BHARATHIAR UNIVERSITY, COIMBATORE – 641 046
M.Sc. INFORMATION TECHNOLOGY *(University Department)*
(Effective from the academic Year 2010-2011)

1. Eligibility for Admission to the Course
Candidates for admission to the first year course leading to the Degree of Master of Science in Information Technology (M.Sc-IT) will be required to possess:

A Pass with 50 % of marks in B.Sc. Computer Science / B.C.A. /B.Sc. Computer Technology / B.Sc. Information Technology /B.Sc Information Sciences/B.Sc Information Systems/ B.Sc. Software Systems/B.Sc Software Sciences / B.Sc Applied Sciences (Computer Science/Computer Technology)

2. Duration of the Course
The course shall be offered on a full-time basis. The course will consist of three semesters of course work and laboratory work and the fourth semester consists of project work.

3. Regulations
The general Regulations of the Bharathiar University Choice Based Credit System Programme are applicable to this programme.

4. The Medium of Instruction and Examinations
The medium of instruction and Examinations shall be in English.

5. Submission of Record Notebooks for Practical Examinations & Project Viva-Voce.
Candidates taking the Practical Examinations should submit bonafide Record Note Books prescribed for the Examinations. Otherwise the candidates will not be permitted to take the Practical Examinations.

Candidates taking the Project Viva Examination should submit Project Report prescribed for the Examinations. Otherwise the candidates will not be permitted to take the Project Viva-voce Examination.

6. Ranking
A candidate who qualifies for the PG Degree Course passing all the Examinations in the first attempt, within the minimum period prescribed for the Course of Study from the date of admission to the Course and secures 1st or 2nd Class shall be eligible for ranking and such ranking will be confined to 10% of the total number of candidates qualified in that particular subject to a maximum of 10 ranks.

7. Revision of Regulations and Curriculum
The above Regulation and Scheme of Examinations will be in vogue without any change for a minimum period of three years from the date of approval of the Regulations. The University may revise /amend/ change the Regulations and Scheme of Examinations, if found necessary.

8. Transitory Provision
Candidates who have undergone the Course of Study prior to the Academic Year 2007-2008 will be permitted to take the Examinations under those Regulations for a period of four years i.e. up to and inclusive of the Examination of April 2012 thereafter they will be permitted to take the Examination only under the Regulations in force at that time.

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SCHEME OF EXAMINATION
M. Sc. INFORMATION TECHNOLOGY   *(University Department)*
(Effective from the academic Year 2010-2011)

Core / Elective / Supportive / Project	Suggested Code	Sem	Title of the Paper	Duration	Credits	Marks
Core 1	10CSEFC01	I	Object Oriented Analysis and Design	4	4	100
Core 2	10CSEFC02	I	Advanced Computer Architecture	4	4	100
Core 3	10CSEFC03	I	Advanced Java Programming	4	4	100
Core 4	10CSEFC04	I	Unix Programming	4	4	100
Core 5	10CSEFC05	I	Advanced Java Programming – Lab	3	3	75
Core 6	10CSEFC06	I	Unix Programming - Lab	3	3	75
Elective -I	10CSEFEXX	I	Elective – I	4	4	100
Supportive - 1	-	I	-	2	2	50
Core 7	10CSEFC07	II	C# and .NET Frame work	4	4	100
Core 8	10CSEFC08	II	Multimedia Systems	4	4	100
Core 9	10CSEFC09	II	Information Security	4	4	100
Core 10	10CSEFC10	II	Distributed Computing	4	4	100
Core 11	10CSEFC11	II	C# and .NET Framework - Lab	3	3	75
Core 12	10CSEFC12	II	Distributed Computing - Lab	3	3	75
Elective – II	10CSEFEXX	II	Elective – II	4	4	100
Supportive - 2	-	II	-	2	2	50
Core 13	10CSEFC13	III	Embedded Systems	4	4	100
Core 14	10CSEFC14	III	Component Based Systems	4	4	100
Core 15	10CSEFC15	III	Grid Computing	4	4	100
Core 16	10CSEFC16	III	Mobile Computing	4	4	100
Core 17	10CSEFC17	III	Component Based Systems –Lab	3	3	75
Core 18	10CSEFC18	III	Mobile Computing - Lab	3	3	75
Elective - III	10CSEFEXX	III	Elective – III	4	4	100
Supportive - 3	-	III	-	2	2	50
Project		IV	Project work and Viva – Voce		6	150
TOTAL					**90**	**2250**

ELECTIVE PAPERS

10CSEFE01	Data Mining and Warehousing	4	4	100
10CSEFE02	Digital Image processing	4	4	100
10CSEFE03	Artificial Intelligence	4	4	100
10CSEFE04	Software Project Management	4	4	100
10CSEFE05	E - Commerce	4	4	100
10CSEFE06	WAP	4	4	100
10CSEFE07	Web Designing	4	4	100
10CSEFE08	Web Services	4	4	100
10CSEFE09	ASP. NET	4	4	100
10CSEFE10	Software Testing	4	4	100

Subject Title: OBJECT ORIENTED ANALYSIS AND DESIGN
Course Number: 10CSEFC01
Number of Credits: 4
Subject Description:
This course presents the object model, classes and objects, object orientation, machine view and model management view.
Goal:
To enable the students to learn the basic functions, principles and concepts of object oriented analysis and design.
Objectives:
On successful completion of the course the students should have:
- Understood the object oriented system development and case models.

UNIT I
Object Orientation – System Development – Review of Objects – Inheritance – Object Relationships – Dynamic binding – OOSD life cycle – Process – Analysis- Design - Prototyping – Implementation – Testing – Overview of Methodologies

UNIT II
OMT – Booch methodology, Jacobson – Methodology – patterns – Unified approach – UML –Class Diagrams – Dynamic Modeling

UNIT III
Using Case model – Creation of classes – Noun Phrase approach – responsibilities – Collaborators and relationships – Super – Sub class - Aggregation

UNIT IV
OO Design axioms – Class visibility – refining attributes- Methods – Access layer – OODBMS – Class mapping view layer

UNIT V
Quality Assurance testing – Inheritance and testing - Test Plan – Usability testing – User satisfaction testing

References:
1. Ali Brahmi , " Object Oriented System Development" , TMH Intl Edition
2. Object-Oriented Analysis and Design by Grady Booch, Addison – Wesley
3. Object Oriented Modelling and Design by James Rumbaugh , Micheal Blaha, Prentice Hall

Subject Title   : ADVANCED COMPUTER ARCHITECTURE
Course Number: 10CSEFC02
Number of Credits: 4
Subject Description

This Course presents the Advanced Computer Architecture emphasizing parallel processing, solving problems in parallel and SIMD processors.

Goals

To enable the students to learn the parallel processing and SIMD arrays.

Objectives

On successful completion of the course the students should have:

- Understood the trends and principles of parallel processing in computers.
- Gained problem solving skills using parallel algorithms.

Contents
UNIT I

Introduction to parallel processing – Trends towards parallel processing – Parallelism in uniprocessor Systems – Parallel Computer structures – Architectural Classification schemes – Flynn' Classification – Feng's Classification – Handler's Classification – Parallel Processing Applications

UNIT II

Solving Problems in Parallel: Utilizing Temporal Parallelism – Utilizing Data Parallelism – Comparison of Temporal and Data Parallel Processing – Data parallel processing with specialized Processor – Inter-task Dependency. Instructional Level Parallel Processing – Pipelining of Processing Elements – Delays in Pipeline Execution – Difficulties in Pipelining

UNIT III

Principles Linear Pipelining – Classification of Pipeline Processors – General Pipeline and Reservation tables – Arithmetic Pipeline – Design Examples – Data Buffering and Busing structure – Internal forwarding and Register Tagging – Hazard Detection and Resolution – Job sequencing and Collision prevention – Vector processing requirements – Characteristics – Pipelined Vector Processing methods

UNIT IV

SIMD Array Processors – Organization – Masking and Data routing – Inter PE communications – SIMD Interconnection Networks – Static Vs Dynamic – Mesh connected Illiac – Cube interconnection network – Shuffle-Exchange and Omega networks - Multiprocessor Architecture and programming Functional structures – interconnection Networks.

UNIT V

Parallel Algorithms: Models of computation – Analysis of Parallel Algorithms Prefix Computation – Sorting – Searching – Matrix Operations.

REFERENCE BOOKS

1. Kai Hwang, Faye A. Briggs, "Computer Architecture and Parallel Processing" Mc Graw – Hill Book Company, 1985.
2. V. Rajaraman, C. Siva Ram Murthy, "Parallel Computers Architectures and Programming", PHI, 2003.
3. Kai Hwang, "Advanced Computer Architecture –Parallelism, Scalability, Programmability", TataMcgraw Hill, 2001.
4. Michael J. Quinn, "Parallel Computing Theory and Practice", TMCH, Second Edition, 2002.
5. Barry Wilkinson, Micheal Allen, "Parallel Programming: Techniques and Applications", Prentice Hall, 1999.

Subject Title: ADVANCED JAVA PROGRAMMING
Course Number: 10CSEFC03
Number of Credits: 4
Subject Description:
This course presents the concepts of RMI, JDBC and JSP.
Goal:
To enable the students to learn the basic functions, principles and concepts of advanced java programming.
Objectives:
On successful completion of the course the students should have:
- Acquired skill in advanced java programming.

Unit I
Java Basics Review: Components and event handling – Threading concepts – Networking features – Media techniques

Unit II
Remote Method Invocation-Distributed Application Architecture- Creating stubs and skeletons- Defining Remote objects- Remote Object Activation-Object Serialisation-Java Spaces

Unit III
Java in Databases- JDBC principles – database access- Interacting- database search – Creating multimedia databases – Database support in web applications

Unit IV
JAVA SERVER PAGES-JSP Overview-Installation-JSP tags-Components of a JSP page-Expressions-Scriptlets-Directives-Declarations-A complete example

Unit V
JAR file format creation – Internationalization – Swing Programming – Advanced java techniques

Reference:
1. Jamie Jaworski, "Java Unleashed" , SAMS Techmedia Publications 1999
2. Campione, Walrath and Huml, "The Java Tutorial", Addison Wesley 1999
3. Jim Keogh," The Complete Reference J2EE", Tata McGrawHill Publishing Company Ltd,2002

Subject Title: UNIX PROGRAMMING
Course Number: 10CSEFC04
Number of Credits: 4
Subject Description:
This course presents the introduction, inter process communication, classical IPC problems, shell programming and system programming in UNIX.
Goal:
To enable the students to learn the basic fundamentals of UNIX operating system, and UNIX programming
Objectives:
On successful completion of the course the students should have:

- Understood the UNIX file system.
- Learnt shell programming & system programming in UNIX

UNIT I
Unix – Introduction – Basic commands – files – permissions – directories – processes – pipes – redirection – filters – vi editor – unix file system – unix file structure.

UNIT II
Shell programming – Shell Syntax : Variables – conditions – control structures – functions – commands – command execution – simple programs

UNIT III
Unix System Programming – System calls and device drivers – Library functions – low level file access – system calls for managing files – files and directory maintenance – scanning directories.

UNIT IV
Process and signals – process – process structure – starting new processes – signals

UNIT V
Interprocess communication – Pipes: process pipes – pipe call – parent and child processes - Semaphores: Definition – example – facilities – shared memory: overview – functions – message queue: overview – functions – Sockets: socket connections.

References
1. Peter Dyson, Stan Kelly – Bootle, John Heilborn, "UNIX Complete", BPB Publications, 1999
2. Richard Stones, Neil Matthew, "Beginning Linux Programming", WROX, 1999
3. Uresh Vahalia, "UNIX Internals, The New Frontiers", Pearson Education Limited,   2002

Subject Title: ADVANCED JAVA PROGRAMMING LAB
Course Number: 10CSEFC05
Number of Credits: 3
Subject Description:
This course presents the practical aspects of RMI, JDBC and JSP
Goal:
To enable the students to learn practice the basic functions, principles and concepts of advanced java programming in the lab.
Objectives:
On successful completion of the course the students should have:
- Acquired skill in advanced java programming practically.

Subject Title: UNIX PROGRAMMING LAB
Course Number: 10CSEFC06
Number of Credits: 3
Subject Description:
This course presents the introduction, inter process communication, classical IPC problems, shell programming and system programming in UNIX in the lab
Goal:
To enable the students to learn and practice the basic fundamentals of UNIX operating system, and UNIX programming in the lab
Objectives:
On successful completion of the course the students should have practically :
- Understood the UNIX file system.
- Learnt shell programming & system programming in UNIX

Subject Title: C# AND .NET FRAMEWORK
Course Number: 10CSEFC07
Number of Credits: 4
Subject Description:
This course presents the Introduction to .NET frame work, C# and its features
Goal:
To enable the students to learn the fundamentals of .NET and C#.
Objectives:
On successful completion of the course the students should have:
- Understood the .NET framework
- Learnt programming techniques in C#

UNIT I
Introduction to .NET frame work - . NET objects – ASP .NET - .NET Web services –
Windows forms

UNIT II
Introduction to C# - Understanding c# in .NET - Overview of C# - Literals, variables and
data types

UNIT III
Operators, Expressions, Branching and looping operations – Methods, Arrays, Strings

UNIT IV
Structures and Enumerations – Classes and Objects – Inheritance and Polymorphism,
Multiple Inheritance

UNIT V
Operator overloading, Events, console I/O operations and Exceptions

References:
1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2002
2. David S. Platt, "Introducing Microsoft .NET", Microsoft Press, SAARC Edition,
   2001
3. Microsoft, "C# Language Specifications", Microsoft Press, 2001

Subject Title: MULTIMEDIA SYSTEMS
Course Number: 10CSEFC08
Number of Credits: 4
Subject Description
This course presents the Introduction to Multimedia, Images & Animation.
Goals
To enable the students to learn the concepts of Multimedia.
Objectives
On Successful completion of the course the students should have:
- Understood the Multimedia animation and Desktop Computing.

Unit I

Introduction : Introduction to Multimedia PCs – Components of Multimedia – Multimedia Tools Sound and Graphics : Digital Sound – Editing and Mixing sound files – MIDI creation – Tracking Procedure – Interactive and Non Interactive Graphics – High Resolution Graphics – Difference between TV and Computer Display.

Unit II

Video and Animation : Digital Image concepts – Video Capturing – Scanning Images – Digital Filters Morphing and Warping – Two Dimensional and Three dimensional animation – Animation Tools – Layering technique – Blue Screen technique – Latest movie technologies – Motion Tracking System – Motion Capturing Syatem.

Unit III

Creating Presentation : Script Writing and creating interactive and non interactive presentation – Linear and Non Linear Editing – Authoring Tools – File Formats SOUND, VIDEO, ANIMATION, Presentation Images. Multimedia Programming : Text Links – Hyper Text system – Form Creation – File storing - Error Trapping.

Unit IV

Sound Links: Multimedia interfaces – MCI- API- High Level Multimedia Functions – WAVE , MIDI file processing. Animation : Color Palette – Events – ROPs.

Unit V

Imaging Special Visual Effects : Bitmap – Brushes – Dissolve –Hotspot Editor – Scrolling . Media Control Interface : Simple Commands – API functions – CD Player – Video Capturing – Form – AVI Play Form.

REFERENCE BOOKS

1.   Tay Vaughan, ' Multimedia Making it Work', McGraw Hill, 1994.
2.   Scott Jarol, ' Visual Basic Multimedia ', Galgotia 1995.
3.   Jeffcoate, Judith, 'Multimedia in Practice', Prentice Hall, 2001.
4.   Vince, John, ' Virtual Reality Systems', Pearsons Education, 1995.

Subject Title: INFORMATION SECURITY
Course Number: 10CSEFC09
Number of Credits: 4
Subject Description
This course presents the concepts of Network Monitoring & control
Goals
To enable the students to learn the concepts of network security and management
Objectives
On Successful completion of the course the students should have:
- Understood the Network Monitoring concepts and protocols
- Understood the SNMP Concepts, encryption and decryption

Unit I
CONVENTIONAL AND MODERN ENCRYPTION
Services – Attacks – Steganography - Classical Encryption Techniques - Block ciphers and the data encryption standard – DES – AES - Differential and Linear Cryptanalysis – Modes of operation – Encryption Algorithms : Triple DES – Blowfish – CAST128

Unit II
PUBLIC KEY ENCRYPTION
Number Theory concepts – Fermat & Euler Theorem – Euclid Algorithm – RSA Algorithm – Elliptic Curve Cryptography – Diffie Hellman Key Exchange

Unit III
AUTHENTICATION AND SECURITY PRACTICE
Message Authentication and Hash function - Digital Signature and Authentication Protocols

Unit IV
NETWORK SECURITY
Authentication Application – Electronic Mail security – IP Security – Web Security

Unit V
SYSTEM SECURITY and Wireless Security
Intruders and Intrusion – Malicious Software – Firewalls – Trusted systems – Security standards and standard settings organisation - Wirelss Security : Issues – Network Security Attach – Key Management – Secure routing

Reference Books :
1. William Stallings, "Cryptography & Network Security", Pearson Education, New Delhi 2005.
2. C.Siva Ram Murthy and B.S. Manoj, "Ad Hoc Wireless Networks – Architecture and Protocols, Pearson Education, Second Edition

Subject Title: DISTRIBUTED COMPUTING
Course Number: 10CSEFC10
Number of Credits: 4
Subject Description:
This course presents the introduction to distributed systems, design considerations, client/server network model, and distributed database.
Goal:
To enable the students to learn the basic functions, principles and concepts of Distributed Systems.
Objectives:
On Successful completion of the course the students should have:

- Understood the Distributed Processing Systems Design, Client/Server Network Model and Distributed databases.

UNIT I
Distributed Systems: Fully distributed processing systems − Networks and Interconnection structures − Designing a Distributed Processing System

UNIT II
Distributed Systems: Pros and Cons of Distributed processing − Distributed databases − the challenge of distributed data − loading factors − managing the distributed resources − division of responsibilities

UNIT III
Design Considerations: Communications line loading − Line loading Calculations − Partitioning and allocation − Data flow systems − dimension analysis − network database design considerations − ration analysis − database decision trees − synchronization of network databases.

UNIT IV
Client/Server Network Model: Concept − file server − printer server − an e-mail server.

UNIT V
Distributed Databases: An overview − Distributed Databases − Principles of Distributed Databases − levels of transparency − Distributed Database Design − The R* Project Technique Problems of Heterogeneous Distributed Databases.

REFERENCE BOOKS
1.John A. Sharp, "An Introduction to Distributed and Parallel Processing", Blackwell Scientific Publications, 1987.
2.Uyless D. Black,"Data Communications & Distributed Networks".
3.Joel M. Crichllow, "Introduction to Distributed & Parallel Computing".
4.Stefans Ceri, Ginseppe Pelagatti, "Distributed Databases Principles and systems", McGraw Hill Book Co., New York, 1985

Subject Title: C# AND .NET FRAMEWORK LAB
Course Number: 10CSEFC11
Number of Credits: 3
Subject Description:
This course presents the Introduction to .NET frame work, C# and its features
Goal:
To enable the students to learn the fundamentals of .NET and C#.
Objectives:
On successful completion of the course the students should have:
- Understood the .NET framework
- Learnt programming techniques in C#

Subject Title: DISTRIBUTED COMPUTING LAB
Course Number: 10CSEFC12
Number of Credits: 3
Subject Description:
This course presents the introduction to distributed systems, design considerations,
client/server network model, and distributed database.
Goal:
To enable the students to learn the basic functions, principles and concepts of Distributed
Systems.
Objectives:
On Successful completion of the course the students should have:
- Understood the Distributed Processing Systems Design, Client/Server Network Model
  and Distributed databases.

Subject Title: EMBEDDED SYSTEMS
Course Number: 10CSEFC13
Number of Credit : 4
Subject Description:
This course presents the embedded system fundamentals, interrupts and software architecture, concepts of RTOS and software tools.
Goal:
To enable the students to learn the basic functions, principles and concepts of Embedded Systems and Real Time Operating systems.
Objectives:
On successful completion of the course the students should have:
*   Understood the Embedded Systems and Real Time Operating system concepts
Contents:

Unit I
Introduction : Definition and Classification – Overview of Processors and hardware units in an embedded system – Software embedded into the system – Exemplary Embedded Systems – Embedded Systems on a Chip (SoC) and the use of VLSI designed circuits

Unit II
Hardware Fundamentals: Terminology- Gates- Timing Diagrams-Memory. Advanced Hardware Fundamentals: Microprocessors-Microprocessor architecture- Direct Memory Access- Conventions used on Schematics.

Unit III
Interrupts & Software Architecture: Interrupts: Interrupt Basics- Interrupt Service Routines. Survey of software Architectures: Round Robin with Interrupts- Function-Queue-Scheduling Architecture- Real Time Operating Systems Architecture.

Unit IV
Concepts of RTOS: Introduction to Real Time Operating Systems – Selecting an RTOS-Tasks and Task States- Tasks and Data- Semaphores and Shared Data. Basic Design Using a Real Time Operating Systems : Principles- Encapsulating Semaphores and Queues-Hard Real Time Scheduling Considerations

Unit V
Software Tools : Embedded Software Development Tools: Hosts and Target Machines-Linker/Locators for Embedded Software –Getting Embedded Software into the Target Systems- Case studies.

REFERENCE BOOKS
1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw Hill, First reprint 2003
2. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.

Subject Title : COMPONENT BASED SYSTEMS
Course Number: 10CSEFC14
Number of credits: 4
Subject Description:

This course presents the fundamentals of component based technology, Java and CORBA component systems and frameworks.

Goals:

To enable the students to learn the Industrialization of software development and technology evolution using components

Objectives:

On successful completion of the course the student should have:
- Learnt the basics of component based technology
- Learnt Java component technology and CORBA component technology

Contents:

Unit I

Introduction to Component based systems: Industrialization of software development - CBD drivers and benefits - Technology evolution- Software Components – objects-interfaces.

Unit II

Fundamental properties of Component technology: Component architecture – components and middleware.
Basic concepts of CBD - Scenarios for CBD - Evolution or revolution - Build,find and use components and objects.

Unit III

JAVA Component Technologies: Threads – Java Beans – Events and connections – properties – introspection – JAR files – reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP.

Unit IV

CORBA Technologies: Java and CORBA – Interface Definition language – Object Request Broker – system object model –CORBA services – CORBA component model – containers – Application server – model driven architecture.

Unit V

Component Frameworks: Encapsulated components - Software frameworks - Pre- built applications - cross-development environment – component-oriented programming – Component design and implementation tools – testing tools - assembly tools**.**

REFERENCES:
1. Clemens Szyperski, "Component Software: Beyond Object-Oriented Programming", Addison Wesley, 2nd Edition 2002.
2. Kuth Short, Component Based Development and Object Modeling, Sterling software,1997.
3. Ed Roman, "Enterprise Java Beans",3rd Edition, Wiley, 2004.
4. Andreas Vogel, Keith Duddy, "Java Programming with CORBA", John Wiley & Sons 1998
5. Corry, Mayfield, Cadman, "COM/DCOM Primer Plus", Tec media, 1st Edition, 1999

Subject Title   : GRID COMPUTING
Course Number: 10CSEFC15
Number of credits: 4
Subject Description:

This course presents a general idea on Service oriented computing, Grid Computing, Grid Architecture and Grid toolkits

Goals:

To introduce the concepts of service oriented computing and Grid activities.

Objectives:

On successful completion of the course the student should have:

- Gained knowledge on Grid computing fundamentals and Architecture
- Learnt about Grid computing toolkits

Unit I

Introduction to Grid Computing: Early Grid Activities-Current Grid Activities-Grid business areas-Grid applications-Grid computing organizations and their roles.

Unit II

The Grid computing anatomy: The Grid problem-Grid Architecture-Virtual organizations-Grid computing roadmap.
Service-oriented Architecture- Web service Architecture-XML messages and enveloping-Service message description mechanisms-Relationship between web service and Grid service.

Unit III

Open Grid Services Architecture (OGSA)-OGSI-OGSA use cases: Commercial data center (CDC), National Fusion collaboratory (NFS), Online media and entertainment − OGSA platform components.

Unit IV

OGSA basic services: Common management model (CMM)- Service domains- Policy Architecture- Security Architecture- Metering and Accounting- Common Distributed Logging- Distributed data access and replication.

Unit V

Resource management on the Grid- Grid resource management systems- Work management-Layers of Grid computing
Globus GT3 Toolkit: GT3 Software Architecture model- Resource allocation- Resource management services- Data management services.

References:

1. Joshy Joseph, Craig Fellenstein, "Grid Computing", IBM Press, Pearson Education, Indian Reprint,2005.
2. Ian Foster, Carl Kesselman, "The Grid 2: Blueprint for a New Computing Infrastructure", Morgan Kaufmann Publishers (Elsevier), II Edition.

Subject Title   : MOBILE COMPUTING
Course Number: 10CSEFC16
Number of credits: 4
Subject Description:

Unit I
Introduction to Mobile computing: Components of wireless environment- Challenges in Mobile environment- Mobile devices - Middleware and gateways- Wireless Internet - Smart clients
Mobile computing Architecture- Three-tier Architecture- Design considerations for mobile computing-Mobile computing through Internet- Mobile-enabled Applications

Unit II
Cellular Wireless Networks – Multiple Access in Wireless System - GSM Architecture- SMS architecture

Unit III
Wireless LAN - IEEE 802.11 - HIPERLAN – Bluetooth – RFID – Java card – GPRS – Mobile Computing through Telephony

Unit IV
ADHOC Wireless Network
Introduction – Issues in wireless Ad Hoc Wireless Network – Issues in designing MAC protocol – Classification of MAC protocols – Issues in Designing a Routing protocol for Ad Hoc - Classification of Routing protocols – Issues in Designing Transport Layer Protocol for Ad Hoc

Unit V
Mobile IP - DHCP - WAP - Dynamic DNS - File systems - Synchronization protocol - Context-aware
applications - Security - Analysis of existing wireless network .

Reference Books:
1. William Stallings, Wireless Communications & Networks, Pearson Education, 2005
2. C.Siva Ram Murthy and B.S. Manoj, Ad Hoc Wireless Networks – Architectures and Protocols, Pearson Education, Second Edition
3. Ashok K Talukder and Roopa R Yavagal, Mobile Computing, Tata McGraw Hill, 2005

Subject Title   : COMPONENT BASED SYSTEMS LAB
Course Number: 10CSEFC17
Number of credits: 3
Subject Description:

This course presents the fundamentals of component based technology, Java and CORBA component systems and frameworks.
Goals:
To enable the students to learn the Industrialization of software development and technology evolution using components

Objectives:
On successful completion of the course the student should have:
- Learnt the basics of component based technology
- Learnt Java component technology and CORBA component technology

Subject Title   : MOBILE COMPUTING LAB
Course Number: 10CSEFC18
Number of credits: **3**
Subject Description:

This course presents an introduction to mobile computing, discusses mobile computing architecture, emerging technologies and security issues.
Goals:
To enable the student learn the basics of mobile computing.
Objectives:
On successful completion of the course the student should have:
- Understood the concept of wireless mobile computing.

ELECTIVE PAPERS

Subject Title   : DATA MINING AND WAREHOUSING
Course Number: : 10CSEFE01
Number of credits: 4
Subject Description:
        This course presents the data mining concepts, classifications algorithms and data warehousing.
Goals:
        Enable the student to be familiar in data warehousing, clustering and rules.
Objectives:
        On successful completion of the course the student should have:
- Understood data mining and data warehousing applications.

UNIT I
Introduction: Definitions – Taxonomy of Data mining tasks – Steps in DM process – Overview of data mining techniques

UNIT II
Predictive modeling: Predictive modeling – classification – Decision trees – Patterns – association rules – algorithms

UNIT III
Other approaches: Visualization – statistical perspective – flustering – regression analysis – Time series analysis –rule learning – inductive logic programming

UNIT IV
Data warehousing: Dimensional modeling – Meta data- performance issues and indexing Development life cycle and merits.

UNIT V
Applications: Tools, applications and case studies

Reference:
1. Usama M.Fayyad , Gregory Piatesky – "Advances in Knowledge discovery and data mining " M.I.T Press
2. Ralph Kimball, "The Data warehouse life cycle tool kit" John Wiley & Sons
3. Sean Lelly , "Data Mining in action" John Wiley & Sons

Subject Title : DIGITAL IMAGE PROCESSING
Course Number: 10CSEFE02
Number of Credits:4
Subject Description
This course presents the Introduction to Digital image Processing, fundamentals, image enhancement and image restoration techniques
Goals
To enable the students to learn the fundamentals of Digital Image Processing, image compression and segmentation

Objectives
On Successful completion of the course the students should have:
- Understood the fundamentals of Digital Image Processing, image compression and segmentation

UNIT I
Digital Image Fundamentals: Digital image, applications of digital image processing-elements of digital image processing-digital camera, line scan CCD sensor – area sensor - flash A/D converter – display element perception – luminance – brightness, contrast- mach band fidelity criteria – color models – RGB, CMY, HIS mathematical preliminaries of convolutions Fourier transforms - ZS transform – orthogonal matrices

UNIT II
Image transform: Properties of Unitary transform – 2d DFT – DCT- DST- Discrete wavelet transform- Hotelling Transform – SVD transform – Slant, Haar transforms

UNIT III
Image enhancement and restoration: Contrast stretching – intensity level slicing – Histogram equalization – spatial averaging – smoothing – Median filtering – non linear filters – maximum , minimum, geometric mean, Lp mean filters – edge detection – degradation model – unconstrained and constrained filtering – removal of blur –Wiener filtering

UNIT IV
Image compression: Huffman's coding- truncated Huffman's coding – B2, binary codes, arithmetic coding, contrast area coding, run length coding- transform coding – JPEG and MPEG coding

UNIT V
Image segmentation: Pixel based approach – feature threshold – choice of feature – optimum threshold – threshold selecting method- region based approach – region growing – region splitting – region merging

Reference:
1. Gonzalez R.C and Woods R. E , "Digital image processing " Addison Wesley
2. Anil K Jain Fundamentals of Digital image processing , Prentice Hall

Subject Title   : ARTIFICIAL INTELLIGENCE
Course Number: 10CSEFE03
Number of Credits: 4
Subject Description
This course presents the Introduction to AI Problems, Heuristic techniques, and Represents Simple facts and learning.
Goals
To enable the students to learn the concepts of AI and Expert Systems
Objectives
On Successful completion of the course the students should have:
- Understood the AI & Expert Systems.
- Learnt the Heuristic techniques and reasoning

UNIT I
Introduction : Foundation and history of AI, AI problems and techniques – AI programming – Introduction to :LISP and PROLOG – Problem spaces and searches – Blind search strategies- Depth first – Heuristic search techniques Hill climbing –Best first – A* algorithm AO*, trees- Minimax algorithm- Game playing and alpha beta pruning

UNIT II
Knowledge representation: Issues of Knowledge representation, - Predicate logic -logic programming – Semantic inheritance – constraints propagation – Representing Knowledge using rules

UNIT III
Reasoning under uncertainty: Uncertain Knowledge – Review of probability – Bye's Probabilistic Inferences and Heuristic methods – symbolic reasoning under uncertainty- statistical reasoning – fuzzy logic – temporal reasoning – Non monotonic reasoning

UNIT IV
Planning in situational calculus – representation for planning – partial order algorithm. Learning from examples – discovery as learning – learning by analogy explanation – Neural nets and genetic algorithms

UNIT V
Applications, NLP – Rule based systems architecture – expert systems – Knowledge based concepts – AI applications to robotics – current trends in intelligent systems

Reference:
1. Rich and Kevin Knight "Artificial Intelligence" Tata McGraw Hill
2. Russel and Peter Norvig, "Artificial Intelligence-A modern approach" Prentice Hall
3. Patrick Henry Winston "AI" Addison Wesley

Subject Title   : SOFTWARE PROJECT MANAGEMENT
Course Number: 10CSEFE04
Number of credits: 4
Subject Description:
This course presents a deep insight to software project management concepts
Goals:
Enable the student to be familiar with software project management
Objectives:
On successful completion of the course the student should have:
- Understood the system software project management, project evaluation effort estimation and risk management.

UNIT I
Product life cycle: Introduction – idea generation – prototype development phase – alpha phase – beta phase – protection phase – Maintenance and obsolescence phase. Project Life cycle models – What is it ? A framework for studying different life cycle models – waterfall model, prototype model, RAD model, spiral model. Metrices: Metric roadmap- metric strategy- why to measure- set target, track them, understand and minimize variability, Act on data- Common fit falls

UNIT II
Software configuration management: Basic definitions and terminology- he process and activities of Software configuration audit – software configuration management in geographically distributed teams- metrics in software configuration management – tools and automation. Software quality assurance Defining quality, importance of quality, quality control and assurance – cost and benefits of quality – software quality analyst's functions, SQA tools, measures for SQA success- pitfalls.

UNIT III
Requirement gathering; inputs and start criteria for requirements, dimensions for requirement gathering, steps, to be followed, output and quality records, skill sets
Estimation – what is estimation, when and why is it needed, three phases of estimation – estimation methodology-models for size estimation-converting effort to schedule

UNIT IV
Design and development phase: Some differences in chosen approach – salient features of design- evolving an architecture, blue print- design for reusability- technology choices/ constraints – design standards – design for portability- user interface issues – design for testability – design for diagnosability- design for maintainability- designs for installability and interoperability

UNIT V
Project management testing and maintenance: Testing – activities that make testing- test scheduling and types of tests – people issues in testing management structures for testing – metrics. Introduction to management phase- configuration management, skill sets, estimating size , effort, and people resources for maintenance, metrics
Reference:
1. Gopalswamy Ramesh ,"Managing Global software projects" Tata Mcgraw Hill
2. S.A. Kelkar "Software project management – a concise study" PHI, 2003

Subject Title: E-COMMERCE
Course Number: 10CSEFE05
Number of Credits: 4
Subject Description:
This course presents the introduction to E-Commerce, Network Infrastructure, Information publishing technology, Securing network transaction, search engines.
Goal:
To enable the students to learn the basic functions, principles and concepts of E-Commerce.
Objectives:
On successful completion of the course the students should have:
   • Understood the E-Commerce framework

UNIT I
E-Commerce Framework- E-commerce of Media Convergence – Anatomy of E-commerce Applications – E-commerce Organization applications – Market forces influencing the I-way – components of I-way – Network Access equipment

UNIT II
Architectural Framework for electronic commerce – World wide Web- background, Hypertext publishing , technology behind the web; security in web- consumer oriented applications – Mercantile models for consumer perspective, Mercantile models for merchants perspective

UNIT III
Types of electronic payment system – Digital token based electronic payment systems, smart cards and electronic payment systems, credit card based systems; Risk and electronic payment- Designing electronic payment systems – electronic data interchange – EOI Applications in Business – EDI: legal, security and Privacy issues –EDI and E-Commerce

UNIT IV
Internal Information systems – Macro forces and Internal Commerce –work flow automation and coordination customization and internal commerce – supply chain commerce system – making a business case for a document library – types of digital documents – Issues behind Document infrastructure- corporate Data warehouses

UNIT V
The new age of information based marketing – advertising on the internet- charting, the online marketing process- market research – search and resource discovery paradigm- information search and retrieval – e-commerce catalogs and directories – information filtering – consumer- data interface emerging tools.

Reference:
   1. Ravi Kalakota, Andreq B.Whinston "Frontiers of Electronic Commerce" Pearson Education Asia , 2003
   2. Jeffery F. Rayport, Bernard J.Jaworski , "E-commerce", TMCH, 2002

Subject Title: WAP
Course Number: 10CSEFE06
Number of Credits: 4
Subject Description:
This course presents the rise of mobile data, the wireless mark up language, user interface design, and wireless telephony applications.
Goal:
To enable the students learns mobile concepts, WML and applications.
Objectives:
On successful completion of the course the students should have:
- Understood clearly the principles of WAP

UNIT I
Mobile Internet: Introduction, Mobile Data – connectivity- Key services for mobile internet access and application service providers: Content providers and developers

UNIT II
Mobile Internet Standards: Current web technologies for wires applications: origin , WAP components of wap standard: Network Infrastructure service supporting WAP –Principle tools, Software editors and emulators

UNIT III
Implementing WAP services: WML Basics and Document model; content generation, enhanced WM: WML Script, rules of script, standard libraries, user interface design

UNIT IV
Tailoring contents to client: Techniques using HTTP1.1; WAP Push, Push access, Push Technology, MIME media types for push messages; Proxy gateway; data base driven applications for WAP ; Object Model- ActiveX database objects(ADO); End-to-end WAP services-Security issues

UNIT V
WTA Architecture; client framework; Server and security; Design of Application creation Toolbox; WA enhancements; Technology, Bluetooth and voice xml

Reference:
1. Sandeep Singal et al. "WAP writing applications for Mobile Internet" Pearson Education

Subject Title: Web Designing
Course Number: 10CSEFE07
Number of Credits: 4
Subject Description:

 This Course presents the basics of Web designing.

Goals:

To enable the students to learn the Programming Languages for Web designing **Objectives :**

On successful completion of the course the students should have:

- Understood the fundamentals of Internet
- Understood the fundamentals of Web design and how to program using HTML and XML.

Contents
Unit I
   Introduction to Internet – World Wide Web – Browsers: Introduction – Popular Web Browsers – know your browsers – Electronic Mail : Introduction – E-mail networks and servers – E-mail protocols – Structure of an E-mail.

Unit II
   HTML : Introduction – Getting started – Creating and saving an HTML document – Document Layout of HTML Page – HTML elements – Some other formatting Styles – Hypertext Links.

Unit III
   HTML (contd) : URLs – Images – HTML tables – Forms – Special Characters – Metatages.
   Interactivity Tools and Multimedia : Introduction – DHTML – Scripting Languages – Java – ASP.

Unit IV
   XML :XML basics – Introduction – need for XML – Advantages – Working with an XML Document – Structure of an XML Document – DTD- XML Schema

Unit IV
   XML (contd) : Working with XML Schema - Declaring Attributes – XML namespaces – Reusing Schema Components – Grouping elements and attributes.
XML Style sheets : Introduction – CSS – eXtensible Style Sheet language – Formatting Data based on controls – Displaying data in a Tabular Format.

REFERENCE Books:
   1. "Internet and Web Design", ITL Education, Macmillan India Ltd..
   2. "HTML and XML an Introduction", NIIT, Prentice Hall of India Pvt.Ltd.

Subject Title: Web Services
Course Number: 10CSEFE08
Number of Credits: 4
Subject Description:
 This Course presents the Web Services Provided.
Goal
To enable the students to learn what is web service and Protocols used for Web services .
Objective
On successful completion of the course the students should have:
Understood how to build the real world applications using Web Services.
Contents
Unit I
    Introduction to Web Services – Industry standards, Technologies and Concepts underlying Web Services – their support to Web Services, Applications that consume Web Services.
Unit II
    XML – its choice for Web Services – Network protocols to backend databases – Technologies – SOAP, WSDL – exchange of information between applications in distributed environment – Locating remote Web Services – its access and usage, UDDI Specification – an introduction.
Unit III
    A brief outline of Web Services – Conversation – static and interactive aspects of system interface and its implementation, Work Flow – Orchestration and refinement, Transactions, Security issues – the Common attacks – security attacks facilitated within Web services Quality of Services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless Services – energy consumption, network bandwith utilization, Portals and Services Management.

Unit – IV
 Building real world Enterprise applications using Web Services – sample source codes to develop Web Services – Steps necessary to build and deploy Web Services and Client applications to meet Customer's requirement – Easier development, Customisation, maintenance, Transactional requirements, seamless porting to multiple devices and platforms.

Unit – V
    Development of Web Services and applications onto Tomcat application Server and Axis SOAP server (both are freewares) – Web Services Platform as a set of Enabling technologies for XML based distributed Computing.

REFERENCE BOOKS :
1. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services: An Architects Guide", Prentice Hall, Nov 2003
2. Keith Ballinger, "NET Web services: Architecture and Implementation with **.**Net", Pearson Education, First Education Feb 2003.
3. Ramesh Nagappan, Developing Java Web Services: Architecting and developing secure Web Services Using Java", John Wiley and Sons, first Edition Feb 2003
4. Eric A Marks and Mark J Werrell, "Executive Guide to Web services", John Wiley and sons, March 2003
5. Anne Thomas Manes, "Web Services: A managers Guide" Addison Wesley, June 2003.

Subject Title: ASP.NET
Course Number: 10CSEFE09
Number of Credits: 4
Subject Description:
 This Course presents the Introduction to ASP.NET programming.
Goals
To enable the students to learn what is ASP.NET fundamentals, Components & Web forms
Objective
On successful completion of the course the students should have:
Understood how to build the applications using ASP.NET.
Contents

Unit I
    Getting Setup - what is ASP.NET- Setting up for ASP.NET- The development environment – ASP & ASP.NET. An overview – ASP.NET Programming Languages. Programming Basics: Basics of Programming - Program Flow – Effective Coding Techniques –Designing Applications.

Unit II
    How Dynamic Website Applications work- Processing ASP.NET with Visual basic. NET:VB.NET Programming Language Structures –Built in ASP.NET objects & Interactivity- The response object –The ASP Server object.

Unit III
Web forms & ASP.NET:
    Web forms- ASP.NET Configuration, Scope and State: ASP.NET and configuration-ASP.NET and state –The application object –ASP sessions – The session object.

Unit IV
ASP.NET objects and components:
    The Scripting Object Model- Active Server Components and Controls –More Active Server Components.

Unit V
   Web services & ASP. NET –WSDL & SOAP- Web services Background – ASP.NET &SQL server- using SQL server –using databases in ASP.NET applications- ActiveX data objects- the ADO.NET objective model –coding structured query language.

REFERENCE BOOKS:
1.Dave Mercer, "ASP. NET A Beginner's Guide", Tata McGraw –Hill Pub. Company Ltd, 2002
2.Matt J. Couch, "ASP. NET and VB. NET Web programming ", Pearson Education, 2002.
3..Kirk Allen Evans, Ashwin Kamanna, Joel Mueller, "XML and ASP.NET", Pearson Education, 2002.

Subject Title: SOFTWARE TESTING
Course Number: 10CSEFE10
Number of Credits: 4
Subject Description:
Contents
UNIT I

Purpose of Software testing – Some Dichotomies – a model for testing – Playing pool and consulting oracles – Is complete testing possible – The Consequence of bugs – Taxonomy of Bugs.

UNIT II

Software testing Fundamentals – Test case Design – Introduction of Black Box Testing and White Box testing – Flow Graphs and Path testing – Path testing Basics - Predicates, Path Predicates and Achievable Paths - Path Sensitizing – Path Instrumentation – Implementation and Application of Path Testing.

UNIT III

Transaction Flow testing – Transaction Flows – techniques – Implementation Comments – Data Flow Testing – Basics – Strategies – Applications, Tools and effectiveness – Syntax Testing – Why, What, How – Grammar for formats – Implementation – Tips.

UNIT IV

Logic Based Testing – Motivational Overview – Decision tables – Path Expressions – KV Charts – Specifications – States, State Graphs and transition Testing – State Graphs – Good & bad states – state testing Metrics and Complexity.

UNIT V

Testing GUIs – Testing Client – Server Architecture – Testing for Real-time System – A Strategic Approach to Software testing – issues – unit testing – Integration Testing – Validation testing – System testing – The art of Debugging.

REFERENCES:
1. Boris Beizer, Software testing techniques, Dreamtech Press, Second Editio – 2003.
2. Myers and Glenford.J., The Art of Software Testing, John-Wiley & Sons,1979
3. Roger.S.Pressman, Software Engineering – A Practitioner's Approach ,Mc-Graw Hill,5th edition, 2001
4. Marnie.L. Hutcheson, Software Testing Fundamentals, Wiley-India,200