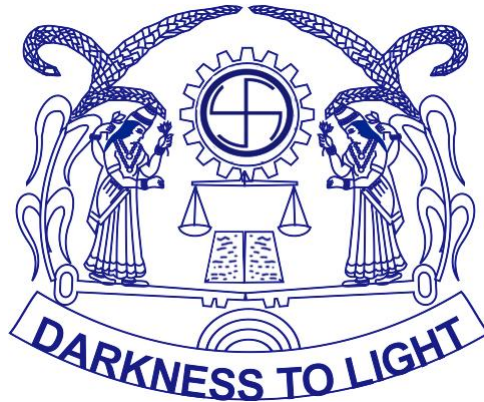# DHANRAJ BAID JAIN COLLEGE
(Autonomous)
Thoraipakkam, Chennai – 600097

Affiliated to the University of Madras

PG DEPARTMENT OF COMPUTER SCIENCE
M.C.A. (Computer Application)

DARKNESS TO LIGHT

SYLLABUS
(Choice Based Credit System)

Total No. of Semesters: **6**

Total No. of Credits: **143**

SCHEME OF EXAMINATIONS
FIRST SEMESTER

S.No.	Course Components	Name of the Course	Credits	Exam Duration(Hrs)	Max. Marks	
					IA	EA
1	Core – 1	Problem solving and Programming	4	3	20	80
2	Core – 2	Data Structures	4	3	20	80
3	Core – 3	Computer Organization	4	3	20	80
4	Core – 4	Practical-I: C Programming Lab	2	3	20	80
5	Core – 5	Practical-II: Data Structure lab	2	3	20	80
6	Non-Major Elective – I	Mathematical foundation and numerical analysis	4	3	20	80
7	Soft skill - I	Language and Communication	2	3	20	80

IA- Internal Assessment ;   EA- External Assessment

SECOND SEMESTER

S.No.	Course Components	Name of the Course	Credits	Exam Duration(Hrs)	Max. Marks	
					IA	EA
8	Core – 6	Operating System	4	3	20	80
9	Core – 7	Object oriented Programming With C++	4	3	20	80
10	Core – 8	Software Engineering	4	3	20	80
11	Core – 9	Practical-III: Object oriented Programming with C++	2	3	20	80
12	Core - 10	Practical-IV: Operating System Lab	2	3	20	80
13	Non-Major Elective – II	Optimizations techniques	4	3	20	80
14	Soft skill – II	Spoken and Presentation Skills	2	3	20	80

THIRD SEMESTER

S.No.	Course Components	Name of the Course	Credits	Exam Duration(Hrs)	Max. Marks IA	EA
15	Core – 11	Java Programming	4	3	20	80
16	Core – 12	Database Management System	3	3	20	80
17	Core – 13	Visual Programming	3	3	20	80
18	Core – 14	Cloud Computing	3	3	20	80
19	Non-Major Elective – III	Accounting and Financial Management	3	3	20	80
20	Core-15	Practical – Java Programming Lab	2	3	20	80
21	Core-16	Practical – Visual programming and RDBMS	2	3	20	80
22	Soft skill-III	Personality Enrichment	2	3	20	80

IA- Internal Assessment ;   EA- External Assessment

FOURTH SEMESTER

S.No.	Course Components	Name of the Course	Credits	Exam Duration(Hrs)	Max. Marks IA	EA
23	Core – 17	Data Communication and Networking	4	3	20	80
24	Core – 18	Computer Graphics	3	3	20	80
25	Core – 19	Elective-I	3	3	20	80
26	Core – 20	Data mining and Data Warehousing	3	3	20	80
27	Core – 21	C# Programming	3	3	20	80
28	Core - 22	Practical – Data Mining and Data warehousing	2	3	20	80
29	Core- 23	Practical – C# Lab	2	3	20	80
30	Soft skill-IV	Foreign Language	2	3	20	80

IA- Internal Assessment ;   EA- External Assessment

FIFTH SEMESTER

S.No.	Course Components	Name of the Course	Credits	Exam Duration(Hrs)	Max. Marks IA	EA
31	Core – 24	Internet Programming	4	3	20	80
32	Core – 25	Soft Computing	4	3	20	80
33	Core – 26	Elective – II	4	3	20	80
34	Core – 27	Elective – III	4	3	20	80
35	Core – 28	Practical – Internet Programming	2	3	20	80
36	Core - 29	Mini Project	2	3	20	80
37		Internship Training	3		20	80

IA- Internal Assessment   EA- External Assessment

SIXTH SEMESTER

S.No.	Course Components	Paper Title	Credit	Max. Marks Internal	External	Total	Hours
38	Core -30	Project	20	60	240	300	3

Elective-I
1. Mobile and Pervasive Computing
2. Software Testing
3. Human Resource Management
4. Artificial Intelligence

Elective-II
1. Knowledge Management
2. Information Security
3. Digital Image Processing
4. Supply chain Management

Elective-III
1. Professional Ethics and Human Values
2. Object Oriented Analysis and Design
3. Cyber Crime
4. E-Commerce

COURSE CODE	COURSE TITLE	L	T	P	C
14P611A	Problem solving and Programming	5			4

UNIT	SYLLABUS
UNIT 1	**Introduction to computer Problem Solving** Introduction – The problem solving aspect – Top down Design – Implementation of algorithms- Program Verifications – Efficiency of Algorithms – Analysis of algorithms
UNIT 2	Introduction – Exchanging the values – counting – Factorial Computation – SINE Computation – Base conversion – Factoring methods – Array Tecniques
UNIT 3	Overview of C – Constants, variables and data types – Operators and expressions – Managing Input/Output Operations – Formatted I/O – decision making – Branching – IF, Nested IF – Switch – Goto – Looping – While, do, for statements
UNIT 4	Arrays – Dynamic and multi-dimensional arrays – Character arrays and strings – String handling functions – User Defined functions – Categories of functions – Recursion – Structures and Unions – Array of Structures – Structures and functions
UNIT 5	Pointers – Declaration, Accessing a variable, character strings, pointers to functions and structures – File management in C – Dynamic memory allocation – Linked lists – Pre processors.

TEXTBOOKS

1. R.G. Dromey, "How to solve it by computer", PHI, 1998
2. E.Balagurusamy, "Programming in Ansi C", Tata McGraw Hill, 2004

REFERENCES:

1. Deitel and Deitel, "C How to program", Addision Wesley, 2001
2. Brian W Kerninghan & Dennis Ritchie, "C Programming Language", PHI,1990
3. Byron S Gottfried, "Schaum's Outline of Programming with C", 2nd ed.,1996.

COURSE CODE	COURSE TITLE	L	T	P	C
14P611B	Data Structures	5			4

UNIT	SYLLABUS
UNIT 1	Abstract data types – asymptotic notations – complexity analysis – Arrays – representation of arrays – operations on arrays – ordered lists – polynomials.
UNIT 2	Linked lists: Singly linked list – circular linked lists – doubly linked lists – general lists – stacks queues – circular queues – Evaluation of expressions.
UNIT 3	Trees – Binary Trees – Binary Tree Traversals – Binary Tree Representations – Binary Search Tree – Threaded Binary Trees – Application of Trees (Sets) – Representation of Graphs – Graph Implementation – Graph Traversals – Application of Graph Traversals – Minimum Cost Spanning Trees – Shortest Path Problems.
UNIT 4	Internal Sorting – Optimal Sorting Time – Sorting Large Objects – Sorting with Tapes – Sorting with Disk.
UNIT 5	Hashing – AVL Trees – Red Black Trees – Splay Trees – B Trees.

BOOKS FOR STUDY AND REFERENCE:

1. E. Horowitz, S, Sahni and Mehta – Fundamentals of Data Structures in C++ - Galgotia 2006.
2. Gregory L. Heileman – Data Structures, Algorithms and Object Oriented Programming – Mc Graw Hill International Editions 1996
3. A.V. Aho, J.D. Ullman, J.E. Hopcraft: Data Structures and Algorithms –Pearson
4. Sahni, Data Structure, algorithms and application, McGraw Hill, 2001.

COURSE CODE	COURSE TITLE	L	T	P	C
14P611C	COMPUTER ORGANIZATION	5			4

UNIT	SYLLABUS
UNIT 1	Number Systems and Conversions – Boolean Algebra and Simplification – Minimization of Boolean Functions – Karnaugh Map, Logic Gates – NAND – NOR Implementation
UNIT 2	Design of Combinational Circuits – Adder / Subtracter – Encoder – Decoder – MUX / DEMUX – Comparators, Flip Flops – Triggering – Master – Slave Flip Flop – State Diagram and Minimization – Counters – Registers.
UNIT 3	Functional units – Basic operational concepts – Bus structures – Performance and Metrics – Instruction and instruction sequencing – Addressing modes – ALU design – Fixed point and Floating point operation .
UNIT 4	Processor basics – CPU Organization – Data path design – Control design – Basic concepts – Hard wired control – Micro programmed control – Pipeline control – Hazards – Super scalar operation.
UNIT 5	Memory technology – Memory systems – Virtual memory – Caches – Design methods – Associative memories – Input/Output system – Programmed I/O – DMA and Interrupts – I/O Devices and Interfaces - Multiprocessor Organization – Symmetric multiprocessors – Cache Coherence – Clusters: Non Uniform Memory Access- Vector Computation.

REFERENCES:

1. Morris Mano, "Digital Design", Prentice Hall of India, Fourth Edition 2007
2. Carl Hamacher, Zvonko Vranesic, Safwat Zaky and Naraig Manjikian, "Computer organization and Embedded Systems", Sixth Edition, Tata McGraw Hill, 2012.

3. William Stallings, "Computer Organization & Architecture – Designing for Performance" 9th Edition 2012.

4. Charles H. Roth, Jr., "Fundamentals of Logic Design", Jaico Publishing House, Mumbai, Fourth Edition, 1992.

5. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software Interface", Fourth Edition, Morgan Kaufmann / Elsevier,2009.

COURSE CODE	COURSE TITLE	L	T	P	C
14P612E	OPERATING SYSTEM	5			4

UNIT	SYLLABUS
UNIT 1	Introduction - Multiprogramming - Time sharing - Distributed system - real-time Systems - I/O structure - Dual-mode operation - Hardware protection - General system architecture - Operating system services - System calls - System programs - System design and implementation. **Process Management:** Process concept - Concurrent process - scheduling concepts - CPU scheduling
UNIT 2	**Process Management contd.:** Scheduling algorithms, Multiple processors Scheduling - Critical section - Synchronization hardware - Semaphores, classical problem of synchronization, Interprocess communication. **Deadlocks:** Characterization, Prevention, Avoidance and Detection.
UNIT 3	Storage management - Swaping, single and multiple partition allocation - paging - segmentation - pages segmentation, virtual memory - demand paging - page replacement and algorithms, thrashing. Secondary storage management - disk structure - free space management - allocation methods - disk scheduling - performance and reliability improvements - storage hierarchy.
UNIT 4	Files and protection - file system organisation - file operations - access methods - consistency semantics - directory structure organisation - file protection - implementation issues - security - encryption.
UNIT 5	**Case Studies:** MS-DOS and UNIX operating systems.

Books for study:

1. A. Silberschatz and P.B. Galvin - Operating System Concepts - Addison-Wesley Publishing Company.
2. A.S. Godbole – Operating Systems – Tata McGraw Hill – 1999.

COURSE CODE	COURSE TITLE	L	T	P	C
14P612G	*OBJECT ORIENTED PROGRAMMING WITH C++*	5			4

UNIT	SYLLABUS
UNIT 1	Introduction to OOP – Overview of C++ - Classes – Structures – Union – Friend Functions – Friend Classes – Inline functions – Constructors – Destructors – Static Members – Scope Resolution Operator – Passing objects to functions – Function returning objects.
UNIT 2	Arrays – Pointers – this pointer – References – Dynamic memory Allocation – functions overloading – Default arguments – Overloading Constructors – Pointers to Functions – Ambiguity in function overloading.
UNIT 3	Operator Overloading – Members Operator Function – Friend Operator Function – Overloading some special operators like [ ], ( ), a comma operator – Inheritance – Types of Inheritance – Protected members – Virtual base class – Polymorphism – Virtual functions – Pure virtual functions.
UNIT 4	Class templates and generic classes – Function templates and generic functions – Overloading a function templates – power of templates – Exception Handling – Derived class Exception – overhandling generic functions – Exception handling functions – terminate() unexpected() – Uncaught – exception();
UNIT 5	Streams – Formations I/O with ios class functions and manipulators – creating own manipulator – overloading << and >> - File I/O – Name spaces – conversion functions – Array based I/O – Standard Template Library (STL).

BOOKS FOR STUDY AND REFERENCE:

1. Herbert Schildt, C++ - The Complete Reference, Third Edition – Tata McGraw Hill – 1999.

2. J.P. Cohoon and J.W. Davidson, C++ Program Design – An Introduction to Programming and Object-oriented Design – 2nd Edition – McGraw Hill 1999.

3. Johnson, C++ programming today, PHI 2002.

COURSE CODE	COURSE TITLE	L	T	P	C
14P612J	SOFTWARE ENGINEERING	5			4

UNIT	SYLLABUS
UNIT 1	The Product – The Process – Project Management Concepts – Software Projects and Project Metrics.
UNIT 2	Software Project Planning – Risk Analysis and Management – Project Scheduling and Tracking Software Quality Assurance.
UNIT 3	Software Configuration Management – System Engineering – Analysis Concepts and Principles – Analysis Modeling.
UNIT 4	Design Concepts and Principles – Architectural Designs – User Interface Design
UNIT 5	Component Level Design – Software Testing Techniques – Software Testing Strategies – Techniques – Metrics for Software.

BOOKS FOR STUDY AND REFERENCES:

1. R S Pressman – Software Engineering A Practitioner's Approach – 5th Edition – McGraw Hill.
2. Ian Sommerville – Software Engineering – 5th Edition – Addison Wesley.

COURSE CODE	COURSE TITLE	L	T	P	C
14P613K	**JAVA PROGRAMMING**	**5**			**4**

UNIT	SYLLABUS
UNIT 1	Introduction to Java – Features of Java – Object Oriented Concepts – Lexical Issues – Data Types – Variables – Arrays – Operators – Control Statements. Classes – Objects – Constructors – Overloading method – Access Control – Static and fixed methods – Inner Classes – String Class – Inheritance – Overriding methods – Using super – Abstract class.
UNIT 2	Packages – Access protection – Importing Packages – Interfaces – Exception Handling – Throw and Throws – Thread – Synchronization – Messaging – Runnable Interface – Inter thread Communication – Deadlock – Suspending, Resuming and Stopping threads – Multithreading.
UNIT 3	I/O Streams – File Streams – Applets – Events Handling – String Objects – String Buffer – Char Array – Java Utilities – Code Documentation.
UNIT 4	Network basics – Socket Programming – Proxy Servers – TCP / IP Sockets – Net Address – URL – Datagrams – Working with windows using AWT Classes – AWT Controls – Layout Managers and Menus, JDBC connectivity.
UNIT 5	Servlets – Environment and Role – Architectural Role for servlets – HTML support – Generation – Server side – Installing Servlets – Servlets APT – servlet life cycle – HTML to servlet communication.

BOOKS FOR STUDY AND REFERENCES:
1. Cay S. Horstmann, Gary Cornell – Core Java 2 Volume I – Fundamentals – Addison Wesley, 1999.
2. P Naughton and H Schildt – Java 2 (The Complete Reference) – Third Edition. TMH, 1999.
3. D R Callaway, Inside Servlets, Addison Wesley.
4. Karl Moss, Java Servlets, TMH Edition.
5. Web using java 2 PHI, 2000.

COURSE CODE	COURSE TITLE	L	T	P	C
14P613L	DATABASE MANAGEMENT SYSTEMS	5			3

UNIT	SYLLABUS
UNIT 1	Database Concepts – ER Model – Basic Concepts – Constraints – Keys ER Diagram – Reduction of ER Schema – UML – Design of an ER Database Schema – Relational Model – Relational Algebra – Views – Tuple Relational Calculus – Domain Relational Calculus – Relational Database – SQL – Basic Structure – Set Quotation – Sub Queries – Join Relation – DDL – DML – Embedded SQL, QBE.
UNIT 2	Integrity & Security – Domain Constraints – Referential Integrity – Assertion – Triggers – Authorization – in SQL – Relational Database Design – 1st, 2nd, 3rd, 4th, BCNF normal forms – Decomposition.
UNIT 3	Object Relational Data Model – Nested Relations – Complex types – Inheritance – Reference – types – Querying with complex types – Functions & Procedures – Object Oriented Versus Object Relational – Introduction to XML concepts – Storage and File Structure – Physical Storage Media – File Organization, Data Dictionary Storage, Storage for Object Oriented Database, Organization of records in files.
UNIT 4	Indexing and Hashing – Basic Concepts – Static Hashing – Dynamic – Multiple Key Access – Query Processing – Selection Operation – Sorting – Join Operation Transaction – Concepts – State – Atomicity & amiability – Serializability – Transaction Definition in SQL – Concurrency Control – Protocols – Deadlock Handling.
UNIT 5	Database System Architecture – Centralized & Client Server Architecture – Server System Architecture – Parallel Systems – Networks Types – Distributed Database – Homogeneous & Heterogeneous Database – Distributed Data Storage – Case Study – Oracle.

BOOKS FOR STUDY AND REFERENCES:

1. A. Silbersehatz, H.F. Korth and Sudharsan, Database System Concepts – 4th Edition, McGraw Hill International Edition.
2. Jeffrey D. Ullman: Principles of Data Base Systems, Galgotia Publishers, 1988.
3. C.J. Date, An Introduction to Data Base Systems, 3rd Edition, Narosa (1985)

COURSE CODE	COURSE TITLE	L	T	P	C
14P613M	**VISUAL PROGRAMMING**	**5**			**3**

UNIT	SYLLABUS
UNIT 1	Customizing a Form – Writing Simple Programs – Toolbox – Creating Controls – Name Property – Command Button – Access keys – Image Controls – Text Boxes – Labels – Message Boxes – Grid Editing Tools – Variables – Data Types – String – Numbers.
UNIT 2	Displaying Information – Determinate Loops – Indeterminate Loops – Conditionals – Built-in functions – Functions and Procedures
UNIT 3	Lists – Arrays – Sorting and Searching – Records – Control Arrays – Combo Boxes – Grid Control – Projects with Multiple forms – Do Events and Sub Main – Error Trapping.
UNIT 4	VB Objects – Dialog Boxes – Common Controls – Menus – MDI Forms – Testing, Debugging and Optimization – Working with Graphics.
UNIT 5	Monitoring Mouse activity – File Handling – File System Controls – File System Objects – COM/OLE Automation – DLL Servers – OLE Drag and Drop.

BOOKS FOR STUDY AND REFERENCE:

1. Gary Cornell – Visual Basic 6 from the Ground up – Tata McGraw Hill, 1999.
2. Noel Jerke – Visual Basic 6 (The Complete Reference) - Tata McGraw Hill, 1999.

COURSE CODE	COURSE TITLE	L	T	P	C
14P613M	**CLOUD COMPUTING**	5			3

UNIT	SYLLABUS
UNIT 1	Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services .
UNIT 2	Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds
UNIT 3	Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.
UNIT 4	Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files .
UNIT 5	Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis

REFERENCES

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

2. Haley Beard, Cloud Computing Best Practices for Managing and Measuring
Processes for On-demand Computing, Applications and Data Centers in the
Cloud with SLAs, Emereo Pty Limited, July 2008

COURSE CODE	COURSE TITLE	L	T	P	C
14P614Q	DATA COMMUNICATION AND NETWORKING	5			4

UNIT	SYLLABUS
UNIT 1	Introduction to data communication, network protocols & standards and standard organization line configuration – topology – Transmission mode – Classification of network – OSI model – layer of OSI model.
UNIT 2	Parallel and serial Transmission – DTE/DCE/such as EIA-449, EIA-202 and X21 interface – Interface standards – Modems – Guided Media – Unguided Media – Performance – types of Error – Error Detection – Error corrections
UNIT 3	Multiplexing – Types of Multiplexing – Multiplexing Application – Telephone system – Project 802 – Ethernet – Token Bus – Token Ring – FDDI – IEEE 802.6 – SMDS – Circuit Switching – Packet Switching – Message switching – Connection Oriented and Connectionless services.
UNIT 4	History of Analog and Digital Network – Access to ISDN – ISDN Layers – Broadband ISDN – X.25 Layers – Packet Layer Protocol – ATM – ATM Protocol.
UNIT 5	Repeaters – Bridges – Routers – Gateway – Routing algorithms – TCP/IP Network, Transport and Application Layers of TCP/IP – World Wide Web .

BOOKS FOR STUDY:

1. Behrouz and forouzan - Introduction to Data Communication and Networking – 2nd Edition – TMH- 2001.

2. Jean Walrand – Communication Networks (A first Course) – Second Edition – WCB/McGraw Hill – 1998.

COURSE CODE	COURSE TITLE	L	T	P	C
14P614R	COMPUTER GRAPHICS	5			3

UNIT	SYLLABUS
UNIT 1	Video Display Devices – Raster Scan Systems – Input Devices – Hard Copy Devices – Graphics Software – Output Primitives.
UNIT 2	Two-Dimensional Transformation – Clipping – Window-view port mapping.
UNIT 3	User dialogue – Input of Graphical Data – Input Functions – Input Device Parameters – Picture Construction Techniques – Virtual Reality Environments.
UNIT 4	Three Dimensional Concepts – 3D Transformations – 3D Viewing
UNIT 5	Visible – Surface Detection: Back – Face Detection – Depth – Buffer Method – Scan Line Method – A Buffer Method – Properties of light – Infinitive Color Concepts – RBG Color Models – Computer Animation.

BOOKS FOR STUDY AND REFERENCES:

1. D Hearn and M P Baker – Computer Graphics – 2nd Edition – PHI – 1998.
2. W M Neumann and R F Sproull – Principle of Interactive Computer Graphics – McGraw Hill – 1979.
3. Foley, Van Dan, Hughes – Computer Graphics – Addison Wesley – 2000.
4. Steven Harrington – Computer Graphics, McGraw Hill, 1989.

COURSE CODE	COURSE TITLE	L	T	P	C
14P614S	DATA WAREHOUSING AND DATA MINING	5			3

UNIT	SYLLABUS
UNIT 1	Introduction: Data Mining Tasks – Data Mining versus Knowledge Discovery in Databases – Relational Databases – Data Warehouses – Transactional Databases – Object Oriented Databases – Spatial Databases – Temporal Databases – Text and Multimedia Databases – Heterogeneous Databases - Mining Issues – Social Implications of Data Mining.
UNIT 2	Data Preprocessing: Reasons for Preprocessing the Data – Data Cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization.
UNIT 3	Data Mining Techniques: Association Rules-Frequent Pattern Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint based Association Mining.
UNIT 4	Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree Induction – Bayesian Classification – Backpropagation – Other Classification Methods – Prediction – Classifier Accuracy.
UNIT 5	Clustering Techniques: Cluster Analysis – Clustering Methods – Hierarchical Methods – Density based Methods – Outlier Analysis – Spatial Mining , Multimedia Mining, Text Mining and Web Mining

TEXTS BOOK:

1. J. Han and M. Kamber, "Data Mining **:** Concepts and Techniques", 2nd Edition, Morgan Kaufmann, 2006.

REFERENCE BOOKS:

1. M. H. Dunham, "Data Mining : Introductory and Advanced Topics" , Pearson Education,2006
2. Paulraj Ponnaiah, "Data Warehousing Fundamentals", Wiley , 2001.
3. S.N. Sivananda and S. Sumathi, "Data Mining : Concepts, Tasks and Techniques" , Thomson , 2006.
4. G.K Gupta, "Introduction to Data Mining with Case Studies", PHI, 2006.

COURSE CODE	COURSE TITLE	L	T	P	C
14P614T	**C# PROGRAMMING**	**5**			**3**

UNIT	SYLLABUS
UNIT 1	Introduction to C # - Overview of C#: Programming structure of C#, - Literals, variables and data types - scope of variables, boxing and unboxing.- Operators and expression -Decision making and branching -Decision making and looping - Methods in C# : declaring methods, the main method, invoking methods, nesting of methods, methods parameters, pass by value, pass by reference, the output parameters, variable arguments list, method overloading.
UNIT 2	Arrays - String handling - Classes and Objects : Basic principles of OOP's, class, objects, constructors, static members, static constructors, private constructors, copy constructors, destructors, member initialization, the this reference, nesting of classes, constant members, read only members, properties, indexers.
UNIT 3	Inheritance and polymorphism : classical inheritance, containment inheritance, defining a subclass, visibility control, defining subclass constructors, multilevel inheritance, hierarchical inheritance, overriding methods, hiding methods, abstract classes, abstract methods,sealed classes : Preventing inheritance, sealed methods, polymorphism.
UNIT 4	Interfaces : Multiple Inheritance : defining an interface, extending an interface, implementing interface, interface & inheritance, explicit interface implementation, abstract class and interface. - Operator overloading : overloadable operators, need for operator overloading, defining Operator overloading, overloading unary operators, overloading binary operators, overloading comparison operator.
UNIT 5	Managing Errors and Exceptions : Types of errors, exceptions, syntax of exception handling code, multiple catch statement, the exception hierarchy, general catch handler, using final statement, nested try blocks, throwing our own exceptions, checked and unchecked operators,using exceptions for debugging.

Books for References
1.C# programming by Balguruswamy.
2. Pro C# 2008 and the .NET 3.5 Platform, Fourth Edition (Windows.Net) Author: Andrew Troelsen
3. Illustrated C# 2008 (Windows.Net) Author: Daniel Solis
4. Professional C# 2008,Authors: Christian Nagel, Bill Evjen, Jay Glynn, and Morgan Skinner
5. Microsoft Visual C# 2008 Step by Step,Author: John Sharp

COURSE CODE	COURSE TITLE	L	T	P	C
14P614ZA	SOFTWARE TESTING	5			3

UNIT	SYLLABUS
UNIT 1	Introduction : Purpose – Productivity and Quality in Software –Testing Vs Debugging – Module for Testing – Bugs – Types of Bugs – Testing and Design Style
UNIT 2	Flow/Graphs and Path Testing – Achievable paths – Path instrumentation – Application – Transaction Flow Testing Techniques – Data Flow Testing Strategies
UNIT 3	Domain Testing : Domains and Paths – Domains and Inter face Testing – Linguistic – Metrics – Structural Metric – Path Products and Path Expressions.
UNIT 4	Syntax Testing – Formats – Test Cases – Logic Based Testing – Decision Table – Transition Testing – States, States Graph, State Testing.
UNIT 5	Verification and Validation – Fundamental Tools- Levels of Testing – Testing Approaches – Types of Testing – Test Plan –Software Testing Tools: WinRunner –Skill Test

Recommended Texts

i) B.Beizer, 2003, Software Testing Techniques, II Edn., Dream Tech India., New Delhi.
ii) K.V.KK.Prasad, 2005,Software Testing Tools, DreamTech. India, New Delhi.

Reference Books

i) I. Burnstein, 2003,Practical Software Testing , Springer International Edn.
ii) E. Kit, 1995, Software Testing in the Real World: Improving the Process, Pearson Education, Delhi.
iii) R.Rajani, and P.P.Oak,2004, Software Testing, Tata Mcgraw Hill, New Delhi.

COURSE CODE	COURSE TITLE	L	T	P	C
14P615U	**INTERNET PROGRAMMING**	5			4

UNIT	SYLLABUS
UNIT 1	Internet Basic – Introduction to HTML – List – Creating Table – Linking document – Frame Graphics to HTML Doc – Style sheet basic – Add style to document - Creating style sheet rules – Style sheet properties – Font – Text – List – Color and background color – box – displaying properties
UNIT 2	Introduction to JavaScript – Advantage of JavaScript – JavaScript Syntax –Datatype -variable – Array – Operator and Expression – Looping Constructor – Functions – Dialog box - DOM
UNIT 3	Introduction to .Net Framework - Introducing ASP .NET – Creating and deploying ASP .NET applications – Web forms – Web controls – working with events – Rich web controls – Custom web controls – Validation controls – Debugging ASP .NET pages.
UNIT 4	Introduction to web services – Web services Infrastructure – SOAP – Building a web service – Deploying and publishing web services – Finding web services – Consuming web services
UNIT 5	Basics of ADO .NET – Changes from ADO – Data Table – Data Views – Data Set – Data Relation Type – ADO .NET Managed Providers – OleDb and SQL Managed Providers – OleDb Data Adapter Type.

References Books

1.HTML Java Script,DHTML and PHP by Ivan Bayross

2.HTML,XHTML,CSS by Steven M.Schafer.

3.Java Script Demystified by Jim Keogh

4.Complete Reference ASP.Net by Mac Donald.

COURSE CODE	COURSE TITLE	L	T	P	C
14P615V	**SOFT COMPUTING**	**5**			**4**

UNIT	SYLLABUS
UNIT 1	Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics .
UNIT 2	Introduction, Building block hypothesis, working principle, Basic operators and Terminologies like individual, gene, encoding, fitness function and reproduction, Genetic modeling: Significance of Genetic operators, Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, GA optimization problems, JSPP (Job Shop Scheduling Problem), TSP (Travelling Salesman Problem),Differences & similarities between GA & other traditional methods, Applications of GA.
UNIT 3	Machine Learning using Neural Network, Adaptive Networks – Feed Forward Networks – Supervised Learning Neural Networks – Radial Basis Function Networks - Reinforcement Learning – Unsupervised Learning Neural Networks – Adaptive Resonance Architectures – Advances in Neural Networks
UNIT 4	Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions-Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making
UNIT 5	Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification and Regression Trees – Data Clustering Algorithms – Rule base Structure Identification – Neuro-Fuzzy Control – Case Studies.

REFERENCES:

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall of India, 2003
2. Kwang H.Lee, "First course on Fuzzy Theory and Applications", Springer–Verlag Berlin Heidelberg, 2005.
3. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1995.
4. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edn., 2003.
5. David E. Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, 2007.

COURSE CODE	COURSE TITLE	L	T	P	C
14P61ZC	*INFORMATION SECURITY*	5			4

UNIT	SYLLABUS
UNIT 1	Introduction: Security- Attacks- Computer criminals- Method of defense Program Security: Secure programs- Non-malicious program errors- Viruses and other malicious code- Targeted malicious code- Controls against program threats.
UNIT 2	Operating System Security: Protected objects and methods of protection- Memory address protection- Control of access to general objects- File protection mechanism- Authentication: Authentication basics- Password- Challenge-response- Biometrics.
UNIT 3	Database Security: Security requirements- Reliability and integrity- Sensitive data- Inferance- Multilevel database- Proposals for multilevel security.
UNIT 4	Security in Networks: Threats in networks- Network security control- Firewalls- Intrusion detection systems- Secure e-mail- Networks and cryptography- Example protocols: PEM- SSL- Ipsec.
UNIT 5	Administrating Security: Security planning- Risk analysis- Organizational security policies- Physical security - Legal- Privacy- and Ethical Issues in Computer Security - **P**rotecting programs and data- Information and law- Rights of employees and employers- Software failures- Computer crime- Privacy- Ethical issues in computer society- Case studies of ethics.

Recommended Texts

1. C. P. Pfleeger, and S. L. Pfleeger, Security in Computing, Pearson Education, 4th Edition, 2003
2.   Matt Bishop, Computer Security: Art and Science, Pearson Education, 2003.

COURSE CODE	COURSE TITLE	L	T	P	C
14P61ZB	PROFESSIONAL ETHICS AND HUMAN VALUES	5			4

UNIT	SYLLABUS
UNIT 1	Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality
UNIT 2	Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories.
UNIT 3	Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study
UNIT 4	Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island and chernobyl case studies. Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination.
UNIT 5	Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-sample code of Ethics like ASME, ASCE, IEEE, Institution of Engineers(India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers(IETE),India, etc.

TEXT BOOKS

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996.

2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

REFERENCES

1. Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint)

2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)

3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.

4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.