Annexure No.	31 H
SCAA Dated	29.02.2008

BHARATHIAR UNIVERSITY, COIMBATORE – 641 046 M. Sc INFORMATION TECHNOLOGY (CBCS) with compulsory Diploma course in Web Applications (Effective from the academic Year 2007-2008)

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 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. An additional Diploma course in **Web Applications** shall also be offered along with this M. Sc (Information Technology) course.

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.

Core/ Elective/ Supportive/ Project	Suggested Code	Sem.	Title of the Paper	L	Р	Credits	Marks
Core 1	07CSEFC01	Ι	Object Oriented Analysis and Design			4	100
Core 2	07CSEFC02	Ι	Advanced Computer Architecture	4		4	100
Core 3	07CSEFC03	Ι	Advanced Java Programming	2	4	4	100
Core 4	07CSEFC04	Ι	Unix Programming	2	4	4	100
Elective 1	07CSEFE01	Ι	Information Coding Techniques	4		4	100
Supportive 1	07CSEGSXX	Ι	General Supportive			2	50
Dip. Paper I		Ι	Diploma Paper I			4	100
Core 5	07CSEFC05	Π	Programming in C# and .NET Framework	2	4	4	100
Core 6	07CSEFC06	Π	Multimedia Systems			4	100
Core 7	07CSEFC07	Π	Network Security and Management	4		4	100
Core 8	07CSEFC08	Π	Distributed Computing	3	2	4	100
Elective 2	07CSEFEXX	Π	Elective 2			4	100
Supportive 2	07CSEGSXX	Π	General Supportive			2	50
Dip. Paper II		Π	Diploma Paper II			4	100
Core 9	07CSEFC09	III	Embedded Systems	4		4	100
Core 10	07CSEFC10	III	I Component Based Systems		2	4	100
Core 11	07CSEFC11	III	III Grid Computing			4	100
Core 12	07CSEFC12	III	Mobile Computing	4		4	100
Elective 3	07CSEFEXX	III	Elective 3	4		4	100
Supportive 3	07CSEGSXX	III	General Supportive			2	50
Dip. Paper III			Diploma Paper III			4	100
Dip. Paper IV			Diploma Paper IV			4	100
Core 13	07CSEFC13	IV	Project Work & Viva-voce			6	150
Тс	otal		M. Sc. Information Technology			72	1800
			Diploma Course in Web Applications			16	400

M. Sc. Information Technology with Compulsory Diploma Course in Web Applications Scheme of Examination (Effective From The Academic Year 2007-2008 – *CBCS*)

ELECTIVE PAPERS

Elective	07CSEFE01	Information Coding Techniques		4	100
Elective	07CSEFE02	Data Mining and Warehousing		4	100
Elective	07CSEFE03	Digital Image Processing		4	100
Elective	07CSEFE04	Artificial Intelligence	4	4	100
Elective	07CSEFE05	Software project management	4	4	100
Elective	07CSEFE06	E-commerce	4	4	100
Elective	07CSEFE07	WAP	4	4	100

DIPLOMA IN WEB APPLICATIONS (DWA)

(Offered compulsorily with PG Courses in Computer Science)

SCHEME OF EXAMINATION

Subject and Paper		Instructional Hours per	University Examinations			
		week/Credits	Duration in Hrs	Max Marks		
Paper I	Web Designing	3/4	3	100		
Paper II	Web Services	3/4	3	100		
Paper III	ASP.NET	3/4	3	100		
Paper IV	ASP.NET programming Lab	3/4	3	100		
Total		12/16		400		

Subject Title: OBJECT ORIENTED ANALYSIS AND DESIGN

Course Number: 07CSEFC01

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

- 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 (for the candidates admitted during 2007-08 only) Course Number: 07CSEFC02

Number of Instruction Hours: 4

Subject Description

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

Goals

To enable the students to learn the parallel processing concepts and standards.

Objectives

On successful completion of the course the students should have:

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

UNIT I

Overview of Computer Design – RISC Vs CISC - Performance related issues – Performance Parameters – Instruction set architecture design- compiler related issues

UNIT II

Pipelining – Pipeline hazards – Overcoming hazards – Instruction set design and pipelining – Concepts of dynamic Scheduling – Dynamic hardware branch prediction

UNIT III

Vector processors - Compiler support for ILP - extracting parallelism - speculation

UNIT IV

Virtual Memory architectures, Distributed shared memory architectures – synchronization – cache coherence issues

UNIT V

Standards- SCSI - Typical RISC processor, stack processors - data flow systems

- 1. J. L. Hennessy and D. A. Patterson, Computer Architecture: A Quantitative Approach, Harcourt Asia, for Morgan Kaufmann Publishing Co 1999.
- 2. Advanced Computer Architecture: Parallelism, Scalability, Programmability by Kai Hwang : Tata Mc Graw Hill.

Subject Title: ADVANCED JAVA PROGRAMMING

Course Number: 07CSEFC03

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:

Jamie Jaworski, "Java Unleashed", SAMS Techmedia Publications 1999
Campione, Walrath and Huml, "The Java Tutorial", Addison Wesley 1999
Jim Keogh," The Complete Reference J2EE", Tata McGrawHill Publishing Company

Ltd,2002

Subject Title: UNIX PROGRAMMING

Course Number: 07CSEFC04

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: PROGRAMMING IN C# AND .NET FRAMEWORK

Course Number: 07CSEFC05

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

- 1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2002
- 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: 07CSEFC06

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 System.

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: NETWORK SECURITY AND MANAGEMENT

Course Number: 07CSEFC07

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

Network Monitoring – Network control – OSI, Internet and IEEE network management standards

UNIT II

SNMP - MIBs, Implementation issues - SNMPv2 - SNMPv3, RMON - CMIP

UNIT III

Public Key , Private key, DES/RSA- Authentication - PGP – PEM – Kerberos –Auditing & Lodging

UNIT IV

TCP/IP security, NFS security, WWW security – Firewalls

UNIT V

High speed network protocols – secure protocols and current trends

- 1. William Stalling "SNMP, SNMPv2, SNMPv2, and RMON and 2" Addison Wesley
- 2. Garfinkel and Gene Spafford "Practical Unix and Internet Security" O'Reilly
- 3. William Stalling, Cryptography and network security.
- 4. Uday O Pabrai, Vijay K Gurbani "Internet & TCP/IP Network Security", McGraw-Hill

Subject Title: DISTRIBUTED COMPUTING

Course Number: 07CSEFC08

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: EMBEDDED SYSTEMS

Course Number: 07CSEFC09

Number of Credits :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: 07CSEFC10

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: 07CSEFC11

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.

- 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: 07CSEFC12

Number of credits: 4

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.

Contents:

Unit – I

Introduction to Mobile computing: Components of wireless environment- Challenges in Mobile environment- Mobile devices- Middleware and gateways- Wireless Internet- Security in mobile computing-Smart clients

Unit - II

Mobile computing Architecture- Three-tier Architecture- Design considerations for mobile computing-Mobile computing through Internet- Mobile-enabled Applications

Unit - III

Emerging Technologies in Mobile Computing: Bluetooth-radio frequency Identification(Rfid)-Wireless Broadband(WiMAX)-Mobile IP-Internet Protocol Version 6 (Ipv6)-Java card

Unit - IV

Global system for mobile communications (GSM): GSM Architecture- Entities- Call routing-PLMN interface-GSM addresses and identifiers-Network aspects- frequency allocation- GSM authentication and security-SMS architecture

Unit - V

Security issues in Mobile Computing: Information security-security techniques and algorithms-security protocols-public key infrastructure-security models.

Reference Books:

 Asoke K Talukder, Roopa R Yavagal,"Mobile Computing-Technology, Applications and Service creation", Tata McGrawHill Publishing Company Ltd,2005.
Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley publishing, 2003.

ELECTIVE PAPERS

Subject Title: INFORMATION CODING TECHNIQUES (for the candidates admitted during 2007-08 batch only)

Course Number: 07CSEFE01 Number of Credits : 4

Subject Description:

This course presents the Information Entropy Fundamentals, Data and Voice Coding, error control coding and encryption coding techniques

Goal:

To enable the students to learn the fundamentals of information coding techniques **Objectives:**

On successful completion of the course the students should have:

- Understood the Information Entropy Fundamentals.
- Learnt various coding techniques

UNIT I

Information Entropy Fundamentals: Relation between information and probability, mutual and self information entropy, Shannon's Theorem, Code design, Shannon-Fano coding, Huffman coding, implementation of Huffman Code.

UNIT II

Data and Voice Coding: context dependent coding, arithmetic codes, overall efficient consideration – voice coding, delta-modulation and adaptive modulation, linear predictive coding, silence coding, sub-band coding

UNIT III

Image and Video Compression: direct cosine transform, quantization loss, loss estimation – JPEG components and standards – Inter-frame coding, motion compensation techniques, MPEG-2 standards, Introduction to MPEG-4.

UNIT IV

Error Control coding: Backward error correction, linear lock codes, BCH codes, Golay codes, efficiency of LBC, performance of simple ARQ, go back-n and selective repeat schemes – Forward correction codes- Convolution coding, decoding algorithms, Viterbi decoding, optimum decoding, performance measures.

UNIT V

Encryption Coding: Transposition and substitution coding, Data Encryption Standards (DES), key distribution problem, public key encryption, public key decryption and MIT algorithm-Direct sequence CDMA based encryption, orthogonal sequences, and R-S code

- 1. Viterbi, "Information Theory and Coding", McGrawHill, 1982.
- 2. Proakis, "Digital Communication", McGrawHill, 1994.
- 3. "Data compression Book" BPB publication, 1992.

Subject Title : DATA MINING AND WAREHOUSING

Course Number: : 07CSEFE02

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

- 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: 07CSEFE03

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 processingelements 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

- 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: 07CSEFE04

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

- 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: 07CSEFE05

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

- 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: 07CSEFE06

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.

- 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: 07CSEFE07

Number of Instruction Hours: 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

- 1. Sandeep Singal et al. "WAP writing applications for Mobile Internet" Pearson Education
- 2. Data Bubrook "WAP: A beginners guide", Tata McGraw Hill.

COMPULOSRY DIPLOMA PAPER I : Web DESIGNING

(for the candidates admitted during 2007-08 batch only)

Subject Title : Web Designing
Course Number:Number of Instruction Hours: 3No. of credits : 4Subject 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 Web design and how to program using ASP and XML.

Contents

UNIT I

Basics of Web Technology: Web page creation- Scripting Language - HTML Tags – VBScript- JavaScript- Looping -Array handling -Functions and Procedures - Object creation - Validating Form Elements;

UNIT II

ASP : Active Server Pages- Server Side Scripting- Servers : IIS, PWS _ ASP Objects – Request- Response- Session- Server- Application objects- globel.asa file - Cookies - External & Internal cookies.

UNIT III

ASP Components - Ad Rotator- Context Rotator- Browser Capability- Page counter -Server objects- Database connectivity - DSN -Retrieving information from table -Manipulating records in tables. Implementation of ASP concepts in .NET environment. **UNIT IV**

XML :XML essentials - XML Documents - Valid Documents- Entities and attributes - Cascade Style Sheets - XML Scheme - Handling XML Documents and Data Binding.

UNIT IV

XML DOM - XSL Transformations - XSL Formatting Objects - XML and ASP-XML and Servlets - XML and Perl- WML

REFERENCE BOOKS:

- 1. Steven Holzner "Inside XML ", 2000 Edition, Techmedia Publishers.
- 2. "Unleashed ASP"- Techmedia Publisher.
- 3. "Interactive VBScript" Techmedia Publishers.

DIPLOMA PAPER II : WEB SERVICES

Number of Instruction Hours: 3

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

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<u>Unit I</u>

Introduction to Web Services – Industry standards, Technologies and Concepts underlying Web Services – their support to Web Services, Applications that consume Web Services.

<u>Unit II</u>

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.

<u>Unit – IV</u>

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.

DIPLOMA PAPER III : ASP. NET

Number of Instruction Hours: 3

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

<u>Unit I</u>

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.

<u>Unit II</u>

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.

<u>Unit III</u>

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.

DIPLOMA PAPER IV : ASP.NET PROGRAMMING LAB

Number of Instructional Hours:3

Number of Credits : 4

Subject Description

This course provides the introduction to .NET programming.

Goal :

To enable the students to learn about the development of web based applications using ASP.NET.

Objectives :

On successful completion of the course the students must have

- understood the basics of .NET programming
- got the skill of developing Web Applications
- knowledge to develop database applications in .NET environment.

REFERENCE BOOKS:

1.Dave Mercer, "ASP. NET A Beginner's Guide", Tata McGraw –Hill Pub. Company Ltd, 2002

2...'Beginning ASP.NET 2.0' by Chris Hart.