GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS) KUMBAKONAM

Department of Computer Science

M.Sc COMPUTER SCIENCE PG - SYLLABUS

(2017 Onwards)

2017-2018

GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS) KUMBAKONAM

M.Sc., Computer Science - Course Structure under CBCS

(For the candidates to be admitted from the year June 2017 - 2018 onwards)

SEMESTER I

Course Type	Course Code	Title of the Course	Hrs/ Week	Credits	Exam Hrs	Marks		
						CIA	ESE	Total
CC I	P17CSC101	Mathematical Foundations	6	4	3	25	75	100
CC II	P17CSC102	Object Oriented Analysis and Design & Unified Modeling Language	6	4	3	25	75	100
CC III	P17CSC103	Advanced Java Programming	6	4	3	25	75	100
CC IV	P17CSC104	Distributed Operating System	6	4	3	25	75	100
CC V	P17CSC104P1	Advanced Java Programming Lab	6	4	3	40	60	100
		TOTAL	30	20		-	-	500

SEMESTER II

Course Type	Course Code	Title of the Course	Hrs/ Week	Credits	Exam Hrs	Marks		
						CIA	ESE	Total
CC VI	P17CSC206	Microprocessors and Microcontrollers	5	4	3	25	75	100
CC VII	P17CSC207	Compiler Design	5	4	3	25	75	100
CC VIII	P17CSC208	Programming in C# and .NET Framework	5	4	3	25	75	100
CC IX	P17CSC209P2	Programming in .Net Lab	5	4	3	40	60	100
EC- I		Any one from the given list	5	4	3	25	75	100
EC -II		Any one from the given list	5	4	3	25	75	100
		TOTAL	30	24				600
NCGPA (Internship)	INT	Internship		2		-	-	-

SEMESTER III

Course Type	Course Code	Title of the Course	Hrs/ Week	Credits	Exam Hrs	Marks		
						CIA	ESE	Total
CC X	P17CSC310	Data Mining	5	4	3	25	75	100
CC XI	P17CSC311	Web Technology	5	4	3	25	75	100
CC XII	P17CSC312P3	Open Source Lab	5	4	3	25	75	100
CC XIII	P17CSC313P4	Web Technology Lab	5	4	3	40	60	100
EC -III		Any one from the given list	5	4	3	25	75	100
EC -IV		Any one from the given list	5	4	3	25	75	100
		TOTAL	30	24				600

SEMESTER IV

Course Type	Course Code	Title of the Course	Hrs/Week	Credits	Exam Hrs	Marks CIA	Marks ESE	Marks Total
CC XIV	P17CSC410	Advanced Computer Architecture	5	4	3	25	75	100
EC -V		Any one from the given list	5	4	3	25	75	100
	P17CSPW411	Major Project Dissertation = 100 Marks [2 reviews = 20+20 marks Report Valuation = 40 marks] Viva = 20 Marks	20	14	3	-	-	100
		TOTAL	30	22				300
		GRAND TOTAL	-	90			-	2000

Total Hours: 120   Credits: 90   Marks: 2000

Recommended credits distribution: (Total should not be less than 90 credits)

Course Type	Course	Credits	Total Credits
Core (Theory)	10	4	40
Core (Practical)	4	4	16
Core(Major Project)	1	14	14
Elective	5	4	20
Total	**20**		**90**

List of Elective Courses (For 2017 - 2018)

Elective	Course code	Title of the Paper
I	P17CSCEC1:1	Mobile Communications
	P17CSCEC1:2	Soft Computing
	P17CSCEC1:3	Bio Informatics
II	P17CSCEC2:1	Network Security
	P17CSCEC2:2	Software Project Management
	P17CSCEC2:3	Genetic Algorithms
III	P17CS3EC3:1	Cloud Computing
	P17CS3EC3:2	Grid Computing

	P17CS3EC3:3	Digital Image Processing
IV	P17CS3EC4:1	Open Source Technologies
	P17CS3EC4:2	Artificial Neural Networks
	P17CS3EC4:3	Robotics
V	P17CS3EC5:1	Software Quality Assurance and Testing
	P17CS3EC5:2	Pervasive Computing
	P17CS3EC5:3	Pattern Recognition

MATHEMATICAL   FOUNDATIONS

Objective :

To know the applications of graph theory, computer representations of graph, fundamental ideas of mathematical logic, concepts of set theory and boolean algebra.

UNIT I

Mathematical Logic - Introduction-Statements and Notations – Connectives - Negation - Conjunction - Disjunction - Statement Formulas and Truth Tables – Logical Capabilities of Programming Languages - Conditional and Biconditional - Well-Formed Formulas Tautologies - Equivalence of Formulas - Duality Law - Tautological Implications - Formulas With Distinct Truth Table - Functionality Complete Sets of Connectives - Two-State Devices and Statement Logic - Normal Forms - Disjunctive Normal Forms - Conjunctive Normal Forms-Principle Disjunctive Normal Form-Principle Conjunctive Normal Forms-Ordering and Uniqueness of Normal Forms-Completely Parenthesized Infix Notation and Polish Notation – The theory of inference for the statement calculus – validity using truth tables- rules of inference – consistency of premises and indirect method of proof – automatic theorem proving.

UNIT II

Set Theory – Introduction - Basic Concepts of Set Theory – Notation - Inclusion and Equality of Sets - The Power Set-Some Operations on Sets - Venn Diagrams - Some Basic Set Identities - The Principle of Specification - Ordered Pairs - and n-tuples - Cartesian Products - Representation of Discrete Structures - Data Structures - Storage Structures - Sequential Allocation - Pointers and Linked Allocation An Application of Bit Represented Sets.

UNIT III

Relations and ordering-Relations-Properties of Binary Relations In a Set-Relation Matrix and The Graph of a Relation-Partition and Covering of a Set-Equivalence Relations – Compatibility Relations-Composition of Binary Relations Partial Ordering-Partially Ordered Set: Representation and Associated Terminology-Functions-Definition and Introduction-Composition of Functions-Inverse functions - Binary and n-ary Operation-Characteristics Function of a Set Hashing Functions.

UNIT IV

Introduction: What is Graph-Application of Graph-Finite and Infinite Graph-Incidence and Degree-Isolated Vertex, Pendant Vertex and Null Graph-Isomorphism-Subgraphs-Walks, Pathsand Circuit-Operation of Graphs-Trees-Some Properties Of Trees-Pendant Vertices in a Tree.

UNIT V

Cut Sets-Fundamental Circuits and Cut Sets-Incidence Matrix-Circuit Matrix-Cut-Set Matrix-Path Matrix-Adjacency Matrix.

Text Book :
For UNIT I, II, III : Discrete Mathematical Structures With Applications to Computer Science - J.P. Tremblay, R. Manohar
For UNIT IV, V : Graph Theory - Narsingh Deo.

Reference :
1.“Discrete Mathematics ”,Seymour Lipschutz and Mare Laris Lipson, m2nd Edn., Schaum’s outline by Tata Mc GrawHill Publishing Company Ltd, New Delhi 1999.
2. “Introductory Mathematical Statistics”, Erwin Kryszig, Zohn Wiley and sons, New York,1990.

OBJECT ORIENTED ANALYSIS AND DESIGN & UNIFIED MODELING LANGUAGE

Objective :

To learn the concept of Object-Oriented Methodology for developing a software application and to gain familiarity with Object Oriented Analysis and Design.

UNIT I

An overview of object oriented systems development & Life cycle. Various object oriented methodologies.

UNIT II

Object oriented analysis – Use cases – Object Classification, relationships, attributes, methods.

UNIT III

The Importance of modeling-Principles of modeling-Object Oriented modeling-Overview of the UML-A Conceptual Model of the UML-Architecture-Software Development Life Cycle-Basic Structural Modeling-Classes-Relationships-Common mechanisms-Diagrams-Class diagrams.

UNIT IV

Basic Behavioral Modeling-Advanced Behavioral Modeling-Events and signals-state machines-Processes and Threads-State chart diagrams.

UNIT V

Architectural Modeling – Components – Deployment – Collaborations - Patterns and Frameworks - Component Diagrams - Deployment Diagrams - Systems and Models.

Text Book(s)

1. Bahrami Ali, "Object oriented systems development", Irwin McGrawHill, 2005 (First 2 Units covered here).
   Unit – I : Chapter 1,2,3.   Unit – II : Chapter - 6,7,8

2. Booch Grady, Rumbaugh James, Jacobson Ivar, "The Unified Modeling Language" – user Guide, Pearson Education, 2006 (ISBN 81-7758-372-7) (Unit - 3,4,5 covered here).
   Unit - III : Section1 - (Chapter-1,2,3), Section2 - (Chapter-4,5,6,7,8).
   Unit - IV : Section 4 - (Chapter-15,16,17,18,19), Section5-(Chapter-20,21,22,24).
   Unit - V : Section 6 - (Chapter-25,26,27,28,29,30,31).

ADVANCED JAVA PROGRAMMING

Objective :

To obtain the basic knowledge of object oriented programming, concepts of basic JAVA, advanced JAVA Server side Scripting (JSP) and to understand the detail idea of JAVA programming

UNIT I
JDBC: Java API for Database Connectivity: Introduction to JDBC – Connecting to a Remote Database – Performing Database Queries and Updates – The JDBC API – Advanced Techniques.

UNIT II
Networking: Networking Basics – Java and the Net - InetAddress – TCP/IP client sockets– URL – URL Connection – – TCP/IP Server sockets – A Caching Proxy HTTP Server - Datagrams – Inet4Address and Inet6Address – The URI Class

UNIT III
Images: File Formats – Image Fundamentals – ImageObserver – Double Buffering – Media Tracker – ImageProducer – ImageConsumer – ImageFilter – Cell Animation – Additional Imaging Classes. New I/O, Regular Expressions, and Other Packages: The Core Java API Packages – New I/O Packages – Regular Expression Processing – Reflection – RMI – Text Formatting.

UNIT IV
Java Beans: What is a Java Bean? – Advantages of Java Beans – Application Builder Tools – Using the Bean Developer Kit – JAR Files – Introspection – Developing a Simple Bean Using the BDK – Using Bound Properties – Using the BeanInfo Interface – Constrained Properties – Persistence – Customizers – The Java Bean API – Using Bean Builder.
A Tour of Swing: JApplet – Icons and Labels – Text Fields – Buttons – Combo Boxes – Tabbed Panes –Trees – Tables - AWT Classes Working with Graphics,Color and Font.

UNIT V
Servlets: Background – The Life Cycle of a Servlet – Using Tomcat For Servlet Development – A simple Servlet – The Servlet API – The javax.servlet Package – Reading Servlet Parameters – The javax.servlet.http Package – Handling HTTP Requests and Responses – Using Cookies – Session Tracking – Security Issues.

Text Book(s):
1. "Java 2 Programming Bible", Aaron Walsh, Justin Couch and Daniel H. Steinberg – IDG Books India(P) Ltd, First Edition 2000 (UNIT I: Chapter – 16).

2. " The Complete Reference : Java 2", Herbert Schildt , Tata McGraw Hill, 2002. (Chapter – 18,19,20,23,24,25,26,27)

Reference Books :
1. Deitel & Deitel, "Java How to Program", Pretice Hall, 5th Edition, 2002.
2. Peter Haggar, "Practical java: Programming Language Guide", Addison – Wesley Pub Co, 1st Edition, 2000.

3. Bruce Eckel, "Thinking in Java", Pearson Education Asia, 2nd Edition, 2000.

DISTRIBUTED OPERATING SYSTEM

Objective :

To provide fundamental concepts in the design of the Unix Operating System and Design Principles that is applicable to distributed operating system.

UNIT I

Distributed Computing Systems : Evolution – Models – Distributed Operating System – Issues in designing DOS – Distributed Computing environment

UNIT II

Communication in Distributed System : Protocols – Features of a Good Message Passing System – Issues in IPC by Message Passing – Synchronization – Buffering – Process addressing – Failure handling – Group Communication – Synchronization : Clock Synchronization – Event ordering – Mutual Exclusion – Deadlock .

UNIT III

Security : Potential Attacks to Computer systems – Cryptography – Authentication – Access control – Digital Signatures – Design Principles.

UNIT IV

File System Structure : History – System structure – User perspective Internal Representation of files: Inodes – Structure of a regular file – Directories – Conversion of a path to an inode – Super block – Inode Assignment to a new file – Allocation of Disk blocks System Calls for the file system: Open – Read – Write – Close – File creation – Creation of special files – Change Directory, root owner and mode – stat and fstat - pipes – dup – mounting and unmounting file systems – link and unlink.

UNIT V

Interprocess Communication: Process tracing – System V IPC – Sockets Multiprocessor Systems: Problem of multiprocessor systems – solution with master and slave processors – solution with semaphores.

Text Book:

1. For UNITs 1,2, and 3: Pradeep K. Sinha, "Distributed System Concepts and Design", PHI Pvt. Ltd, 1998
2. For UNITs 4 and 5: Marice J Bach, "The Design of UNIX OS",

Reference Book:
1. Andrew S. Tanenbaum, "Modern Operating Systems"

2. W. Richard Stevens, "UNIX Network Programming"

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Semester I - Core Paper V

ADVANCED JAVA PROGRAMMING LAB

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List of exercises for practical Laboratory

1. Write a Program for implementing simple calculator using Swing controls.
2. Create a Japplet using swing control, which will create the layout shown below and handle necessary events.

<div align="center">Format</div>

Enter your Name:
Enter your Age:
Select your s/w:* Oracle *Visual Basic
*Java
Select your city:*Delhi *Mumbai
*Chennai
Ok   Cancel

3. Use JDBC Connectivity and create Table, insert and update data.
4. Write a program in Java to implement a Client/ Server application using RMI.
5. Write a program in Java to create a Cookie and set the expiry time of the same.
6. Write a program in Java to create Servlet to count the number of visitors to a web page.
7. Write a program in Java to create a form and validate a password using Servlet.
8. Develop a Java Bean to demonstrate the use of the same.
9. Write a program in Java to convert an image in RGB to a Grayscale image.
10. Develop Chat Server using Java.

MICROPROCESSOR AND MICROCONTROLLERS

Objective :

To realize the 8086 Microprocessor Architecture, Operations, Programming, and to understand the concepts of Embedded Systems and 8051 Microcontroller.

UNIT I

8086 Software Aspects: Intel 8086 Microprocessors – Architecture – Pin Details of 8086 – Addressing modes in 8086 – Instruction set of 8086 - Assembly language programming – Linking and relocation – stacks – procedures – Macros – Interrupts and Interrupt Routines – Byte & String Manipulation - 8086 System Design: Basic Configuration – System Bus timing.

UNIT II

I/O Interfaces: Serial communication Interface – Parallel communication Interface – Programmable Timer – Keyboard and Display Controller – DMA Controller – Interrupt Controller.

UNIT III

Advanced Processors: Intel 80x86 family of processors – Salient features of 80286, 80386, Basic 486 Architecture: 486 memory system and memory management – Features of Pentium memory Pentium memory and I/O systems – Pentium memory management – Introduction to Pentium Pro features.

UNIT IV

8051 Microcontrollers : Introduction to 8051 Microcontrollers – 8051 Instruction Set and Programming – Hardware Features of 8051 – 8051 Interfacing examples.

UNIT V

8096 16 bit Microcontrollers : Overview of Intel 8096 microcontrollers – Instruction Set and Programming of 8096 – Hardware Features of 8096.

Text Books :
1. "Microprocessors and Interfacing", Douglas V.Hall, Tata Mcgraw Hill,1999
2. "The Intel Microprocessors – 8086/8088,80186,286,386,486, Pentium Pro Processor", Barry B. Brey, Prentice Hall of India Pvt. Ltd., 1998
3. "Microprocessors and Microcontrollers", N.SenthilKumar, M.Saravanan and S.Jeevananthan (UNIT IV & V)

Reference Books :
1. "Microcomputer Systems: The 8086 / 8088 Family Architecture, Programming & Design", Yu-Cheng Liu and Glenn A.Gibson, 2nd edition, Prentice Hall of India Pvt. Ltd., 2001
2."Microprocessors and Interfacing", A.P Godse and D.A. Godse

COMPILER DESIGN

Objective :

To acquire the knowledge about the compiler design and to understand the different phases of Compiler.

UNIT I

Introduction to the phase of the Compilers – Lexical Analysis, Regular expression, Non-Deterministic automata, deterministic automata equivalent to NFA – Minimizing the states of DFA – implementation of Lexical analyzer

UNIT II

Syntax Analysis – Top down parsing concepts – Bottom up parsing, handle pruning, shift reducing parsing.

UNIT III

Intermediate code generation: syntax directed definition, construction of syntax trees – Top down translation, bottom up evaluation of inherited and attributed recursive evaluations, assigning space of compiler construction time – Type checking .

UNIT IV

Storage Organization: Storage organization, storage allocation strategies, parameter parsing – Symbol tables – Dynamic storage allocation, Intermediate languages – Representation of declarations – Assigning statement, Boolean expressions – Back Patching, procedure calls

UNIT V

Code generation & Optimization: Design of a code generators – Run time storage management, basic blocks and flow graphs, register allocation & assignment, DAG representation of basic blocks, peep hole optimization, code optimization – the principle source of optimization, optimization of basic blocks, global data flow analysis, loop optimization

Text Book:
1. "Compilers Principles Technical and Tools" – Alfred Aho, Ravi
2. "Compiler construction Principle" – Dhamdare

Reference Book:
1. "Compiler Design" – Reinhard Wilhelm 1995 edition

PROGRAMMING IN C# AND .NET FRAMEWORK

Objective :

To understand the goals and Objectives of the .NET Framework. To apply C#.NET programming techniques to various real world problems.

UNIT I
Review of OOP Concepts – Overview of .NET Framework – Basic Elements of C# - Program Structure and simple Input and Output Operations – Operators and Expressions – Statement – Arrays and Structures.

UNIT II
Inheritance - Namespace – Polymorphism – Interface and Overloading – Multiple Inheritance – Property – Indexes – Delegates – Publish / Subscribe Design patterns – Operator Overloading – Method Overloading.

UNIT III
C# Concepts for creating Data Structures – File Operation – File Management systems – Stream Oriented Operations – Multitasking – Multithreading – Thread Operation – Synchronization.

UNIT IV
Working with XML - Techniques for Reading and Writing XML data – using XPath and Search XML – ADO.NET Architecture – ADO.NET Connected and Disconnected Models – XML and ADO.NET – Simple and Complex Data Binding – Data Grid View Class.

UNIT V
Application Domains – Remoting – Leasing and Sponsorship - .NET Coding Design Guidelines – Assemblies – Security – Application Development – Web Services – Building an XML Web Service – Web Service Client – WSDL and SOAP – Web Service with Complex Data Types – Web Service performance.

Text Books :
1. S. Thamarai Selvi and R.Murugesan "A Textbook on C#", Pearson Education,2003.
2. Stephen C.Perry " Core C# and .NET", Pearson Education ,2006.

Reference Books :
1. Jesse Liberty, "Programming C#", Second Edition, O' Reilly Press,2002.
2. Robinson et al, "Professional C#", Fifth Edition, Wrox Press, 2002.
3. Herbert Schildt, " The Complete Reference: C# ", Tata McGraw Hill, 2004.
4. Andrew Troelsen , "C# and the .NET Platform", A! Press,2003.
5. Thuan Thai and Hoang Q. Lam, ".NET Framework Essentials, Second Edition, O'Reilly, 2002.

Semester II - Core Paper IX

PROGRAMMING IN .NET LAB

1. Design an ASP.Net web form using Html Server Controls to enter Job Seeker's details.

2. Create an ASP.Net web form using Web control to enter E-Mail registration form.

3. Apply appropriate validation techniques in E-Mail registration form using Validation controls.

4. Write an ASP.Net application to retrieve table from MS-Access and display it the client browser using GridView Control.

5. Create a web application using ADO.Net which performs basic data manipulations:

    (i) Insertion (ii) Updating (iii) Deletion (iv) Selection

    Hint: Do operations using Ms-Access and MY SQL.

6. Create an application using Data grid control to access information from table in MY SQL.

7. Create an application using Data list control to access information from table in MY SQL.

8. Job Search Portal.

9. College Portal.

10. Company Portal.

11. Create a website that uses Menu Control.

MOBILE COMMUNICATIONS

Objective :

To learn about the functions of various mobile communication systems.

UNIT I

Introduction: Mobile and Wireless Devices – Simplified Reference Model- Need for Mobile Computing – Wireless Transmission – Multiplexing – Spread Spectrum and cellular systems – Medium Access Control – Comparisons

UNIT II

Telecommunications System: Telecommunication System – GSM – Architecture – Sessions – protocols – Hand over and security – UMTS and IMT 2000- Satellite System

UNIT III

Wireless LAN : IEEE S02.11- Hiper LAN- Bluetooth – MAC Layer – Security and Link Management.

UNIT IV

Mobile IP: Goals – Packet Delivery – Strategies – Registration- Tunneling and Reverse Tunneling – Adhoc networks – Routing Strategies.

UNIT V

WIRELESS APPLICATION PROTOCOL: Wireless Application Protocol (WAP) - Architecture – XML- WML Script – Applications.

Text Books :

1. Jochen Schiller," Mobile Communication", Pearson Education, Delhi, 2000.

Reference Books :

1. "The Wireless Application Protocol: Writing Applications for the Mobile Internet", Sandeep Singhal, et al.

SOFT COMPUTING

Objective:

To Provide necessary Mathematical background for understanding and implementing Soft Computing Techniques such as neural networks, fuzzy systems and genetic algorithm.

UNIT I

Fuzzy Set Theory : Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set – Theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT II

Optimization : Derivative based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative Free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT III

Genetic Planning: evolving plans, evolving heuristics, evolving planners, optimising plans. Ant Colony Optimization: Basic method for the TSP, local search, application to bin packing. Applications: engineering optimisation; scheduling and timetabling; data-mining; neural net design; etc. Some further ideas: co-evolution; evolvable hardware; multi-level Gas; polyploid GAs.

UNIT IV

Neuro Fuzzy Modeling : Adaptive Neuro – Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework – Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT V

Application of Computational Intelligence : Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

Text Books :

1. J.S.R. Jang, C.T. Sun and E. Mizutani, "Neuro Fuzzy and Soft Computing", PHI, Pearson Education, 2004.
2. M. Mitchell: An Introduction to Genetic Algorithms. MIT Press, 1996.
3. W.Banzhaf, P.Nordin, R.E.Keller, F. D. Francone: Genetic Programming:An Introduction. Morgan Kaufmann, 1998.

Reference Books :

1. Timothy J. Ross, "Fuzzy Logic with Engineering Application, " Mc Graw Hill, 1977.
2. Davis E. Goldberg, "Genetic Algorithms Search, Optimization and Machine Learning", Addision Wesley, 1989.
3. S. Rajasekaran and G.A.V. Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003. Emereo Pty Limited, July 2008.
4. Ahmar, Abbas, "Grid Computing A Practical Guide to technology and Applications", Charles River media, 2003.

BIOINFORMATICS

Objective :

To gain knowledge in Bioinformatics and its Applications.

UNIT I

The Central Dogma: Killer Application – Parallel Universes – Watson's Definition – Top Down Versus Bottom Up – Information Flow – Convergence. Database: Definition – Data Management – Data Life Cycle – Database Technology – Interfaces – Implementation.

UNIT II

Network: Geographical Scope – Communication Models – Transmission Technology – Protocols – Bandwidth – Topology – Hardware – Security. Search Engines: The Search Process – The Search Engine Technology – Searching and Information Theory – Computational Methods – Search Engines and Knowledge Management.

UNIT III

Data Visualization: Sequence Visualization – Structure Visualization – User Interface – Animation versus Simulation – General Purpose Technology. Statistics: Statistical Concept – Microarrays – Imperfect Data – Basics – Quantifying Randomness – Data Analysis – Tool Selection – Statistical Of Alignment – Clustering And Classification.

UNIT IV

Data Mining: Methods – Technology Overview – Infrastructure – Pattern Recognition And Discovery – Machine Learning – Text Mining – Tools. Pattern Matching: Fundamentals – Dot Matrix Analysis – Substitution Matrices – Dynamic Programming – Word Method – Bayesian Methods – Multiple Sequence Alignment – Tools.

UNIT V

Modeling and Simulation: Drug Discovery – Fundamentals – Protein Structure – Systems Biology – Tools. Collaboration: Collaboration and Communication – Standards – Issues.

Text Book :
1. "Bioinformatics Computing", *Bryan Bergeron*, Pearson Prentice Hall Education.

Reference Book :
2. "Introduction to Bio Informatics", *T.K.Attwood, D.J.Parry Smith*, Pearson Education, Fourth Impression, 2006.

NETWORK SECURITY

Objective :

To learn the security issues in computer networks. To learn about the threats in Network and Internet security.

UNIT I

Introduction: Security Trends – The OSI Security Architecture- Security Attacks – Security Services – Security Mechanisms – A Model for Network Security – Classical Encryption Techniques: Symmetric Cipher Model – Substitution Techniques – Transposition Techniques – Rotor Machines – Stegnography.

UNIT II

Block ciphers and the Data Encryption Standard: Block cipher principles – The Data Encryption Standard – The Strength of DES – Differential and Linear Cryptanalysis – Block Cipher Design Principles- Public-Key Cryptography and RSA: principles of Public key Cryptosystems – The RSA Algorithm.

UNIT III

Authentication Applications: Kerberos – X.509 Authentication Service – Public-key Infrastructure – Electronic Mail Security: Pretty Good Privacy – S/MIME.

UNIT IV

IP Security: IP Security Overview – IP Security Architecture – Authentication Header – Encapsulating Security Payload – Combining Security Associations – Key Management – Web Security: Web Security Considerations – Secure Socket Layer and Transport Layer Security – Secure Electronic Transaction.

UNIT V

Intruders: Intruders – Intrusion Detection – Password Management – Malicious Software: Viruses and Related Threads – Virus Countermeasures – Distributed Denial of Service Attacks – Firewalls: Firewall Design Principles – Trusted Systems – Common Criteria for Information Technology Security Evaluation.

Text Book :
1.William Stallings, Cryptography and Network Security-Principles and Practices, Prentice-Hall, Fourth Edition, 2003

Reference Books :
1. Johannes A. Buchaman , Introduction to cryptography, Springer-Verlag.
2. Atul kahate , Cryptography and Network Security, TMH.

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SOFTWARE PROJECT MANAGEMENT

Objective :

To introduce the basic concepts of Software Project Management and the various phases in Software Management Framework.

UNIT I

Software Management Renaissance : Conventional Software Management – Evolution of Software Economics – Improving Software Economics – The Old Way and the New.

UNIT II

A Software Management Process Framework: Live-Cycle Phases – Artifacts of the Process – Model-Based Software Architectures – Work Flows of the Process – Check Points of the Process.

UNIT III

Software Management Disciplines–I : Iterative Process Planning – Project Organizations and Responsibilities – Process Automation.

UNIT IV

Software Management Disciplines – II : Project Control and Process Instrumentation – Tailoring the Process

UNIT V

Risk Management : Introduction – Risk – Categories of risk – A framework for dealing with risk – Risk Identification – Risk assessment – Risk Planning – Risk Management – Evaluating risks to schedule – Applying the PERT Technique – Monte Carlo Simulation – Critical Chain Concepts

Text Books:

1. "Software Project Management" - Walker Royce - Pearson Education
2. "Software Project Management" - Bob Hughes & Mike Cotterell - Fourth Edition - 2008 - ISBN: 978 - 0 - 07 - 061985-2

GENETIC ALGORITHMS

Objective:

To learn knowledge about genetic concepts.

UNIT I

Basics of biological evolution - Darwin, DNA, etc. Basics of Gas – selection, recombination and mutation - Choices of algorithm: (mu,lambda) - (mu+lambda), steady-state, CHC, etc. Linkage and epistasis. The standard test functions. Fitness and Objective functions: scaling, windowing etc. Representational issues: binary, integer and real-valued encodings; permutation-based encodings. Operator issues: different types of crossover and mutation, of selection and replacement. Inversion and other operators.

UNIT II

Constraint satisfaction: penalty-function and other methods; repair and write-back; feasibility issues. Experimental issues: design and analysis of sets of experiments by t-tests, F-tests, bootstrap tests etc.Some theory: the schema theorem and its flaws; selection takeover times; optimal mutation rates; other approaches to providing a theoretical basis for studying GA issues.Rival methods: hill-climbing, simulated annealing, population-based incremental learning, tabu search, etc. Hybrid/memetic algorithms.

UNIT III

Multiple-solutions methods: crowding, niching; island and cellular models. Multi-Objective methods: Pareto optimisation; dominance selection; VEGA; COMOGA.

UNIT IV

Genetic programming: functions and terminals, S-expressions; parsimony; fitness issues; ADFs. Evolving rules and rule-sets. SAMUEL and related methods. Classifier systems: the Pittsburgh and Michigan approaches. Credit allocation: bucket-brigade and profit-sharing. Hierarchic classifier systems.

UNIT V

Genetic planning: evolving plans, evolving heuristics, evolving planners, optimising plans. Ant Colony Optimization: Basic method for the TSP, local search, application to bin packing.Applications: engineering optimisation; scheduling and timetabling; data-mining; neural net design; etc. Some further ideas: co-evolution; evolvable hardware; multi-level Gas; polyploid GAs.

Text / References Books:

1. M. Mitchell: An Introduction to Genetic Algorithms. MIT Press, 1996.
2. W. Banzhaf, P. Nordin, R. E. Keller, F. D. Francone: Genetic Programming: An Introduction. Morgan Kaufmann, 1998.
3. E. Bonabeau, M. Dorigo, G. Theraulez: Swarm Intelligence: From Natural to Artificial Systems. Oxford University Press, 1999

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EXTRA CREDIT COURSE
INTERNSHIP

SUBJECT CODE: INT Credit: 2 credits (Extra credits)

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The curriculum includes the internship for students for 30 hours during the summer vacation after the second semester of all PG programs.

OBJECTIVES
The following are the intended objectives of internship training:

• To Enhance the employability skills of the students.

• To expose students to the industrial/Societal environment, which cannot be simulated in the classroom hence creating competent professionals for the industry and other organizations.

• To Provide possible opportunities to learn, understand, and sharpen the real-time technical/managerial skills required at the job.

Duration: 30 hours at the minimum

Period: During the summer vacation which could be completed within the third semester.

Assessment:

1. The assessment of the internship will be based on the feedback given by the internship provider and the report submitted by the student by the mentor.

2. After completion of the internship, the mentor has to make arrangements to get a proper training certificate from the industry/institution.

3. An abstract for details of the internship in the prescribed format has to be submitted by the departments to the COE on time.

4. Two credits are provided for the Internship as extra credits included under the Non-CGPA course for all PG programs.

LETTER FORMAT

GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS), KUMBAKONAM

REQUEST LETTER FROM THE COLLEGE TO INTERNSHIP PROVIDER

To

………………………………………

....

....

Subject: REQUEST FOR INSTITUTIONAL/INDUSTRIAL TRAINING of M.A./M.Com/M.Sc Degree Programme,

Dear Sir/Madam,

You must be aware that our College has made internship mandatory for all M.A./M.Com/M.Sc students.

In view of the above, I request your good self to allow following students of our college for practical training in your esteemed organization. Kindly accord your permission and give at least 30 hours of training for the students to complete the internship.

S.NO	NAME OF THE STUDENT	REG.NO	DISCIPLINE

If vacancies exist, kindly plan for Campus/Off Campus Interviews for_____ batch passing out students in above branches.

A line of confirmation will be highly appreciated.

With warm regards,

Yours sincerely,

Head of the Department.

GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS), KUMBAKONAM
REQUEST LETTER FROM THE COLLEGE TO INTERNSHIP PROVIDER

To
……………………………………
....
....

Subject: REQUEST   FOR   INSTITUTIONAL/INDUSTRIAL   TRAINING   of
       M.A./M.Com/M.Sc Degree Programme,

Dear Sir/Madam,
    Our Students have undergone internship training in your esteemed Organization in the previous years. I acknowledge the help and the support extended to our students during training in previous years.

    In view of the above, I request your good self to allow our following students for practical training in your esteemed organization. Kindly accord your permission and give at least 30 hours of training for the students to complete internship.

S.NO	NAME OF THE STUDENT	REG.NO	DISCIPLINE

    If   vacancies   exist,   kindly   do   plan   for   Campus/Off   Campus   Interview for_____ batch passing out students in above branches.
A line of confirmation will be highly appreciated.

With warm regards,
Yours sincerely,
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

Head of the Department.

FORM - 1
INTERNSHIP DETAILS (THIS WILL BE PREPARED IN CONSULTATION WITH

FACULTY MENTOR AND TO BE MAINTAINED BY tHe department)

Student

Name:_____Reg.No._____Class_____

Campus Address: _____

_____

Phone:_____Email: _____

Internship Provider

Name:_____

Title:_____

Company/Organization:_____

Internship Company Adress_____

_____

_____

Phone:_____Email:_____

Faculty Mentor

Name:_____Phone: _____

Designation:_____Department:_____

Academic Credit Information

Internship Title: _____

Date of Initiation:_____Date of Completion: _____

Total Hours: _____

FORM - 2
STUDENT'S DAYWISE LOG ENTRY
Name andReg.No. of the Student: Name and address of the Internship
                                                                        Provider:

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Period of Internship: From:			To:	
Date	**Hours**	**Details of work done**	**Signature of the Student**	**Signature of the Supervisor**

Signature of the Mentor: Signature of the Internship Provider:

FORM -3

SUPERVISOR EVALUATION OF CANDIDATE

Student Name: _____ Date:_____

Work Supervisor:_____Title:_____

Company/Organization:_____

Internship Address:_____

Dates of Internship: From _____To_____

Please evaluate your candidate by indicating the frequency with which you observed the following behaviors:

Parameters	Needs improvement	Satisfactory	Good	Excellent
Interest in work				
Punctuality				
Reliability				
Responsibility				
Communication				
Team work				
Overall performance				

Additional comments, if any:

Signature of Internship Provider

FORM – 4

STUDENT FEEDBACK OF INTERNSHIP (TO BE FILLED BY STUDENTS AFTER INTERNSHIP COMPLETION)

Student Name:_____ Class: _____

Internship Provider: _____

Address: _____

Title of Internship :_____

Supervisor Email:_____

Faculty Mentor:_ _____

Indicate the degree to which you agree or disagree with the following statements.

This experience has	Strongly Agree	Agree	Disagree
Given me the opportunity to explore a career field			
Allowed me to apply classroom theory to Practice			
Expanded my knowledge			
Helped me develop my written and oral communication skills			
Given me a chance to improve my interpersonal skills			
Provided me with contacts which may lead to future employment			
Helped me clarify my career goals			

Considering your overall experience, how would you rate this internship?
    (Tick one).(Satisfactory/ Good/ Excellent)

                                                    Signature of the Student

FORM – 5

EVALUATION SHEET (FOR MENTOR)

S.NO	NAME OF THE STUDENT	REG.NO	NO. OF ACTUAL INTERNSHIP HOURS	GRADE*

* Evaluation based on report submitted by the student and evaluation by Internship provider.
       (Excellent/ Very good/ Good)

Signature of the Head of the Department   Signature of the Mentor

DATA MINING

Objective :

To reveal the principles of data retrieval from large databases through data mining. To acquire knowledge in different mining principles To acquire knowledge in prediction and classification.

UNIT I

Introduction: Why data Mining? – What is Data Mining? - What kind of Data can be mined? – What kind of Data can be mined? - Which Technologies are used? – Which kinds of Applications are Targeted? – Major Issues in Data Mining – Getting to know your data: Data objects and Attribute Types – Basic Statistical Descriptors of data – Data Visualization – Measuring Data Similarity and Dissimilarity – Data Preprocessing: Data Preprocessing: An Overview – Data Cleaning – Data Integration – Data Reduction – Data Transformation and Data Discretization.

UNIT-II

Data Warehousing and Online Analytical Processing : Data warehouse: Basic concepts – Data warehouse Modeling: Data Cube and OLAP – Data Warehouse Design and Usage – Data warehouse implementation – Data generalization by attribute oriented induction – Mining Frequent Patterns, Associations And Correlations :Basic Concepts And Methods: Basic concepts – frequent itemset mining methods – which patterns are interesting? – pattern evaluation methods.

UNIT III

Classification: Rule Based Classification – Model evaluation and selection – Techniques to improve classification accuracy – Classification: Advanced Methods: Classification by Backpropagation – Support vector machines – Classification using frequent patterns – Lazy learners (or learning from your neighbors) – Other classification methods – Addition topics regarding classification.

UNIT IV

Cluster Analysis: Basic Concepts and methods: Cluster Analysis – Partitioning methods – Hierarchical methods – Density based methods – Grid based methods – Evaluation of Clustering.

UNIT V

Outlier Detection: Outliers and Outliers Analysis – Outlier Detection methods – Statistical Approaches – Proximity based approaches – Cluster based approaches – Classification based approaches – Mining contextual and collective outliers – Outlier detection in high dimensional data.

Text Book :
1. Data mining Concepts and techniques – Jiawei Han, Micheline Kamber, Jian Pei, Third Edition, MK Publications. UNIT I (Chapter 1, 2 & 3), UNIT II (Chapter 4& 6), UNIT III (Chapter 8 & 9), UNIT IV (Chapter 10), UNIT V (Chapter 12)

Reference Books:
1. Insight to data Mining Theory and Practice, K.P.Soman & Shyam Diwakar and V.Ajay, Prentice Hall of India, 2006 (ISBN – 81-201-2897-3)
2. Introduction to Data mining with case studies, G.K.Gupta, Prentice Hall India, 2006 (ISBN 81-203-3053-6).

WEB TECHNOLOGY

Objective:

To introduce the basic concepts of XHTML, CSS, JAVASCRIPT, XML, AJAX and To impart the advanced programming skills about dynamic web page design.

UNIT I

XHTML : Introduction – Editing XHTML – First XHTML Example – W3C XHTML Validation Service – Headings – Linking – Images – Special Characters and Horizontal Rules – Lists – Tables – Forms – Internal Linking – Meta Elements.

UNIT II

Cascading Style Sheets : Introduction – Inline Styles – Embedded Style Sheets – Conflicting Styles – Linking External Style sheets – Positioning Elements – Backgrounds - Element Dimensions – Box Model and Text Flow – Media Types – Building a CSS Drop - down Menu – User Style Sheets - CSS 3.
.

UNIT III

JavaScript : Introduction to scripting - Control Statements– Java Script Functions – Function Definitions – Random number generation – Recursion Vs Iteration – Java Script Arrays – Declaring and Allocating Arrays – Examples Using Arrays – Objects – Introduction – Introduction to Object Technology – Math Object – String Object – Date Object - Cookies.

UNIT IV

XML and RSS - Introduction – XML Basics – Structuring Data – XML Namespaces – Document Type Definitions (DTDs) – W3C XML Schema Documents – XML Vocabularies - Extensible StyleSheet Language and XSL Transformations – Document Object Model – RSS.

UNIT V

Ajax-Enabled Rich Internet Applications- Introduction – Traditional Web Applications vs. Ajax Applications - Rich Internet Applications (RIAs) with Ajax – History of Ajax – "Raw" Ajax Example Using the XML HttpRequest Object – Using XML and DOM – Creating a Full-Scale Ajax – Enabled Application – Dojo Toolkit.

Text book :

Deitel & Deitel, Goldberg, "Internet and world wide web – How to Program", 4th Edition, Pearson International Edition.

Reference book :

"Web Technology", S. Padmapriya, Scitech Publication (India) Pvt. Ltd.

OPEN SOURCE LAB

PHP

1) Write a PHP program that displays marks, total, grade of a student in tabular format by accepting user inputs for name, number and marks from a HTML form.
2) Write a PHP program that adds products that are selected from a web page to a shopping cart.
3) Write a PHP program to access the data stored in a MY SQL table.
4) a) Write a PHP program interface to create a database and to insert a table into it.
   b) Write a PHP program using classes to create a table.
   c) Write a PHP program to upload a file to the server.
5) Write a PHP program to create a directory, and to read contents from the directory.

LINUX

Write Shell Programs for the following using the Linux Operating System

1) Write a shell program to find the details of a user session.
2) Write a shell program to change the extension of a given file.
3) Check whether the given number is prime or not.
4) Find the biggest of given two numbers.
5) Write a program to check the given number is odd or even.
6) Write a program to generate Fibonacci Series.
7) Write a program to prepare electric bill for domestic consumers.
   For first 100 UNITs - Rs.0.75/ UNIT
   For next 100 UNITs - Rs.1.50/UNIT
   Above 200 UNITs - Rs.3.00/UNIT.
   Prepare the bill for the following format:

   Customer No. -----------
   Customer Name -----------
   Pre.Reading -----------
   Cur.Reading -----------
   UNITs Consumed -----------
   Charge -----------
   Signature

8) Write a program to prepare a Payroll with Basic Pay, DA, Allowances, PF and GP.
9) Using Case Statement, write a program to check the files ending with vowels.
10) Write a program to sort the numbers in ascending and descending order.

11) Write a menu driven program to print Bio-data for five persons.

MY SQL LAB

1. Create a MySQL table and write queries to add, insert, delete and modify the data.
2. Consider the following relations:

STUDENT (snum: integer, sname: string, major: string, level: string, age: integer)

CLASS (name: string, meets at: string, room: string, d: integer)

ENROLLED (snum: integer, cname: string)

FACULTY (fid: integer, fname: string, deptid: integer)

The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class. Level is a two character code with 4 different values (example: Junior: JR etc)

Write the following queries. No duplicates should be printed in any of the answers.

i. Find the names of all Juniors (level = JR) who are enrolled in a class taught by Prof.Anand.

ii. Find the names of all classes that either meet in room R18 or have five or more Students enrolled.

iii. Find the names of all students who are enrolled in two classes that meet at the same time.

iv. Find the names of faculty members who teach in every room in which some class is taught.

v. Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than five.

3. The following relations keep track of airline flight information:

FLIGHTS (no: integer, from: string, to: string, distance: integer, Departs: time, arrives: time, price: real)

AIRCRAFT (aid: integer, aname: string, cruisingrange: integer)

CERTIFIED (eid: integer, aid: integer)

EMPLOYEES (eid: integer, ename: string, salary: integer)

Note that the Employees relation describes pilots and other kinds of employees as well; Every pilot is certified for some aircraft, and only pilots are certified to fly.

Write each of the following queries.

i. Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80, 000.

ii. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruising range of the aircraft for which she or he is certified.

iii. Find the names of pilots whose salary is less than the price of the cheapest route from Chennai to California.

iv. For all aircraft with cruising range over 1000 Kms, find the name of the aircraft and the average salary of all pilots certified for this aircraft.

v. Find the aids of all aircraft that can be used on routes from Chennai to New Delhi.

4. The following tables are maintained by a book dealer.

      AUTHOR (author-id:int, name:string, city:string, country:string)

      PUBLISHER (publisher-id:int, name:string, city:string, country:string)

      CATALOG (book-id:int, title:string, author-id:int, publisher-id:int, category-id:int, year:int, price:int)

      CATEGORY (category-id:int, description:string)

      ORDER-DETAILS (order-no:int, book-id:int, quantity:int)

i. Create the above tables by properly specifying the primary keys and the foreign keys.

ii. Enter at least five tuples for each relation.

iii. Give the details of the authors who have 2 or more books in the catalog and the price of the books is greater than the average price of the books in the catalog and the year of publication is after 2000.

iv. Find the author of the book which has maximum sales.

v. Demonstrate how you increase the price of books published by a specific publisher by 10%.

5. Consider the following database for a banking enterprise

      BRANCH(branch-name:string, branch-city:string, assets:real)

      ACCOUNT(accno:int, branch-name:string, balance:real)

      DEPOSITOR(customer-name:string, accno:int)

      CUSTOMER(customer-name:string, customer-street:string, customer-city:string)

      LOAN(loan-number:int, branch-name:string, amount:real)

      BORROWER(customer-name:string, loan-number:int)

i. Create the above tables by properly specifying the primary keys and the foreign keys

ii. Enter at least five tuples for each relation

iii. Find all the customers who have at least two accounts at the Main branch.

iv. Find all the customers who have an account at all the branches located in a specific city.

v. Demonstrate how you delete all account tuples at every branch located in a specific city.

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Semester III - Core Paper XIII

WEB TECHNOLOGY LAB

</div>

1. Write an XHTML Program
   a. Create a basic table
   b. Create a complex XHTML table

2. Create a form using variety of components in an XHTML.

3. Create an XHTML Program Using Internal Hyperlinks to display the Webpage.

4. Write a CSS rule that places a background image halfway down the page, filling it horizontally. The image should remain in place when the user scrolls UP or Down.

5. Write a Program to create drop-down menu using CSS and XHTML.

6. To Create a CSS Program to place an element behind another element using Z-index.

7. To Create a Program to add background Image and Indentation using CSS.

8. a. Write a JavaScript Program to read two integers that displays whether the first is a multiple of the second using XHTML.
   b. Write a JavaScript Program to read five integers that displays the largest and smallest integers in the group using XHTML.

9. Write a JavaScript to store user identification data using cookies

10. Create a Program to display Mouse Events using JavaScript.

11. Write a Program to display dynamically change color of an Image using JavaScript.

12. Write a JavaScript Program to prepare Employee Paybill.

13. Write a JavaScript Program to evaluate Student performance.

14. To Create a Client side validation for the Railway reservation forms using JavaScript.

15. Create a XML Program to display the Bio-Data.

16. Create a XML Program at locate nodes using Xpath.

17. Write a Program to create asynchronously display content without reloading the page Using AJAX.

18. Create an AJAX Program to develop a calendar application.

CLOUD COMPUTING

Objective:
       To study the concepts and methods of cloud computing using security, and disaster recovery techniques.

UNIT I

       Understanding Cloud Computing : Introduction to Cloud computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why cloud computing Matters – Advantages of Cloud computing – Disadvantages of Cloud Computing – Who Benefits from Cloud computing.

UNIT II

       Developing Cloud Services :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 - Google App Engine – IBM Clouds.

UNIT III

       Cloud Computing For Everyone : Cloud computing for the family: 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 IV

       Using Cloud Services: 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 Word Processing – Collaborating on Databases

UNIT V

       Storing And Sharing Files And Other Online Content –Understanding cloud storage –Evaluating online file storage and sharing services-Outside the cloud : Other ways to collaborate online :Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

Text Book :

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

Reference Book :

1. Haley Bear, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs.

GRID COMPUTING

Objective :

To enable the students to learn the virtualized distributed computing environment

UNIT I

Introduction: Grid Computing & Key Issues – Applications – Other Approaches – Grid Computing Standards – Pragmatic Course of Investigation.

UNIT II

Grid Benefits & Status of Technology: Motivations – History of Computing, Communications and Grid Computing – Grid Computing Prime Time – Suppliers and Vendors – Economic Value – Challenges.

UNIT III

Components of Grid Computing Systems and Architectures: Basic Constituent Elements-A Functional View – A Physical View – Service View.

UNIT IV

Grid Computing Standards-OGSI: Standardization – Architectural Constructs – Practical View – OGSA/OGSI Service Elements and Layered Model – More Detailed View.

UNIT V

Standards Supporting Grid Computing-OGSA: Functionality Requirements – OGSA Service Taxonomy – Service Relationships – OGSA Services – Security Considerations.

Text Book :
A Networking Approach to Grid Computing, Daniel Minoli, Wiley Publication

Reference Book :
Grid Computing – A Practical Guide to Technology and Applications, Ahmar Abbas, Charles River Media Publication.

DIGITAL IMAGE PROCESSING

Objective:

To learn the fundamental concepts of Digital Image Processing. To study basic image Processing Operations.

UNIT I
Introduction And Digital Image Fundamentals: Introduction - What is Image Processing- examples of fields that uses DIPFundamentals step in DIP. Digital image fundamentals – image sensing and acquisition, Image sampling and quantization – Basic relationship between pixels.

UNIT II
Image Enhancement Techniques: Some basic intensity transformation functions – Histogram processingFundamental steps of spatial filtering – smoothing spatial filters.

UNIT III
Image Restoration: Model of Image Degradation/restoration process – noise models – restoration in the presence of Noise only Spatial filtering.

UNIT IV
Image Compression : Fundamentals – Coding redundancy – Spatial and temporal redundancy – Irrelevant information. Some basic compression methods: Huffman coding – arithmetic coding – LZW coding – Run Length coding – Bit-plane coding.

UNIT V
Image Segmentation And Representation : Morphological image processing: preliminaries – Erosion and Dilation. Fundamentals – point, line, and Edge detection: Line Detection – Basic edge detection – More advanced techniques for Edge detection – Edge linking and boundary detection – Thresholding

Text Book :
Digital Image Processing, Third Edition, Rafel C.Gonzalez and Richard E. Woods, Pearson Education, 2008. Chapters:1.1, 1.3, 1.4, 2.3, 2.4, 2.5, 3.2-3.5, 5.1-5.3, 8.1.1, 8.1.2, 8.2.3-8.2.5, 8.2.7, 9.1, 9.2, 10.1, 10.2.3, 10.2.5-10.2.7, 10.3

Reference Books :

1. Fundamentals of Digital Image Processing, Anil K. Jain, Prentice Hall of India, 1989.
2. Digital Image Processing and Analysis, B. Chandra and D. Dutta Majumder, PHI, New Delhi, 2006.

OPEN SOURCE TECHNOLOGIES

Objective :

To understand open source, Server Side Script and database concept. To gain knowledge in developing application using PHP and MySQL. To gain knowledge in Linux administration and developing application based of Linux.

UNIT - I
Open Source - Introduction : Open Source – Open Source vs. Commercial Software – Linux: Introduction - Download and Install - Decisions, Decisions – Linux Partition Sizes - Accounts - Security - Basic UNIX: Shell - Owner, Groups, Permissions, Ownership - Processes - PATH and Environment - Commands-Basic File System Essentials - Useful Programs.

UNIT - II
Apache Web server: Starting and Stopping and Restarting Apache-Configuration - Securing Apache - Create the Web Site-Apache Log Files.

UNIT - III
My SQL: Commands - Database Independent Interface - Tables – Loading and Dumping Database.

UNIT - IV
PHP: Embedding PHP into HTML -Configuration - Language Syntax: Variables - Data Types - Web variables - Operators - Flow Control Constructs Writing PHP Papers.

UNIT - V
Built in PHP function - Important Functions - Array Functions – String Functions - Other Functions - PHP and MySQL: MySQL Functions.

Text Book :
James Lee and Brent Lee "Open Source Development with LAMP -Using Linux, Apache, My SQL ,Perl and PHP", Pearson Education , 2009.

Reference Book :
Json Gerner, Elizabeth Naramore, Morgan Owens and Matt Warden, "Professional LAMP -Using Linux, Apache, My SQL and PHP5Web development", Wiley Publisher,2006.

ARTIFICIAL NEURAL NETWORKS

Objective :

To enable the students to learn the fundamentals of neural networks.

UNIT I

Basics of Artificial Neural Networks : Characteristics of Neural Networks – Historical development of Neural Network principles – Artificial Neural Networks: Terminology – Models of Neuron – Topology – Basic Learning Laws.

UNIT II

Activation and Synaptic Dynamics : Introduction – Activation Dynamic Models – Synaptic Dynamic Model – Learning Models – Learning Methods.

UNIT III

Functional Units of ANN for Pattern Recognition Tasks **:** Pattern Recognition Problem – Basic Functional UNITs – Pattern Recognition Tasks by the Functional UNITs – FEED Forward Neural Networks: Introduction – Analysis of Pattern Association Networks – Analysis of Pattern classification Networks – Analysis of Pattern Mapping Networks.

UNIT IV

Feedback Neural Networks **:** Introduction – Analysis of Linear Auto Associative FF Networks – Analysis of Pattern Storage Networks.
Competitive Learning Neural Networks : Introduction – Components of a Competitive Learning Network – Analysis of Feedback Layer for Different Output Functions – Analysis of Pattern Clustering Networks – Analysis of Feed Mapping Network.

UNIT V

Applications of Neural Systems : Applications of Neural Algorithms and Systems character Recognition – Expert Systems Applications – Neural Network Control Applications, Spatio – Temporal Pattern Recognition – Neocognitron and other Applications.

Text Books :
1. For UNITs I to IV : "ARTIFICIAL NEURAL NETWORKS",
   B.YEGNANARAYANAN, Eastern Economy edition – Chapter 1, 2.
2. For UNIT – V: "INTRODUCTION TO ARTIFICIAL NEURAL SYSTEMS" JACEK M.ZURADA (1994) – Jaico Publishing House.

Reference Book :
"Introduction to the theory of Neural Computation", - J.Hertz, A.Krogh., and R.G. Palmer, Addison – Wesley 1991 .

ROBOTICS

Objective:

Robotics Technology and applications are increasingly raising ethical questions related to emerging interactions between robots and human beings

UNIT I

Fundamentals of robot Technology : Robot anatomy. Work volume. Drive systems. Control - Systems and dynamic performance - Accuracy and repeatability - Sensors in robotics – Robot reference frames and coordinates and robot kinematics.

UNIT II

Robot kinematics : Matrix representation - Homogeneous transformations - Forward and inverse kinematics - Robot dynamics - Differential motions of a frame - Jacobian static force analysis.

UNIT III

Configuration of a robot controller : End effectors - Mechanical and other types of grippers - Tools as end effectors - Robot and effector interface - Gripper selection and design - Introduction to robot languages.

UNIT IV

Applications for manufacturing - Flexible automation - Robot cell layouts – Machine interference - Other considerations in work cell design - Work cell control – Interlocks – Robot cycle time analysis.

UNIT V

Simulation of robotic work cells - Typical applications of robots in material transfer, machine loading/unloading; processing operations; assembly and inspection.

Text Books :
1. "Introduction to Robotics analysis, Systems & Applications" - Saeed B. Niku – Pearson Education Singapore P. Ltd., 2002.
2. "Robotic Technology and Flexible Automation" - S.R. Deb, Tata McGraw Hill Publishing Co. Ltd., 2003.
3. "Robotics & Control"- R.K. Mittal, I.J. Nagrath - Tata McGraw & Hill, 2005.

.**Reference Books :**
"Fundamentals of Robotics, analysis & Control" Robert J. Schilling, Prentice Hall of India P.Ltd., 2002.

ADVANCED COMPUTER ARCHITECTURE

Objective :

To gain substantial knowledge about the architecture of computer and to understand the concepts of CPU, Cache, I/O and different processors.

UNIT I
Parallel Computer Models – The state of Computing- Multiprocessors and Multicomputers-Multivector and SIMD computers-PRAM and VLSI Models.

UNIT II
Program and Network Properties : Conditions of Parallelism-Program Partitioning and Scheduling – Program Flow Mechanisms – System Interconnect Architectures – Principles of Scalable Performance - Performance Metrics and Measures- Speedup Performance Laws-Scalability Analysis and Approaches : Scalability Metrics and Goals.

UNIT III
Processors and Memory Hierarchy – Advanced Processor Technology-Superscalar and Vector Processors – Memory Hierarchy Technology – Virtual Memory Technology.

UNIT IV
Bus, Cache, and Shared Memory – Backplane Bus systems-Cache Memory Organizations – Shared Memory Organizations - Sequential and Weak Consistency Models.

UNIT V
Pipelining and Superscalar Techniques –Linear Pipeline Processors- Nonlinear Pipeline Processors-Instruction Pipeline Design - Arithmetic Pipeline Design - Superscalar and Super pipeline Design.

Text Book :
"Advanced Computer Architecture"- Parallelism, Scalability, Programmability – Kai Hwang - Tata McGraw – Hill - Edition 2001.

Reference Book :
D.A.PATTERSON, J.L.HENNESSY – " Computer Architecture : A Quantitative Approach ", Harcourt Asia, Morgon Kaufmann, 1999.

SOFTWARE QUALITY ASSURANCE AND TESTING

Objective :

To facilitate the intakes to obtain knowledge in analyzing the program flow and identify bugs over it in a systematic approach. This paper provides skills to preparing test cases and use cases and test the programs through manual and automated tools.

UNIT I
Principles of Testing – Software Development Life Cycle Models

UNIT II
White Box Testing-Integration Testing-System and acceptance testing.

UNIT III
Testing Fundamentals -2 & Specialized Testing: Performance Testing Regression testing-Testing of Object Oriented Systems-Usability and Accessibility Testing.

UNIT IV
Test Planning, Management, Execution and Reporting.

UNIT V
Software Test Automation-Test Metrics and Measurements

Text Book :
Software Testing - Srinivasan Desikan, Gopalaswamy Ramesh, Pearson Education 2006.

Reference Books :

1. Introducing Software testing-Louis Tamres, Addison Wesley Publications, First Edition.

2. Software testing, Ron Patten, SAMS Techmedia, Indian Edition 2001.

3. Software Quality-Producing Practical, Consistent Software - Mordechai BenMenachem, Gary S Marliss, Thomson Learning, 2003.

PERVASIVE COMPUTING

Objective:

To create awareness about the architecture and functioning of Pervasive Computing.

UNIT I
Pervasive Computing: Past, Present and Future Pervasive Computing-Pervasive Computing Market-m-Business-Application examples: Retail, Airline check-in and booking-Sales force automation-Health care-Tracking-Car information system-E-mail access via WAP.

UNIT II
Device Technology: Hardware-Human Machine Interfaces-Biometrics-Operating Systems-Java for Pervasive devices .

UNIT III
Device Connectivity: Protocols-Security-Device Management Web Application Concepts: WWW architecture-Protocols-Transcoding-Client authentication via internet .

UNIT IV
WAP and Beyond: Components of the WAP architecture-WAP infrastructure-WAP security issues-WML-WAP push-Products-i-Mode-Voice Technology: Basics of Speech recognition- Voice Standards-Speech applications-Speech and Pervasive Computing .

UNIT V
PDA: Device Categories-PDA operation Systems-Device Characteristics-Software Components-Standards-Mobile Applications-PDA Browsers Pervasive Web Application architecture: Background-Scalability and availability-Development of Pervasive Computing web applications-Pervasive application architecture .

Text Book :
1. Pervasive Computing, Technology and Architecture of Mobile Internet Applications, Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaech & Klaus Rindtorff, Pearson Education, 2006

Reference Book :
1. Fundamentals of Mobile and Pervasive Computing, Frank Adelstein, Sandeep KS Gupta, Golden Richard III, Loren Schwiebert, McGraw Hill edition, 2006 .

PATTERN RECOGNITON

Objective :

To learn knowledge about Pattern Recognition concepts.

UNIT I
Introduction and Bayerian Decision Theory-Introduction to pattern recognition, Systems, design cycles, learning and adoptation,Bayerian decision theory, minimum error-rate classification, classifiers, discriminant functions and decisions surfaces.

UNIT II
Maximum – Likelihood and bayerian parameter estimation - Maximum – Likelihood estimation, bayerian estimation, bayerian parameter estimation, Guarian case and general theory, problems of dimeusability, Hidden marker models.

UNIT III
Nonparameter Techniques - Density estimation, parazen windows, Kn – Nearest neighbour, estimation, The nearest neghlaur, rode, metris and nearest – neghron, classification, fuzzy classification, approximation by series expansions.

UNIT IV
Linear Discriminant functions - Linear discriminant functions and decision surfaces, generadized linear discrminant functions, The two category unicorly separate case, minimizing the perception criterion function, relaxation procedures, nonrepersable behaviour, Minimum squared-error procedures, The Ho – Kashyap Procedures, support vexter machines, multicategory generatization.

UNIT V
Multilayer Neural Networks - Feed forward operations and classifications, back propagation algorithm, error factors, back propagation as feature & mapping, back propagation, bayer theory and probability, practical techniques for improving back propagation, regularization, complexity adjustment and pruning.

Text / Reference Books:
1. Richard O. Duda, Peter E. Hart and David G. Stork, "Pattern Classification" 2nd Edition, John Wiley.

2. John Hertz, Andres Krogh & Richard G. Palmer, "Introduction to the theory of Neural Computation", Addison Wesley.

CORE COURSE – XVPROJECT / DISSERTATION WITH VIVA VOCE

Objectives: To promote original thinking, insemination of knowledge, modulation and innovation of thought, as an exercise, in order to transport the young minds to the expanding horizon of their chosen area of knowledge and transform them into knowledge generators.

Project / Dissertation	**80 Marks**
2 Reviews	20+20 = 40marks
Report Valuation	40Marks
Viva voce	**20 Marks**