



Structured Curriculum

M.Sc. in Computer and Information Science (CIS)

With CBCS



**Raiganj
University,
West Bengal,
India-733 134**



Detailed Syllabus

M.Sc. in Computer and Information Science (CIS) *With CBCS*

2017-18



Raiganj University, Raiganj,
Uttar Dinajpur, West Bengal, India

Computer and Information Science
At
Raiganj University

*“Where Information and Technology interact for the
inclusive Development and promoting Digital Humanities
& Economy”*

Program Highlights at a Glance

Overview of the MSc-Computer and Information Science Program:

The Master of Science in CIS is designed specifically for those graduates that need to learn more about the utilization of computing, information science and technology in society, business environments. The target groups in this respect are those who are interested to become IT Professionals, Information Professionals, Systems and Network Engineers and senior and management positions.

Interdisciplinary facets of MSc-Computer and Information Science Program:

The CIS combined not only from the Computer science and information sciences but also behavioral sciences, engineering, environmental sciences, law, life sciences, health sciences, management, philosophy, physical sciences, policy, mathematics, social sciences etc

Program Aim:

- Learn and gain an integrated set of IT and Interdisciplinary skills.
- Gain the latest IT skills in Data Management and Cloud Computing etc for easy industrial input.
- Gain the theoretical and practical knowledge required to design Computer applications for various settings and environment.
- Embrace future developments in the field and retain professional relevance.
- Build a strong foundation of Computer system and Information Sciences.

Program Nature and Distribution:

Number of Semester: 4 (Four)/ 1300+ Hours of Teaching Activities

Number of Teaching/Academic Days: 90 in a Semester (Or 13 Weeks or 300+ Hours)

Number of Coursework Papers: 22+ Core Papers 8+ Core Applied Papers with Other Seasons

Full Marks: 1600

Credit: 128

Nature: Taught-classroom Based, Assignment and Continuous Short Project Enriched, Seminar included, with Grand Project/Dissertation, Internship Added.



Estd. 2015

Structured Curriculum
M.Sc. in Computer and Information Science (CIS)
Raiganj University, Raiganj, Uttar Dinajpur,
West Bengal, India
Semester-1

Sl. No.	Paper Code	Papers/Coursework	Nature	Contact Hours/Week			Total Hr	Total Credit	Marks
				L	T	P			
Theory Papers									
1	CIS-01	Computer and Information Science: Basics and Current Trends	Theory with Project/Assignment	2	2		4	4	50
2	CIS-02	Computer Organization with Theory of Computation	Theory with Project/Assignment	3	1		4	4	50
3	CIS-03	C++ with UML and Software Systems	Theory with Practical	4			4	4	50
4	CIS-04	Internet Science with Web Systems	Theory with Project/Assignment	3	1		4	4	50
Practical Courses									
5	CIS-P-01	C & C++ (Applied)	Practical			8	8	4	50
6	CIS-P-02	Applied Web Engineering	Practical			8	8	4	50
One Interdisciplinary Program offered by any other Department of Raiganj University (Choice of the Candidate)								8	100
								32	400
IDC Course at Dept. of CIS (for MA/MSc/MCom/LLM)									
CIS-IDC-01		IT & Digital Society	Theory with Project/Assignment	6	2		8	8	100
For Enrolment of other Masters students at The Dept. of CIS, Raiganj University									

Semester-2

Sl. No.	Paper Code	Papers/Coursework	Nature	Contact Hours/Week			Total Hr	Total Credit	Marks
				L	T	P			
Theory Papers									
1	CIS-05	Java Technologies With Software & Knowledge Engineering	Theory with Project/Assignment	2		4	4	4	50
2	CIS-	Database Engineering	Theory with						50

	06	and SQL	Practical	2		4	4	4	
3	CIS-07	Operating Systems with Discrete Structures	Theory with Project/Assignment	4			4	4	50
4	CIS-08	Information and ICT Policies with Laws	Theory with Project/Assignment	3	1		4	4	50
Practical Courses									
7	CIS-P-03	Java Technologies (Applied)	Practical				8	4	50
8	CIS-P-04	SQL & Data Systems (Applied)	Practical				8	4	50
One Interdisciplinary Program offered by any other Department of Raiganj University (Choice of the Candidate)								8	100
								32	400
IDC Course at Dept. of CIS (for MA/MSc/MCom/LLM)									
CIS-IDC-02		Cyber Laws & E Business	Theory with Project/Assignment	6	2		8	8	100
For Enrolment of other Masters students at The Dept. of CIS, Raiganj University									

Semester-3

Sl. No.	Paper Code	Papers/Coursework	Nature	Contact Hours/Week			Total Hr	Total Credit	Marks
				L	T	P			
Theory Papers				L	T	P			
1	CIS-09	Computer Networks & Cloud Systems	Theory with Practical	2	2		4	4	50
2	CIS-10-A/ 10-B	Information Systems and Management Or Knowledge Economy and Management with ICT4D	Theory with Project/Assignment	3	1		4	4	50
3	CIS-11-A Or CIS-11-B	Advanced Data Structure Or Compiler Design	Theory with Project/Assignment	3	1		4	4	50
4	CIS-12-A/ 12-B	E Commerce with E Governance Or Human Computer Interaction with CSS	Theory with Project/Assignment	3	1		4	4	50
Practical Courses									
5	CIS-P-05	Cloud Computing & Networking (Applied)	Practical			8	8	4	50
6	CIS-P-06	Interactive Usability Systems (Applied)	Practical			8	8	4	50

Seminar & Viva Voce									
7	CIS-V-01	GD, Grand Seminar & Viva Voce	Practical			8	8	8	100
								32	400

Semester-4

Sl. No.	Paper Code	Papers/Coursework	Nature	Contact Hours/Week			Total Hr	Total Credit	Marks
				L	T	P			
1	CIS-13 A/13 B/13 C	Business Information Science Or Health Information Science Or Geo Information Science	Theory with Project/Assignment	2		2	4	4	50
2	CIS-14A/ 14B	Windows Programming and VB Or Network Engineering (CISCO Mapped)	Theory with Practical	2		2	4	4	50
3	CIS-15A Or 15B Or 15C	Information Systems with Analysis and Designing Or Computer Graphics Or PHP with Scripting	Theory with Project/Assignment	2	2		4	4	50
4	CIS-16A Or CIS-16-B	SEO Engineering & Management Or Digital Sociology	Theory with Practical	2		2	4	4	50
Practical Courses									
5	CIS-P-07-A / P-07-B	Advance Applied Networking & Cloud (With or Without Internship) Or Applied VB	Practical			8	8	4	50
6	CIS-P-08-A / P-07-B	Applied SEO & Engineering (With or Without Internship) Or Lab with PHP	Practical			8	8	4	50
7	CIS-Project	Project/Dissertation/Field Studies	Based on Topic					8	100
								32	400

Note: 1- In each Theory paper out of 50 Marks 12 are for IA (including Assignment and Or Project etc)

Note: 2-Project/Dissertation will be academic in nature and will commence after the Fourth Semester Exams.

Note: 3- Internship (of minimum 100 hours) need to complete at the end of 4th semester and the program may be run parallel in other timing or continuous basis with prior approval only. An Industrial Internship Report will be mentored by the Faculty at RGU and may also Co Mentored by the designated professionals where candidate going to complete Internship.

Note: 4- Alternative Paper may be selected with proper approval of concerned board as a changed paper with same number of Credit.

Detailed Coursework/Papers

CIS-01 Computer and Information Science: Basics and Current Trends

Unit-1

Information as a Field of Study (Basics of Information Systems, Information Management, Information Technology, Information Science), Computing as a Field of Study (Basics of Computing, Computer Science, Computer Engineering, Computer Applications), Merging Domains and its importance- Computer and Information Science, Information Science and Technology, Information Systems and Technology etc. Information and Types, Role of Information, Communication and Fundamentals

Unit-2

Parallel Computing: Concept, Features and Emerging Trends-*Mobile Computing*: Mobile connectivity-Cells, Framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internetworking standards, cellular data communication protocols, mobile, computing applications. Mobile databases - protocols, scope, tools and technology. M-business.

Unit-3

Electronic Commerce: Framework, Media Convergence of Applications, Consumer Applications, Organisation Applications. Electronic Payment Systems: Digital Token, Smart Cards, Credit Cards, Risks in Electronic Payment System, Designing Electronic Payment Systems. Electronic Data Interchange (EDI): Concepts, Applications, (Legal, Security and Privacy) issues, EDI and Electronic Commerce, Standardization and EDI, EDI Software Implementation. EDI Envelope for Message Transport, Internet-Based EDI.

Unit-4

Software Agents: Characteristics and Properties of Agents, Technology behind Software Agents (Applets, Browsers and Software Agents), Broadband Telecommunications: Concepts, Frame Relay, Cell Relay, Switched Multimegabit Data Service, Asynchronous Transfer Mode. Main concepts in Geographical Information Systems (GIS), E-cash, E-Business, ERP packages.

Unit-5

Data Warehousing: Data Warehouse environment, architecture of a data warehouse methodology, analysis, design, construction and administration. Data Mining: Extracting models and patterns from large databases, data mining techniques, classification, regression, clustering, summarization, dependency modelling, link analysis, sequencing analysis, mining scientific and business data.

Text/References:

- 1.Laudon, Kenneth C., and Jane Price Laudon. Management information systems. Vol. 8. New Jersey: Prentice Hall, 2011.
- 2.Lucey, T. (2005). Management information systems. Cengage Learning EMEA.
- 3.Leeuwen, J. V., Hartmanis, J., & Goos, G. (1995). Computer science today: recent trends and developments. Springer-Verlag New York, Inc..

4. Ten Teije, A., Miksch, S., & Lucas, P. (Eds.). (2008). Computer-based medical guidelines and protocols: a primer and current trends (Vol. 139). Ios Press.
5. Davis, C. H., Shaw, D., Katz, J. M., Tejedor, F. J., Allard, C. K., Allard, K., & Martín, A. G. (2011). Introduction to information science and technology (No. 004 004). e-libro, Corp..
6. Pour, M.K. (2015), Encyclopedia of information science and technology, 3rd Edition, IGI Global, USA

CIS-02 Computer Organization with Theory of Computation

Unit-1

Pre-requisite: Concept of basic components of a digital computer, Basic concept of Fundamentals & Programme structures. Basic number systems, Binary numbers, representation of signed and unsigned numbers, Binary Arithmetic as covered in Basic Computation & Principles of Computer Programming Second semester, first year. Boolean Algebra, Karnaugh Maps, Logic Gates

Basic organization of the stored program computer and operation sequence for execution of a program.

Role of operating systems and compiler/assembler.

Fetch, decode and execute cycle, Concept of operator, operand, registers and storage, Instruction format.

Instruction sets and addressing modes. Commonly used number systems. Fixed and floating point representation of numbers.

Unit-2

Overflow and underflow.

Design of adders - ripple carry and carry look ahead principles, Design of ALU.

Fixed point multiplication -Booth's algorithm, Fixed point division - Restoring and non-restoring algorithms.

Floating point - IEEE 754 standard. Memory unit design with special emphasis on implementation of CPU-memory interfacing.

Memory organization, static and dynamic memory, memory hierarchy, associative memory.

Cache memory, Virtual memory. Data path design for read/write access.

Design of control unit - hardwired and microprogrammed control.

Introduction to instruction pipelining, Introduction to RISC architectures. RISC vs CISC architectures.

I/O operations - Concept of handshaking, Polled I/O, interrupt and DMA.

Unit-3

Combinational Circuit Design, Sequential Circuit Design, Hardwired and Microprogrammed Processor Design, Processor Design, Instruction Format, Addressing Modes Memory Types and Organization, Interfacing Peripheral Devices, Interrupts, Microprocessor and Architecture, Instruction Set and Programming (8085, P-III/P-IV)

Unit-4

Finite State Machines : Definition, concept of sequential circuits, state table & state assignments, concept of synchronous, asynchronous and linear sequential machines.

Finite State Models : Basic definition, mathematical representation, Moore versus Mealy m/c, capability & limitations of FSM, state equivalence & minimization, machine equivalence, incompletely specified machines, merger graph & compatibility graph, merger table, Finite memory, definite, information loss less & inverse machines : testing table & testing graph.

Structure of Sequential Machines: Concept of partitions, closed partitions, lattice of closed partitions, decomposition: serial & parallel. Finite Automata: Preliminaries (strings, alphabets & languages, graphs & trees, set & relations), definition, recognition of a language by an automata - idea of grammar, DFA

Unit-5

NFA, equivalence of DFA and NFA, NFA with ϵ -moves, regular sets & regular expressions : equivalence with finite automata, NFA from regular expressions, regular expressions from DFA, two way finite automata equivalence with one way, equivalence of Moore & Mealy machines, applications of finite automata. Closure Properties of Regular Sets : Pumping lemma & its application, closure properties minimization of finite automata : minimization by distinguishable pair, Myhill-Nerode theorem.

Context Free Grammars: Introduction, definition, derivation trees, simplification, CNF & GNF.

Unit-6

Top-down parsers- left recursion and its removal. Recursive descent parser. Predictive parser, Intermediate codes- Quadruples, Triples, Intermediate code generation, Code generation, Code optimization, Main functions of operating systems, Multiprogramming, multiprocessing, and multitasking
Pushdown Automata : Definition, moves, Instantaneous Descriptions, language recognized by PDA, deterministic PDA, acceptance by final state & empty stack, equivalence of PDA and CFL. Introduction to Z. Regular language properties and their grammars. Context sensitive languages.

Text/References: (Computer Organization)

- 1 Hayes J. P., "Computer Architecture & Organisation", McGraw Hill,
- 2 Hamacher, "Computer Organisation",
- 3 Computer Organization and System Software, EXCEL BOOKS
4. Chaudhuri P. Pal, "Computer Organisation & Design", PHI,
5. Mano, M.M., "Computer System Architecture", PHI.
6. Burd- System Architecture, Vikas

Text/References: (Theory of Computation)

1. Hopcroft JE. and Ullman JD., "Introduction to Automata Theory, Languages & Computation", Narosa.
2. K.L.P Mishra & N. Chandrasekharan – "Theory of Computer Science", PHI
3. Ash & Ash – "Discrete Mathematics", TMH
4. Martin—Introduction
5. Lewis H. R. and Papadimitrou C. H., "Elements of the theory of Computation", P.H.I.
6. Kain, "Theory of Automata & Formal Language", McGraw Hill.
7. Kohavi ZVI, "Switching & Finite Automata", 2nd Edn., Tata McGraw Hill.
7. Linz Peter, "An Introduction to Formal Languages and Automata", Narosa
8. "Introduction to Formal Languages", Tata McGraw Hill, 1983.

CIS-03 C++ with UML and Software Systems

Unit-1

Programming in C: Elements of C-Tokens, identifiers, data types in C. Control structures in C. Sequence, selection and iteration(s). Structured data types in C-arrays, struct, union, string, and pointers. O-O Programming Concepts: Class, Object, instantiation, Inheritance, polymorphism and overloading.

Unit-4

C++ Programming: Elements of C++ - Tokens, identifiers. Variables and constants, Data types, Operators, Control statements. Functions, parameter passing, Class and objects. Constructors and destructors. Overloading, Inheritance, templates, Exception handling.

Unit-3

Data Structure Data, Information, Definition of data structure. Arrays, stacks, queues, linked lists, trees, graphs, priority queues and heaps. File Structures: Fields, records and files. Sequential, direct, index-sequential and relative files. Hashing, inverted lists and multi-lists. B trees and B⁺ trees

Unit-4

Difference with procedure oriented programming, Data Abstraction and Information Hiding: Objects, Classes and Methods, Encapsulation, Inheritance, Polymorphism, Object. Fundamentals of Object Oriented design in UML: Static and dynamic models, why modeling, UML diagrams: Class diagram, interaction diagram: collaboration diagram, sequence diagram, state chart diagram, activity diagram, implementation diagram, UML extensibility- model constraints and comments,

Unit-5

Variables, Expressions and Statements: Values, Variables and keywords; Operators operator precedence, Expressions and Statements; Taking input and displaying output (print statement); Putting Comments.

Modules, importing Modules (entire module or selected objects), invoking built in functions, generating random numbers

Text/References (C & C++):

1. B.W. Kernighan and D.M.Ritchie, the C Programming Language, PHI. (Reference)
2. R.C. Hutchinson and S.B. Just, Programming using the C Language, McGraw-Hill. (Reference)
3. B.S. Gottfried, Schaum's Outline of Theory and Problems of Programming with C, McGraw-Hill.
4. H. Schildt, C Made Easy, Osborne McGraw-Hill. (Reference)
5. Y. Kanetkar, Let Us C, BPB Publications.
6. E.Balagururwami, Basic Computation & Principles of Computer Programming, TMH
8. D. E. Knuth, Fundamental Algorithms, Narosa Publication.
9. N. Wirth, Algorithms+Data Structures= Program, Prentice Hall.
10. Sahni S, data Structures, Algorithms and Applications in C++, Mc Graw- Hill, 2002.
11. Goodrich, M. and Tamassia, R. Data Structures and Algorithms in Java 3ed, John Wiley and Sons, Inc

Text/References (UML & SS):

1. Fowler, M. (2004). *UML distilled: a brief guide to the standard object modeling language*. Addison-Wesley Professional.
2. Mellor, S. J., Balcer, M., & Foreword By-Jacobson, I. (2002). *Executable UML: A foundation for model-driven architectures*. Addison-Wesley Longman Publishing Co., Inc..
3. Larman, C. (2012). *Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design and Iterative Development*. Pearson Education India.
4. Eriksson, H. E., & Penker, M. (2000). Business modeling with UML. *Business patterns at work*.

CIS 04 Internet Science with Web Systems

Unit-1

Introduction to Internet, History of Internet, Internet users, Internet working, Information on Internet, Requirements for connecting to Internet, Basic Internet Terms, Introduction to world wide web, Evaluation of world wide web, basic features, web browsers, popular web browsers, web servers, HTTP, URL, Search Engines, Search Engines categories

Unit-2

HTML: Introduction, Objective, HTML Browsers, Windows Switching, HTML Command Tags, URLs, links, new web page creation, main body of the text, putting headers, adding paragraph , formatting text in HTML and font mechanism

Unit-3

Color settings, superscripts and subscripts and other manipulations on text and paragraphs, using directory and menu lists, creation of links, inserting graphics, using images, all manipulations on tables and its display, Detailed working with forms, allowing visitors to upload files, active images ,working with frames & framesets, Frames handling, scroll bars, alternatives to frames

Unit-4

Introduction to browsers, Working with e-mail, Parts of e-mail text, working with messages. DHTML: using DHTML in internet explorer, heading and horizontal line, hidden message, the message at the center of the page, moving boxes ,changeable box.

CIS-P-01: C & C++ (Applied)

- C programming on variables and expressions.
- Precedence of operators, Type casting.
- Decision control structures— if and nested if-else.
- Loop controls— do, while, for and case control structure.
- Unconditional jumps— break, continue, goto.
- Modular program development using functions.
- Arrays and matrix operations—add, subtract, multiply.
- Recursion
- Pointers, address operators and pointer arithmetic.
- Structures and Unions, Accessing their members.
- Self-Referential Structures and Linked lists.
- Files and file operations, standard streams.
- Dynamic memory allocation and deallocations.
- Different mathematical operations using <math.h>.
- Pointers to pointers, arrays, functions, structures and unions.
- Command line arguments, enums and preprocessors.
- Different problem solving using C++
- matrix operations using C++
- Solution of numerical problems under the course 32
- Problems on data structures using C++
- 5.Solution of different problems using class concept
- Problems on operator overloading in C++
- Problems on polymorphism in C++
- Problems in inheritance in C++
- File operation (Read/Write) under C++
- String manipulation in

CIS-P-02: Applied Web Engineering

- Writing different HTML pages using HTML commands
- Creating Web pages
- Writing HTML documents for Basic styles, creating lists, Adding links, adding images to a
- Web page.
- Program using image map for navigation
- Program for creating frames, creating HTML forms.
- Programs for creating tables of data.
- Creating dynamic web pages
- Solution of different common problems using JAVA
- Solution of different problems using arrays.
- Writing programs for inheritance, polymorphism, operator overloading
- Writing program for multithreading handing.
- Applet programming and tagging of applet in HTML document.

Text/References:

1. Internet and web design by R Bangia, Second edition , firewall media
2. Multimedia and Wed technology by R Bangia
3. Internet and web designing by ITELS (Macmillan)
4. Web Enabled Commercial Application Development Using HTML, DHTML, JS, Perl by Ivan Bayross
5. Deitel, Deitel & Nieto, Internet and Worldwide Web how to Program, Pearson Education, PHI.
6. Internmet Programming with VBScript and Java Script. Kathhleen Kalata, (Thomsaon Publication)

IDC Course Title: IT & Digital Society

Paper Code: CIS-IDC-01

Credit: 08

(Not for MSc CIS Students)

Unit: 1

Information as a Field of Study (Basics of Information Systems, Information Management, Information Technology, Information Science), Computing as a Field of Study (Basics of Computing, Computer Science, Computer Engineering, Computer Applications), Merging Domains and its importance- Computer and Information Science, Information Science and Technology, Information Systems and Technology etc. Information and Types, Role of Information, Communication and Fundamentals

Unit: 2

Information Policy- Meaning, Types, Need, Function, Case Studies, Need, Convergence, Information Divide, Digital Divide, Information Literacy, Network Literacy, Digital Humanities & Sociology, Information and IT Policy as a Discipline and Degrees worldwide

Unit: 3

Information Society, Knowledge Society, Development and Knowledge Societies, Worldwide Tour and Knowledge Society, Digital Transformation, Information Industry and Revolution, Network Society

Unit: 4

Digital Addict, Digital Dark Ages, Digital Tools, Emerging Digital Technologies, Offence in Digital Age, India and Digital India, Governance Projects in India, E Governance in West Bengal, Digital Phobic, Video Game Addiction, Digital Dark Age

Unit: 5

Digital Education-Meaning, Types, Trends and Future, Digital Business- Meaning, Types, Trends and Future, Digital Technologies in Hands On, Basic Digital tools for Education

Text/References:

- 1.Laudon, Kenneth C., and Jane Price Laudon. Management information systems. Vol. 8. New Jersey: Prentice Hall, 2011.
- 2.Lucey, T. (2005). Management information systems. Cengage Learning EMEA.
- 3.Leeuwen, J. V., Hartmanis, J., & Goos, G. (1995). Computer science today: recent trends and developments. Springer-Verlag New York, Inc..
- 4.Ten Teije, A., Miksch, S., & Lucas, P. (Eds.). (2008). Computer-based medical guidelines and protocols: a primer and current trends (Vol. 139). Ios Press.
- 5.Davis, C. H., Shaw, D., Katz, J. M., Tejedor, F. J., Allard, C. K., Allard, K., & Martín, A. G. (2011). Introduction to information science and technology (No. 004 004). e-libro, Corp..
- 6.Pour, M.K. (2015), Encyclopedia of information science and technology, 3rd Edition, IGI Global, USA

CIS-05 Java Technologies With Software & Knowledge Engineering

Unit-1

Oops Concept and Introduction to JAVA, An overview of Java, Data Types - variables and arrays Operators, Control statements. Type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, exploring string class.

Unit-2

Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism method overriding, abstract classes, the Object class. Packages and Interfaces Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. Exploring java.io.

Unit-3

Exception handling Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. String handling, Exploring java.util Multithreading Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads. Enumerations, auto boxing, annotations, generics. Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, dialogs, menubar, graphics, layout manager – layout manager types – border, grid, flow, card and grid bag.

Unit-4

Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets. Swing – Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

Unit-5

Software and software process models: software categories and characteristics, legacy software, software myths, Software engineering A layered technology, A process framework, waterfall model, incremental and evolutionary models. Requirement engineering: Requirement engineering task, initiating the requirement engineering process, eliciting requirements, developing use cases, building analysis model, Negotiating requirements, validating requirements, data modeling, functional modeling and behavioral modeling.

Unit-6

Design Engineering: Design process and design quality, design concepts, design model, architectural design, Interface Design, Testing Strategies and Tactics: Unit testing, integration testing, validation testing, system testing, white box testing, black box testing. Product Metrics: Software quality, framework for product metrics, Metrics for analysis model, Metrics for design model, Metrics for source code, Metrics for testing, metrics for maintenance. Managing Software Projects: Management spectrum, people, product, process, project, software project estimation, decomposition techniques, Empirical Knowledge Engineering, History, Features, Functions, Tools, Trends in AI & ES, Knowledge Representation, Knowledge Retrieval, Knowledge Management, KADS- A Case Study

Text/References (Java Technologies)

1. Ali Bahrami, - "Object –Oriented System Development" - Mc Graw Hill.
2. Rambaugh, James Michael, Blaha - "Object Oriented Modelling and Design" - Prentice Hall India/ Pearson Education
3. Bruce, Foundations of Object Oriented Languages, PHI
4. Patrick Naughton, Herbert Schildt – "The complete reference-Java2" – TMH

Text/References (Software & Knowledge Engineering)

1. R. Pressman, Software Engineering: A Practitioner's Approach, 6th Edition.2005.
2. J. D. Musa, A. Iannino, K. Okumoto: Software Reliability – Measurement, Prediction and Application, McGraw Hill, New Delhi, 1987.
3. R. Fairly: Software Engineering Concepts, Tata McGraw Hill, New Delhi, 1999.
4. P. Jalote: An Integrated Approach to Software Engineering, 2nd ed. Narosa, New Delhi, 1997.
5. P. Oman and S. L. Pfleeger: Applying Software Metrics, IEEE Computer Society Press, Los Alamos, California, 1996.
6. S. L. Pfleeger: Software Engineering – Theory and Practice, Prentice Hall, New York, 1998.
7. C. Larman: Applying UML and Patterns, Addison-Wesley, Reading, Mass., 1998.
8. Capability Maturity Model: The Guidelines for Improving the Software Process, CMU, Software Engg. Inst., 1995.

CIS-06 Database Engineering and SQL

Unit-1

Introduction to DBMS, architecture, administration roles, data dictionary, Traditional models, three-level architecture, hierarchical model, network model and relational model, File organization , Security. Relational model – definitions and properties, keys , integrity rules, relational algebra, joins, set operations, Tuple relational calculus

Unit-2

SQL constructs, embedded SQL , Query & Query Optimisation Techniques, Database design, conceptual, logical and physical models, ER diagram and model, Functional Dependency (Armstrong's Axioms), Normal forms(1NF, 2NF, 3NF, BCNF) Indexing- Primary, Secondary, Multilevel

Unit-3

Brief introduction to distributed database, temporal database and object-oriented database. Embedded SQL & Applications

Unit-4

Database Issues- Security, Transaction Management, Introduction to Query Processing and Query Optimization, Concurrency Control, and Recovery Techniques

Unit-5

Indexing- Primary, Secondary, Multi Level, PL/SQL, Query & its optimization techniques- Concept, Multimedia Database- Features, Challenges, Emerging Trends

Text/References:

1. Henry F. Korth and Silberschatz Abraham, "Database System Concepts", Mc.Graw Hill.
- 2 Elmasri Ramez and Novathe Shamkant, "Fundamentals of Database Systems", Benjamin Cummings Publishing. Company.
3. Ramakrishnan: Database Management System , McGraw-Hill
4. Date C. J., "Introduction to Database Management", Vol. I, II, III, Addison Wesley.
5. Ullman JD., "Principles of Database Systems", Galgottia Publication.

6. Feuerstein ; Oracle PL/SQL Programming – 3/edition, Shroff Publishers / O'reilly
7. Jain: Advanced Database Management System CyberTech

CIS-07 Operating Systems with Discrete Structures & Arithmetic

Unit – 1

Overview of Computer System and Architecture, Introduction to Operating Systems – Structure & Architecture , Functions of Operating Systems, Types of Operating systems, Operating system Interface, OS services, System calls and its types, Operating Systems Structure, design and its implementation, Virtual Machines.

Unit – 2

Process-concept, Process scheduling and its algorithms, Operations on Processes, Inter-process Communication, multi-processor scheduling Threads: Multi-threading models, Thread Libraries, Thread Scheduling Synchronization: Critical section problem, Peterson's solution, synchronization hardware, semaphores, monitors, Classical problems of synchronization, (Dinning philosopher's problem Bounded buffer problem, Reader's- Writers problem) Deadlock characterization, deadlock detection, deadlock prevention, deadlock avoidance, Recovery from deadlock, Memory management requirements, Swapping, contiguous memory allocation, Fragmentation, Paging, Structure of Page table, Segmentation Virtual memory management: Demand paging, Page replacement algorithms, Allocation of frames, Thrashing, Copy-on-Write

Unit – 3

File concepts, access methods, Directory structure, Mounting, File sharing, Protection, Directory implementation, allocation methods, free space management, Efficiency and performance, recovery, Overview of Storage devices, Disk structure/ attachment/ scheduling/ Management, Swap-Space Management, RAID, Tertiary Storage Structure, I/O management: hardware, Application Interface, Kernel I/O subsystems, Streams, Device drivers System protection, OS in Applied Context: Operating System Trends & Future, Multimedia Operating Systems, Server Operating Systems and Trends, Network Operating Systems, OS as Large Field, System Administration & OS, Market Place in OS, Jobs, Placement in Current OS, Cloud and OS, Network Function Virtualization (NFV), Network OS & Management, Distributed Operating System

Unit-4

Sets, relations, Functions, Pigeonhole Principle, inclusion-Exclusion Principle, Equivalence and Partial Orderings, Elementary Counting Techniques, Probability, Measure(s) for Information and Mutual information. Computability: Models of computation-Finite Automata, Pushdown Automata, Non-determinism and NFA, DPDA and PDAs and Languages accepted by these structures. Grammars, Languages, Non computability and examples of non-computable problems.

Unit-5

Graph: Definition, walks, paths, trails, connected graphs, regular and bipartite graphs, cycles and circuits, Tree and rooted tree, Spanning trees, Eccentricity of a vertex, radius and diameter of a graph, Central Graphs, Center(s) of a tree, Hamiltonian and Eulerian graphs, planar graphs, Groups: Finite fields and Error correcting / detecting codes. Propositional (Boolean) Logic, Predicate Logic, Well-formed-formulae (WFF), Satisfiability and Tautology

Unit-6

Logic Families: TTL, ECL and C-MOS gates. Boolean algebra and Minimization of Boolean functions, Flip-flops-types, race condition and comparison. Design of combinational and sequential circuits Representation of integers: Octal, Hex, Decimal, and Binary. 2's complement and 1's complement arithmetic. Floating point representation

Text/References (Operating Systems):

1. Silberschatz, A., Peter B. Galvin and Greg Gagne : Operating System Principles, 8th Edition Wiley – Indian Edition, 2009.
2. Sumitabha Das :Unix concepts & application, 4th Edition, Tata McGraw Hill, 1992.

3. Kenneth Rosen, Douglas Host, James Farber and Richard Rosinski: The Complete Reference, Tata McGraw Hill, 1999.
4. Andrew S. Tanenbaum: Modern Operating Systems, Prentice Hall of India Pvt. Ltd, 2003.
5. Venkateshmurthy: Introduction to Unix and Shell Programming, Pearson Education (India).

Text/References (Discrete Structure)

- 1.Theory of Computer Science, Mishra & Chandrasekharan, PHI
- 2.Discrete Mathematics for Comp. Scientists & Mathematicians, Mott, Kandel & Baker, PHI
- 3.Discrete Mathematical Structure, C.L.Liu,TMH
- 4.Discrete Mathematical Structure, G.S.RAO,New Age International
- 5.Discrete Mathematics With Applications, Rosen, TMH, 5th Ed
6. Discrete Mathematics, Ash & Ash, MH.
7. Discrete Mathematical Structure, Somasundaram, PHI
8. Discrete Mathematical Structure, Dubey, EXCEL BOOKS

CIS-08 Information and ICT Policies with Laws

Unit-1

Information Privacy and Data Protection Laws- Basics, Features, Functions, Information Privacy and Data Protection Laws in USA, Europe and other countries

Unit-2

Policy, Planning, Policy Vs Planning, Policy Cycle, Policy Content, Policy Typology, Types of Policy, Policy Governance, Policy Administration, Policy Alteration

Unit-3

Information Policy- Meaning, Types, Need, Function, Case Studies, Need, Convergence, Information Divide, Digital Divide, Information Literacy, Network Literacy, Digital Humanities & Sociology, Information and IT Policy as a Discipline and Degrees worldwide

Unit-4

Information Technology Act, Information Security Protocols, Non-repudiation services, related protocols, Fairness in Information Exchanges Protocols, Trusted Third Party, its use as Adjudicator, message authenticator, Information Security standards, Information Security Infrastructure.

Unit-5

International Information Act & IT Act, Right to Information Act-2005 with Process, Features and Functions, IT Act 2000-Role, Features, Summary, Changes, Data Privacy Rules, Real life Example of IT Act uses, Emerging Cyber Act in India

Text/References:

- 1.Kahin, B., & Nesson, C. (1996). *Borders in cyberspace: Information policy and the global information infrastructure*. MIT Press.
2. Kamisar, Y. (1980). *Police interrogation and confessions: Essays in law and policy* (p. 1). Ann Arbor, MI: University of Michigan Press.
3. Holtshouse, D. K. (2013). *Information technology for knowledge management*. U. M. Borghoff, & R. Pareschi (Eds.). Springer Science & Business Media.

CIS-P-03 Java Technologies (Applied)

- Simple Java applications - for understanding reference to an instance of a class (object), methods
 - Handling Strings in Java

- Simple Package creation. - Developing user defined packages in Java
- Interfaces - Developing user-defined interfaces and implementation
 - Use of predefined interfaces
- Threading
 - Creation of thread in Java applications
 - Multithreading
- Exception Handling Mechanism in Java
 - Handling pre-defined exceptions
 - Handling user-defined exceptions
 - Swings and Applets

Text/References (Java Technologies)

1. Ali Bahrami, - “Object –Oriented System Development” - Mc Graw Hill.
2. Rambaugh, James Michael, Blaha - “Object Oriented Modelling and Design” - Prentice Hall India/ Pearson Education
3. Bruce, Foundations of Object Oriented Languages, PHI
4. Patrick Naughton, Herbert Schildt – “The complete reference-Java2” – TMH

CIS-P-04 SQL & Data Systems (Applied)

- Creating, altering and dropping tables with integrity constraints.
- Retrieving and modifying data from a database
- Retrieving data from database using IN, BETWEEN, LIKE, ORDER BY, GROUP BY and HAVING clause.
- 4.Use of scalar and aggregate functions.
- 5.Retrieving data from a database using Equi , Non Equi , Outer and Self Join.
- 6.Using sub queries, rowid and rownum for retrieving data.
- 7. Use of views, indexes and sequences.
- Introduction to Data Warehouse and Data mining Structure

Text/References:

1. Henry F. Korth and Silberschatz Abraham, “Database System Concepts”, Mc.Graw Hill.
- 2 Elmasri Ramez and Novathe Shamkant, “Fundamentals of Database Systems”, Benjamin Cummings Publishing. Company.
3. Ramakrishnan: Database Management System , McGraw-Hil
4. Date C. J., “Introduction to Database Management”, Vol. I, II, III, Addison Wesley.
5. Ullman JD., “Principles of Database Systems”, Galgottia Publication.

IDC Course Title:
Cyber Laws & E Business

Paper Code: CIS-IDC-02

Credit: 08

(Not for MSc CIS Students)

Unit-1

Information Technology-Its basics, Meaning of Law, Act, Offence, Ordinance, Cyber World, Cyber Crime-Its nature, types, policies, Legal aspects of computing, Cyber Terrorism, Hacking, DNS, Web Security, IT Products security and laws, Cyber Laws in developed countries, Indian Cyber Acts, Digital Signature, Encryption, Social Issues in Cyber Systems

Unit-2

Cyber Division in Police Stations, Domain Hijacking, Computer Fraud and Abuse Act, Information Technology Act, Information Security Protocols, Non-repudiation services, related protocols, Fairness in Information Exchanges Protocols, Trusted Third Party, its use as Adjudicator, message authenticator,

Unit-3

Information Security standards, Information Security Infrastructure. International Information Act & IT Act, Right to Information Act-2005 with Process, Features and Functions, IT Act 2000-Role, Features, Summary, Changes, Data Privacy Rules, Real life Example of IT Act uses, Emerging Cyber Act in India

Unit: 4

E Business- Meaning, Types, Characteristics, E Business Models, Related areas, Role, Contemporary areas, Models, Major Concerns in E Business, Digital Marketing: Meaning, Characteristics, Types, Need and Role, E Commerce Business Applications, E Commerce Types, M Commerce, Shopping Carts, Shopping Cart Software- Detailed study,

Unit: 5

E – strategy: Overview, Strategic Methods for developing E – commerce, Four C's : (onvergence, Collaborative Computing, Content Management & Call Center), Payment through card system, E – Cheque, E – Cash, E – Payment Threats & Protections, E – Marketing :. Home –shopping, E-Marketing, Tele-marketing

Text/References:

- 1.Kahin, B., & Nesson, C. (1996). *Borders in cyberspace: Information policy and the global information infrastructure*. MIT Press.
2. Kamisar, Y. (1980). *Police interrogation and confessions: Essays in law and policy* (p. 1). Ann Arbor, MI: University of Michigan Press.
3. Holtshouse, D. K. (2013). *Information technology for knowledge management*. U. M. Borghoff, & R. Pareschi (Eds.). Springer Science & Business Media.
4. Information Technology Law and Practice by Vakul Sharma – Universal Law Publishing Co. Pvt. Ltd.
- 5.The Indian Cyber Law by Suresh T Vishwanathan – Bharat Law house New Delhi.

6. Hand book of Cyber & E-commerce Laws by P.M. Bakshi & R.K.Suri – Bharat Law house New Delhi.
7. Guide to Cyber Laws by Rodney D. Ryder-Wadhwa and Company Nagpur.
8. The Information Technology Act,2000 – Bare Act –Professional Book Publishers – New Delhi.

CIS-09 Computer Networks & Cloud Systems

Unit-1

Network Fundamentals: Local area Networks (LAN), Metropolitan Area Networks (MAN), Wide Area Networks (WAN), Wireless Networks, Inter Networks.

Unit-2

Reference Models: The OSI model, TCP/IP model

Unit-3

Data Communication: Channel capacity. Transmission media - twisted pair, coaxial cables, fibre-optic cables, wireless transmission - radio, microwave, infrared and millimetre waves. Light wave transmission. Telephones - local loop, trunks, multiplexing, switching, narrowband ISDN, broadband ISDN, ATM, High speed LANS, Cellular radio, Communication satellites - geosynchronous and low-orbit.

Unit-4

Internetworking: Switch/Hub, Bridge, router, Gateways, Concatenated virtual circuits, Tunnelling, Fragmentation, Firewalls. Routing: Virtual circuits and datagrams, Routing algorithms, Congestion control
Network Security: Cryptography - public key, secret key. Domain Name System (DNS) - Electronic mail and World Wide Web (WWW). The DNS, Resource Records, Name Servers. E-mail architecture and Servers

Unit-5

Cloud Computing: Meaning, Characteristics, Types, Role of Cloud Computing, Advantages, Mode of Cloud Computing, Cloud and related areas

Text/References:

1. Computer Networks –A. Tanenbaum, (PHI pub.)
2. Data and Computer Communication –Willam Stallings, PHI pub.
3. Data Communication & Network –Forouzan (TMH)
4. Internetworking with TCP/IP Vol I-Comer (PHI pub.)
5. Data Communications and distributed Networks] V.B, Black, (Prentice Hall pub.)
6. W. Stallings: Local and Metropolitan Area Networks, 4th ed., Macmillan, New York, 1993.
7. L. Gracial and I. Widjaja: Communication Networks, Tata-McGraw Hill, New Delhi, 2000.
8. L. L. Paterson and B. S. Davie: Computer Network, Morgan Kaufman, San Mateo, 2000

CIS-10/A Information Systems and Management

Unit-1

Information Systems as a Field, Information Systems Function, Information Systems Professionals, IS Development, IS for Development, Carrier opportunities as Information Systems, Management Science with its principles, Management in Information Systems

Unit-2

Introduction to Information Systems, shift in Information system thinking, latest trends in Information Technology, Use of computers for managerial applications, Technology issues and data and information processing in organizations

Unit-3

Computer Based Information Systems- office automation systems, decision making and MIS, transaction processing systems, decision support system, Group Decision Support, Executive Information systems, DSS generator, Artificial Intelligence based systems, end user computing, distributed data processing

Unit-4

Knowledge Management, Business system, deciding on IS architecture, IT leadership & IS strategic planning, IS strategy and effects of IT on competition, ERP, re-engineering work processes for IT applications, Business Process Redesign

Unit-5

Information Systems beyond MIS, Information Systems and Domain based Nature, Geo Information Systems, Bio Information Systems, Health Information Systems, Environmental Information Systems, Educational Information Systems

Text/References:

1. Management Information System, O'Brien, TMH
2. Management Information System: A Concise Study, Kelkar, PHI
3. Decision support Systems, Janaki Raman, PHI
- 4 Business Information Systems, Munish Kumar, VIKAS
5. Business Application of Computers, M.M. Oka, EPH

CIS-10-B Knowledge Economy and Management with ICT4D

Unit-1

Information and Knowledge, Economics-Concept, Techniques and Types, Economics for Development, Knowledge Economy with its Concept Evolution, Driving Forces, Features and Characteristics

Unit-2

Industrial Economy to Knowledge Economy-The Journey, Challenges of Knowledge Economy, SWOT of Knowledge Economy, Information Vs Knowledge Economy, Knowledge Policy, Knowledge Economics Index

Unit-3

Learning Society and Digital Economy—Concept and Features, Need and Trends, Case Studies, Knowledge Technologies, Real Manpower for solid Knowledge Economy Building

Unit-4

Management-Basics, Management as a Tool and Techniques, Principles, Functions, Strategic Management, Types of Management, Planning, TQM, MBE, MBO, Management in Discipline, Management in Information and Computing

Unit-5

ICT its Meaning, Features and Function, ICT and its comparison with IT, IS, Information Science, Information Management, About IST, ICT Uses, ICT4D, ICT and Organization, ICT4D and some Projects in

International and Indian Context, ICT in Developed and Developing Countries, ICT Projects and Development

Text/References:

1. Essentials of Knowledge Management by Byron Bergeron
2. Bharat, Bhaskar : Electronic Commerce - Technologies & Applications. TMH
3. Westland & Clark : Global Electronic Commerce, Universities Press
4. Davis & Olson, Management Information System, Tata McGraw Hill
5. Loudon and Loudon, Management Information System, Prentice Hall/Pearson Education
6. Mahadeo Jaiswal & Monica Mittal : Management Information Systems, OUP
7. O'Brien, Introduction to Management Information System, Tata McGraw Hill

CIS-11-A Advanced Data Structure

Unit: 1

Introduction: Basic Terminology, Elementary Data Organization, Structure operations, Algorithm Complexity and Time-Space trade-off.

Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices and Vectors.

Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Applications of recursion in problems like 'Tower of Hanoi'.

Unit: 2

Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, D-queues and Priority Queues. Linked list: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Linked List in Array, Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.

Unit: 3

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Traversing Threaded Binary trees, Huffman algorithm.

Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

Unit: 4

Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting.

Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees.

Unit: 5

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

File Structures: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Comparisons.

1. Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd., New Delhi.
2. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education Asia, Delhi

CIS-11 B Compiler Design

Unit: 1

Classification of grammars. Context free grammars. Deterministic finite state automata (DFA) Non-DFA Scanners. Top down parsing, LL grammars. Bottom up parsing.

Unit: 2

Polishing expressions Operator precedence grammar. LR grammars. Comparison of parsing methods. Error handling. Symbol table handling techniques. Organization for non-block and block structured languages.

Unit: 3

Run time storage administration. Static and dynamic allocation. Intermediate forms of source program. Polish N-tuple and syntax trees. Semantic analysis and code generation.

Unit: 4

Code optimisation, folding, and redundant sub-expression evaluation. Optimization within iterative loops.

Books:

1. Compiler Design, Aho & Ullman
2. Compiler Design in C, Holub, PHI

CIS-12-A E Commerce with E Governance

Unit-1

Overview, Definitions, Advantages & Disadvantages of E – Commerce, Threats of E – Commerce, Managerial Prospective, Rules & Regulations for Controlling E – Commerce, Cyber Laws. Technologies: Relationship Between E – Commerce & Networking, Different Types of Networking For E – Commerce, Internet, Intranet & Extranet, EDI Systems

Unit-2

E – strategy: Overview, Strategic Methods for developing E – commerce, Four C's : (Convergence, Collaborative Computing, Content Management & Call Center), Payment through card system, E – Cheque, E – Cash, E – Payment Threats & Protections, E – Marketing ∴ Home –shopping, E-Marketing, Tele-marketing

Unit-3

Overview, Security for E – Commerce, Security Standards, Firewall, Cryptography, Key Management, Password Systems, Digital certificates, Digital signatures

Unit-4

E-Governance and the concept, Emerging E-Governance Technologies, Implementing Cloud Computing in E-Governance, Usability Systems in E-Governance, Models of E-Governance- Government to Citizen, Government to Employees, Government to Government, Government to Business, Open Source Governance

Unit-5

E Goods, Digital Distribution, Social Media and Commerce, Social Computing, Social Informatics, ERP with Features, capabilities and Overview of Commercial Software, reengineering work processes for IT

applications, Business Process Redesign, Mobile Commerce and Mobile Banking and Economical Development

Text/References:

1. E-Commerce, M.M. Oka, EPH
2. Kalakotia, Winston : Frontiers of Electronic Commerce , Pearson Education.
3. Bhaskar Bharat : Electronic Commerce - Technologies & Applications. TMH
4. Loshin Pete, Murphy P.A. : Electronic Commerce , Jaico Publishing Housing.
5. Murthy : E – Commerce , Himalaya Publishing.
6. E – Commerce : Strategy Technologies & Applications, Tata McGraw Hill.
7. Global E-Commerce, J. Christopher & T.H.K. Clerk, University Press
8. Beginning E-Commerce, Reynolds, SPD

CIS-12-B Human Computer Interaction with CSS

Unit-1

Foundations of human-computer interaction , Human-centered development and evaluation, Human performance models, accommodating human diversity, Principles of good design and good designers, engineering tradeoffs, HCI and Differences with related Fields, Principles of HCI, Methodologies of HCI

Unit-2

HCI and Display Design, Factors of HCI Changes, Human Centered Software, Human Centered Hardware, Choosing interaction styles and interaction techniques, HCI aspects of common widgets, HCI aspects of screen design: layout, color, fonts, labeling, Handling human failure, Beyond simple screen design: visualization, representation, metaphor, Multi-modal interaction: graphics, sound, and haptics, 3D interaction and virtual reality

Unit-3

HCI as a Discipline, HCI in Information Science and Technology, Interaction Design its concept and emergence, Web Indexing and Knowledge Visualization, Experience Design ad Concepts, Psychological Interaction, Virtual Reality

Unit-4

Introduction to CSS 3, Basic CSS3 Selectors Advanced CSS3 Selectors, Border Image, Box Shadow, Text-Shadow Property, Text-Stroke Property Multiple Backgrounds, Column Rules, Background Origin, Background Resize, CSS Gradientsn Column Rules, Opacity Transitions Transform, Animations, Using CSS3 in Practical Layout

Unit-5

Current Trends in HCI and Usability Engineering, Standards and Methods for better Usability Engineering Practices, HCI and GUI, HCC, Information Designing and IA for better Usability

Text/References:

1. Alan Dix: Human-Computer Interaction, Pearson Education
2. Yvonne Rogers, Helen Sharp, Jenny Preece: Interaction Design: Beyond Human-Computer Interaction, Wiley India Pvt Ltd
3. Donald A. Norman: The Design of Everyday Things, PERSEUS BOOKS GROUP

CIS-P-05 Cloud Computing & Networking (Applied)

- Introduction to Cloud Computing in Practical
- Designing Cloud Models
- Infrastructure as a service (IaaS) with example

- Platform as a service (Paas) with example
- Software as a service (Saas) with example
- Virtualization Using Google Tools
- Storage using Cloud Tools
- Installing Virtual Machines (VMWare)
- Modification and Updating VM using VMWare.
- Connecting LAN with configuration.
- Using Network Simulation software (CISCO)
- Installing CISCO simulator (Basics)

Text/References:

1. Computer Networks –A. Tanenbaum, (PHI pub.)
2. Data and Computer Communication –Willam Stallings, PHI pub.
3. Data Communication & Network –Forouzan (TMH)
4. Internetworking with TCP/IP Vol I-Comer (PHI pub.)
5. Data Communications and distributed Networks] V.B, Black, (Prentice Hall pub.)
6. W. Stallings: Local and Metropolitan Area Networks, 4th ed., Macmillan, New York, 1993.
7. L. Gracial and I. Widjaja: Communication Networks, Tata-McGraw Hill, New Delhi, 2000.
8. L. L. Paterson and B. S. Davie: Computer Network, Morgan Kaufman, San Mateo, 2000

CIS-P-06 Interactive Usability Systems (Applied)

- Basic CSS3 Selectors Advanced CSS3 Selectors
- Border Image, Box Shadow
- Text-Shadow Property
- Text-Stroke Property Multiple Backgrounds, Column Rules
- Background Origin, Background Resize
- CSS Gradientsn Column Rules
- Opacity Transitions
- Transform, Animations,
- Using CSS3 in Practical Layout

Text/References:

1. Alan Dix: Human-Computer Interaction, Pearson Education
2. Yvonne Rogers, Helen Sharp, Jenny Preece: Interaction Design: Beyond Human-Computer Interaction, Wiley India Pvt Ltd
3. Donald A. Norman: The Design of Everyday Things, PERSEUS BOOKS GROUP

CIS-13-A Business Information Science

Unit-1

Business Informatics- Definition, History, Concept, Need, Role and Values of Business Informatics, Educational Programs and research in Business Informatics in the world.

Unit-2

IT Governance, Standards in IT Governance, Legal Issues of Business Informatics, Cost Benefit Analysis, Database for Business Informatics, Multimedia for Business Informatics, Networking for Business Informatics, Cloud Computing for Business Informatics

Unit-3

IT Business Management, Executive IS, DSS, IS Security Issues and Aspects, Change Management, Introduction to Business Process Management, Managing Business Process

Unit-4

IT Project Management, IT Project Life Cycle-Project Initiation, planning, execution, controlling, closing, project scope management, time management, HRM Management.

Unit-5

Big Data- Concept, History, Values and Need, Big Data for healthy Business Informatics, Big Data and Technologies, Data Science, Data Science software, Data Mining, Data Warehousing

Text/References:

- 1.Essentials of Knowledge Management by Byron Bergeron
- 2.Bharat, Bhaskar : Electronic Commerce - Technologies & Applications. TMH
- 3.Westland & Clark : Global Electronic Commerce, Universities Press
- 4.Davis & Olson, Management Information System, Tata McGraw Hill
- 5.Loudon and Loudon, Management Information System, Prentice Hall/Pearson Education
- 6.Mahadeo Jaiswal & Monica Mittal : Management Information Systems, OUP
- 7.O' Brien, Introduction to Management Information System, Tata McGraw Hill
- 8.Turban, Decision Support and Business Intelligence Systems, Pearson Education
- 9.George M. Marakas, Decision Support Systems, 2nd Edition, Pearson Education
- 10.Janakiraman V.S. and Sarukesi. K., Decision Support Systems, Prentice Hall of India
- 11.Lofti, Decision Support System and Management, International Edition, McGraw Hill Inc., New Delhi

CIS-13-B Health Information Science

Unit-1

Health and its Meaning, Health; its determinants and its types, Informatics, Definition of Health Informatics, Emerging Health Informatics practices, Need and Values of Health Informatics

Unit-2

Health Informatics and related fields such as Clinical Informatics, Health IT, Medical Information Science, Health Information Systems, Issues of Health Informatics, Countrywide development of Health Informatics, technological integration in Health Informatics

Unit-3

Fundamentals of Biomedicine, Public Health, Medical Sciences including Dental Sciences, Pharma Science, Biological Sciences, Bio Technology, Health Informatics Vs. Bio Informatics, Health Informatics tools and software

Unit-4

Health Informatics and electronic records, Consumers in eHealth era, Communication in Healthcare, Legal aspects of Health Informatics, Research and development in Health Informatics, Educational programs in Health Informatics

Unit-5

Basic Human Anatomy and Emerging Medicals Issues, Medical Specialties, Knowledge Products and Events in the Health Informatics, SWOT of Health Informatics, Emerging Cloud Applications in Health Informatics, Usability in Medical Purposes, Health Information Systems

Text/References:

1. Nelson, R., & Stagers, N. (2014). Health Informatics: An Interprofessional Approach. St. Louis: Mosby.
2. Hasman, A. (Ed.). (1995). *Education and Training in Health Informatics in Europe: State of the Art, Guidelines, Applications* (Vol. 25). IOS press.
- 3.Lewis, D., Chang, B. L., & Friedman, C. P. (2005). Consumer health informatics. In *Consumer Health Informatics* (pp. 1-7). Springer New York.

4. Lorenzi, N. M., & Riley, R. T. (2013). *Organizational aspects of health informatics: managing technological change*. Springer Science & Business Media.
5. Hoyt, R. E., & Yoshihashi, A. K. (2014). *Health Informatics: Practical guide for healthcare and information technology professionals*. Lulu. com.

CIS-13-C Geo Information Science

Unit-1

Basic concepts about Spatial information, Definition, Historical evolution and need for spatially based resource information system, objectives of GIS - Manual v/s automated GIS, Technologies for GIS

Unit-2

Data structure types of data structure, Raster and Vector formats, advantages and disadvantages of various data structures and data formats, important GISc softwares

Unit-3

Data input: data pre-processing, methods of data capture, digitization and scanning methods, commonly used map projections and ellipsoids. The format of GIS - Handling digital Geographical Information Data - Analysis of single data planes in Raster format - Analysis of Multiple data planes in Raster format - Uses of topographic data in Raster format - Data structures for thematic maps.

Unit-4

Digital Elevation Model (DEM): need, methods, data sources and products of DEM - Digital Terrain Modeling (DTM) - Input verification, storage and methods of data analysis for Spatial modeling - Methods of GIS and Spatial interpolation

Unit-5

Geo Information Sciences and its relationship and differences with Geo Informatics, Geo Spatial Science, Earth Observation Sciences, Remote Sensing, Trends in GISc, Educational programs in GISc, Emerging Tools of GIS

Text/References:

1. Geographical Information System for Geoscientists by Bonham-Carter G.F., Pergamon Press, Tarrytown, New York, 1994.
2. Principles of Geographical Information System for Land Resources Assessment by Burrough, PA., Clarendon, Press, Oxford, 1986.
3. Geographical Information System by Fraser Taylor, D.R., The Microcomputer and Modem Cartography, Pergamon Press, 1991.
4. Mathematical Geography by Jameson, A.H. and Mornsby, M.t. Mornsby., Vol I and II, Sir Issac Pitman and Sons Ltd. London.
5. Cartographical design and production by Keates, J.S., London, Longman group, 1973.
6. Topographic Surveying by Wilson, H.M., John Wiley and sons, New York.
7. Geographic Information System by Les Worall, (Ed), Development and Applications, Beihaven Press, 1990
8. Remote Sensing and Image Interpretations by Thomas M. Lillesand and Ralph W. Kiefer., John Wiley and Sons, New York, 1994

CIS-14-A Windows Programming and VB

Unit-1

Windows Programming: Introduction to Windows programming-Win32, Microsoft Foundation Classes (MFC), Documents and views, Resources, Message handling in windows.

Unit-2

Simple Applications (in windows): Scrolling, splitting views, docking toolbars, status bars, common dialogs. Advanced Windows Programming: Multiple Document Interface (MDI), Multithreading. Object linking and Embedding (OLE). Active X controls. Active Template Library (ATL). Network programming

Unit-3

Introduction to Visual Basic & difference with BASIC. Concept about form Project, Application, Tools, Toolbox, Controls & Properties. Idea about Labels, Buttons, Text Boxes.

Unit-4

Data basics, Different type variables & their use in VB, sub-functions & Procedure details, Input box () & MsgBox (). Making decisions, looping

Unit-5

List boxes & Data lists, List Box control, Combo Boxes, data Arrays. Frames, buttons, check boxes, timer control, Programming with data, built in functions, database basics, file concepts, ODBC data base connectivity. Data form Wizard, query, and menus in VB Applications, Graphics

CIS-14-B Network Engineering (CISCO Mapped)

Unit-1

Operation of IP Data Networks: Recognize the purpose and functions of various network devices such as Routers, Switches, Bridges and Hubs. Select the components required to meet a given network specification. Identify common applications and their impact on the network Describe the purpose and basic operation of the protocols in the OSI and TCP/IP models. Identify the appropriate media, cables, ports, and connectors to connect Cisco network devices to other network devices and hosts in a LAN

Unit-2

LAN Switching Technologies: Determine the technology and media access control method for Ethernet networks, Identify basic switching concepts and the operation of Cisco switches, Configure and verify initial switch configuration including remote access management, Verify network status and switch operation using basic utilities such as ping, telnet and ssh.

Unit-3

Describe how VLANs create logically separate networks and the need for routing between them. Configure and verify VLANs, Configure and verify trunking on Cisco switches, DTP, Auto negotiation, Identify enhanced switching technologies, RSTP, PVSTP, Etherchannels, Configure and verify PVSTP operation, describe root bridge election, spanning tree mode

Unit-4

IP Routing Technologies: Describe basic routing concepts. Configure and verify utilizing the CLI to set basic Router configuration. Configure and verify operation status of an ethernet interface. Verify router configuration and network connectivity. Configure and verify routing configuration for a static or default route given specific routing requirements.

Unit-5

Differentiate methods of routing and routing protocols, Configure and verify OSPF (single area), Configure and verify inter VLAN routing (Router on a stick), Configure SVI interfaces, Describe the boot process of Cisco IOS routers, POST, Router bootup process, Configure and verify operation status of a Serial interface, Manage Cisco IOS Files, Boot preferencesn Cisco IOS image(s)

CIS-15-A Information Systems with Analysis and Designing

Unit-1

Information Systems, Types and Overview, Information Analysis, Systems Analysis, Software Analysis, IT Management Analysis, Professionals and Tools associated with Information SAD, Data Analysis with Analytics

Unit-2

Overview of System analysis and design: Development life cycle (Waterfall, Spiral, incremental models), feasibility studies, Requirements determination, Logical design, Physical design, Program design, Risk and feasibility analysis, prototyping

Unit-3

Information requirement analysis: Process modelling with physical and logical data flow diagrams, Data modelling with entity relationship diagrams, Normalization upto 3NF

Unit-4

System design: Process descriptions, Input/output controls, object modelling, Database design, User Interface design, Documentation, Data Dictionary

Unit-5

Development methodologies: Top down, bottom up, structured chart, decision table, decision tree, CASE productivity tools.

Testing – Unit, integration, system, Acceptance, regression, Test Case generation

Text/References:

1. System Analysis & Design, Parthasarathi, EPH
2. Analysis & Design of Information Systems, Rajaraman, PHI
3. Analysis & Design of Information Systems, Senn, MH
4. Information Systems: Analysis and Design, Ram Bansal 'Vigyacharya', New Age International.
5. System Analysis, Design & MIS, EXCEL BOOKS
6. Analysis, Design & Implementation of Information System, Sharma, VIKAS
7. System Analysis & Design, V.K. Jain, Wiley Dreamtech

CIS-15-B Computer Graphics

Unit-1

Application of Computer Graphics, Graphics Devices, Cathode Ray Tube, Raster Scanning, Raster Refresh graphics displays. Graphics Operations – 2D & 3D Graphics, Bezier, B-Spline, Hermite, Bresenham Line & Circle Drawing Algorithms, Polygon filling, Edge Filling Algorithms.

Unit-2

Clipping—Cohen-Sutherland subdivision line clipping algorithm, Mid-Point subdivision algorithm, 2-dimensional clipping algorithm (Convex Boundaries & Partially visible lines), Cyrus-Beck algorithm for Partially & Totally Visible Lines), Visible Surfaces- Floating Horizon Algo.

Unit-3

Upper & Lower Horizon, Roberts algo, Warnock algo, Scan-line Z-buffer algo. Rendering- introduction (illumination models), shading- Gouraud Shading, Phong Shading. Shadowing- Shadow Algorithms Introduction to GKS.

Unit-4

Computer Graphics Software, Graphics and Hardware Requirement, Graphics Industries in world, Indian Graphics Companies, Graphics Vs Multimedia

Unit-5

Computer Graphics Research, Trends in Computer Graphics, Graphics and Usability Engineering Relation, GUI and Changing Scenario with Graphics

Text/References:

1. Hearn, Baker – “ Computer Graphics (C version 2nd Ed.)” – Pearson education
2. Z. Xiang, R. Plastock – “ Schaum’s outlines Computer Graphics (2nd Ed.)” – TMH
3. D. F. Rogers, J. A. Adams – “ Mathematical Elements for Computer Graphics (2nd Ed.)” – TMH
4. Mukherjee, Fundamentals of Computer graphics & Multimedia, PHI
5. Sanhker, Multimedia –A Practical Approach, Jaico
6. Buford J. K. – “Multimedia Systems” – Pearson Education
7. Andleigh & Thakrar, Multimedia, PHI
8. Mukherjee Arup, Introduction to Computer Graphics, Vikas

CIS-15-C PHP with Scripting

UNIT - 1

Introduction to PHP: What Does PHP Do, A Brief History of PHP, Installing PHP, A Walk Through PHP Language Basics: Lexical Structure, Data Types, Variables, Expressions and Operators, Flow-Control Statements, Including Code, Embedding PHP in Web Pages, Installing and Configuring PHP on Windows and Linux Platforms

UNIT – 2

Functions: Calling a Function, Defining a Function, Variable Scope, Function Parameters, Return Values, Variable Functions, Anonymous Functions, Strings: Quoting String Constants, Printing Strings, Accessing Individual Characters, Cleaning Strings, Encoding and Escaping, Comparing Strings, Manipulating and Searching Strings, Regular Expressions, POSIX-Style Regular Expressions, Perl-Compatible Regular Expressions, **Arrays:** Indexed Versus Associative Arrays, Identifying Elements of an Array, Storing Data in Arrays, Multidimensional Arrays, Extracting Multiple Values, Converting Between Arrays and Variables, Traversing Arrays, Sorting, Acting on Entire Arrays, Using Arrays

UNIT – 3

Reading data in web pages: Setting Up Web Pages to Communicate with PHP, Handling Text Fields, Text Areas, Check Boxes, Radio Buttons, List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads. Handling Buttons: Making Button Data Persist, Using Submit Buttons as HTML Buttons. PHP Browser-Handling Power: Using PHP’s Server Variables, Using HTTP Headers, Getting the User’s Browser Type, Redirecting Browsers with HTTP Headers, Dumping a Form’s Data All at Once, Handling Form Data with Custom Arrays, Putting It All in One Page. Data Validation: Performing Data Validation, Checking if the User Entered Required Data, Requiring Text, Persisting User Data, Client-Side Data Validation, Handling HTML Tags In User Input.

UNIT – 4

Classes and Objects: Terminology, Creating an Object, Accessing Properties and Methods, Declaring a Class, Introspection, Serialization, Web Techniques: HTTP Basics, Variables, Server Variables, Server Information, Processing Forms, Setting Response Headers, Session, cookies, files, Maintaining State, SSL. Working With Database: Using PHP to Access a Database: Relational Databases and SQL, Mysql database Basics, Execute SQL Queries In PHP, Accessing The Database In PHP: Connecting To The Database, Reading, Displaying, Closing Connection, Database Manipulation: Inserting, Updating, Sorting and Deleting Records. Advanced Database Techniques.

Unit- 5

Setting a Cookie, Reading a Cookie, setting cookies Expiration, Deleting Cookies. Working with FTP: Downloading with FTP, Uploading files with FTP, Deleting a file with FTP, Creating and Removing Directories with FTP, Sending E-mail, Advanced E-mail, Adding Attachments to E-mail, Storing Data in Sessions, Writing a Hit Counter Using Sessions. PHP Code, Shell Commands.

Text/References:

1. PHP 5.1 for beginners by Evan Bayross and Sharman Shah, SPD Publications
2. PHP 5.2 The Complete Reference by Steven Holzner, Mc Graw Hill Edition 2008.
3. Programming PHP by Rasmus Lerdorf and Kevin Tatroe, Orilly Publications

CIS-16-A SEO Engineering & Management

Unit-1

Search Engine Optimization and its meaning, features, function and need. Search Engine Optimization and Google, Indexing Methods, Search Engines its features, history, emerging search engines, search strategies

Unit-2

Ranking Concept, Long tail-concept and theory, why content is a king?, SEO Copywriting, Content Development and its features with style, Content Designing, Content Management, Content Management Systems, Content Engineering, Role of Search Engine Optimization in Digital Marketing

Unit-3

On Page SEO-Concept of Content, URL Structure, Pictures in On Page Optimization, Title Tag & Meta Tag in On Page Optimization, Headline Tag, Internal Linking

Unit-4

Off Page Optimization, Linking Approaches, Use Of Social Media, Use of Email on Off Page Optimization promotion, identifying a keywords, long-tail keywords, checking web analytics, keyword research tools, search for keywords

Unit-5

Tariff and SEO, Leads/ROI, Indexed Pages, Inbound Links, Keywords, Ranking, Creating list of Keywords, building keyword focused webpage, setup a blog, creating a link building plan, PPC Advertisement, Webmaster edge, site maps, use of color and psychology

Text/References:

1. Ledford, J. L. (2015). Search Engine Optimization Bible (Vol. 584). John Wiley & Sons.
2. Kent, P. (2012). Search engine optimization for dummies. John Wiley & Sons.
3. Amerland, D. (2013). Google Semantic Search: Search Engine Optimization (SEO) Techniques That Get Your Company More Traffic, Increase Brand Impact, and Amplify Your Online Presence. Que Publishing

CIS-16-B Digital Sociology

Unit: 1

Information Society, Knowledge Society, Development and Knowledge Societies, Worldwide Tour and Knowledge Society, Digital Transformation, Information Industry and Revolution, Network Society

Unit: 2

Digital Addict, Digital Dark Ages, Digital Tools, Emerging Digital Technologies, Offence in Digital Age, India and Digital India

Unit: 3

Governance Projects in India, E Governance in West Bengal, Digital Phobic, Video Game Addiction, Digital Dark Age

Unit: 4

Digital Education-Meaning, Types, Trends and Future, Digital Business- Meaning, Types, Trends and Future, Digital Technologies in Hands On, Basic Digital tools for Education

Text/References:

- 1.Laudon, Kenneth C., and Jane Price Laudon. Management information systems. Vol. 8. New Jersey: Prentice Hall, 2011.
- 2.Lucey, T. (2005). Management information systems. Cengage Learning EMEA.
- 3.Leeuwen, J. V., Hartmanis, J., & Goos, G. (1995). Computer science today: recent trends and developments. Springer-Verlag New York, Inc..
- 4.Ten Teije, A., Miksch, S., & Lucas, P. (Eds.). (2008). Computer-based medical guidelines and protocols: a primer and current trends (Vol. 139). Ios Press.
- 5.Davis, C. H., Shaw, D., Katz, J. M., Tejedor, F. J., Allard, C. K., Allard, K., & Martín, A. G. (2011). Introduction to information science and technology (No. 004 004). e-libro, Corp..
- 6.Pour, M.K. (2015), Encyclopedia of information science and technology, 3rd Edition, IGI Global, USA

CIS-P-07-A Advance Applied Networking & Cloud

- Configure and verify utilizing the CLI to set basic Router configuration.
- Configure and verify operation status of an ethernet interface.
- Verify router configuration and network connectivity.
- Configure and verify routing configuration for a static or default route given specific routing requirements.
- Differentiate methods of routing and routing protocols
- Configure and verify OSPF (single area),
- Configure and verify inter VLAN routing (Router on a stick),
- Configure SVI interfaces,
- Describe the boot process of Cisco IOS routers, POST,
- Router bootup process, Configure and verify operation status of a Serial interface,
- Manage Cisco IOS Files, Boot preferencesn Cisco IOS image(s)

Text/References:

1. Computer Networks –A. Tanenbaum, (PHI pub.)
2. Data and Computer Communication –Willam Stallings, PHI pub.
3. Data Communication & Network –Forouzan (TMH)
4. Internetworking with TCP/IP Vol I-Comer (PHI pub.)
5. Data Communications and distributed Networks| V.B, Black, (Prentice Hall pub.)
6. W. Stallings: Local and Metropolitan Area Networks, 4th ed., Macmillan, New York, 1993.
7. L. Gracial and I. Widjaja: Communication Networks, Tata-McGraw Hill, New Delhi, 2000.
8. L. L. Paterson and B. S. Davie: Computer Network, Morgan Kaufman, San Mateo, 2000

CIS-P-07-B Applied VB

- Computer programming with Visual Basic
- Different constructs and applications
- Connecting with MS-ACCESS using data controls.
- Data basics, Different type variables & their use in VB, sub-functions & Procedure details,
- Input box () & MsgBox (). Making decisions, looping
- List boxes & Data lists, List Box control, Combo Boxes, data Arrays.

- Frames, buttons, check boxes, timer control,
- Programming with data, built in functions, database basics, file concepts
- ODBC data base connectivity. Data form Wizard, query, and menus in VB Applications

Text/References:

1. Win32 API Programming With VB , Roman,SPD/O'REILLY
- 2.Learn Microsoft VB 6.0 Now,Halvorson, PHI/MSP
- 3.Visual Basic 6 from the Ground Up, Cornell,TMH
- 4.Visual Basic 6, CDG, TMH
- 5.Visual basic 6.0 in 30 days, Krishnan, Scitech
- 6.Beginning VB 6 ,Wright,SPD/WROX

CIS-P-08-A Applied SEO & Engineering

- Web Ranking & Green Informatics
- Keywords Research and Analysis
- Content Writing
- On Page Optimization
- Latent Semantic Indexing and SEO
- Off Page Optimization & Green Informatics
- Special Site maps
- Black Hat SEO
- Syndicating Content (Feeds)
- Social Media Marketing
- SEO-Don'ts & Common Mistakes
- PPC Advertisements
- Useful SEO Tools & Cloud Computing
- Online Reputation Management
- Webmaster's Edge
- Website Analytics & Energy Efficiency

Text/References:

1. Ledford, J. L. (2015). Search Engine Optimization Bible (Vol. 584). John Wiley & Sons.
2. Kent, P. (2012). Search engine optimization for dummies. John Wiley & Sons.
3. Amerland, D. (2013). Google Semantic Search: Search Engine Optimization (SEO) Techniques That Get Your Company More Traffic, Increase Brand Impact, and Amplify Your Online Presence. Que Publishing.

CIS-P-08-B Lab with PHP

- Loops
- String Functions in PHP
- PHP Email Function
- PHP Basics, Variables
- Arrays in PHP with Attributes
- Date & Time, Image Uploading
- File handling in PHP
- Functions in PHP
- Errors handling in PHP
- Mini project in header and footer

Text/References:

1. PHP 5.1 for beginners by Evan Bayross and Sharman Shah, SPD Publications
2. PHP 5.2 The Complete Reference by Steven Holzner, Mc Graw Hill Edition 2008.
3. Programming PHP by Rasmus Lerdorf and Kevin Tatroe, Orilly Publications

Alteration Paper (if any: with approval)

CIS-ALT01 Multimedia Technologies & Images

Unit-1

Multimedia encodings: text (SGML, Unicode, TEI, XML), page images (CCITT FAX IV) images (JPEG, PNG, PS), video (MPEG), audio (MP3,WAV), synchronized media (SMIL), Traditional classification schemes (DDC, LCSH, MeSH), metadata types, Dublin core, Warwick framework, Identifiers: Open Archives Initiative, metadata harvesting, OpenURL. DL economics and social policy and issues.

Unit-2

Definition - Taxonomy - Multimedia Information Representation - Text -Images - Audio - Video - Multimedia Architecture - Multimedia Applications -Challenges of Multimedia Systems, Compression Principles - Need for Compression - Redundancy and Visibility -Text Compression - Binary Image Compression - Color, Gray Scale and Still -Video Image Compression - Audio Compression - Video Compression.

Unit-3

Data and File Formats: RTF, TIFF, RIFF, MIDI, JPEG, AVI Video File Formats, MPEG Standards – TWAIN Architecture - Digital Audio and Video as Multimedia I/O Technology – Animation, Multimedia Application Design - Virtual Reality & Design – Organizing Multimedia Databases - Application Workflow Design Issues – Distributed Application Design Issues.

Unit-4

Multimedia Presentation and Authoring - Hypermedia Messaging – Multimedia in Future: High Definition Television and Desktop Computing – Knowledge Based Multimedia systems

Unit-5

Digital Image Processing, Image Sampling and Quantization, Enhancement and Restoration, Image Segmentation and Compression, Emerging Trends in Multimedia, Research in Multimedia, Multimedia as a Domain

Text/References:

1. Prabhat K. Andleigh and Kiran Thakrar, Multimedia System Design, Pearson Education.
2. Ralf Steinmetz and Klara Nahrstedt, Multimedia Computing, Communications and Applications, Pearson Education.
3. Fred Halsall, Multimedia Communications : Applications, Networks, Protocols and Standards, Pearson Education.
4. John F Koegel Buford, Multimedia Systems, Pearson Education.
5. Judith Jeffcoate, Multimedia in Practice - Technology and Applications, Prentice Hall of India, 2001.
6. Keyes: Multimedia Handbook, MH.
- 7.G. Blair, L. Blair, A. Chetwynd, H. Bowman: Formal Specification of Distributed Multimedia Systems, UCL Press, London.
8. Digital Image Processing, Gonzalves and Wintz, Pearson Education.
9. Digital Image Processing, Jahne, Springer India
10. Digital Image Processing & Analysis, Chanda & Majumder, PHI.

CIS-ALT02 Business Communication & Technical Report Writing

Unit-1

Introduction Business Communication : Basic forms of communicating; Communication models and processes; Effective communication; Theories of communication; Audience Analysis, Self-Development and Communication : Development of positive personal attitudes; SWOT analysis; Vote's model of interdependence; Whole communication,

Unit-2

Corporate Communication : Formal and informal communication networks; Grapevine; Miscommunication (Barriers); Improving communication. Practices in business communication; Group discussions; Mock interviews; Seminars; Effective listening exercises; Individual and group presentations and reports writing. Principles of Effective Communication. Corporate dressing.

Unit-3

Writing Skills: Planning business messages; Rewriting and edition; The first draft; Reconstructing the final draft; Business letters and memo formats Appearance request letters; Good news and bad news letters; Persuasive letters; Sales letters; Collection letters; Office memorandum.

Unit-4

Report Writing : Introduction to a proposal, short report and formal report, Technical Report writing, Technical Notes preparation, Oral Presentation : Principles of oral presentation, factors affecting presentation, sales presentation, training presentation, conducting surveys, speeches to motivate, effective presentations skills.

Unit-5

Non-Verbal Communication: Body languages : meanings, Effective Listening : Principles of effective listening; Factors affecting listening exercises. Modern Forms of Communicating : Fax; E-mail; Video conferencing; etc. Interview sessions- do's and don'ts of facing a successful interview. Conversion practice is done on given situation topics, Group Discussions: language of conversion & strategies.

Text/References:

1. Monipally: Business Communication , Tata McGraw Hill
2. Ronald E. Dulek and John S. Fielder : Principles of Business Communication; Macmillan
3. Madhukar : Business Communications; Vikas Publishing House
4. Rai & Rai: Business Communication, Himalaya Publishing
5. Kaul : Business Communication; Prentice Hall
6. Senguin J : Business Communication; Allied Publishers

CIS-ALT03 Intelligent Systems

Unit-1

Scope of Artificial Intelligence, games, theorem proving, natural language processing, vision and speech processing, robotics, expert systems, AI techniques in search and knowledge abstraction

Unit-2

Problem solving; state space search, search space control, heuristic search, hill climbing, branch and bound Knowledge representation; predicate logic, rule-based system, structured knowledge representation, semantic net

Unit-3

Handling uncertainty, Fuzzy sets, probabilistic reasoning

Unit-4

Learning, learning automation, learning by induction, Neural Networks, Genetic Algorithms Emerging technologies and devices

Text/References:

1. Artificial Intelligence, Rich & Knight, TMH
2. Introduction to AI & Expert Systems, Patterson, PHI

3. Neural Networks, Fuzzy Logic & Genetic Algorithms, Rajsekharan, PHI

CIS-ALT04 Unix and Shell Programming

Unit-1

The UNIX Operating System, File system, General-purpose utilities, The Bourne Shell, Simple filters, Advanced Filters – I, Advanced Filters - II

Unit-2

Line editing with ex, Vi editor, The Process, communication and scheduling, Programming with the Shell, Introduction to System administration.

Unit-3

Signals programming using system calls. Advanced I/O multiplexing. Memory mapped I/O.

Unit-4

Interprocess communication: Pipes, shared memory, semaphores, messages. Advanced inter-process communications. Streams, Pipes, Open server

Text/References:

1. Your UNIX, The Ultimate Guide, Sumitava Das, TMH
2. Design of Unix Operating System, Bach, PHI
3. UNIX Programming Environment, Kernighan & Pike, PHI
4. Learning UNIX Operating System, Peek, SPD/O'REILLY
5. Learning the Vi Editor, Lamb, SPD/O'REILLY
6. Essentials Systems Administration, Frisch, SPD/O'REILLY

CIS-ALT05 Advance Network & Information Engineering (CISCO Mapped)

Unit-1

IP Services: Configure and verify DHCP (IOS Router), Describe the types, features, and applications of ACLs, Standard Sequence numbers, Editing Extended Named Numbered Log option, Configure and verify ACLs in a network environment Named Numbered Log option., Identify the basic operation of NAT, Purpose, Pool, Static, 1 to 1, Overloading, Source addressing, One way NAT, Configure and verify NAT for given network requirements, Configure and verify NTP as a client n Network Device Security,

Unit-2

Configure and verify network device security features such as: Device password security, Enable secret vs enable, Transport, Disable telnet, SSHn VTYs, Physical security, Service password, Describe external authentication methods, Configure and verify Switch Port Security features such as Sticky MAC ?MAC address limitation Static / dynamic, Violation modes, Err disable, Shutdown, Protect restrict, Shutdown unused ports, Err disable recovery, Assign unused ports to an unused VLAN, Setting native VLAN to other than VLAN 1, Configure and verify ACLs to filter network trafficn Configure and verify an ACLs to limit telnet and SSH access to the router, Configure and verify ACLs to filter network trafficn Configure and verify an ACLs to limit telnet and SSH access to the router, Recognize High availability (FHRP), VRRP, HSRP, GLBP, Configure and verify Syslog, Utilize Syslog Output, Describe SNMP v2 & v3 Troubleshooting : Identify and correct common network problems, Utilize netflow data

Unit-3

Troubleshoot and Resolve Spanning Tree operation issues, root switch, priority, mode is correct, port states, Troubleshoot and Resolve routing issues, routing is enabled, routing table is correct correct path selection, Troubleshoot and Resolve OSPF problems, Neighbor Adjacencies, Hello and Dead timers, OSPF area, Interface MTUn Network types, Neighbor states, OSPF topology database, Troubleshoot and Resolve

EIGRP problems, neighbor adjacencies, AS number, Load balancing, Split horizon Troubleshoot and Resolve interVLAN routing problems, Troubleshoot and Resolve WAN implementation issues, Monitor NetFlow statistics ? Troubleshoot etherchannel problems

Unit-4

Troubleshoot and correct common problems associated with IP addressing and host configurations, Troubleshoot and Resolve VLAN problems, identify that VLANs are configured, port membership correct, IP address configured, Troubleshoot and Resolve trunking problems on Cisco switches, correct trunk states, correct encapsulation configured, correct vlans allowed, Troubleshoot and Resolve ACL issues, Statistics, Permitted networks, Direction, Interface, Troubleshoot and Resolve Layer 1 problems, Framing, CRC, Runts, Giants, Dropped packets, Late collision, Input / Output errors

Unit-5

Identify different WAN Technologies, Configure and verify a basic WAN serial connection, Configure and verify a PPP connection between Cisco routersn Configure and verify Frame Relay on Cisco routersn Implement and troubleshoot PPPoE.

Text/References:

1. Computer Networks –A. Tanenbaum, (PHI pub.)
2. Data and Computer Communication –Willam Stallings, PHI pub.
3. Data Communication & Network –Forouzan (TMH)
4. Internetworking with TCP/IP Vol I-Comer (PHI pub.)
5. Data Communications and distributed Networks] V.B, Black, (Prentice Hall pub.)
6. W. Stallings: Local and Metropolitan Area Networks, 4th ed., Macmillan, New York, 1993.
7. L. Gracial and I. Widjaja: Communication Networks, Tata-McGraw Hill, New Delhi, 2000.
8. L. L. Paterson and B. S. Davie: Computer Network, Morgan Kaufman, San Mateo, 2000

CIS-ALT06 Information Architecture and Designing

Unit-1

Information Architecture with Meaning, Function, Need, Values and Sectors, Information Architecture in Web Architecture, Information Architecture with Information collection, selection, organization and processing

Unit-2

Information Architecture Vs Software Architecture, Green Information Architecture, Cloud Computing and Information Architecture, Information Architect with Case Studies

Unit-3

Data Architecture, Application Architecture, Enterprise Architecture, Enterprise Security Architecture, Taxonomies, Ontology and Trends

Unit-4

Content Strategies and Knowledge Organization with Traditional and Emerging Approaches, Informatics and Information Architecture, Psychology and User Studies with Information Architecture

Unit-5

Implementing Information Architecture with User Study and Informatics Ethics, Emergence of Process Architecture, Emerging Factors in Information Architecture for healthy Web Systems Designing, Interface and Information Architecture

Text/References:

1. Russell-Rose, T., & Tate, T. (2012). *Designing the search experience: The information architecture of discovery*. Newnes.
2. Resmini, A., & Rosati, L. (2012). A brief history of information architecture. *Journal of Information Architecture*, 3(2).

3. Bernus, P., Mertins, K., & Schmidt, G. J. (Eds.). (2013). *Handbook on architectures of information systems*. Springer Science & Business Media.

Note: At the end of each semester, the overview and detailed structure of Practical/ Projects/Assignments will be provided in each paper. This is for updating the new knowledge into curriculum of the concerned time.



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