Master of Computer Applications
(MCA)

3 YEARS PROGRAMME

CREDIT BASED SYSTEM
wef JULY 2006

Department
of
Computer Sc. & Engineering
GJUS&T HISAR

SCHEME OF EXAMINATION
M C A (Credit System)
w.e.f. July 2006

SEMESTER-I

Paper No.	Nomenclature of Paper	Duration of Exam.	Total Credits
CSL-611	Computer Fundamentals and Problem Solving Through C	3 Hours	4
CSL-612	Computer Organisation	3 Hours	4
CSL-613	Discrete Mathematical Structure	3 Hours	4
CSL-614	Structured System Analysis and Design	3 Hours	4
CSL-615	Computer Oriented Numerical and Statistical Methods Using C	3 Hours	4
CSP-611	Software Laboratory-I (Based on CSL-611)	3 Hours	2
CSP-612	Software Laboratory-II (Based on CSL-615)	3 Hours	2
CSP-613	Seminar		1
		Total :	**25**

SEMESTER-II

CSL-621	Data Structures Using C	3 Hours	4
CSL-622	Software Engineering	3 Hours	4
CSL-623	System Simulation	3 Hours	4
CSL-624	Computer Oriented Optimization Techniques	3 Hours	4
CSL-625	Object Oriented Systems and C ++	3 Hours	4
CSP-621	Software Laboratory-III (Based on CSL-621)	3 Hours	2
CSP-622	Software Lab-IV (Based on CSL-625)	3 Hours	2
CSP-623	Seminar		1
		Total:	**25**

SEMESTER-III

Paper No.	Nomenclature of Paper	Duration of Exam	Total Credits
CSL-631	Data Base Systems	3 Hours	4
CSL-632	Visual Programming using VB	3 Hours	4
CSL-633	Computer Networks	3 Hours	4
CSL-634	Operating System	3 Hours	4
CSL-635	Windows Programming & Visual C++	3 Hours	4
CSP-631	Software Laboratory-V ORACLE (Based on CSL-631)	3 Hours	2
CSP-632	Software Laboratory-VI VISUAL PROGRAMMING (based on CSL-632 & CSL-635)	3 Hours	2
CSP-633	Seminar		1
		Total:	**25**

SEMESTER-IV

CSL-641	JAVA Programming and Internet Applications	3 Hours	4
CSL-642	Computer Architecture & Parallel Processing	3 Hours	4
CSL-643	LINUX and Shell Programming	3 Hours	4
	Programme Elective-I	3 Hours	4
	Programme Elective-II	3 Hours	4
CSP-641	Software Laboratory-VII JAVA Programming (Based on CSL-641)	3 Hours	2
CSP-642	Software Laboratory-VIII LINUX & Shell Programming (Based on CSL-643) and CASE Tools	3 Hours	2
CSP-643	Seminar		1
		Total:	**25**

List of Elective Papers

Programme Elective - I

i) CSL-644 System Programming
ii) CSL-645 Advanced Database Systems
iii) CSL-646 High Speed Networks

Programme Elective - II

i) CSL-647 Microprocessors and Interfaces
ii) CSL-648 Software Project Management
iii) CSL-649 Management Information System

SEMESTER-V

Paper No.	Nomenclature of Paper	Duration of Exam	Total Credits
CSL-651	Computer Graphics and Multimedia	3 Hours	4
CSL-652	Artificial Intelligence	3 Hours	4
CSL-653	Web Engineering	3 Hours	4
	Programme Elective-III	3 Hours	4
	Open Elective-I	3 Hours	4
CSP-651	Software Laboratory-IX PROLOG Programming and Graphics (Based on CSL-651 & CSL-652)	3 Hours	2
CSP-652	Software Laboratory-X HTML,CGI using PERL,JSP, XML (Based on CSL-653)	3 Hours	2
CSP-653	Seminar		1
		Total:	**25**

List of Elective Papers
Programme Elective-III
i) CSL-654 Compiler Construction
ii) CSL-655 Neural Networks
iii) CSL-656 Security of Information Systems
Open Elective-I
To be offered by other PG departments of university

SEMESTER-VI

CSD-601 Project 10

(To be carried out at industry/company under supervision of official at industry / company where he/she is doing project. Evaluation & Viva Voce to be done jointly by internal and external examiner)

Grand Total for all Semesters 135

Note : One credit in theory papers is equivalent to 1 hour classroom teaching per week and one credit in practical/lab course is equivalent to 2 hour practical/lab work per week. A teacher will conduct practical class in a group of 15 students.

CSL-611 COMPUTER FUNDAMENTALS & PROBLEM SOLVING THROUGH C

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Computer Fundamentals: Computer components, characteristics & classification of computers, hardware & software, peripheral devices.

Algorithmic Development: Techniques of problem solving, Flowcharting, decision table, structured programming concepts, Modular Programming, Algorithms for searching, sorting and merging. Programming methodologies: top-down and bottom-up programming.

Elements of C: C character set, identifiers and keywords, Data types: declaration and definition.

Operators: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their hierarchy & associatively.

Data input/output.

Control statements: Sequencing, Selection: if and switch statement; alternation, Repetition: for, while, and do-while loop; break, continue, goto.

Functions: Definition, prototype, passing parameters, recursion.

Data Structures: arrays, struct, union, string, data files.

Pointers : Declaration, operations on pointers, array of pointers, pointers to arrays.

References:

- Computer Programming and Problem Solving Through C by Dharminder Kumar, Varun Kumar, Excel books, 2005, New Delhi.
- Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, 3rd Ed., Addison Wesley, 2000.
- AK Sharma, Fundamental of Computer & Programming with C, Dhanpat Rai Publications.
- Yashwant Kanetker, Let us C, BPB Publications.
- Gottfried, Programming with C, Tata McGraw Hill.

CSL-612 Computer Organization

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Information Representation : Number systems, BCD codes, character codes, error detecting and correcting codes, fixed-point and floating point representation of information. Binary arithmetic operations, Booths multiplication.

Binary Logic : Boolean algebra, boolean functions, truth tables, canonical and standard forms, simplification of boolean functions, digital logic gates.

Combinational Logic : Design procedure, adders, subtractors, encoders, decoders, multiplexers, de-multiplexers and comparators.

Sequential Logic : Flip-flops, shift registers and counters.

Memory System : Memory parameters, semiconductor RAMs, ROMs, magnetic and optical storage devices.

CPU organization : Processor organization, Machine instructions, instruction cycles, instruction formats and addressing modes, microprogramming concepts, micro-program sequencer.

I/O Organization : I/O interface, interrupt structure, transfer of information between CPU/memory and I/O devices, and IOPs.

References :

- Mano, M. Morris Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd., 2000.
- Rajaraman, V., Radhakrishanan,T., An Introduction To Digital Computer Design,Prentice Hall of India Pvt. Ltd., 4th Ed.
- Hayes, J.P., Computer Architecture and Organization, McGraw Hill, 1998, Third Ed.
- Heuring, V.P., Jordan, H.F., Computer Systems Design and Architecture, Addison Wesley, 2000.

CSL-613 DISCRETE MATHEMATICAL STRUCTURES

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	**T**	**P**	**(Examination)**
4	**-**	**-**	

SYLLABUS

GROUP AND SUBGROUPS: Group axioms, Permutation Groups, Subgroups, Cosets, Normal subgroups, Semi-groups, FREE Semi-groups, Applications, (modular arithmetic, error correcting codes, grammars, language, Finite State Machine).

Graphs: Directed and undirected graphs, chains, Circuits, paths, Cycles, connectivity, Adjacency and incedence matrices, Minima's path Application(Flow charts and state transition graphs, algorithms for determining cycle and minimal paths, polish notation and trees, flows in networks).

Lattices and Boolean Algebra: Relations to partial ordering, Lattices, Hasse diagram, Axiomatic definition of Boolean algebra as algebraic structures with two operations basic results truth values and truth tables. The algebra of propositional function. The Boolean algebra of truth values, Applications (Switching circuits, Gate circuits).

Finite Fields: Definition Representation, Structure, Integral domain Irreducible polynomial, Polynomial roots, Splitting field.

REFERENCES:

- Alan Doerr, Kenneth Levaseur, APPLIED DISCRETE STRUCTURES FOR COMPUTER SCIENCE, Galgotia Publications Pvt. Ltd.
- Scymour Lipschutz, Marc Lars Lipson, DISCRETE MATHEMATICS, McGRAW-HILL international editions, Schaum's Series.
- Bernard Kolman,Robert C.Busby,DISCRETE MATHEMATICAL STRUCTURES FOR COMPUTER SCIENCE, Prentice-Hall of India Pvt. Ltd.
- Kenneth G.Rosen: DISCRETE MATHEMATICS and ITS APPLICATIONS, McGRAW-HILL INTERNATIONAL EDITIONS, Mathematics series.

CSL-614 STRUCTURED SYSTEM ANALYSIS AND DESIGN

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

System Concepts & the Information System Environment, The System Development Life Cycle, Role of the System Analyst, Automated Tools for System Development.

System Analysis: Requirement determination and specification, feasibility study, Information gathering, structuring system requirements, process modelling, logic modelling and conceptual data modelling.

System Design : Designing forms and reports, interface and dialogues, databases, process, output/input, files.

Implementation: Preparing for implementation, planning, test plans, program development, implementation management, changeover and routine operations.

Maintenance and Review: Types of maintenance, Cost of maintenance, performance evaluation.

References :

- Modern System Analysis & Design, Hoffer J.A., George J.F., Valacich J.S., Addison-Wesley, Second Edition.
- Practical SSADM 4 4/e, A Complete Tutorial Guide, Philip Weaver, Nicholas Lambrou & Matthew Walkley, Addison-Wesley.
- Systems Analysis and Design, Awad E.M., Galgotia Booksource.
- Elements of System Analysis, Gore M. & Stubbe J., Galgotia Booksource, Third Edition.
- Introducing System Analysis and Design, Lee, Galgotia Booksource, Combined Volume Set.

CSL-615 COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS USING C

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Computer Arithmetic : Floating point representation of numbers, arithmetic operations with normalized floating point numbers and their consequences. Error in number representation - pitfalls in computing.

Iterative Methods: Bisection, False position, Newton-Raphson methods, Discussion of convergences, Polynomial evaluation, Solving polynomial equations (Bairstow's Method).

Solving of Simultaneous Linear Equations and ordinary Differential Equations: Gauss elimination method, Ill-conditioned equations, Gauss-Seidal iterative method, Taylors series and Euler methods, Runge-kutta methods, Predictor corrector methods.

Numerical Differentiation and Integration : Differentiation formulae based on polynomial fit, Pitfalls in differentiation, Trapezoidal, Simpson's rules and Gaussian Quadrature.

Interpolation and Approximation : Polynomial interpolation, Difference tables, Inverse interpolation, Polynomial fitting and other curve fitting. Approximation of functions by Taylor series and Chebyshev polynomials.

Statistical methods: Sample distributions, Test of Significance, n2, t and F test.

Analysis of Variance : Definition, Assumptions, Cochran's Theorem, One-way classification, ANOVA Table, Two-way classification (with one observation per cell).

Time Series Analysis : Components and Analysis of Time Series, Measurement of Trend, Seasonal fluctuations and Cyclic movement.

References :

- Gupta S.P. and Kapoor, V.K., Fundamentals of Applied station statistics, Sultan Chand & Sons, 1996.
- Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995.
- Rajaraman V., Computer Oriented Numerical Methods, Prentice Hall, India.
- Graybill, Introduction to Statistics, McGraw.
- Anderson, Statistical Modelling, McGraw.

CSL-621 DATA STRUCTURES USING C

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Introduction to Data Structures, Primitive and Composite, Arrays, Matrices, Sparse Matrices, String representation and manipulation, Stack, Queue, Dequeue, Linked lists, Trees, Binary trees, Threaded Binary tree, Balanced tree, Different tree traversal algorithms, Representation of Graphs and Applications, various searching and sorting techniques, Hashing, Dynamic Memory Management.

References:

- Yedidyah Langsam, Moshe J Augernstein and Aarson M.Tanenbaum, Data Structures using C and C ++, PHI, New Delhi (1997)
- Trembley, J.P. and Sorenson P.G.An Introduction to Data Structures with Applications, McGraw-Hill International Student Edition, New York(1984
- Seymour Lischutz, Data Structures, McGraw-Hill Book Company, Schaum's Outline Series, New York(1986).

CSL-622 SOFTWARE ENGINEERING

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Software and software engineering - Software characteristics, software crisis, software engineering paradigms.

Planning a software project - Software cost estimation, project scheduling, personnel planning, team structure.

Software configuration management, quality assurance, project monitoring, risk management.

Software requirement analysis - structured analysis, object oriented analysis and data modeling, software requirement specification, validation.

Design and implementation of software - software design fundamentals, design methodology (structured design and object oriented design), design verification, monitoring and control, coding.

Software reliability - metric and specification, fault avoidance and tolerance, exception handling, defensive programming.

Testing - Testing fundamentals, white box and black box testing, software testing strategies: unit testing, integration testing, Validation testing, System testing, debugging.

Software maintenance - maintenance characteristics, maintainability, maintenance tasks, maintenance side effects. CASE tools.

References :

- Pressman S. Roger, Software Engineering, Tata McGraw-Hill.
- Jalote Pankaj, An integrated Approach to Software, Engineering, Narosa Publishing House
- Sommerville Ian, Software Engineering, 5th ed., Addison Wesley-2000
- Fairley Richard, Software Engineering Concepts, Tata McGraw Hill

CSL-623 SYSTEM SIMULATION

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

INTRODUCTION: Concept of System, stochastic activities, continuous and discrete systems, system modeling, principals used in modeling.

SIMULATION OF SYSTEM : Concepts of simulation of continuous system with the help of examples; use of integration formulas; concepts of discrete system simulation with the help of examples. Generation of random numbers, Generation of non-uniformly distributed random numbers.

SIMULATION OF QUEUING SYSTEMS: Basic concepts of queuing theory, Simulation of single - server, two-server and general queuing systems.

SIMULATION IN INVENTORY CONTROL AND FORECASTING: Elements of inventory theory, inventory models, Generation of Poison and Erlang variates, forecasting and aggression analysis.

DESIGN AND EVALUATION OF SIMULATION EXPERIMENTS: Experiment layout and Validation.

SIMULATION LANGUAGES : Continuous and discrete simulation languages, Black-Structured continuous simulation languages, Expression based languages, Discrete system simulation languages: GPSS, SIMCRIPT, SIMULA, Factors in selection of discrete system simulation languages.

References:

- Gordon G. :"System Simulation" , Prentice-Hall of India Pvt. Ltd. New Delhi-1993
- Narsingh Deo : "System Simulation with Digital Computer", PHI, New Delhi, 1993
- Payne, James A. : Introduction to Simulation: Programming Techniques and Methods of Analysis. Mcgraw-Hill International Editions, Computer Science Series, New York(1998).

CSL-624 COMPUTER ORIENTED OPTIMIZATION TECHNIQUES

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Introduction : The Historical development, Nature, Meaning and Management Application of Operations research. Modelling, It's Principal and Approximation of O.R.Models, Main characteristic and phases, General Methods of solving models, Scientific Methods, Scope, Rule on Decision Making and development of Operation Research in India.

Linear Programming : Formulation, Graphical solution, standard and matrix forms of linear programming problems, Simplex method and its flow chart, Two phase Simplex method, Degeneracy.

Duality : Introduction, Definition, General Rule for converting any primar into its Dual, Dual Simplex method and its flow chart.

Integer Programming: Importance and Applications, Gomorg's all integer programming problem technique, Branch and Bound Method.

Queuing Models : Introduction, Applications, Characteristic Waiting and Ideal time costs, Transient and Steady states, Kendall's Notations, M/M/1, M/M/C, M/Ek/1 and Deterministic Models. (No Mathematical derivations included).

PERT and CPM : Basic steps in PERT and CPM, Forward and Backward computation, Representation in Tabular form, Slack and Critical path, Difference between CPM and PERT, Float.

References :

- Gupta P.K., Hira and D.S., Operation Research, Sultan Chand & Sons, New Delhi, 1994.
- Kanti Swarup, Gupta P.K. & Man Mohan, Operation Research, Sultan Chand & sons, New Delhi, 1990.
- Mittal, K.V., Optimization Methods in Operations Research and System Analysis, New Age International (P) Ltd., New Delhi, 1992.
- Rao S.S., Optimization Theory and Applications,Wiley Eastern Ltd. New Delhi, 1991.
- Sharma, S.D., Operations Research, Kedar Nath and Ram Nath, Meerut, 1996.
- Taha, H.A., Operation Research - An Introduction, McMillan Publishing Co, New York, 1986.
- Bazara, Operation Research & Networking, Wiley.
- Avieral, Optimization Techniques.

CSL-625 OBJECT ORIENTED SYSTEMS AND C++

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Object-Oriented Concepts: Data abstraction, encapsulation, Classes and objects, modularity, hierarchy, typing, concurrency, persistence.

Object-Oriented Methodology: Advantages and disadvantages of OO methodologies. Modeling, Domain analysis. OMT Methodology- Object Model, links and associations, multiplicity, link attributes, role names, ordering qualification, aggregation, generalization and inheritance, abstract class, meta data, object diagram. Dynamic Model-events, states, scenarios, event traces, state diagram. Functional Model-data flow diagrams. Analysis, System design and Object design.

Programming in C++: Data Types, struct vs classes, static data & member function, constant parameters & member functions, friend functions & friend classes, role of constructors & destructors, dynamic objects, operator overloading, function overloading, inheritance, virtual functions, abstract class, virtual class, template functions & template classes, exception handling, file stream classes, ASCII & Binary files, sequential & random access to a file.

References :

- Rumbaugh, J. et. al., Object-Oriented Modelling and Design, Prentice Hall of India, 1998
- Booch, Grady, Object Oriented Analysis & Design, Addison Wesley, 1994
- Stroustrup, B., The C++ Programming Language, Addison-Wesley,1993
- Lippman, C++ Primer, 4/e, Addison-Wesley
- Balaguruswami, E., Object Oriented Programmming In C++, Tata McGraw-Hill,1998
- Schildt, Herbert, C++ : The Complete Reference, 2/e, Tata McGraw-Hill,1998

CSL-631 DATABASE SYSTEMS

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Basic Concepts: A Historical perspective, File Systems vs. DBMS, Characteristics of the Data Base Approach, Abstraction and Data Integration, Database users, Advantages and Disadvantages of a DBMS, Implication of Data Base approach.

Data Base Systems Concepts and Architecture: Data Models, Schemas and Instances, DBMS architecture and Data Independence, Data base languages & Interfaces, DBMS functions and component modules.

Entity Relationship Model : Entity Types, Entity Sets, Attributes & Keys, Relationships, Relationship Types, Roles and Structural Constraints, Design issues, weak entity types, E-R Diagrams. Design of an E-R Database Schema, Reduction of an E-R Schema to Tables, The Unified Modeling Language (UML).

Relational Data Model : Relational model concepts, Integrity constraints over Relations, Relational Algebra - Basic Operations.

SQL : Data Definition, Constraints, & Schema Changes in SQL, Insert, Delete & update statements in SQL, view in SQL, Specifying Constraints and Indexes in SQL, Queries in SQL.

A Relational Data Base Management System : ORACLE - A Historical perspective, Basic structure, Data base Structure and its manipulation in ORACLE, Storage Organisation in ORACLE Programming ORACLE Applications.

Conventional Data Models : An overview of Network and Hierarchical Data Models.

Relational Data Base Design : Functional Dependencies, Decomposition, Desirable properties of decomposition, Normal forms based on primary keys (1 NF, 2 NF, 4 NF and BC NF).

Practical Data Base Design : Role of Information systems in Organizations, Database design process, physical database design in Relational Databases.

Transaction Processing Concepts : Introduction to Transaction Processing, Transaction & System Concepts, Properties of Transaction, Schedules and Recoverability, Serializability of Schedules.

Concurrency Control Techniques : Locking Techniques, Time stamp ordering, Multi-version Techniques, Optimistic Techniques, Granularity of Data Items.

Recovery Techniques : Recovery concepts, Recovery Techniques in centralized DBMS.

Data Base Security : Introduction to Database Security issues.

References :

- Elmasri & Navathe: Fundamentals of Database systems, 3rd Edition, Addison Wesley, New Delhi.
- Korth & Silberschatz : Database System Concept, 4th Edition, McGraw Hill International Edition.
- Raghu Ramakrishnan & Johannes Gehrke: Database Management Systems, 2nd edition, Mcgraw Hill International Edition.
- C.J.Date : An Introduction to Data bases Systems 7th Edition, Addison Wesley, New Delhi.
- Bipin C.Desai : An Introduction to Database System, Galgotia Publication, New Delhi
- Abbey, Abramson & Corey : Oracle 8i-A Beginner's Guide Tata McGraw Hill Publishing Company Ltd.
- Ivan Bayross : SQL, PL/SQL-The Program Language of ORACLE, BPB Publication, New Delhi.

CSL-632 VISUAL PROGRAMMING USING VISUAL BASIC

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Concepts of Object based Event Oriented Languages, Visual Architecture : Method, Statement, Properties and Event; Basic concept of Visual Program Design and comparison with Non-Visuals.

The VB Integrated Development Environment and its elements : Menu bar, tool bars, project explorer, tool box, properties window, form designer, form layout, etc.

The VB language and its elements : Variables, constants, arrays, collections, subroutines, functions, arguments, and control structures.

Designing a VB application : Working with VB forms, form properties, adding, deleting, and managing forms at run time, coding event procedures, implementing drag and drop operations, menu designing, adding menu interface to forms, attaching code to events, dynamic menu appearance.

Coding a VB application : Implementing user interface controls, common controls and their properties, dynamic controls, custom controls, control arrays, using variable, subroutines, function and control structures, accessing data through code and data controls, using DLLs in VB applications, building ActiveX clients, activeX servers, ActiveX controls, ActiveX documents, and web-enabled applications, Multiple Document Interface, Graphics Programming.

Database programming(DAODC,ADODC) and Object Oriented programming with VB.

References :

- Visual Basic - 6 by Howard Hawee PHI
- Teach yourself Visual Basic by Warner TMH
- Mastering VB-6 by Evangelos Petroutsos TMH
- Programming in VB-6 by J C Bradley TMH
- VB-6 The Complete Reference by Jerke TMH
- Visual Basic by Gery Corner.

CSL-633 COMPUTER NETWORKS

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Network Concepts : Goals and applications of Computer Networks; Topologies; Categories of Networks - LAN, MAN, WAN, Inter-networks; point-to-point and broadcast networks; Introduction to SMDS, X.25 Networks, ISDN, frame relay and ATM networks.

Network architecture : Concept of protocols & services; OSI model and functions of its layers; TCP/IP reference model.

Data communication concepts : Components of a data communication system; transmission modes; transmission media - guided and wireless media; introduction to switching (circuit, message and packet) and multiplexing (frequency division and time division); concept of Modems.

Framing and Error control : Framing techniques; Error control- error detection & correction.

Data Link Control : Acknowledgments; Elementary data-link protocols, Automatic Repeat Request; Sliding Window protocols.

Medium Access Control and LANs : Multiple Access protocols of MAC sublayer - ALOHA, 1-persistent, p-persistent and non-persistent CSMA, CSMA/CD, Collision free protocols, Limited contention protocols, Wavelength Division Multiple Access, MACA, GSM, CDPD, CDMA; IEEE Standard 802 for LANs and MANs- Ethernet, token bus, token ring, DQDB, Logical Link Control.

Routing : Deterministic and Adaptive routing; Centralized and distributed routing; shortest-path; flooding; flow based; optimal; distance vector, link-state, hierarchical; routing for mobile hosts; broadcast and multicast routing;

Congestion control : Principles of congestion control; Traffic shaping; choke packets; load shedding; RSVP.

TCP/IP: Elements of Transport Protocols; transmission control protocol(TCP);user datagram protocol(UDP); Internet protocol(IP).

References:

- Computer Networks - Andrew s. Tanenbaum, PHI.
- Data Communications, Computer Networks and Open Systems, fourth edition-Fred Halsall, Addison Wesley.
- Introduction to Data communications and Networking- Behrouz, Forouzan, Tata Mc-Graw Hill.
- Data and Computer Communications, fifth edition-William Stallings, PHI.

CSL-634 OPERATING SYSTEMS

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Introductory Concepts: Operating system functions and characteristics, historical evolution of operating systems, Real time systems, Distributed systems, Methodologies for implementation of O/S service system calls, system programs, Interrupt mechanisms.

File Systems: Functions of the system, File access and allocation methods, Directory Systems: Structured Organizations, directory and file protection mechanisms, implementation issues: hierarchy of file and device management.

CPU Scheduling: Levels of Scheduling, Comparative study of scheduling algorithms, Multiple processor scheduling.

Storage Management: Storage allocation methods: Single contiguous allocation, Multiple contiguous allocation, Paging; Segmentation combination of Paging and Segmentation, Virtual memory concepts, Demand Paging, Page replacement Algorithms, Thrashing.

Hardware Management: Hardware Organisation, Device scheduling policies.

Deadlocks: Deadlock characterization, Deadlock prevention and avoidance, Deadlock detection and recovery, practical considerations.

Concurrent Processes: Critical section problem, Semaphores, Classical process co-ordination problems and their solutions, Interprocess Communications.

Protection: Goals of protection, mechanism & policies implementation dynamic protection structures, revocation protection schemes in UNIX / MULTICS.

Case Studies: Comparative study of DOS, WINDOW, UNIX & LINUX system.

References :

- Peterson, J.L.& Silberschatz, A., Operating System Concept, Addison Wesley, reading.
- Brinch, Hansen, Operating System Principles, Prentice Hall of India
- Haberman, A.N., Introducing to Operating System Design Galgotia Publication, New Delhi
- Tanenbaum, A.S., Operating System
- Hansen P.B., Architecture Concurrent Programs,PHI
- Shaw, A.C., Logic design of Operating Systems, PHI
- Deitel, H.M., Operating System, John Wiley/Addison Wesley.

CSL-635 WINDOWS PROGRAMMING & VISUAL C++

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Windows basic concepts, window API, DEF files, creating windows, message, x-windows, Mouse and keyboard.

Introduction to resources, designing and creating menus, pop-up menus, user defined resources.

Bitmaps and dialogues; windows animation; Font basics; window controls; Font display; static controls, edit controls, list boxes, psychic windows.

Overview and structure of widows programming, coding conventions; Displaying text, mouse, graphics device interfaces.

Programming using visual C++.

References:

- Windows Programming by Charles Petzol.
- Windows Programming by Jim Conger.
- Visual C++ by Yashwant Kanetkar.

CSL-641 JAVA PROGRAMMING AND INTERNET APPLICATIONS

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Internet Applications : Introduction to internet; E-Mail- Architecture & services, user agent, message format & transfer, SMTP; World Wide Web(WWW) - Domain Name System, The Client side, The Server side, Creating and locating information on the web, search engines, URL's, HTTP, FTP, Telnet; Web Browsers, Chat & Bulletin Board, USENET & NNTP (Network News Transfer Protocol).

JAVA and The Internet : The JAVA programming language and its characteristics; Java run- time environment; Java compiler; Java developers kit; running Java applications and Java applets.

JAVA programming : Elements of Java: Data types, scalar data types, operators & expressions, control structures. Class, objects & methods, constructors, finalizer, visibility controls, array, string & vectors, inheritance, interfaces, packages multithreading, applet programming.

Exception Handling- defining and throwing exceptions, creating your own exceptions.

Input/Output: streams, byte and character stream, the class Printstream, data streams, StringTokenizer class, stream tokenizers.

Delegation Event Model. AWT classes, AWT controls, Layout managers & menues.

References :

- Computer Networks and Internets, second edition - Douglas E. Comer, Addison-Wesley, 2000
- Programming the Internet with Java, revised edition- Darrel Ince & Adam Freeman, Addison-wesley,2000
- Programming with Java - E.Balaguruswami, Second Edition, TMH-1998.
- The Complete Refernce Java 2, Fourth edition - Herbert Schildt (TMH),2001
- A Programmer's Guide to Java Certification, Mughal K.A., Rasmussen R.W., Addison-Wesley,2000

CSL-642 COMPUTER ARCHITECTURE & PARALLEL PROCESSING

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Parallel Computer Models

The state of Computing, Multiprocesors and Multicomputers, Multivector and SIMD Computers, PRAM and VLSI Models

Program and Network Properties

Conditions of Parallelism, Program Partitioning and Scheduling, Program Flow Mechanism, System Interconnect Architecture,

Processors and Memory Hierarchy

Advanced Processor Technology, Superscalar and vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.

Bus, Cache, and Shared Memory

Backplane Bus Systems, Cache Memory Organizations, Shared-Memory Organizations, Sequential and Weak Consistency Models

Pipelining and Superscalar Techniques

Linear Pipeline Processors, Nonlinear Pipelene Processors, Instruction Pipeline Design, Arithmetic Pipeline Design, Superscalar and Superpipeline Design

Multiprocessors and Multicomputers

Multiprocessor System Interconnects, Cache Coherence and Synchronization Mechanisms, Message-Passing Mechanisms

Multivector, Scalable, Multithreaded, Data Flow Architecture

Vector Processing principles, Multivector Multiprocessors, Compound Vector Processing, Principles of Multithreading, Dataflow and Hybrid Architectures.

References :

- Hwang, Kai, Advanced Computer Architecture, McGraw Hill, International Ed.
- Hwang Kai, Briggs Faye A., Computer Architecture and Parallel Processing, McGraw Hill, International Ed.
- Kain, Richard Y., Advanced Computer Architecture, PHI, 1999

CSL-643 LINUX & SHELL PROGRAMMING

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Linux Startup
User accounts, accessing linux - starting and shutting processes, Logging in and Logging out, Command line, simple commands.

Shell Programming
Unix file system: Linux/Unix files, inodes and structure and file system related commands, Shell as command processor, shell variables, creating command substitution, scripts, functions, conditionals, loops, customizing environment.

Regular Expressions and Filters
Introducing regular expressions patterns, syntax, character classes, quantifiers, introduction to egrep, sed, programming with awk and perl.

The C Environment
The C compiler, vi editor, compiler options, managing projects, memory management, use of makefiles, dependency calculations, memory management - dynamic and static memory, building and using static and dynamic libraries, using ldd, soname, dynamic loader, debugging with gdb.

Processes in Linux
Processes, starting and stopping processes, initialization Processes, rc and init files, job control - at, batch, cron, time, network files, security, privileges, authentication, Password administration, archiving, Signals and signal handlers, Linux I/O system.

References:

- John Goerzen: Linux Programming Bible, IDG Books, New Delhi, 2000.
- Sumitabha Das: Your Unix - The Ultimate Guide, TMH, 2000.
- Aho, Hopcroft and Ullman: The Design and Analysis of Computer Algorithms, Addison Wesley.

CSL-644 SYSTEM PROGRAMMING

(Programme Elective-I 4th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Introduction to System Software : Definition, Components of System Software, evolution of System Software.

Assemblers : Elements of Assembly language programming, overview of assembly process, design options- one pass assembler & multi pass assembler.

Macroprocessors: Basic functions, Design options-Recursive macro expansion, General purpose macro processors, Macro processing within language translators.

Compilers : Overview of Compilation process, Programming Language Grammar, Scanning, Parsing, Storage allocation, Compilation of expressions, Compilation of Control Structures, Code optimization, Design options- Compiler-Compilers, P-code compilers, Interpreters.

Loaders & Linkage Editors : Loading, Linking & Relocation, Program relocatibility, Overview of Linkage editing, linking for program overlays.

Software Tools : Spectrum of Software tools, text editors, Program generators, debug monitors, Programming environments.

References :

- Beck L. Leland, System Software, 3rd ed. (Addison Wesley - 2000)
- Donovan J. John, System Programming, (Tata McGraw Hill)
- Dhamdhere D.M, System programming and operating system, (Tata Mc-Graw-Hill)

CSL-645 ADVANCED DATABASE SYSTEMS

(Programme Elective-I 4th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Extended E-R Model : Subclasses, Superclasses and Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization.

Object-Oriented Data Model : Object Identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods and Persistence, Type Hierarchies and Inheritance, Complex Objects, Polymorphism, Multiple Inheritence, Versions and Configurations.

Object Relational Databases : Basic Concepts of Object-Relational Systems, Object-Relational features of Oracle, An Overview of SQL3, Object-Relational support in SQL3, Nested Relational Data Model.

Further Normalization : Higher Normal Forms, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Forms, Domain-Key Normal Form.

Database System Architectures : Centralized Systems, Client-Server Systems, Server System Architecture, Parallel Systems, Distributed Systems.

Distributed Databases and Client-Server Architecture : Distributed Database Concepts, Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design, Types of Distributed Database Systems, Overview of Concurrency Control and recovery in Distributed Databases. An Overview of Client-Server Architecture, Distributed Databases in Oracle.

Web Interfaces to Databases : Web Fundamentals, Databases and the Web, Web Servers and Sessions, Providing access to Database on WWW. The Oracle Webserver.

Performance Tuning, Performance Benchmarks.

Enhanced Data Models for Advanced Applications : An overview of Active Databases, Spatial Databases, Deductive Databases and Multimedia Databases.

References :

- Elmasri & Navathe: Fundamentals of Database systems, 3rd Edition, Addison Wesley, New Delhi.
- Korth & Silberschatz : Database System Concept, 4th Edition McGraw Hill International Edition.
- Raghu Ramakrishnan & Johannes Gehrke: Database Management Systems, 2nd Edition, Mcgraw Hill International Edition.
- C.J.Date : An Introduction to Data bases Systems 7th Edition, Addison Wesley, New Delhi.
- Bipin C.Desai : An Introduction to Database System, Galgotia Publication, New Delhi
- Abbey, Abramson & Corey : Oracle 8i-A Beginner's Guide Tata McGraw Hill Publishing Company Ltd.
- Ivan Bayross : SQL, PL/SQL-The Program Language of ORACLE, BPB Publication, New Delhi.

CSL- 646 HIGH SPEED NETWORKS

(Programme Elective-I 4th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4			**Time: 3 Hours**
L	**T**	**P**	**(Examination)**
4	-	-	

SYLLABUS

HIGH SPEED LAN

- **Gigabit Ethernet** → Overview of fast Ethernet, Gigabit Ethernet – overview, specifications, layered protocol architecture, network design using Gigabit Ethernet, applications, 10GB Ethernet – overview, layered protocol architecture, applications.
- **Wireless Networks** → Existing and emerging standards, Wireless LAN(802.11), Broadband Wireless(802.16), Bluetooth(802.15) their layered protocol architecture and security. Mobile Networks – GSM, CDMA and GPRS
- **Fibre Channel** → Fibre channel physical characteristics – topologies & ports, layered protocol architecture, class of service, technology comparison, SAN overview and architecture.

HIGH SPEED WAN

Frame Relay : Protocol architecture, frame format, routing.

ISDN & B-ISDN : Channels, interfaces, addressing, protocol architecture, services.

ATM : Virtual circuits, cell switching, reference model, traffic management.

INTERNET SUITE OF PROTOCOLS

Internet Layer : IPV4 and IPV6, IP addressing, ARP, IP routing(OSPF & BGP), internet multicasting, mobile IP.

Transport Layer : UDP/TCP protocols & architecture, TCP connection management, wireless TCP.

Application Layer : DNS, FTP, Voice over IP, audio & video compression.

References:

- High Speed Networks - William Stallings, Pearsons Publication.
- Computer Networks and Internets - Douglas E.Comer, Addison Wesley.
- An Engineering Approach to Computer Networking - S.Keshav, Addison Wesley.
- High Speed Network – Tere Parnel, TMH Publications.

CSL-647 MICROPROCESSORS AND INTERFACES

(Programme Elective-II 4th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	**T**	**P**	**(Examination)**
4	**-**	**-**	

SYLLABUS

Introduction to Microprocessor and Microcomputer : Historical background, modern microprocessors and microcomputers, architecture of pentium processor, real and protected modes of operations, addressing modes and instruction set of pentium processor, concept of RISC and CISC microprocessors.

Memory Interface : Memory devices, address decoding, 8/16/32/64 - bit memory interfaces.

Input-Output Interfaces : Introduction to I/O interfaces, I/O mapped I/O and memory mapped I/O, basic input interface and basic output interface, I/O port address decoding, 8/16/32 - bit wide I/O ports, 82C55 PPI.

Interrupt Structure : Basic interrupt processing, interrupt instructions of pentium, operations of real and protected mode interrupts, 8259 PIC and its programming, expanding interrupt structure by cascading 8259's.

Direct Memory Access : DMA data transfer and basic DMA operations, 8237 DMA controller, its programming.

Bus Interface : The 8/16 - bit ISA bus and its interfacing with input & output ports, EISA 32 - bit bus and its interfacing, VESA and VL busses, PCI and PCMCIA busses.

REFERENCES :

- The Intel Microprocessors : Architecture, Programming, and Interface. By Berry B. Brey (PHI).
- Microcomputer Systems : Architecture, Programming, and Design. By Liu and Gibson (PHI).
- Microprocessors By DV Hall.

CSL-648 SOFTWARE PROJECT MANAGEMENT

(Programme Elective-II 4th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	**T**	**P**	**(Examination)**
4	**-**	**-**	

SYLLABUS

Conventional Software Management. Evolution of software economics. Improving software economics : reducing product size, software processes, team effectiveness, automation through software environments. Principles of modern software management.

A software management process framework : Life cycle phases - inception, elaboration, construction and training phase. Artifacts of the process - the artifact sets, management artifacts, engineering artifacts, pragmatics artifacts. Model based software architectures. Workflows of the process. Checkpoints of the process.

Software management disciplines : Iterative process planning. Project organizations and responsibilities. Process automation. Project control and process instrumentation - core metrics, management indicators, life cycle expectations. Process discriminants.

References :

- Software Project management, Walker Royce, Addison Wesley, 1998.
- Project management 2/e, Maylor.
- Managing the Software Process, Humphrey.
- Managing Global Software Projects, Ramesh, THM, 2001.

CSL-649 MANAGEMENT INFORMATION SYSTEM

(Programme Elective-II 4th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Background Meaning, Nature, Need, Role, Importance, Evolution of management through information system; Relatedness of MIS with management process. Management functions and decision making.

Concept of balance MIS effectiveness and efficiency criteria.

Development of Management Information System: Introduction, Information system planning, Motivational forces behind development of information system, Principles for information system development, SDLC for MIS development process.

Development of MIS: Methodology and Tools techniques for systematic identification, implementation, evaluation, and maintenance of MIS.

Control and Security Issues in Management Information Systems: Control, Why need to Control MIS, Types of Control, Audit in MIS, Security Hazards, Security Techniques.

Case studies: To introduce business problems and to discuss various stages for understanding the systems development process.

References:

- Management Information Systems: A Computer oriented approach for business applications by Dharminder Kumar, Sangeeta Gupta, Excel books, 2006, New Delhi.
- James A.O'Brien, Management Information Systems.

CSL-651 COMPUTER GRAPHICS AND MULTIMEDIA

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Introduction : Survey of computer Graphics and its applications; Interactive and passive graphics; Introduction to GKS primitives; display processors;

Graphic Devices : Display systems-refresh CRTs, raster scan and random scan monitors, Grey shades, Interlacing, beam penetration shadow mask monitors, look up tables, plasma panel, LED and LCD monitors, VGA and SVGA resolutions; Hard copy Devices-printers, plotters; Interactive Input Devices-mouse, digitizing tablet, light pen, touch panels, image scanners, voice systems, joy stick, track ball.

Drawing Geometry : Coordinate system; resolution; use of homogeneous coordinate system; scan conversion: symmetrical DDA, simple DDA, Bresenhams line drawing algorithm, Circle drawing using DDA and polar coordinates, Bresenhams circle drawing algorithm, generation of ellipse.

2-D Transformations : Translation; rotation; scaling; mirror reflection; shearing; zooming; panning; input techniques-pointing, positioning, rubber band methods and dragging; tweening.

Graphic operations : Clipping-line clipping using Sutherland-Cohen and midpoint sub-division algorithm, polygon clipping; window and viewport; windowing transformation; Filling-stack based fill algorithm, scan-line seed fill algorithm;

4-D Graphics : 3D modelling of objects; 3D display techniques; coordinate system; 3D transformation matrices for translation, scaling and rotation; parallel projection; perspective projection; Hidden-surface removal - Z-buffer,back face, scan-line, depth-sorting, area subdivision; Shading - modelling light intensities, gouraud shading, phong shading.

Multimedia: Concepts of Hypertext/Hypermedia; multimedia applications; multimedia authoring; multimedia hardware; images; bitmaps; windows paint brush.

References :

- Computer Graphics - Donald Hearn, M.Pauline Baker, PHI
- Principles of Interactive Computer Graphics - Newman & Sproull, McGraw Hill
- Multimedia Systems - John F. Koegel Buford, Addison Wesley
- Computer Graphics Principles & Practice - Foley etc. Addison Wesley
- Procedural elements of Computer Graphics – Rogers McGraw Hill
- Fundamentals of Computer Graphics and Multimedia - D.P. Mukherjee, PHI

CSL-652 ARTIFICIAL INTELLIGENCE

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4			**Time: 3 Hours**
L	**T**	**P**	**(Examination)**
4	**-**	**-**	

SYLLABUS

Introduction: Background and history, Overview of AI applications areas.

The predicate calculus: Syntax and semantic for propostional logic and FOPL, Clausal form, inference rules, resolution and unification.

Knowledge representation: Network representation-Associative network & conceptual graphs, Structured representation- Frames & Scripts.

Search strategies: Strategies for state space search-data driven and goal driven search; Search algorithms- uninformed search (depth first, breadth first, depth first with iterative deepening) and informed search (Hill climbing, best first, A* algorithm, mini-max etc.), computational complexity, Properties of search algorithms- Admissibility, Monotonicity, Optimality, Dominance, etc.

Production system: Types of production system, Control of search in production system.

Rule based expert systems: Architecture, development, managing uncertainty in expert systems(Bayesian probability theory, Stanford certainty factor algebra, Nonmonotonic logic and reasoning with beliefs, Fuzzy logic, Dempter/Shaffer and other approaches to uncertainty.

Knowledge acquisition: Types of learning, learning automata, genetic algorithms, intelligent editors, learning by induction.

Programming with Prolog.

References :

- George F. Luger, William A. Stubblefield Artificial Intelligence, The Benjamin/Cummings Publishing Company, Inc.
- Dan W. Patterson Introduction to Artificial Intelligence and Expert system PHI.
- Eugene Charniak, Drew McDermott Introduction to Artificial Intelligence Addison Wesley-2000.
- Nils J. Nilsson Principles of Artificial Intelligence Narosa publishing house.
- Jackson Peter, Introduction to Expert systems, 3rd ed., (Addison Wesley -2000).

CSL-653 WEB ENGINEERING

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Information Architecture The Role of Information Architect, Collaboration and Communication, Organizing information, Organizational challenges, Organizing Web Sites and Intranets, Creating Cohesive Organization Systems, Designing Navigation Systems, Types of navigation Systems, Integrated Navigation Elements, Remote Navigation Elements, Designing Elegant Navigation Systems, Searching your Web Site, Designing the Search Interface, Indexing the Right Stuff, To Search or Not To Search, Grouping Content, Conceptual Design; High-Level Architecture Blueprints, Architectural Page Mockups, Design Sketches.

Dynamic HTML and Web Designing HTML Basic Concepts, Good Web Design, Process of Web Publishing, Phases of Web Site development, Structure of HTML documents, HTML Elements - Core attributes, Language attributes, Core Events, Block Level Events. Text Level Events, Linking Basics, Linking in HTML, Images and Anchors, Anchor Attributes, Image Maps, Semantic Linking Meta Information, Image Preliminaries, Image Download issues, Images as Buttons, Introduction to Layout: Backgrounds, Colors and Text, Fonts, Layout with Tables, Advanced Layout : Frames and layers, HTML and other media types. Audio Support in Browsers, Video Support, Other binary Formats. Style Sheets, Positioning with Style sheets. Basic Interactivity, and HTML: FORMS, Forms Control, New and emerging Form Elements.

CGI using PERL Introduction to CGI, Alternative Technologies, The Hypertext Transport Protocol, URLs, HTTP, Browser Requests, Server Responses, Proxies, Content Negotiation, the Common Gateway Interface, The CGI Environment, Environment Variables. CGI Output, Forms and CGI, Sending Data to the Server, Form Tags, Decoding Form Input, Architectural Guidelines, Coding Guidelines, Efficiency and Optimization.

Java Server Pages Basics, Integrating Scripts in JSPs, JSP Objects and Components, configuring and troubleshooting, JSP: Request and response objects, Retrieving the Contents of a an HTML form, Retrieving a Query String, Working with Beans. Cookies, Creating and Reading Cookies. Using Application Objects and Events.

XML Relationship between HTML, SGML, and XML, Basic XML, Valid Documents. Ways to use XML, XML for Data Files, Embedding XML into HTML documents, Converting XML to HTML for DISPLAY, Displaying XML using CSS and XSL, Rewriting HTML as XML, The future of XML.

References:

- Thomas A Powell, HTML-The Complete Reference,Tata McGraw Hill.
- Scott Guelich, Shishir Gundavaram, Gunther Birzniek; CGI Programming with Perl 2/e. O'Reilly.
- Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web Services with SOAP, O'Reilly.
- Pardi, XML in Action, Web Technology, PHI.
- Yong, XML Step by Step, PHI.
- Aaron Weiss, Rebecca Taply, Kim Daniels, Stuven Mulder, Jeff Kaneshki, Web Authoring Desk Reference, Techmedia Publications.

CSL-654 COMPILER CONSTRUCTION

(Programme Elective III 5th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Introduction to Compilation : Compilers and phases of compilation, analysis-synthesis model of translation, compiler construction tools.

Lexical Analysis : Process of lexical analysis, finite state automata, DFA and NFA, recognition of regular expressions, LEX.

Syntax Analysis : Process of syntax analysis, types of grammar, top-down and bottom-up parsing techniques, parser generator.

Intermediate Code Generation : Intermediate languages, generating intermediate code for declarative statement, assignment statement, boolean expression, and case statement.

Code Optimization : Introduction to code optimization, potential cases of code optimization, optimization of basic blocks, loops in flow graphs, code improving transformation.

Code Generation : Issues in the design of a code generator, the target machine, dynamic storage management, translating basic blocks, a simple code generator,peephole optimization, directed acyclic graphs and basic blocks, code generation from directed acyclic graphs.

Overview of syntax directed translation scheme.

REFERENCES :

- Compilers : Principles, Techniques & Tools, By Aho, Ullman, & Sethi (Addison Wesley)
- Principles of Compiler Design, By Aho & Ullman (Narosa Publications)
- Practice & Principles of Compiler Building with C, By Henk Alblas et al. (PHI)
- Principles of Compiler Design, By Trembley & Sorenson (McGraw Hill)

CSL-655 NEURAL NETWORK

(Programme Elective III 5th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Fundamental of Neural Networks
Overview of Biological neurons, neuron concept, single layer neural network, notation and representation of neural networks, training of ANNs.

Single Layer Neural network
Representation of preceptron and issues, perceptron learning and training, classification, Linear seperability, structure of Hopfield nets, training, application and stability.

Backpropagation
Backpropagation training algorithm, application of back propagation, advance algorithms.

Counter propagation networks
Kohonen network, Grossberg layer, application of counter propagation, Image classification.

Multilayer Neural Networks
BAM structure retrieving a stored association,encoding the association, memory capacity, ART architecture,ART classification operation,cognitron and neocognitron.

References:

- Jock. M.Juroda, "Artificial Neural Systems".
- Kevin Gurney,"Introduction to Neural Networks: (UCL Press).
- Philip D. Wasserman,Neural Computing and Practice, ANZA Research Inc.

CSL-656 SECURITY OF INFORMATION SYSTEMS

(Programme Elective III 5th Semester)

Note: Total 8 questions are to be set by the examiner/teacher covering the entire syllabus uniformly. A candidate is required to attempt any five questions. All questions shall carry equal marks.

Total Credits: 4 **Time: 3 Hours**

L	T	P	(Examination)
4	-	-	

SYLLABUS

Overview of Information Security : Basic Concepts, Cryptosystems, Cryptoanalysis, Ciphers & Cipher modes.

Symmetric Key Cryptography : DES, AES.

Asymmetric Key Cryptography : RSA algorithm, Key management protocols, Diffie Hellman Algorithm

Digital Signature : Digital Signatures, Public Key Infrastructure

Program Security : Security problems in Coding, Malicious Logic, Protection.

Database Security : Access Controls, Security & Integrity Threats, Defence Mechanisms.

.Net Security : User based security, Code access security, form authentication.

LAN Security : Threats, Authentication & access control, Secured communication Mechanisms (IPSec, Kerberos, Biometric, PKI), Secured Design for LAN.

Email & Transaction Security Mechanisms : Privacy Enhanced Mail(PEM), S/MIME, SET protocol, Client-Server Security on web.

Wi-Fi & IEEE 802.11 Security : Protocol architecture, WEP, Access controls

References:

- "Security in Computing (Second Edition)", Charles P. Pfleeger, 1996, Prentic-Hall International, Inc.,
- "Applied Cryptography Protocols, Algorithms, and Source Code in C (Second edition)", Schneier, 1995, John
- "Security Technologies for the World Wide Web", Rolf Oppliger, Artech House, Inc.
- "Digital Certificates Applied Internet Security", Jalal Feghhi, Jalli Feghhi and Pete Williams, Addison Wesley Longman,

June 2006. Requests for copies of publications, or for additions/changes to the mailing list, should be sent to: Bank for International Settlements Press & Communications CH-4002 Basel, Switzerland. E-mail: publications@bis.org Fax: +41 61 280 9100 and +41 61 280 8100. Â© Bank for International Settlements 2006. All rights reserved. Brief excerpts may be reproduced or translated provided the source is stated. At the other end, credit-based financial systems (e.g. France, Germany) â€œtypically have weak and fairly illiquid or thin capital markets, which play only a minor role in mobilizing and. 15. pricing investment fundsâ€ (Whitely, 1999, p.49).Â In market based financial systems with well-developed equity markets, corporations strive to secure the most favorable financing terms. Typically, financing decisions by the markets are based on short-term profitability and therefore, within such systems, that is what firms focus on maximizing (Teoh, Welch & Wong, 1998a; Teoh, Welch & Wong, 1998b). Professor Klaus Schwab World Economic Forum. Professor Michael E. Porter Harvard University. Co-Directors, The Global Competitiveness Report. The Global Competitiveness Report 2006â€“2007. Dr Augusto Lopez-Claros Director, Global Competitiveness Programme, World Economic Forum Editor. The Global Competitiveness Report 2006-2007 Â© 2006 World Economic Forum. The Global Competitiveness Report 2006â€“2007 is published by the World Economic Forum within the framework of the Global Competitiveness Programme. Professor Klaus Schwab Executive Chairman. Augusto Lopez-Claros Director.