programming with Java	5 (3+0+4)
3	CSIT 505	Relational Database Management System	4 (3+0+2)
4	CSIT 511	Principles of Computer Networks	5 (3+1+2)
5	CSIT 514	Theory of Automata and Formal Languages	4 (3+1+0)
6	CSIT 515	Principles of Software Engineering	4 (3+1+0)
			27

SEMESTER V

S.No	Course Code	Course Name	Credits (L T P)
1	MAS 651	Principal Of Operation Research	43+1+0)
2	CSIT 506	Principles of Artificial Intelligence	4(3+1+0)
3	CSIT 507	Computer Graphics & multimedia	4(2+1+2)
4	CSIT 510	.Net Framework and C#	5(3+1+2)
5	CSIT 513	Microprocessor & Applications	4(2+1+2)
6	CSIT 604	System Programming	5(3+1+2)
7	CSIT 699a	Project (Project Formulation)	2 (0+0+4)
			28

SEMESTER VI

S.No	Course Code	Course Name	Credits (L T P)
1	CSIT 517	Computer Architecture	4 (3+1+0)
2	CSIT 522	Data warehousing	4(3+1+0)
3	CSIT 601	Linux and Shell Programming	5 (3+1+2)
4	CSIT 602	Latest trends in IT	4(2+2+0)
5	CSIT 699b	Project (Project Execution and Report)	6 (0+0+12)
			23

Total: 161

LNG 302	Professional Communication 1	3 (2+1+0)

PROFESSIONAL COMMUNICATION – I

Sub. Code: LNG-302   **Credits 3 (2-1-0)**

1. **Study of selected Literacy Texts.**
   - i. Collection of short essays.
   - ii. Collection of short stories.

2. **Testing Written Comprehension Ability.**
   Comprehension Passages of 500 words
   Multiple Choice Questions.

3. **Composition & Grammar.**

4. **Report Writing**
   Characteristics of Business Reports.
   Structure of reports: Front Matter, Main Body, and Back Matter
   Style of Reports: Definition, the Scientific Attitude, Readability of Reports, Choice of Words and Phrases, Construction and length of sentences, Construction and length of Paragraphs. The lineout or break up of a format report Blank Form Report, Frogen Report, Memoranda Form Report, Periodic Report, Miscellaneous Report.

5. **Speech Drills**
   Using the language laboratory to develop Speaking Communication Skills.
   - (i) Word Accent: Production of correct accentual patterns involving two and three syllabi words.
   - (j) Rhythm: Stress-tone rhythm in sentences.
   - (k) Intonation: Rising Tone and Talking Tone Ear Training and Production Tests.

References:
1. Close R.A.: A University Grammar of English Workbook. Longman, London, 1998.
2. Jones, Daniel: English Pronouncing Dictionary, ELBS, and London, 1999.
3. Sharma S.D: A Textbook of Spoken and Written English, Vikas, 1994.
4. Alvarez, Joseph A.: The Elements of Technical Writing, New York: Harcourt, 1998.
5. Bansal, R.K.: Spoken English For India, Orient Longman, 1993.

GPT 301	Moral & Value Education	2 (2+1+2)

Moral & Value Education

Code: GPT 301   **Credits: 2(2+0+0)**

My country and my people, the many Indians, being and becoming an Indian, Nationalism and Internationalism.

Some life issues – Love, Sex, and Marriage: Men and money-value of time, Meaning of work, human communication, Human suffering, Addiction, Ecology, Women's Issues

Understanding one's neighbour, neighbourhood groups: their structure and functions, patterns of social interaction of group dynamics

Preparation of career, choice of vocation, motivation for study and research, the present education system, curriculum and syllabus, teaching methods, examination and work experience

Definition of value education, moral and ethics, laws and morale based on Ten Commandments and two grate commandments

Discovery of self, self awareness, growth of intellect-man's spiritual nature emotions, will, respect the rights of life, Liberty, Property, Truth reputation

Sin, Origin of Sin, Manifestation of Sin, Results of Sin, The remedy of sin, Sin as an act, Sin as a state, Sin as a nature

Conscience-as defined in Oxford dictionary and Winston dictionary, types of consciousness (Such as evil, Convicted, Purged, Pure, Weak, Good, Void of offence)

ENV 415	Environmental Studies-I	2 (2+0+0)

Environmental studies- I

Code : ENV- 415   **CREDIT- 2 (2+0+0)**

i. The Multidisciplinary Nature of Environmental Studies
   Definition, Scope and Importance

ii. Ecosystem
- Concept of an Ecosystem
- Structure and function of an Ecosystem
- Producers, consumers and decomposes
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, Characteristics features, structures and function of the following ecosystems:
(a) Forest Ecosystem
(b) Grassland Ecosystem
(c) Desert Ecosystem
(d) Aquatic Ecosystem (Ponds, streams, lakes, rivers, oceans, estuaries)

(ii) Social Issues and the Environment
- From Unsustainable of sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, Water shed Management
- Resettlement and rehabilitation of people; Its problems and concerns Case studies
- Environmental ethics: Issues and possible solutions
- Climate Change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies
- Wasteland reclamation
- Consumerism and waste products
- Environment Protection Act
- Air (Prevention and Control of Pollution) Act
- Visit to local polluted site- Urban/ Rural/ Industrial/ Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems- ponds, river, Hill slopes etc (Field work equal to 5 lecture hours)
- Issues involved in enforcement of environmental legislation; Public awareness.

ECE 301	Basic Electronics	4(3-0-2)

BASIC ELECTRONICS

SUB CODE: ECE-301   **CREDITS 4 (2-1-2)**

1. Energy Bands in Solids:
   Energy band theory of solids, Concept of forbidden gap, Insulators, Metals and Semiconductors.

2. Transport Phenomenon in Semiconductors:
   Mobility and conductivity, electrons and holes in an intrinsic semiconductor, Donor and acceptor impurities, Fermi level, carrier densities in semiconductor, electrical properties of semiconductor, Hall effect, Diffusion.

3. Junction Diode:
   P-N junction, depletion layer, V-I characteristics, diode resistance, capacitance, switching time, diode application as a rectifier (half wave and full wave), diode circuits (clipper, clamper, voltage multipliers) Breakdown mechanism, Zener & Avalanche, breakdown characteristics, Zener diode and its applications.

4. Bi-junction Transistor:
   Bipolar junction Transistor, CE, CB and CC configuration, characteristic curves (cut off, active and saturation region), Requirement of biasing, biasing types and biasing analysis, stability.

5. Transistor as an Amplifier:
   Graphical analysis of CE amplifier, concept of voltage gain, current gain and power gain, h-parameter (low frequency), computation of A_v, R_I, R_o and approximate formulae.

6. Operational Amplifiers:
   Concepts of ideal op-amp, inverting, non-inverting and unity gain amplifiers, adders, difference amplifiers. , Integrators.

7. Switching Theory & Logic Gates:
   Number systems, conversion of bases, Boolean algebra, Logic Gates, concept of universal gate, canonical forms, and minimization using K-map.

8. Electronic Instruments:
   Multimeter, CRO and its Applications.

References:

1. Boylestad & Nashelsky/Electronic Devices & Circuits/ PHI.
2. Morris Mano/Digital Computer Design/ PHI.
3. Milliman, J. Halkias/Integrated Electronics/TMH.
4. Malvino & Leach/Digital Principles & Application/

List of Experiments:

1. Study of Diode characteristics.
2. Study of Common Base Transistor characteristics.
3. Study of Common Emitter Transistor characteristics.
4. Study of Half Wave Rectifier with effect of Capacitor and also calculate the ripple factor.
5. Study of Full- Wave Rectifier with effect of Capacitor and also calculate the ripple factor.
6. Study of Various Logic Gates.
7. Study of Clipping and clamping Circuits.
8. Study of C.R.O., Function generator, Multimeter**.**

PROBLEM SOLVING & PROGRAMMING IN C

Code: CSIT 404   **Credits: 5(2+1+4)**

Unit – I

Introduction: History of 'C' language, Algorithms and Flowcharts, Developing algorithm and flowchart for simple problems.

'C' basics: character set, Identifiers & keywords, Data types, Constants, Variables, Operators, Symbolic constants, Expressions, Compound statements, Structure of C program. Input and Output Statements.

Unit – II

'C' constructs: if statements & its forms, goto statement, while statement, for statement, do…while statement, break and continue statement, nesting concepts, switch statement.

Unit – III

Arrays: definition, types of Arrays, declaring Arrays, i/o operations on Arrays.

Functions: basics of functions, applications, function declaration, definition, scope, parameter passing and recursion.

Unit – IV

Pointers: definition, applications of pointers: pointer to Arrays, call by reference in functions.

Character Handling: Strings, standard library string functions, and two-dimensional array of characters, array of pointers to strings.

Unit-V

Structures: basics of Structures, Structure and Functions, pointers to structures, union.

File handling: file concepts, file creation, I/O operations on files, file functions, working with text files

TEXT:
1. YeshwantKanetkar, "Let us C", BPB Publications, 2002
2. B. Kernighan & D. Ritchie, " The ANSI C programming Language", PHI, 2000

REFERENCES:
1. E. Balaguruswamy, "Programming in ANSI C", TMH, 1999
2. AI Kelly and Ira Pohl, " A Book in C", (4th Edition), Addison Wesley, 1999.
3. R.G. Dromey, "How to solve it by computer", PHI, 1992

CSIT 405	Fundamentals of Computer Science	5 (3+1+2)

FUNDAMENTALS OF COMPUTER SCIENCE

CODE: CSIT-405   **Credits : 4(2+1+2)**

UNIT-1

Introduction to Computers: Need and Role of computers, Definition, Characteristics and Applications, Generations of Computer, Hardware: Basic block diagram, CPU, Primary and Secondary storage devices and I/O Devices.

UNIT-2

Information Concepts: Data and its representation, Information and its characteristics, Categories of information, Levels of information. Data storage and retrieval.Concept of file, record and field.

Number System: Basic concepts, Binary, Octal, Decimal, and Hexadecimal numbering system, conversion from one system to another.

UNIT-3

Introduction to Software: Definition, Types of Software, System software: Operating System, Functions of OS, Overview of DOS, Windows and Linux.

Application software: Word Processor, MS-Excel. Database concepts, Flat file versus Database.

UNIT-4

Computer Languages: Definition, Generations of computer languages, Types of Languages, Language Translators: Assembler, Interpreter, Compiler, Linker and Loader. Programming constructs, Algorithm & flowchart.

UNIT-5

Computer Network Concepts: Introduction to Computer Networks, History and usage of Internet, Browser and its types, Domain Name System (DNS), WWW, Electronic Mail (e-mail) , Search Engines and Intranets**.**

Text Book:

P.K. Sinha& P. Sinha, "Foundation of Computing", BPB

Chanchal Mittal, "Computer and Languages with C", PragatiPrakashan

References:

V. K. Jain, "Fundamentals of IT and Computer Programming", Katson Books

S. Sagman, "Microsoft Office 2000 for Windows", Pearson

Yashavant P. Kanetkar "Unix Shell Programming", BPB

LNG 303	Professional Communication 2	3 (3+0+0)

PROFESSIONAL COMMUNICATION II

Sub. Code (LNG-303)   **Credit 3 (2-1-0)**

1. **Technical Written Communication**
   (a) Nature, origin and development of technical written communication.
   (b) Salient Features.
   (c) Difference between technical writing and general writing.
2. **Pre-requisites of Scientific and Technical Communication**
   (a) Fragment sentences.
   (b) Parallel comparisons.
   (c) Elements of a series.
   (d) Squinting construction and split infinitive.
   (e) Modifiers, connectives, antecedents and clause subordination.
   (f) Dangling participles and gerunds.
   (g) Ellipsis.
   (h) Coherence, Unity, Chronological method, spatial method, inductive method, linear method, deductive method, interrupted method.
3. **Business Correspondence**
   (a) General principles of business correspondence.
   (b) Ramifications of business letters.
   (c) Letters giving instructions, inquiries and answers to enquiries, complaints and adjustments, letters urging action, employment letters, application and resumes.
4. **Proposal Writing**
   (a) Proposal: Definitions and kinds.
   (b) Division of format proposals (front matter, title page, summary/ abstract, Table of contents etc.)
   (c) Statement of request, body- statement of problem, background, scope, methodology, Advantages and disadvantages.
5. **Writing Scientific and Semi-technical Articles**
   (a) Source material, topic sentence, literature review.
   (b) Tables, figures, footnotes, bibliography.
6. **Study of Scientific and General Texts.**
   (A). Prescribed text books for detailed study
   - Arora, V.N (et. al.), Improve your writing (Delhi: Oxford University Press, 1981.
   - Lesson No. 1.2, 1.6, 2.4, 3.5, 4.1, 4.3, 5.1, 5.4, 6.2.
   (B). For extended Reading (any one of the following)
   - Orwell George, Nineteen Eighty Four (New York: Penguin, 1984)
   - Hemingway, Ernest, The old man and the Sea, (Oxford: 1990)
7. **Listening Comprehension**
   (a). Ear-training.
   (b). Uses of latest scientific techniques (AVR Comprehension trainer, SRA Comprehension trainer, SRA Comprehension Accelerator, AVR Comprehension Reteometer.)
8. **Reading Comprehension.**
   (a) Scanning method.
   (b) Skimming method.
9. **Phonetic Transcription**
10. **Stresses and Intonation.**

References
- Sherman, Theodore A. (et al) Modern Technical Writing, New Jersey, Prentice Hall, 1991.
- Legget, Glenn (et al) Essentials of grammar and composition, Macmillan, Delhi 1994.
- Strunk, Jr. William (et al), The elements of style, Macmillan, 1987.
- Sharma, S.D A Text Book of Scientific and Technical Writing, Vikas, Delhi, 1990.

MAS 461	Numerical and statistical Computing	4(3+0+2)

Numerical & Statistical Computing

Code: MAS 461   **Credits: 4(3+0+2)**

Introduction: Errors in Numerical Computation, Mathematical Preliminaries, Errors and their Analysis, Machine Computations, Computer Software.

Algebraic & Transcendental Equation: Bisection Method, Iteration Method, Method of False Position, Rate of Convergence, Method for Complex Root, Newton Raphson Method.

Interpolation: Introduction, Errors in Polynomial Interpolation, Finite Differences, Decision of Errors, and Newton's Formulae for Interpolation.

Curve Fitting, Cubic Spline & Approximation: Introduction, Method of Least Square Curve Fitting Procedures, Fitting a Straight Line, Approximation of functions.

Numerical Integration &Differentiation : Introduction, Numerical differentiation, Numerical Integration, Trapezoidal Rule, Simpson 1/3 Rule, Simpson 3/8 Rule.

Statistical Computation: Frequency Chart, Correlation, Regression Analysis, Least Square Fit, Polynomial Fit, Linear & Non Linear Regression, Multiple Regressions, And Statistical Quality Control Methods.

References:
1. Jain, Iyengar, Jain, "Numerical Methods for Scientific & Engineering
   Computation", New Age International.
2. Balaguruswamy, "Numerical Methods", TMH.
3. Sastry, "Introductory Method of Numerical Analysis", PHI.

Practical List:
1.   To deduce error involved in polynomial equation.
2.   To Find out the root of the Algebraic and Transcendental equations using Bisection, Regula-falsi, Newton Raphson and Iterative Methods. Also give the rate of convergence of roots in tabular form for each of these methods.
3.   To implement Newton's Forward and Backward Interpolation formula.
4.   To implement Gauss Forward and Backward, Bessel's, Sterling's and Evertt's Interpolation formula
5.   To implement Newton's Divided Difference and Lang ranges Interpolation formula.
6.   To implement Nuumerical Differentiations.
7.   To implement Numerical Integration using Trapezoidal, Simpson 1/3 and Simpson 3/8 rule.
8.   To implement Least Square Method for curve fitting.

ENV 416	Environmental Studies-II	2 (2+0+0)

Environmental Studies – II

Code: ENV- 416   **CREDIT- 2(2+0+0)**

1) Natural Resources
   a) Forest Resources
   b) Water Resources
   c) Mineral Resources
   d) Food Resources
   e) Energy Resources
   f) Land Resources

Role of an individual in conservation of natural resources, Equitable use of Resources for sustainable life style.

2) Biodiversity and its conservation
   a) Introduction- Definition: genetic, species and ecosystem diversity
   b) Biogeographical classification of India
   c) Value of diversity: consumptive use, productive use, social, ethical aesthetic and optional values.
   d) Biodiversity at global, National and Local levels.
   e) India as Mega-diversity nation
   f) Hot-spots of biodiversity
   g) Threats to Biodiversity: habitat loss, poaching of wild life, man- wild life conflicts
   h) Endangered and endemic species of India
   i) Conservation of biodiversity: In- situ and Ex- situ conservation of biodiversity.

3) ENVIRONMENTAL POLLUTION
   Definition of Pollution and Pollutant, Kinds and classification of pollutant and pollution
   Causes, effects and control measures of
   a) Air pollution
   b) Water pollution
   c) Soil pollution
   d) Noise pollution

e) Thermal pollution
Solid Waste management: Causes, effect and control measures of urban and industrial wastes

| CSIT 406 | Fundamentals of Computer Organization | 4 (3+1+0) |

Fundamentals of Computer Organization

Code: CSIT 406   **Credits: 4(3+1+0)**
UNIT-I
Introduction to Computers: Analog, Digital, Hybrid and Modern Digital Computers.
Digital Logic circuits and Components: Logic gates, Boolean algebra, K- maps, Half Adder, Full Adder, Coder, Decoder, Multiplexer, Demultiplexer, Flip-flop, Counters, Registers, Basic design of ALU.
UNIT-II
Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation, Error Detection codes.
UNIT III
Register Transfer and Microperations: Register Transfer language, Bus and memory Transfer, Binary Adder, Binary Subtracter, Binary Adder – Subtracter, Binary Increment, Binary Decrement, Arithmetic Circuit, Addition and Subtraction Algorithms.
UNIT IV
Memory and Processor Organization: Memory Hierarchy, Main Memory (RAM & ROM) Associative memory, cache memory, Auxiliary memory, General Register Organization, Stack Organization, Addressing modes, Instruction Formats. RISC and CISC.
UNIT V
Introduction to Classification of Computers and Concepts of Pipeline : Flynn's Classification, Parallel Architecture Classification, Pipelining of processes.
Text Book:
Computer System Architecture – M. Mano, Pearson Ed.
Reference Books:
    Digital circuits and Logic Design - M.Mano, Pearson Ed.
    Digital Logic – T.C. Bartee ,Mcgraw Hill
    William Stalling, "Computer Organization & Architecture", Pearson education Asia

| CSIT 407 | Algorithms and Data Structure Through C | 5 (3+1+2) |

Algorithm & Data Structure through 'C'

Code: **CSIT-407**   Credits**: 5(3+1+2)**
Unit –I
Algorithm: Introduction, Characteristics, Notation and format conventions of Algorithms, Algorithm Complexity and Time-Space trade-off.
Data Structure: Definition and classification of data structures, description of various data structures.
Arrays: Definition, Representation and analysis, Single and Multidimensional Arrays, Application of Arrays.
UNIT-II
Stack: Basic concepts and operations. Implementation: sequential and linked representation. Applications: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression.
Queue: **Basic concepts and operations. Implementation: sequential and linked representation.**
Introduction to double ended Queues and Priority Queues. Applications of Queues.

UNIT-III
Linked List: **Basic concepts and operations. Types of linked lists: Singly linked, Circular linked list,**
Doubly Linked list, and circular doubly linked list. Application of linked lists

UNIT-IV
Binary Trees: Definition, terminology and Applications of Binary Tree. Representation and Basic operations of binary tree.Traversal algorithms. Binary Search Trees: BST
UNIT-V
Sorting: Notation, concepts and algorithms: Selection, Bubble, Merge and Quick Sort.
Searching: Basic search techniques: Sequential and Binary searching
Graphs: **Basic concepts, Representation and traversal algorithms: Breadth first search, Depth first search.**
Introduction of spanning trees, Applications of Graphs.

Text Books :
A.M.Tenenbaum& M.J. Augenstein, "Data Structures using C&C++", PHI

Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd.
References:
Jean – Paul Trembley G. Sorenson, "Introduction of Data Structure with Applications",. TMT
RajniJindan, "Data Structures", Umesh Publications N.Delhi.
G.S. Baluja, " Data Structures Through C", DhanpatRai& Co.

CSIT 418	Information Security	2 (2+0+0)

INFORMATION SECURITY

Code: CSIT-418   Credits: 2(2+0+0)

Unit 1:
Introduction- Computer Security, Threats to security, History of Computer security,Computer System Security and Access Controls (System access and data access).

Unit 2:
Threats - Viruses, worms, Trojan horse, bombs, trap doors, spoofs, email virus, macro Viruses, remedies, Intruders, Malicious software, Firewalls, vulnerabilities &
Threats, Network Denial of service attack.

Unit 3:
Communication security- Encryption, classical encryption techniques, data encryptions Standards, advance encryption techniques Network Security-Kerberos, X.509, some network security projects- SDNS, DISNet , Project MAX, Secure NFS

Unit 4:
Security- E-Mail Security, IP security, Web security
Server security- security for network server, web servers, mobile technologies (java and java script etc)

Unit 5:
Intrusion detection techniques – techniques to provide privacy in Internet Application and protecting digital contents(music, video, software) from unintended use, authentication.

Text Book:

CSIT 504	Internet & Web Technologies	5(3+0+4)

Internet and Web Technologies
Code: CSIT 504   **Credit: 5(3+0+4)**
 Unit-1
Introduction to Internet
Introduction to Internet and Word Wide Web, History of Internet, Applications, Connection types, Internet domain, Working of Internet, Internet Service Providers, Uniform Resource Locator, E-mail, Search Engine, Web Browsers, Web Servers, HTTP, FTP and other Protocols.
Unit-2
HTML
Introduction to HTML, HTML tags, Structure of HTML Program, Text Formatting, Heading Style, Text Style, Controlling font Size and Color, Creating Lists, Creating Tables, Linking Documents, Frame, Creating Forms.
Unit-3
Dynamic HTML
Understanding Cascading style sheet, Attaching a style sheet to an HTML document, External style Sheets, Setting a default style sheet language, Making style Sheets Cascade, DIV and LAYER tags, Introduction to XML, Features and Applications, Data Interchange with an XML Document.
Unit-4
JavaScript
Introduction, The Document Object, Script Tags, Java Script Variables, Operators, Control Flow and Looping Constructs, Function, Arrays, Forms, Buttons, Script Event Handlers.
Unit-5
Server Side Scripting:

Introduction to Server Side Scripting Languages, Introduction to ASP, Active Server Objects, Active Server Components, Database Management with ASP, Development of Interactive commercial sites using ASP.

Text Books:
1. Ivan Bayross, " Web Enabled Commercial Application Development using: HTML, DHTML, JavaScript, Perl CGI', BPB
2. EvangelousPetroustsos, " Active Server Pages 3.0", BPB

References:
1. Web Publishing, D'Souza
2. HTML Complete, BPB
3. David Hunter et al, "Beginning XML", Wiley Publications.
4. ASP Professional, Wrox Publications.

SEMESTER III

MAS 621	Discrete Mathematics	3 (3+0+0)

DISCRETE MATHEMATICS

Code: MAS 621   **Credits: 3(3-0-0)**

1. **Propositions and logical operations**
   a. Notation, Connections, Normal Forms, Truth Tables
   b. Equivalence and Implications
   c. Theory of inference for statement calculus, predicate calculus
   d. Rules of logic
   e. Mathematical Induction and Quantifiers

2. **Sets, Relations and Digraphs**
   a. Review of set concepts
   b. Relations and digraphs
   c. Properties of relations
   d. Equivalence relations
   e. Computer representation of relations and digraphs
   f. Manipulation of relation
   g. Partially Ordered Sets (Posets)

3. **Graph theory**
   a. Definition, paths, circuits, reachability, connectedness
   b. Matrix representation of graphs, trees, spanning trees
   c. List structures and graphs, PERT related techniques
   d. Transitive closure, Warshall's Algorithms
   e. Eularian and Hamiltonian graphs

4. **Groups and applications**
   a. Monoids, semigroups
   b. Product and quotients of algebraic structures
   c. Isomorphism, homomorphism, automorphism
   d. Normal subgroups, codes and group codes

Text Books:
1. Discrete Mathematical Structure : Tremblay and Manohar, McGraw Hill
2. Discrete Mathematical Structure : Kolman, Busby and Ross, Printice Hall India
3. Elements of Discrete Structures : C.L. Liu

CSIT 408	Fundamentals of Database management System	4 (3+1+0)

Fundamentals of Database Management System

Code: **CSIT 408**   Credits: **4(3+1+0)**
UNIT-I

Introduction : Database system concepts, Data Abstraction, Data Models, Schema and Instances, Data independence. Data Definition Language, Data Manipulation Language, Overall Database Structure.
Data Models: Introduction, Basic concepts and notations for E-R diagram, mapping constraints, keys: super key, candidate key, primary key, Generalization and Specialization, Aggregation, Reduction of an E-R diagram in to tables, extended E-R models
UNIT- II
Relational Data Model and Languages: Relational data Model Concepts, Query languages: Relational algebra, Tuple relational calculus, Domain relational calculus and SQL.
UNIT-III
Database Design: First Normal Form, Pitfalls in Relational -Database Design, Functional dependencies, Decomposition, Desirable properties of Decomposition, Normal Forms: First, Second, Third, BCNF and Fourth Normal form.
UNIT-IV
Transactions & Concurrency Control: Transaction concepts, ACID properties, Transaction States, Concurrent execution of transactions, Locking techniques for concurrency control and Protocols.
Recovery System: Failure classification, Recovery and Atomicity, Recovery Techniques: Log-Based and Shadow Paging.
UNIT-V
Introduction to Database System Architecture: Distributed database, object Oriented database management system, Client/server database, and Knowledge Database.
Text Books
>   Henry F. Korth, "Database system concept", T MH
>   S.B. Navathe, "Database Management System", Wesley Addition
References:
>   Vipin Desai, "Database Management System", BPB
>   Date C J, "An Introduction To Database System", Addision Wesley
>   Majumdar& Bhattacharya, "Database Management System", TMH
>   Ramakrishnan, Gehrke, "Database Management System", McGraw Hill

CSIT 409	Principles of Programming Languages	4(3+1+0)

PRINCIPLES OF PROGRAMMING LANGUAGES
Code: CSIT 409   Credits: 4 (3 –1-0)
Unit -I
Introduction: Characteristics of Programming Languages, Factors influencing the evolution of programming language, developments in programming methodologies, desirable features and design issues. Programming Language Processors: Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding time.

Unit -II
Elementary and Structured Data Types: Data object variables, constants, data types, elementary data types, declaration, assignment and initialization, enumeration, characters, strings. Structured data type and objects: Specification of data structured types, vectors and arrays, records, variable size data structure, pointers and programmer constructed data structure, Sets, files. Sub Program and programmer defined data types: Evolution of data types, abstractions, encapsulations, information hiding, sub programs, abstract data types.

Unit -III
Sequence Control: Implicit and Explicit sequence control, sequence control with and within expression and statements, recursive sub programs, exception handling, co routines, Scheduled sub programs, concurrent execution.

Unit -IV
Storage Management: Major run time requirements, storage management phases, static storage management - stack based, heap based.
Syntax and translation: General syntactic criteria, syntactic elements of a language, stages in translation, formal syntax and semantics.
Unit -V
Programming Environment: Embedded system requirements, Theoretical models, Introduction to Functional Programming, Lambda calculus, Data flow language and Object Oriented language.
Text Book(s):
>   Terrance W Pratt, "Programming Languages: Design and Implementation" PHI
Reference Books :
>   **1.** Sebesta, "Concept of Programming Language", Addison Wesley

2. E Horowitz, "Programming Languages", 2nd Edition, Addison Wesley
3. Dr. Sachin Kumar, " Paradigms of Programming", Katson Books
4. UditAgrawal, " Paradigms of Programming Languages", DhanpatRai& Co.

CSIT 414	Principles of Operating System	5 (3+1+2)

PRINCIPLES OF OPERATING SYSTEMS

Code : CSIT 414   **Credits: 5(3-1-2)**

Unit –I: Introduction
Functions of Operating System, Evolution of Operating System, Batch, Interactive, Time Sharing and Real Time System, System Protection. Operating System Structure: System Components, System Structure, Operating System Services.

Unit – II: Process Management
Concurrent Processes: Process Concept, Principle of Concurrency, Producer / Consumer Problem, Critical Section, Problem, Semaphores, Classical Problems in Concurrency, Inter- Process Communication, Process Generation, Process Scheduling.
CPU Scheduling: Scheduling Concept, Performance Criteria, Scheduling Algorithms, Multiprocessor Scheduling. Deadlocks: System Model, Deadlock Characterization, Prevention, Avoidance and Detection, Recovery from Deadlock.
Unit – III: Memory Management
Basic Machine, Resident Monitor, Multiprogramming with Fixed Partition, Multiprogramming with Variable Partition, Multiple Base Register, Paging, Segmentation, Paged Segmentation, Virtual Memory Concept, Demand Paging, Performance, Page Replacement Algorithms, Allocation of Frames, Thrashing, Cache Memory Organization, Impact on Performance.

Unit – IV: File Management
I/O Management & Disk Scheduling: I/O Devices and Organization of I/O Function, I/O Buffering, Disk I/O, Operating System Design Issues.
File System: File Concept, File Organization and Access Mechanism, File Directories, File Sharing, Implementation Issues.

Unit – V: Case Study
Linux Operating System: Introduction to Linux Commands, Shell Programming, Basic System Calls, Kernel Models, File system, Security.

Text Book(s) :
1. Silverschatz, Peterson J, "Operating System Concepts", Willey.
2. Milenekovic, "Operating System Concept", McGraw Hill.

Reference Books:
1. Petersons, "Operating Systems", Addision Wesley.
2. Dietal, "An Introduction to Operating System", Addision Wesley.
3. Tannenbaum, "Operating System Design and Implementation", PHI.
4. Gary Nutt, "Operating System, A Modern Perspective", Addision Wesley.
5. Stalling, Willium, "Operating System", Maxwell Macmillan
6. Crowley, "Operating System", TMH.

CSIT 416	System Analysis and Design	4 (3+1+0)

System Analysis and Design
Code: CSIT 416   **Credit: 3 (2+1+0)**
UNIT-I
   Introduction: Definition of System, Characteristics of a System, Elements of a System, Types of System.
   System Development: System Development Life Cycle, Phases of SDLC, Role of System Analyst
   UNIT-II
   Feasibility Study: Basic concepts, Steps in the feasibility study, Types of feasibility study, Feasibility report, Cost Benefit analysis, Procedure for Cost benefit determination.

System Analysis: Basic concepts, System planning and initial investigation, Information gathering, Information gathering tools, Tools for Structured Analysis: Data Dictionary, Data Flow Diagram, Decision Tree, Decision table.

UNIT-III

System Design: Basic concepts, Logical and Physical Design, Structured Design, Coupling, Cohesion, Structured Chart, Architectural Design, Data Design, User Interface Design.

UNIT-IV

System Testing: Testing Principles, Testing Objectives, Test Plan, Types of Testing: Black Box and White Box Testing, Unit Testing, Integration Testing, System Testing, Software Quality and Quality Standards.

UNIT-V

Quality Assurance: Software Quality Assurance, Software Quality Standards.

Implementation and Maintenance: Introduction, Conversion, Maintenance, Activities of maintenance procedure

Text Book:
1. Elias M. Awad, "System Analysis and Design", Galogotia Publications (P) Limited, 2nd Edition

Reference Books:
1. Jeffery L. Whitten, Lonnie D. Bentley and Kevin C. Dittman, "System Analysis and Design Methods" 5th Edition, 2000, McGraw-Hill.

Assignment: Students to present a case study (in groups of 4 to 5) on an existing system.

CSIT 503	Object Oriented Systems	5 (3+1+2)

Object Oriented Systems

Code: CSIT 503   **Credit: 5 (3 + 1 + 2)**

UNIT – I

Introduction: Introduction, Characteristics of Objects, Object Oriented Development, Object Oriented Themes – Abstraction, Encapsulation, Polymorphism and Inheritance.

UNIT – II

Basic C^{++} Concepts: Classes and objects, Constructors and Destructors, Function overloading, Operator Overloading, Friend Function.

UNIT – III

Object Modeling: Objects and Classes, Links and Associations, Generalization and Inheritance, Aggregations, Abstract Classes, Multiple Inheritance, Sample Object Model.

UNIT – IV

Dynamic Modeling: Events and States, Operations and Methods, State Diagrams, Concurrency, Relation of Object and Dynamic Models.

Functional Modeling: Functional Model, Data Flow Diagrams, Specifying Operations, Relation of Functional to Object and Dynamic Model.

UNIT – V

Advance C^{++} Concepts: Inheritance – Basic Concepts, types, Constructors and Destructors in derived classes. Pointers, Polymorphism – Compile Time and Run time.Introduction of Virtual functions and Abstract Classes.

Text Book :
1. Object Oriented Design and Modeling – James Rambaughetal, PHI.
2. Object Oriented Programming with C++ - E. Balagurusamy, TMH.

References:

1. Object Oriented Conceptual Modeling – Dillon and Lee, PHI.
2. Introduction to Object Oriented Analysis and Design – Stephen R. Shah, TMH.
3. The Waite's Group OOP using C++ - Robert S. Lafore, Galgotia Publications.

SEMESTER IV

ECE 506	Digital Communication Systems	5 (3+1+2)

DIGITAL COMMUNICATION SYSTEM

Code: ECE-506   **Credits: 5 (3-1-2)**

Element Of Digital Communication And Information Theory: Model of digital communication system, logarithmic measure of information, entropy and information rate, conditional entropy and redundancy source coding, fixed and variable length code words, source-coding theorem, prefixes doing and Kraft Inequality.

Shannon-Fano and Hoffman coding for 1st, 2nd, 3rd order extension, maximum entropy of continuous source (with Gaussian distribution) entropy of band limited white Gaussian noise, mutual information & channel capacity of the discrete memory less channel, calculation of channel capacity of a discrete memory less channel

of BSC, of a continuous AWGN channel, Hartley Shannon law, maximum limit of channel capacity exchange of band and SNR.

Sampling Theory And Pulse Modulation: Sampling Theorem, Signal reconstruction in time domain, Practical and flat top sampling, Sampling of band-pass signal; Types of analog pulse modulation, Method of generation and Detection of PWM, PNM & PPM, Spectra of pulse modulated systems.

Waveform Coding Techniques: Discretization in time and amplitude. Linear Quantizer, Quantization noise power calculation, signal to Quantisation noise ratio, non-uniform Quantizer A law & μ law companding; encoding and pulse code modulation bandwidth of PCM, Differential Pulse Code Modulation using predictor, Delta modulation, Idling noise and slope overload, Quantization noise in DM for sinusoidal modulation, Adaptive Delta Modulation, Demodulation, Comparison of PCM and DM, MPEG audio digital signal standard

Digital Multiplexing: Fundamental of Time division multiplexing, Electronic commutator, Bit, Byte inter leaving, T1 carrier, synchronization and signaling of T1, TDM, PCM hierarchy, North -America * CCITT standards, T1 to T4 PCM TDM system (DS1 to DS4 signals), Signal formats of M12 Mux for AT & T (Bell) system, Bit rate calculation DS1 to DS4 signals.

Digital Base Band Transmission: Line coding and its properties. NRZ & RZ types, signaling format for unipolar, polar, bipolar (AMI) & Manchester coding and their power spectra (no derivation), HDB and B8ZS signaling, ISI, Nyquist criterion for zero ISI and raised cosine spectrum. Matched filter receiver, derivation of its impulse response and peak pulse signal to noise ratio, correlation detector decision threshold and error probability for binary unipolar (on – off) signaling.

Digital Modulation Techniques: Types of digital modulation, Wave forms for amplitude, Frequency and Phase shift keying. Method of generation and detection of coherent and non-coherent binary ASK, FSK & PSK, differential phase shift keying, quadrature modulation techniques, (QPSK & MSK) probability of error and comparison of various digital modulation techniques.

Error Control Coding: Error free communication over a noisy channel, hamming sphere, hamming distance and hamming bound, relation between minimum distance and error detection and correction capability, linear block codes, encoding and syndrome decoding, cyclic codes, encoder and decoders for systematic cycle codes, convolution codes, code tree and Trellis diagram, Viterbi and sequential decoding, Burst error correction, comparison of performance.

References:
1. B.P. Lathi / Modern Analog and Digital Communication / Oxford University Press.
2. Simon Haykin / Digital Communication / John Wiley & Sons.
3. Simon Haykin / Communication Systems (IV Ed) /
4. A.B. Carlson / Communication Systems / TMH.
5. Proakis, J.J. / Digital communication / McGraw Hill.

List of Experiments
1. Study of Sample and hold circuit-using Op-amp.
2. To study PAM generator and observe characteristics of both single and dual polarity pulse amplitude modulation.
3. Study of Pulse Width Modulation and demodulation.
4. Study of Pulse Position Modulation and demodulation.
5. Study of Time Division Multiplexer.
6. Study of Pulse Code Modulation and demodulation.
7. Study of Delta Modulation and demodulation and observe effect of slope overload.
8. Study pulse data coding technique for NRZ formats.
9. Data decoding technique for NRZ formats.
10. Study of amplitude shift keying modulator and demodulator.
11. Study of frequency shift keying modulator and demodulator.
12. Study of phase shift keying modulator and demodulator.
13. Single bit error detection and correction using Hamming code.
14. Simple fiber optic link fabrication using discrete components with available digital data input.
15. Digital link simulation, error introduction and error estimation in a link using MAT LAB (SIMULINK)/ VI.
16. Simulation of switching scheme of 8 line digital exchange using VI.

CSIT423	Programming with Java	5 (3+0+4)

Programming with Java

Code: CSIT 423   **Credit: 5(3+0+4)**

UNIT – I :
Basics of Java

The genesis of java, importance of java.Security and Portability. Concept of javaBytecode and Java Virtual Machine. Characteristics of java.

UNIT – II :
Object-oriented Concepts

Objects and classes. Object oriented programming characteristics: Abstraction, Encapsulation, Inheritance and Polymorphism. Implementation of OOP in java: classes, access modifiers, extending classes, overloading and overriding.

UNIT – III :
Programming with Java

Data types, constants, variables, arrays, operators and control statements used in java.

Classes and Objects

Concept of class.The general form of class.Declaring objects.Introducing methods in a class.Constructors.Inner and outer class.Exploring the String class.

UNIT – IV :
Access control and modifiers

Public access control.Private access control.Protected access control.Implementation of static, this and super keywords.Understanding final keyword in java.

Inheritance

Basic concepts.Using super.Method overloading.Method overriding.Dynamic method dispatch.Using abstract classes.Using final with inheritance.

UNIT – V :
Advanced Concepts

Packages.Importing packages.Interfaces.Exception types. Exception handling: using try/catch statements, using throws statement. Multi-threaded programming.

Text Book:

"Programming with Java" by E Balaguruswamy.

Reference Books:

"Java-2, The Complete Reference" by Patrick Naughton and HerbertzSchidt.

"HTML 4 unleashed" by Rick Dranell, second edition, Techmedia publication.

"Dynamic web publishing" unleashed by Shelley Powers, second edition, Techmedia.

Horstmann, "Computing Concepts with Java 2 Essentials", John Wiley.

Decker &Hirshfield, "Programming.Java", Vikas Publication.

CSIT 505	Relational Database Management System	4 (3+0+2)

Relational Database Management System

Code: CSIT 505   **Credit: 4(2+1+2)**

UNIT – 1 Overview

Basic Database Concepts and characteristics, Relational Data base Concepts and its characteristics
Introduction to Oracle, Introduction to SQL (Structured Query Language) * Plus , SQL Data types

UNIT – 2 Data Manipulation and Control

Data Definition language, Creating tables, Creating a table with Rows from another table, Inserting Values into table, Updating columns of a table, Deleting rows from a table, Querying Database tables, Conditional Retrieval of rows, Working with Null values, Matching a pattern with column from a table, Introduction to Sequences, Database security and privileges, GRANT Command, REVOKE Command, COMMIT and ROLLBACK commands

Querying Multiple Tables

Equi joins, Cartesian joins, Outer join, Self join, Set operator, Union, Intersect, Minus, Nested Queries

UNIT -3 View

Introduction to views, Manipulation of Base table through views, Rules for DML statements on join views, Dropping a view

Functions

Column Functions, Arithmetic Functions, Character function, Data function, General Functions, Group functions.

SQL * Plus Reporting

Introduction to SQL * Plus reporting, SQL * Plus Environment Commands, Manipulating variables, Defining Header, Footer & Column Heading, Formatting columns, Control break reports

UNIT -4 Embedding SQL Statements into Procedural Language (PL)

Introduction to PL/SQL, The advantages of PL/SQL, PL/SQL Block Structure, PL/SQL Architecture, PL/SQL Data types, Variables and Constants, Scope and Visibility of a variable, Assignments & Expressions, Referencing Non PL/SQL variables, Introduction to Built – in – functions, Conditional and Interactive Control, SQL within PL/SQL

Cursor and Exception handling

Introduction to cursor and its management in PL/SQL, Cursor manipulation, Implicit cursor & its attributes, Exception handling in PL/SQL, Predefined exceptions, User defined exceptions

Advanced features of procedural language for database applications

Subprogram in PL/SQL, Advantages of subprograms, Introduction to procedures, Introduction to functions. Stored packages, Advantages of packages, Dropping procedures, functions and packages

Triggers: Introduction to triggers, Types of triggers, Dropping triggers

UNIT 5 Introduction to object relational database management system (ORDBMS)

What is an object, What is an object technology, Creation of objects, How to maintain database using objects

Text Books:
1.   Ivan Byross, "SQL PL/SQL ", BPB
References:
1.   Scott Urman, " SQL PL/SQL Programming", TMH
2.   S.B. Navathe, "Database Management System", Wesley Addition

CSIT 511	Principles of Computer Networks	5 (3+1+2)

Principles of Computer Network

Code: CSIT 511   **Credit: 5(3-1-2)**

Unit 1: Computer Network and the Internet: Introduction to Computer Network, Internet, History of Computer Networks, Layered Architecture, TCP/IP protocol Suite

Unit 2: Local Area Network: MAC address, LAN Topologies, LAN Architecture, IEEE 802.3 LAN: MAC Technique (CSMA/CD), Physical Layer Specification. Fast Ethernet, Hubs and Switches, IEEE 802.11 Wireless LAN: Architecture, MAC protocol, Physical Layer. Bluetooth.

Unit 3: Network Layer: Forwarding and Routing, Routers, IPv4 Addressing: Notations, Classful and Classless addressing, Subnetting, Network Address Translation. Internet Protocol: Header Format, Fragmentation, Routing, Routing Protocols (RIP, OSPF, BGP), Routing Algorithms: Distance Vector and Link State Routing. IPv6

Unit 4: Transport Layer: Transport Layer Services, Socket, Port Numbers, User Datagram Protocol (UDP), Transmission Control Protocol (TCP): TCP Segment Structure, Flow control, TCP Connection, Congestion Control

Unit 5: Application Layer: Domain Name System, The Web, HTTP, Web Caching, Electronic Mail, Mail Access Protocols, File Transfer Protocol

Text Book:
1. Data Communication Na Behrouz Forouzan, Introduction to data communication and networking, TMH.

Reference Books:
1. William Stallings, Data and computer communication, Pearson
2. James F. Kurose, Keith W. Ross, Computer Networking, A Top-down approach, Pearson

CSIT 514	Theory of Automata and Formal Languages	4 (3+1+0)

THEORY OF AUTOMATA AND FORMAL LANGUAGES

Code: CSIT 514   **Credits: 4(3-1-0)**

Unit – I

Introduction, Alphabets, Strings and Languages. Automata and Grammars: Deterministic Finite Automata (DFA), Language of DFA, Nodeterministic Finite Automata (NFA), Language of NFA, Equivalence of NFA and DFA, Minimization of Finite Automata.

Unit – II

Regular expression (RE), Algebraic laws for Regular expressions, Kleen's Theorem, Regular expression to FA, DFA to Regular expression, Non Regular Languages, Pumping Lemma for regular Languages. Application of Pumping Lemma, Closure properties of Regular Languages, FA with output: Moore and Mealy machine, Applications and Limitation of FA.

Unit – III

Context free grammar (CFG) and Context Free Languages (CFL): Definition, Examples, Derivation, Derivation trees, Ambiguity in Grammar, Inherent ambiguity, Useless symbols, Simplification of CFGs, Normal forms for CFGs: CNF and GNF, Closure properties of CFLs, Decision Properties of CFLs: Emptiness, Finiteness and Membership, Pumping lemma for CFLs,

Unit – IV

Push Down Automata (PDA): Description and definition, Instantaneous Description, Language of PDA, Acceptance by Final state, Acceptance by empty stack, Deterministic PDA, Equivalence of PDA and CFG, CFG to PDA and PDA to CFG, Two stack PDA

Unit – V

Turing machines (TM): Basic model, definition and representation, Instantaneous Description, Language acceptance by TM, Variants of Turing Machine, TM as Computer of Integer functions, Universal TM, Church's Thesis, Recursive and recursively enumerable languages, Halting problem.

Text Books
1. Hopcroft, Ullman, "Introduction to Automata Theory, Language and   Computation", Nerosa Publishing House
2. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science(Automata, Languages and Computation)", PHI

Reference Books :
1. Martin J. C., "Introduction to Languages and Theory of Computations", TMH
2. Papadimitrou, C. and Lewis, C.L., "Elements of theory of Computations", PHI
3. Cohen D. I. A., "Introduction to Computer theory", John Wiley & Sons
4. Kumar Rajendra, "Theory of Automata (Languages and Computation)",PHI

CSIT 515	Principles of Software Engineering	4 (3+1+0)

PRINCIPLES OF SOFTWARE ENGINEERING

Code : CSIT 515   **Credits : 4(3-1-0)**

UNIT-I

Introduction: Introduction to software engineering, Importance of software, The evolving role of software, Software Characteristics, Software Components, Software applications, Software Crisis, Software engineering problems, Software Development Life Cycle, Waterfall Model, Prototyping Model, The Incremental Model, Spiral Model

UNIT-II

Metrics for Process and Projects: Metrics for project size estimation, Project estimation techniques-Empirical, Heuristic and Analytical estimation technique, Halstead Software Science, COCOMO, Staffing level Estimation

Software Requirement Specification: Requirement gathering and Analysis, Software requirement Specification, Functional and Non-Functional Requirement

UNIT-III
Software-Design: Design principles, Design Concepts, Cohesion and Coupling. Function Oriented Design-Structured Analysis, Data Flow Diagrams, Structured Design, Transform and Transaction Analysis. Object Oriented Design- Concepts, Unified Modelling language, Use Case Model, Class Diagram, Activity Diagram. User Interface Design

UNIT-IV
Coding: Top-Down and Bottom –Up programming, structured programming, information hiding, programming style and internal documentation.

Testing: Testing principles, Levels of testing, functional testing, structural testing, test plane, test case specification, software testing strategies, Verification & validation, Unit testing, Integration Testing, Alpha & Beta testing, system testing and debugging.

UNIT-V
Software Reliability & Quality Assurance: Reliability issues, Reliability metrics, Reliability growth modeling, Introductory concepts of Software quality Assurance.
CASE (Computer Aided Software Engineering): CASE and its Scope, CASE support in software life cycle, documentation, project management, internal interface, Reverse Software Engineering, Architecture of CASE environment.
Component Based Development
Formal methods

Text Book:
     R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
Reference Books:
1. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
2. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
3. Carlo Ghezzi, M. Jarayeri, D. Manodrioli, Fundamentals of Software Engineering, PHI Publication.
4. Ian Sommerville, Software Engineering, Addison Wesley.
5. Pankaj Jalote, Software Engineering, Narosa Publication
6. Pfleeger, Software Engineering, Macmillan Publication.

SEMESTER V

MAS 651	Principal Of Operation Research	43+1+0)

PRINCIPLES OF OPERATIONS RESEARCH

 Code: MAS-651   **Credits: 4(3-1-0)**

Unit-I
Linear programming problems: Linear Programming Problems (LPP)- Formulation of a LPP graphical method-Simplex Method - Revised Simplex Method - two Phase Method - Dual Simplex Method.

Unit-II
Transportation Problems: Least cost Method, Vogel's Approximation Method, MODI (Modified Distribution) Method. Introduction to Integer Liner Programming.

Assignment Problems: Hungarian Method, Sequencing, Routing Problem.

Unit-III

CPM and PERT: CPM and PERT- Network Diagram - Events and Activities - Project Planning reducing Critical Events and Activities - Critical Path calculations – Examples - Resources and man power leveling. Sequencing Problems - Traveling Salesman Problems– Machine-Scheduling Problem (Job-shop).

Unit-IV
Replacement problems and Inventory models: Replacement Problems - Capital Equipment- Discounting costs - Replacement in anticipation of failure - Group replacement – stochastic nature underlying the failure phenomenon. Inventory models - various costs - Deterministic Inventory Models - Economic lot sizes – Price breaks –Finite storage.

Unit-V
Game Theory: Matrix (or rectangular) games, MinMax and MaxMin Theorem, Saddle point, game without saddle point, Fundamental theorem of game theory, Dominance principle.

Text Book :

H.A. TAHA, "Operation research- An Introduction", Macmillan1976.

References Books

1. Hillier and Liebarman: "Introduction to operation research", (1990) Mc Graw Hill, Company.
2. Ecker and Kuperfersch mid: "Introduction to Operation research" (1988), John Wiley
3. Swapnil Srivastava, "A fundamental Approach to operations Research "
4. B.E. Gillet, "introduction to Operation Research", TMH

CSIT 506	Principles of Artificial Intelligence	4(3+1+0)

PRINCIPLES OF ARTIFICIAL INTELLIGENCE

CSIT-506   4(3+1+0)

Unit-1 Introduction
        Definition, DIKW chain, History, Foundation, introduction to intelligent agents, examples,
        AI technique

Unit-2 AI Problems
        Defining problems, production system, state space, problem characteristics, production
        system characteristics, issues in design of search problems

Unit-3 Knowledge Representation
        Knowledge representations, introduction to knowledge base, structure based:- CD, Script,
        Frames, Associational graph, rule based:- predicate logic; FOPL, Resolution, unification,
        propositional logic, reasoning under uncertainty, Statistical reasoning

Unit-4 Search and Control Strategies
        Search: -Informed search:- generate and test, Hill climbing, Best-First search, A*,
        Uninformed search:- DFS, BFS, control strategy

Unit-5 Advanced topics
        Expert Systems, Game playing, Natural Language Understanding, learning, planning

Text Book: 1. Artificial Intelligence :- Elaine Rich and Kevin Knight

Reference Book: 1. Artificial Intelligence and Expert System:- Dan W Patterson
                 2. Artificial Intelligence, A modern Approach:- Stuart Russell and Peter Norvig

CSIT 507	Computer Graphics & multimedia	4(2+1+2)

Computer Graphics and Multimedia

CSIT – 507   **5(3+1+2)**

Unit 1: Introduction

Definition. Application of Graphics in Computer Science. Interactive devices. Cathode Ray Tube. Color Generation in CRT. DVST displays. Computer Display: Flat-Panel Display: Plasma Display, TFT Display, LED and Liquid Crystal Display.

Unit 2: Output Primitives

Attributes, Points and Lines, Line Drawing Algorithms: DDA and Brasenham`s method. Mid point Circle Generation Algorithm, Ellipse Generation Algorithm. Polygons: Types, Representation, Inside outside test, Polygon filling Algorithms.

Unit 3: 2-D Transformations and Viewing

Matrix Representation and Homogenous Coordinates, Basic Transformations, Composite Transformations, Reflection and Shear, 2-D Viewing Pipeline, Clipping Operations, Point Clipping, Line Clipping, Polygon Clipping.

Unit 4: 3-D Transformations and viewing

Basic Transformations, 3-D Viewing Pipeline, Projections: Parallel   Projections and Perspective Projections

Unit5: Multimedia and its Applications

Multimedia Concept, Uses and Applications of Multimedia. Tools, Building Blocks, File   Format, H/W Peripherals, S/W Requirement. Audio, Video, Compression, Compression Techniques (jpeg, mpeg), Animation. Principles of Animation, Animation Techniques: Concept of Key Frames. Morphing.

Text Book:
1.Computer graphics: - Hearn and Baker
2.Multimedia making it work: - Vaughan

Reference Books:
1.Fundamentals of Interactive Computer Graphics: - J.D.Foley
2.Principles of Multimedia: - Ranjan Parekh
3.Multimedia in Practice: Technology & Applications: - Judith Jeffcoate

CSIT 510	.Net Framework and C#	5(3+1+2)

. NET TECHNOLOGY

Code : CSIT 606   **Credits : 4(2-1-2)**

UNIT-I

The .NET framework: Introduction, Common Language Runtime, Common Type System, Common Language Specification, The Base Class Library, The .NET class library Intermediate language, Just-in-Time compilation, garbage collection, Application installation & Assemblies, Web Services, Unified classes.

UNIT-II

C# Basics: Introduction, Data Types, Identifiers, variables & constants, C# statements, Object Oriented Concept, Object and Classes, Arrays and Strings, System Collections, Delegates and Events, Indexes Attributes, versioning.

UNIT-III

C# Using Libraries: Namespace-System, Input/Output, Multi-Threading, Networking and Sockets, Data Handling, Windows Forms, C# in Web application, Error Handling.

UNIT-IV

 Advanced Features Using C#: Web Services, Windows services, messaging, Reflection, COM and C#, Localization.

UNIT-V

Advanced Features Using C#: Distributed Application in C#, XML and C#, Unsafe Mode, Graphical Device Interface with C#, Case Study (Messenger Application)

Text Books
1. Shibi Panikkar and Kumar Sanjeev, "C# with **.**NET Frame Work", Firewall Media.
2. Shildt, "C#**:** The Complete Reference", TMH

Reference Books
1. Jeffrey Richter, "Applied Microsoft .Net Framework Programming", (Microsoft)
2. Fergal Grimes, "Microsoft .Net for Programmers", (SPD)
3. Tony Baer, Jan D. Narkiewicz, Kent Tegels, Chandu Thota, Neil Whitlow, "Understanding the **.**Net Framework", (SPD)
4. Balagurusamy, "Programming with C#", TMH

CSIT 513	Microprocessor & Applications	4(2+1+2)

MICROPROCESSORS AND APPLICATIONS

Code: CSIT 513   **Credits: 4(2-1-2)**

Unit-I

Introduction: Microprocessor evolution and types, Microprocessor architecture and operations of its components, addressing modes, Interrupts, data transfer schemes, instruction and data flow, timer and timing diagram. Interfacing devices. Architectural advancement of microprocessor. Typical microprocessor development schemes.

Unit-II

16-bit Microprocessor: Introduction to 8085 microprocessor. Architecture of 8086 microprocessor: register organization, bus interface unit, execution unit, memory addressing, memory segmentation. Operating modes. Instruction sets, instruction format, Types of instructions. Interrupts: hardware and software interrupts.

Unit-III

Programming: Assembly language programming based on Intel 8086. Instructions, data transfer, arithmetic, logic, branch operations, looping, counting, indexing, programming techniques, counters and time delays, stacks and subroutines, conditional call and return instructions

Unit-IV

Peripheral Interfacing: Peripheral Devices: 8237 DMA Controller, 8255 programmable peripheral interface, 8253/8254programmable timer/counter, 8259 programmable interrupt controller, 8251 USART and RS232C.

Unit - V

Micro controller (8051): Input/output pins, Port and circuits, External memory, counter, timers, interrupts and serial data Input/Output.

Text Books
1. Gaonkar , Ramesh S , "Microprocessor Architecture, Programming and Applications with 8085", Penram International Publishing.

Reference Books
1. Ray A K , Bhurchandi K M , "Advanced Microprocessors and Peripherals", TMH
2. Hall D V ,"Microprocessor Interfacing", TMH
3. Liu and Gibson G A , " Microcomputer System: The 8086/8088 family'' ,PHI
4. Aditya P Mathur, " Introduction to Microprocessor", TMH
5. Brey, Barry B, "INTEL Microprocessors", PHI

CSIT 604	System Programming	5(3+1+2)

SYSTEM PROGRAMMING

Code : CSIT 604   **Credits : 5(3-1-2)**

UNIT-I :
Introduction: Machine Structure, Evolution of the components of a programming system: Assemblers, Loaders, Macros, Compilers, and Formal Systems. Operating System, computer languages: Machine language, assembly language.

UNIT-II
Assemblers: Elements of assembly language programming, Structure of assemblers, design of two-pass assembler and single pass assembler.

Macros and Macro Processors: Macro definition and call, Macro Expansion, Nested Macro calls, advanced macro facilities, Design of Macro -Processors.

UNIT-III
Linkers & Loaders: Relocation and Linking concepts, Design of linker, self-relocating programs, design of sample linker, Linking for overlays, Loaders: Loader Schemes, Design of absolute loader, design of direct linking loader.

UNIT- IV
Introduction: Basic Unix programming concepts and terminologies, System Calls and Library Functions
I/O - Unbuffered I/O, properties of files and directories, standard I/O library, standard system data files, Terminal I/O and daemon process.

UNIT-V
Process: Fundamentals, Process Identifiers, Functions: fork, vfork, exit, wait, exec. Race Conditions, Process relationships,
Signals: Concepts, unreliable signals, Interrupted system calls, Re-entrant Functions, Different signal handling functions.
IPC - Pipes, Coprocessors, FIFOs, Semaphores, Shared Memory.

Text Books :
1. "John J. Donovan", system programming , TMH
2. W. Richard Stevens and Stephen A. Rago, *Advanced Programming in the UNIX Environment*, Second Edition, Addison Wesley, 2005

Text Books :
1. "D M Dhamdhere", Systems Programming and Operating Systems, TMH
2. "Robert Love ", Linux system programming, O'Reilly
3. "D. S. W. Tansl", Linux and UNIX shell programming, Addison-Wesley

CSIT 517	Computer Architecture	4 (3+1+0)

COMPUTER ARCHITECTURE

Code : CSIT 517   **Credits : 4(3-1-0)**

UNIT -I
Introduction: Introduction to Parallel Computing, Need for Parallel Computing, Parallel Architectural classification schemes, Flynn's, Shores, Fengs classification, Performance of Parallel Processors. Amdahl Law Distributed Processing and Quantitative Approach.

UNIT-II

Memory: Processor & memory hierarchy, bus, cache & shared memory introduction to super scalar architectures, Quantitative evaluation of performance gains using memory, cache miss/hits.

UNIT-III
Pipeline Processing: Introduction to Pipeline Processing, SIMD parallel processors, Arithmetic pipelines, steady state analysis of pipeline, Pipelined instruction processing, interlocks, hazards, hazards detentions and resolution memory systems used in pipelines, scheduling of dynamic pipelines.

UNIT-IV
Synchronous Parallel Processing: SIMD Parallel algorithm, recurrence and matrix computations, Distributed array processor, Processor Arrays, Multiprocessors, parallel programming languages, mapping and scheduling.

UNIT-V
Interconnection Networks: Introductions, Elementary Permutations used in Interconnection Network, Network Classification - Cross bar network, Commonly used Interconnection Network, Data Manipulator, Network Routing, and Multistage Data Manipulator.

Text Book :

1. Hwang, "Advanced Computer Architecture", McGraw Hill.

Books & References:

1. Peterson & Heresy, "Quantitative approach to computer Architecture," "Morgan Kaufman".
2. Quin, "Parallel Computing, Theory and Practices," McGraw Hill.
3. **Bhujde, "Parallel Computing," New Age International.**
4. **Englander, "Architecture of Computer Hardware & Software System," Jon Willey & Sons.**

CSIT 522	Data warehousing	4(3+1+0)

Data Warehousing

Course Code: CSIT-522   **Credit:** 4 (3 + 1 + 0)
 UNIT – I
Data Warehousing: Introduction, Characteristics of a Data Warehouse, Data Warehouse Architecture , Data Mart, Types of Data Mart, Nature of Data in Data Mart, Fact Tables and Dimensions in Data Warehouse, Performance issues, Security in Data Mart.
 UNIT – II
OLTP and OLAP Systems: Data Modeling, Data Warehouse Schemas, Difference between OLTP and OLAP, Types of OLAP Servers: ROLAP, MOLAP and HOLAP, OLAP operations, Managed Query Environment (MQE).
 UNIT – III
 Data Mining: Introduction, From Data Warehouse to Data Mining, Steps of Data Mining, Knowledge Discovery Databases, ETL Process, Data Mining Techniques: Classification, Association, Clustering: Decision Trees and Neural Networks.
UNIT – IV
Developing Data Warehouses: Building a Data Warehouse, Data Warehouse architectural strategies, Design considerations, Data content, Metadata distribution of Data, Tools for Data Warehousing, Performance considerations, Crucial decisions in designing a Data Warehouse, Various technological considerations.
 UNIT – V
Applications : Applications of Data Warehousing and Data Mining, National Data Warehouses, Census Data.
Text Book :
1. Data Mining: Concept and Techniques By Jiawei Han and Micheline Kamber Morgan Kaufmann Publishers
2. **Data Warehousing – C. S. R. Prabhu, PHI.**
References:
    Data Warehousing and Knowledge Management – Mattison, TMH

LINUX & SHELL PROGRAMMING

Code: CSIT 601   **Credit: 5(3+1+2)**

Unit-I Introduction

Introduction to Unix, Unix system organization (the kernel and the shell), Files and directories, Library Functions and system calls, vi Editor , Introduction to open source

Unit-II Unix Shell Programming

Types of shells, Shell Metacharacters, Shell variables, Shell scripts, Shell commands, the environment, Integer arithmetic and string manipulation, Decision making and loop control, controlling terminal input, trapping signals, arrays.

Unit-III Portability with C

Introduction : 'C' programming in Unix Environment , Basics of Unix system calls and Libraries.
Process Management System calls: fork, exit, wait, exec, kill etc.

UNIT-IV Signals and IPC

Signals: Concepts, unreliable signals, Interrupted system calls, Reentrant Functions, Different signal handling functions.

Inter Process Communication: Pipes, Coprocessors, FIFOs, Semaphores, Shared Memory.

Unit-V Unix System Administration

File System, mounting and unmounting file system, System booting, handling user accounts, backup, recovery, security, creating files, storage of files, Disk related commands.

Text Books

1. Sumitabha Das, "Unix Concepts and applications", TMH.
2. W. Richard Stevens and Stephen A. Rago, Advanced Programming in the UNIX Environment, Second Edition, Addison Wesley, 2005

References:

1. YashwantKanitkar, "Unix Shell Programming", BPB.
2. Meeta Gandhi, TilakShetty, Rajiv Shah, "The 'C' Odyssey Unix- the open boundless C", BPB.
3. Prata, "Advance Unix Programming guide", BPB.

Latest Trends in IT

Code :CSIT 602   **Credits : 4(3-1-0)**

   Aim: This course aims to upgrade the knowledge of students in respect of contemporary and innovative technologies/tools in the field of Information Technology. This course will also help the students to hone their skills to the requirements of the industry.

   Some of the major areas of thrust (but not limited to) are as given below:

   - Information Representation Technologies
   - Computer Organization and Architecture
   - Operating System
   - Software Engineering
   - Data Communication & Networking
   - Data Base Management System
   - Forensics
   - Digital Libraries

Note: Students will also be required to give presentation on selected topics.