Faculty of Engineering & Technology

Board of Studies in Computer Science & Engineering

Proposed Curriculum structure of B.E. (CSE)

Part – I **W.E.F. 2009-10**

Sr. No.	Subject Code	Subjects	Teaching Scheme (Hours/Week)		Examination Scheme (Marks)			
			Lecture	Practical	Theory	TW	Practical	Total
01	CSE	Advanced Algorithms	4	2	100	50	--	150
02	CSE /IT	Principles of Compiler Design	4	2	100	--	50	150
03	CSE/IT	Professional Ethics & Cyber Security	4	--	100	--	--	100
04	CSE	Advanced Java	4	2	100	--	50	150
05	CSE	Elective-I	4	2	100	--	50	150
06	CSE	Project Part- I	--	2	--	50	--	50
		Total of I	**20**	**10**	**500**	**100**	**150**	**750**

Part – II

Sr. No.	Subject Code	Subjects	Teaching Scheme (Hours/Week)		Examination Scheme (Marks)			
			Lecture	Practical	Theory	TW	Practical	Total
07	CSE/IT	Soft Computing	4	2	100	--	50	150
08	CSE/IT	Data Warehousing & Data Mining	4	2	100	50	--	150
09	CSE/IT	Mobile Computing	4	2	100	--	50	150
10	CSE	Elective-II	4	2	100	--	50	150
11	CSE	Project Part - II	--	6	--	50	100	150
		Total of II	**16**	**14**	**400**	**100**	**250**	**750**
Total of I and II					**900**	**200**	**400**	**1500**

Elective –I: 1. Advanced DBMS 2. Object Oriented Analysis and Design 3. Embedded Systems

Elective- II: 1. Enterprise Information Systems 2. Multimedia Systems 3. Bio-informatics

CSE/IT - Advanced Algorithms

Teaching Scheme :
Lectures : 4 Hrs/Week
Practical : 2 Hrs/Week

Examination Scheme :
Theory Paper : 100 Marks (3 Hrs)
Term Work: 50 marks

Unit -1 Introduction: (8 hrs)
Revision of fundamental algorithms, sorting, searching, recursion, Algebraic simplification and transformation: The general method, evaluation and interpolation, FFT, modular arithmetic.

Unit -2 (8 hrs)
Lower Bound Theory: Comparison trees for sorting and searching, techniques for algebraic problems, some lower bounds on parallel computation.

Unit -3 (8 hrs)
NP hard and NP complete problems: basic concepts, Cook's theorem, NP hard graph problems, NP hard scheduling problems, NP hard code generation problems, some simplified NP-hard problems.

Unit -4 (8 hrs)
Approximate algorithms for NP hard problems: Introduction, absolute approximation, epsilon approximation, polynomial time approximation schemes, probabilistically good algorithms.

Unit -5 (8 hrs)
Parallel algorithms: Complexity measure for a parallel algorithm, parallel searching algorithm, parallel sorting algorithm, parallel algorithm for matrix manipulation, parallel algorithms for path problems- shortest path and related path problems.

Text/ Reference Books:

1. A.V. Aho, Hoperoft and J.D. Ullman: "Design analysis of computer algorithms" – Addison Wesley
2. Elis Horowitz and Sahni – "Fundamentals of Computer Algorithms", (Galgotia)
3. R.E. Tarjan- "Data structures and network algorithms "– SIAM press
4. K. Mehlhorn- "Data structures and algorithms, Vol II "– Springer Verlag

Term Work:
The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

Assessment of term work should be done, which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals/ assignments in the laboratory during the semester

CSE/IT - Principles of Compiler Design

Teaching Scheme:
Lectures: 04 Hours/Week
Practical: 02 Hours/Week

Examination Scheme:
Theory Paper: 03 Hours. 100 Marks
Practical Exam: 50 Marks

Objectives

- To learn and understand the design of a compiler
- To learn and use tools for construction of a compiler

Unit 1: **(08 Hrs)**

Introduction to compilers: Compilers & translators, Phases of compilers, bootstrapping, compiler construction tools.
Lexical analysis: Role of LA, Finite automata as recognizer Language for specifying LA – LEX programs, Implementation of LA.
The syntactic specification of programming languages: Context free grammars, derivations & parse trees, Ambiguity, non context free languages.

Unit 2: **(08 Hrs)**

Syntax Analyzers (or Parsers): Parsing techniques, shift reduce parsing, top down parsing. Recursive Descent parsing left factoring, Predictive parsing – FIRST & FOLLOW functions, LR parsers, LR grammars, the canonical collection of LR (O) items, LALR parser.
Automatic parser Generator YACC, YACC programs, Error detection and correction with YACC.

Unit 3: **(08 Hrs)**

Syntax Directed Translation (SDT) : SDT schemes, SDT schemes for desks calculator, intermediate code, Postfix notations, parser trees and syntax trees, Three address code – Quadruples and triples, indirect triples. SDT scheme for translation of following types of statement – assignment statements, Boolean expressions, Boolean expressions with control flow method, if then else statement, while do statement, Translation with Top – down parsers. Array references in Arithmetic expressions, procedure calls, variable declarations, CASE statements, Record structures

Unit 4: **(08 Hrs)**

Symbol tables: Contents of symbol table, data structures for symbol table lists, Self organizing lists, search trees, hash tables, Representing scope information.
Run – time storage Administration: Implementation of simple stack – allocation scheme, implementation of block structured languages – displays, parameter passing, returns.
Error detection & Recovery: Types of errors, reporting curves, sources of errors, syntactic phase errors, panic mode of recovery, error recovery in LR passing, automatic error recovery in YACC.

Unit 5 **(08 Hrs)**

Code Optimization: Principal sources of optimization , loop optimization - Basic blocks, flow graphs, loops, code motion, induction variables, DAG representation of basic blocks, Application of DAGs, Global Data Flow Analysis, Data Flow equations. Loop unrolling, loop jamming, constant folding.

Code Generation: Object programs, the environment of code, generator, run-time addresses for names, problems in code generation, working of a simple code generator in brief, register allocation and assignments, peephole optimization

Text / Reference Books:

1. A.V. Aho, J.D. Ullman , "Principles of Compiler Design" – (NAROSA)
2. D. M. Dhamdhere, "Compiler Construction – Principles & practices"
3. A V Aho, R. Sethi, J D Ullman, "Compilers: Principles, Techniques, and Tools", Pearson Education, ISBN 81 – 7758 – 590 – 8

Practical Examination:

The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Suggestive list of experiments:

1. Program to generate lexical tokens
2. Program to convert NFA to DFA
3. Study of LEX tool
4. Design of a Predictive parser
5. Study of YACC
6. Implementation of code generator
7. Implementation of code optimization for Common sub-expression elimination, Loop invariant code movement.

CSE/ IT - Professional Ethics and Cyber Security

Teaching Scheme:
Theory: 4 Hrs/week

Examination Scheme:
Theory Paper: 03 Hours. 100 Marks

Objectives:

- To make students familiar with the fundamental concepts of computer ethics
- To know the linkage between computer, professional , philosophical ethics and decision making
- To develop the concepts in computer forensics
- To give emphasis on how cyber security operations are carried out
- To introduce the linkage between technology, law and ethics

CONTENTS

Unit 1- Computer ethics and philosophical ethics: (08 Hrs)

Vacuum of policies, conceptual muddles, social context, moral and legal issues, uniqueness of ethical issues, role of analogy, descriptive and normative claims, ethical relativism, utilitarianism, other theories

Professional Ethics:

Characteristics, the system of professions, computing as a profession, professional relationships, responsibilities, code of ethics and professional conduct

Privacy: Computers and privacy issue, reframing this issue, legislative background, better privacy protection

Unit- 2 (08 Hrs)

Intellectual property issues in cyberspace:

Introduction to intellectual property Protections via Copyright, Trade Secrets, Trademarks, Patents, Contracting to protect intellectual property, Protection options – Encryption, copyright on web-content, copyright on software

Ethical Decision Making: (08 Hrs)

Types of ethical choices, Making defensible decisions, Ethical dilemmas, law and ethics, Guidelines for dilemma (Informal and Formal), Four-step analysis process of solving dilemma

Case studies: i) A stolen password ii) Recovery of data leads to Discovery of confidential files iii) Do copyright ethics change overseas?

Unit 3- Crime incident Handling Basics: **(08 Hrs)**

Hacking, cyber activism, Tracking hackers, clues to cyber crime, privacy act, search warrants, common terms, organizational roles, procedure for responding to incidents, reporting procedures, legal considerations

Information Technology Act 2000

Scope, jurisdiction, offense and contraventions, powers of police, adjudication

Unit 4- Cyber Forensics: (08 Hrs)

Cyber forensics, cyber crime examples, forensics casework, investigative incident-response actions, computer forensics tools, Threats in cyberspaces, Blended attacks

Sample Policy Documents: i) Antivirus Guidelines Policy ii) Internal Lab Security Policy iii) Server Security Policy iv) Wireless Communications Policy

Unit 5- **(08 Hrs)**

Information Security Certifications, CISSP and SSCP, CISA and CISM, SCP, GIAC, certification weaknesses, Role of these certified professionals, Windows Server 2003 Security Fundamentals

Text/ Reference Books:

1. Deborah G Johnson, " *Computer Ethics*", Pearson Education Pub., ISBN : 81-7758-593-2.
2. Earnest A. Kallman, J.P Grillo, "*Ethical Decision making and IT: An Introduction with Cases",* McGraw Hill Pub.
3. John W. Rittinghouse, William M. Hancock, "*Cyber security Operations Handbook*", Elsevier Pub.
4. Michael E. Whitman, Herbert J. Mattord, "*Principles of Information Security",* 2nd Edition,, CengageLearning Pub.
5. Randy Weaver, Dawn Weaver, "*Network Infrastructure Security*", Cengage Learning Pub.

CSE- Advanced Java

Teaching Scheme:
Lectures: 04 Hours/Week
Practical: 02 Hours/Week

Examination Scheme:
Theory Paper: 03 Hours. 100 Marks
Practical Exam: 50 Marks

Objectives:

- To study advanced concepts of Java Language
- To enable students to develop Network based and Advanced Online Applications in Java

Unit 1: Introduction to J2EE **(08 Hrs)**

Overview of Java EE 5, Enterprise Architecture, Introduction to Java EE Platform, Introduction to Java EE related technologies, HTTP protocol: Request and Response, Web application Introduction, Web Containers, Introduction to JDBC.

.**Unit 2: Java Servlets** **(08 Hrs)**

Features of Java Servlets, Servlet life cycle, Working with ServletConfig and ServletContext, Working with HttpServletRequest and HttpServletResponse, Session Management in Servlets, Creating Sample Servlet Application, Servlet Collaboration. Packaging and deployment of web application

Unit 3: Java Server Pages **(08 Hrs)**

JSP: Overview, lifecycle, Architecture. JSP Elements: Directives, Scripting, Action tags, Implicit Objects, Comments. Custom Tags, Scope: page, request, session, application JSP and JDBC Connectivity, JSP Exception handling.

Unit 4: Hibernate and Struts **(08 Hrs)**

Introduction to Hibernate, Architecture, Hibernate Query language, Hibernate Object Relational Mapping: Understanding and Implementation, Mapping inheritance, Using Hibernate to generate queries, Struts2: Overview, Architecture, Model View Controller Architecture, Basic Components of Strut, Application development using Strut.

Unit 5: Web Service **(08 Hrs)**

Introduction to Web services, Overview of Web-service related technologies, Service oriented architectures, Serializing and deserializing XML via JAXB (Java API for XML Binding), Service lifecycles: deployment, registration, discovery and invocation, Presentation of the SOAP protocol: architecture, the invocation context, and the creation of messages, WSDL (Web Service Definition Language), Publication and discovery of Web services with UDDI (Universal Description Discovery and Integration), Invocation of Web services using JAX-WS (Java API for XML Web Services).

Text/ Reference Books:

1. Java Server Programming (Java EE 5) Black Book by Wiley Publication.
2. Subrahmanyam Allamaraju, Samir Tyagi, Karl Avedal, John Griffin, “Professional Java Server Programming J2EE”, Edition by Wrox Publication.
3. James Holmes, “The Complete Reference Struts”, TataMcGraw Hill.
4. Dave Minter, Jeff Linwood, “Beginning Hibernate from Novice to Professionals”, Apress Publication

5. J Richard Monson, “J2EE Web Service”, Addison Wesley Publication .
6. Kathy Sierra and Bert Bates, “Head First JSP and Servlets”, O’reilly Publication.

Practical Examination:
The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

The Practical should be carried out using Open Source IDE for Java such as Netbeans, Eclipse. These tools are available for free download at

1. www.netbeans.org
2. www.eclipse.org
3. www.sun.com

Suggestive List of Experiments-

1. Basic Servelet program(Hello World)
2. Program to perform database operation (insert, delete, update, select) using JSP and JDBC.
3. Program to perform database operation(insert,delete,update,select) using Hibernate
4. Program to use ServletContext,ServletConfig.
5. Program to use <jsp:useBean> tag in jsp.
6. Program to create Session Management using jsp.
7. Program to create Custom jsp tag.
8. Program to create MVC architecture using Strut.
9. Program to create Simple Web service.
10. Program to create application using JSP, Strut and Web Service.

CSE Elective- I – (i) Advanced Database Management System

Teaching Scheme:
Lectures: 4 Hrs / week
Practical: 2 Hrs/ week

Examination Scheme:
Theory Paper: 100 marks (3 Hrs)
Practical Exam: 50 marks (3 Hrs)

Objectives:

- To reinforce students' ability to apply modern database management concepts to real problems.
- To learn and understand advances in Database System .
- To learn and understand various database architectures and applications.

UNTT 1:- Parallel databases (8 Hrs)
Introduction, Parallel database architecture, I/O parallelism, Inter-query and Intra-query parallelism, Inter-operational and Intra-operational parallelism, Design of parallel systems

UNIT 2 :- Distributed Databases (8 Hrs)
Introduction, DDBMS architectures, Homogeneous and Heterogeneous Databases,
Distributed data storage, Distributed transactions, Commit protocols, Concurrency control in Distributed databases, Availability, Distributed query processing

UNIT 3 :- Advanced Data Types & New Applications (8 Hrs)
Introduction, Time in Databases, Spatial & geographical Data, Multimedia Databases, Mobility & Personal Databases

UNIT 4:- Internet Databases (8 Hrs)
Introduction**,** Overview of client server architecture, Databases and web architecture, N-tier architecture,
XML - Introduction, XML DTD's, Domain specific DTD's , Querying XML data.

UNIT 5:- Object Based Databases (8 Hrs)
Object Oriented Databases - Object Oriented Data Model Concepts, Persistent Programming Languages, OMDG Standard.
Object Relational Databases- Database Design for an ORDBMS, Nested Relations, Complex Types, Inheritance, Reference Types.
Comparing RDBMS with OODBMS & ORDBMS.

Text / Reference Books:

1. Abraham Silberschatz, Henry Korth, S, Sudarshan, "Database system concepts", 5th Edition , McGraw Hill International Edition
2. Abraham Silberschatz, Henry Korth, S, Sudarshan, "Database system concepts", 4th Edition , McGraw Hill International Edition
3. Raghu Ramkrishnan, Johannes Gehrke, "Database Management Systems", Second Edition, McGraw Hill International Edition
4. Rob Coronel, Database systems : "Design implementation and management", 4th Edition, Thomson Learning Press
5. Date C.J. , "Database Systems" (Pearson Education Asia 7th Ed.)

Practical Examination:
The term work shall consist of at least **8** experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Suggestive List of assignments:-

1. Implement HTML template, URL by taking suitable example.
2. Implementation of Java Servlet
3. Implementation of Java Bean
4. Simple Web based system using ASP / JSP
5. Introduction to XML,DTD
6. Consider University/Company Database :-
    - Create well formed XML Document.
    - Create DTD for your XML Document
    - Write an XML-QL query to retrieve some information
7. **ORDBMS** — Implement system using composite, multivalued attributes, inheritance
8. Case Study :- Any one from open source (eg: Postgres SQL »My SQL)
9. Case Study :- Any one from Oracle, SQL Server, DB2

CSE Elective- I (ii) Embedded Systems

Teaching Scheme:
Lectures: 4hrs/week
Practical: 2 hrs/week

Examination Scheme:
Theory Paper: 100 Marks (03 hrs)
Practical: 50 Marks

Objectives:

- To make students ware of Embedded systems
- To learn and understand concepts of RTOS.

UNIT I: 8051 Microcontroller (08 Hrs)
Introduction, Comparison with Microprocessor, Evolution of Microcontroller , Microcontroller and embedded systems, Microcontroller selection criteria, Architecture and Block Diagram of 8051, Flag bits and PSW, ROM memory space allocation, RAM memory space allocation, Pin diagram of 8051,Addressing modes, Memory organization of 8051.

Unit II: 8051 Programming in C (08 Hrs)
Bit Addresses of I/O and RAM, Data types in 8051 C, Time delay in 8051 C, I/O Programming, Logic operations, Data conversion, Accessing Code ROM Space, Data Serialization, Registers for Timer Programming, Modes of Timers, Counter Programming, Programming Timers of 8051.

Unit III: Serial Communication and Interrupt Programming (08 Hrs)
Basics of Serial Communication, Registers of 8051 used for Serial Communication, Programming 8051 for receiving and transmitting serial data, 8051 Interrupts, Programming Timer Interrupts, Programming External Hardware Interrupts, Programming serial communication interrupt, Interrupt priority in 8051.

Unit IV: Interfacing of 8051 (08 Hrs)
LCD Interfacing, Keyboard Interfacing, ADC 0804 and 0808/09 Interfacing, DAC 0808 interfacing, Interfacing and Accessing External data memory, Stepper motor interfacing using 8255, RTC Interfacing, DC Motor control and PWM.

Unit V: Real Time Operating Systems (08 Hrs)
Real Time Operating System Concept, Architecture of kernel, Schedule management, Task scheduler, Interrupt routines, Semaphores, Mailbox, Message queues, Pipes, Events, Timers, Memory management, RTOS services in contrast with traditional OS, Overview of commercial RTOS like Vxworks, RT Linux, µcos, QNX,

Text/ Reference Books:

1. Mazidi "The 8051 Microcontroller and Embedded Systems Using Assembly and C", PHI.
2. Rajkamal, "Embedded Systems", TMH.
3. Frank Vahid, "Embedded System Design", PHI.
4. Mazidi, "The 8051 Microcontroller and Embedded Systems", PHI.
5. Kenneth J. Ayala, " The 8051 Microcontroller", PHI

Practical Examination:
The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Suggestive List of Experiments:

1. Program for different C data types for 8051.
2. Program for time delay generation using loop and timer of 8051.
3. Program for I/O programming using byte sized data and bit addressable I/O.
4. Program for Accessing SFR registers of 8051.
5. Program for logical operations in 8051 using C.
6. Program for data serialization using 8051 C.
7. Program for data conversion (ASCII to BCD, BIN to ASCII, HEX to ASCII).
8. Program for Interfacing of ADC.
9. Program for Interfacing of LED.
10. Program for Interfacing of stepper motor.

The experiments shall be carried out using any commercial “C Compiler” or “Sim”

CSE Elective I – (iii) Object Oriented Analysis and Design

Teaching Scheme:
Lectures: 4hrs/week
Practical: 2 hrs/week

Examination Scheme:
Theory Paper: 100 Marks (03 hrs)
Practical: 50 Marks

Objectives:

- To provide a sound understanding of the fundamental concepts of the object model.
- To teach how large, complex software systems are developed using modern software engineering methods and models.
- To teach the realistic application of object oriented development within a variety of problem domains.

Unit 1: (8 hrs)

The inherent Complexity of software ,The Structure of Complex Systems ,Bringing Order to Chaos ,On Designing Complex Systems ,Categories of Analysis and Design Methods.

The Evolution of the Object Model, Elements of the Object Model, Applying the Object Model, Foundations of the Object Model, The Nature of an Object ,Relationships Among Objects ,

Unit-2 (8 hrs)

The Nature of a Class, Relationships Among Classes,The Interplay of Classes and Objects ,On Building Quality Classes and Objects , Invoking a Method. The importance of proper classification, Identifying Classes and Objects Key Abstraction and Mechanism, A Problem of Classification

Unit-3 The Notation and the Process (8 hrs)

Elements of the Notation, Class Diagram, State Transition Diagrams, Object Diagrams, Intersection Diagram, Module Diagrams, Process Diagrams, Applying the Notation, First Principles, The Micro Development process, The Macro Development process.

Unit- 4: Pragmatics (8 hrs)

Management and Planning, Staffing, Release Management, Reuse, Quality Assurance and Metrics, Documentation, Tools, Domain specific issues ,Technology Transfer , The Benefits and Risk of Object-Oriented Development.

Unit-5: Applications (8 hrs)

Data Acquisition: Weather Monitoring System, Frameworks: Foundation Class Library, Client Server Computing: Inventory Tracking, Command and Control: Traffic Management

Text/ Reference Book:

1. Grady Booch, "*Object oriented analysis and Design with applications"* , Second Edition, Pearson application.
2. J W. Satzingr, Robert B.Jackson, Stephen D. Burd, *"Object oriented analysis and Design with Unified Process"*, Cengage Learning Pub.
3. Grady Booch, James Rumbaugh, Ivar Jacobson, "*The Unified Modeling Language User Guide"* (Addison-Wesley Object Technology Series)
4. Richard Lee , William M.Tepfenhart, *"UML and C++ - A practical guide to object oriented development"* , Second edition

Practical Examination:
The term work shall consist of at least two mini projects to be developed OR case studies to be solved using object oriented modeling language called UML **.**

The Practical Examination shall consist of **oral** based on the syllabus as per the journal record.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

CSE - Project Part –I

Teaching Scheme:
Practical: 2 Hrs. / Week

Examination Scheme:
Term Work: 50 marks

1. Project Group size = maximum 4 students

2. The project is to be taken up at the start of the semester- I and the project must be completed by the end of semester II.

3. While submitting project proposal care is to be taken that project will be completed within the available time of two terms.

4. Project title should be precise and clear. Selection and approval of topic: Topic should be related to real life or commercial application in the field of Computer Engineering
   OR
   Investigation of the latest development in a specific field of Computer Engineering
   OR
   Commercial and Inter-disciplinary projects should be encouraged.

   The examination will be conducted independently in respective departments.

5. The group should maintain a logbook of activities. It should have entries related to the work done, problems faced, solution evolved etc., duly signed by guide. This data should be used for finding the total man hours and estimating the cost of the project.

6. **The group is expected to complete details Literature Survey, system/problem definition, analysis, design, etc. in (B.E. first Term) seventh term, as a part of term work in the form of a joint report.** Project report must be submitted in the prescribed format only. No variation in the format will be accepted.
7. The guides should regularly monitor the progress of the project work.
8. Assessment of the project for award of term work marks shall be done by the guide and a departmental committee as per the guidelines given in the following table.

9. The **suggestive format** of the report is as follows:
   (Only one report should be submitted per group as a part of term work submission.)

   Title of the Project:

   Names & Roll Nos of the students:

   Name of the guide:

   Chapter 1: Introduction

   Chapter 2: Literature Survey

   Chapter 3: System Development

A) ASSESSMENT OF PROJECT I TERMWORK B.E. FIRST TERM

NAME OF THE PROJECT: _____

NAME OF THE GUIDE: _____

Sr No	Exam Seat No	Name Of Student Marks	Assessment by guide (70%)					Assessment by Departmental committee (30%)			Grand Total
			Literature survey	Topic Selection	Documen-tation	Attendance	Total	Evaluation (10%)	Pres-ntaion (20%)	Total	
			10	05	15	05	35	05	10	15	50

Sign of Guide Sign. of Committee Members Sign. of H. O. D.

CSE/IT - Soft Computing

Teaching Scheme:
Lectures : 4 Hrs/Week
Practical : 2 Hrs/Week

Examination Scheme:
Theory Paper : 100 Marks (3 Hrs)
Practical Exam: 50 marks

Objectives:
- To study models of ANN and Fuzzy Logic
- To be able to apply these models in practice for solving problems in diverse areas such as pattern recognition, pattern matching
- To study and understand techniques of Feed forward and feedback neural networks

Unit 1 - (8 hrs)
Basics of Artificial Neural Network
Characteristics of Neural Networks, Structure and working of a biological neural network, artificial neural network: terminology, models of neurons: Mc-Culloch - Pitts model, Perceptron model, Adaline model, topology, Basic learning laws.
Functional Units for ANN for Pattern Recognition Task: Pattern Recognition Problem, Basic Functional units, PR by functional units.

Unit 2 (8 hrs)
Feedforward Neural Networks
Supervised Learning I: Perceptrons – Learning and Memory, Learning Algorithms, Error Correction and Gradient Decent Rules, Perceptron Learning Algorithms,
Supervised Learning II: Backpropogation- Multilayered Network Architectures,
Back propagation Learning Algorithm, example
Applications of feed forward neural networks.

Unit 3 (8 hrs)
Feedback Neural Networks & Self Organizing Feature Map
Introduction, Associative Learning, Hopfield network, Error Performance in Hopfield networks, simulated annealing, Boltzmann machine and Boltzmann learning,
State transition diagram and false minima problem, stochastic update, simulated annealing, Boltzmann machine, Bidirectional Associative Memory, BAM Stability Analysis.
Self Organization, Generalized Learning Laws, Competitive Learning, Vector Quantization, self organizing feature map, Applications of self organizing feature map.

Unit 4 - Fuzzy Logic (8 hrs)
Fuzzy set theory, crisp sets, operations on crisp set, fuzzy sets, fuzzy versus crisp, operations, fuzzy relations, crisp relations, properties Fuzzy logic
Application: Fuzzy Control of Blood Pressure

Unit 5 (8 hrs)
Fuzzy Logic in database and Information systems- Fuzzy Information, Fuzzy Logic in database Systems, Fuzzy Relational data Models, operations in Fuzzy Relational data Models, Design theory for Fuzzy Relational databases, Fuzzy information Retrieval and Web search, Fuzzy Object Oriented databases.
Introduction to Genetic Algorithms, Evolutionary Algorithms.

Text / Reference Books:

1. B. Yegnanarayana , "*Artificial Neural Networks*", PHI publications
2. Satish Kumar, "*Neural Networks- A classroom Approach*", TMH Publication
3. John Yen, Reza Langari, "*Fuzzy Logic*", Pearson Education
4. S. Rajasekaran, Vijaylakshmi Pari, "Neural networks, Fuzzy Logic and Genetic Algorithms- Synthesis and Applications", PHI publication.
5. Lotfi A. Zadeh, "Soft computing and Fuzzy Logic", World Scientific Publishing Co., Inc. River Edge, NJ, USA.

Practical Examination:
The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Assessment of term work should be done , which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals/ assignments in the laboratory during the semester

Suggestive List of Programs –

1) Implementation of McCulloh-Pitts model.
2) Implementation of perceptron model.
3) Implementation of Hopfield model.
4) Implement Delta rule.
5) Implement back propagation rule.
6) Implement model for multilayer perceptron.
7) Study of pattern classification and pattern clustering
8) Study of ART networks

Implementation of the programs is to be done using MATLAB platform.

CSE/IT - Data Warehousing and Data Mining

Teaching Scheme:
Lectures : 4 Hrs/Week
Practical : 2 Hrs/Week

Examination Scheme:
Theory Paper : 100 Marks (3 Hrs)
Term Work: 50 marks

Objectives:

- To familiarize with the fundamental concepts of Data warehousing and OLAP
- To develop the concepts of data mining methods in database management skills
- To be able to efficiently design and manage data storages using data warehousing, OLAP, and data mining techniques,
- To use the concepts in Text mining, web mining and Knowledge Discovery

Unit 1- Introduction to Data Warehousing: (8 hrs)

Introduction to Decision Support System: DSS Defined, History of DSS, Ingredients of DSS, Data and Model Management, DSS Knowledge base, User Interfaces, The DSS Users, Categories and Classes of DSSs Need for data warehousing, Operational & informational data, Data Warehouse definition and characteristics, Operational Data Stores.

Unit 2- Data warehouse Components (8 hrs)

Architectural components, Data Preprocessing: Why Preprocess Data? Data Cleaning Techniques, Data Integration and Transformation, Data Reduction Techniques, Discretization and Concept Hierarchy Generation for numeric and categorical data, Significant role of metadata , Building a Data warehouse, Benefits of Data Warehousing.

Unit 3- OLAP in the Data Warehouse (8 hrs)

A Multidimensional Data Model, Schemas for Multidimensional Databases: Stars, Snowflakes, Star join and Fact Constellations Measures, Concept Hierarchies, OLAP Operations in the Multidimensional Data Model, Need for OLAP, OLAP tools , Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web.

Unit 4- Data Mining Algorithms (8 hrs)

Concept Description: What is Concept Description? Data Generalization and Summarization-Based Characterization, Mining Descriptive Statistical Measures in Large Databases. Mining Association Rules: Association Rule Mining, Market Basket Analysis, Association Rule classification, The Apriori Algorithm, Mining Multilevel Association Rules, Constraint-Based Association Mining, Sequential mining.

Classification and Prediction: What is Classification and Prediction? Data Classification Process, Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification,

Unit 5- Classification, Knowledge Discovery (8 hrs)

Classification Based on Association Rule Mining, Other Classification Methods Cluster Analysis: What is Cluster Analysis? Types of Data in Cluster Analysis, A Categorization of Clustering Methods.

Introduction to **Knowledge Discovery**, innovative techniques for knowledge discovery, application of those techniques to practical tasks in areas such as fraud detection, scientific data analysis, and web mining, Introduction to huge data sets such as Web, telecommunications networks, relational databases, object-oriented databases, and other sources of structured and semi-structured data, Problem of Large Data sets

Text/Reference Books –

1. Paul Punnian, “Data Warehousing Fundamentals”, John Wiley Pub
2. Han, Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann .
3. Alex Berson, S.J. Smith, “Data Warehousing, Data Mining and OLAP”, Tata McGraw Hill
4. Margaret Dunham, “Data Mining: Concepts and Techniques”, Morgan Kaufmann Pub.
5. Ralph Kimball, "The Data Warehouse Lifecycle toolkit', John Wiley.
6. Jiawei Han, Micheline Kamber, “Data Mining : Concepts and Techniques”, 2nd edition, Morgan Kaufmann, ISBN 1558609016, 2006.
7. A B M Shaukat Ali, Saleh A Wasimi, “Data Mining: Methods and Techniques”, Cengage Learning Pub.
8. Ian Witten and Eibe Frank, Data Mining, “Practical Machine Learning Tools and Techniques with Java Implementations”, Morgan Kaufman, ISBN 1558605525, 1999,

Term Work:
The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

Assessment of term work should be done, which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals/ assignments in the laboratory during the semester

Suggestive List of experiments:

1. Evolution of data management technologies, introduction to data warehousing concepts
2. Develop an application to implement defining subject areas, design of fact and dimension tables, data marts.
3. Develop an application to implement OLAP, roll-up, drill-down, slice, and dice operations.
4. Develop an application to construct a multidimensional data
5. Develop an application to implement data generalization and summarization techniques
6. Develop an application to extract association mining rules.
7. Develop an application for classification of data.
8. Develop an application for implementing one of the clustering technique
9. Develop an application for implementing Naïve Bayes classifier
10. Develop an application for Decision tree classifier

CSE/IT – Mobile Computing

Teaching Scheme:
Lectures: 4hrs/week
Practical: 2 hrs/week

Examination Scheme:
Theory Paper: 100 Marks (03 hrs)
Practical: 50 Marks

Objectives:

1. To make students familiarize with Wireless Networking.
2. To know the basics of WAP and WML
3. To familiarize students with open source tools for Mobile Applications

CONTENTS:

Unit-1 Wireless and Mobile Network Architecture (8 Hrs)
Principle of Cellular Communication, Overview 1G, 2G, 2.5G and 3G and 4G technologies, GSM Architecture and Mobility management hand off management, Network signaling, Mobile Devices –PDA and mobile OS, PalmOs, Win CE and Symbian.

Unit-2 Mobile IP Protocol Architecture (8 Hrs)
Mobile IPv4 and IP v 6 and its application in mobile computing. Cellular Digital Packet Data CDPD, VOIP, GPRS Services, Wireless Local Loop-WLL system.

Unit-2 Wireless Application Protocol (WAP) (8 Hrs)
The Wireless Application Protocol application environment, wireless application protocol Client software, hardware and websites, wireless application protocol gateways, Implementing enterprise wireless application protocol strategy.

Unit -4 Wireless Markup Language (8 Hrs)
An Introduction to Wireless Technologies, Markup Languages, An Introduction to XML, Fundamentals of WML, Writing and Formatting Text, Navigating Between Cards and Decks, Displaying Images, Tables, Using Variables, Acquiring User Input

Unit-5 Wireless Markup Language Script (8 Hrs)
An Introduction to WMLScript, WMLScript Control Structures, Events, Phone.com Extensions, Usability, Application of Mobile computing**:** ASP and Dynamic WAP Sites, Developing WAP Applications using Emulators.

Text/ Reference Books:

1.Yi Bing Lin, "*Wireless and Mobile Networks Architecture*", John Wiley.
2. Wrox, "*The Beginning WML and WML Script*", Wrox Publication
3. Tomasz Imielinski et.al, "*Mobile Computing"*, Kluwer Academic Press 1996.
4. Jochen Burkhardt, et.al. "*Pervasive Computing, Technology and Architecture of Mobile Internet Applications*", Addison Wesley, 2002
5. Gary J.Mullet "introduction to Wireless Telecommunication Systems and Networks",DELMAR CENGAGE Learning 2007

Practical Examination:
The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Suggestive List of Experiments –

1. WAP and WML
2. Programs Wireless Markup Language
3. Writing and formatting of text in WML
4. Navigation between cards and deck
5. Displaying of Image using WML
6. Table properties of WML
7. Methods of acquiring user inputs in WML
8. WML scripts basics
9. If – else structure of WML script
10. Assignment on latest Open Source Operating Systems for Mobile

Elective II - CSE/IT (i) Enterprise Information System

Teaching Scheme:
Lectures: 04 Hours/Week
Practical: 02 Hours/Week

Examination Scheme:
Theory Paper: 03 Hours, 100 Marks
Practical Exam: 50 Marks

Objectives

- To learn and understand the scope of Information Management
- To introduce the Control, audit and security

Course Content:

Unit 1 Information and Management (8 hrs)

Types of information, why do we need a computer based information system? Management structure, Management and information requirements, qualities of information.

Examples of Information Systems

Various functions in organizations, Information processing for a store- An overview, Varieties of information systems.

Information Systems Analysis & Design Overview:

Overview of design of an information system. The role and tasks of a systems analysts, Attributes of a systems analyst, Tools used by system analyst, System Development Life Cycle

Unit 2 (8 hrs)

Information Gathering

Strategy to gather information, Information sources, Methods of searching for information, Interviewing techniques, Questionnaires, Other methods of information search, Case example- Hostel information system.

System requirements specification: Example, Data dictionary, Steps in Systems Analysis, Modularizing requirements specifications, Conclusions.

Unit 3 (8 hrs)

Feasibility Analysis, Data flow diagrams:

Deciding on project goals, Examining alternative solutions, Evaluating proposed solution, Cost-benefit analysis, Pay back period, Feasibility report, System proposal, Symbols used in DFD's Describing a system with a DFD, Good conventions in developing DFDs, Leveling of DFDs, Logical and Physical DFDs, Process Specifications - Process specification methods, structured English Some examples of process specification.

Unit 4 (8 hrs)

Decision Making

Decision table terminology and development, Extended entry decision tables, Establishing the logical correctness of decision tables, Use of Karnaugh maps to detect logical errors in decision tables, Eliminating redundant specifications.

Unit 5 (8 hrs)

Control, audit and security of information systems

Review of following standards – CMM, ISO 17799, ISO 27001, BS 7799

Text/Reference Books:

1. Kennth C. Laudon, Jane P. Laudon, "Management Information Systems", 9th Ed. Pearson

Practical Examination:

The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of **an oral** based on the syllabus as per the journal record. Duration of examination is three hours.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Elective II – CSE (ii) Multimedia Systems

Teaching Scheme:
Theory: 4 Hrs/Week
Practical : 2 Hrs/Week

Examination Scheme:
Theory paper: 100 marks (3 hrs)
Practical Exam : 50 Marks (3 hrs)

Objectives:
- To introduce to the students the characteristics and design methodologies of Multimedia
- To focus on content creation for the web and multimedia
- To expose students to theoretical and fundamental concepts of multimedia, its applications and the techniques involved.
- To help students learn the issues involved in capturing, processing, manipulating, storing, and retrieving various kinds of continuous media.

Unit 1: Multimedia-An Overview (8 hrs)
Introduction, Multimedia Presentation and Production, Characteristics of a Multimedia presentation, Multiple Media, Utilities of Multi-sensory Perception, Hardware and Software Requirements, Uses of Multimedia, Promotion of Multimedia Based Content, Steps for Creating a Multimedia Presentation, Analog Representation, Digital Representation and its Need, Analog to Digital Conversion, Digital to Analog Conversion, Visual Display Systems, Cathode ray Tube, TFT, Video Adapter Card, Video Adapter Cable, Liquid Crystal Display, Plasma Display Panel.

Unit 2: Text, Images, and Graphics (8 hrs)
Text, Types of Text, Font, Insertion of Text, Text Compression, File Formats, Image, Image Types, Color and its Models, Basic Steps for Image processing, Scanner, Digital Camera, Interface Standards, Specifications of Digital Images, Color Management System, Image File Formats, Image Output on Monitor and Printer, Graphics, Advantages and Uses of Graphics, Components of Graphics systems, Coordinate Systems, 3D Graphics, 3D Polygon Modelling, Surface Characteristics and Texture, Lights, History and Uses of Animation, Keyframes and Tweening, Principles of Animation, Creating Animation, VRML.

Unit 3: Audio and Video Technology (8 hrs)
Audio, Acoustics, Nature of Sound Waves, Fundamental Characteristics of Sound, Musical Note and Pitch, Psycho – acoustics, Elements of Audio Systems, Microphone, Amplifier, Loudspeaker, Audio Mixer, Digital Audio, Synthesizers, MIDI and their Connections, Audio Transmission, Audio Recording Devices-Phonograph, Gramophone, Compact Cassette, CD-DA, and DAT, Audio File Formats-WAV, MID, AU, MP3, and WMA. Audio and Multimedia, Video, Analog Video Camera, Transmission of Video Signals, Video Signal Formats, Television Broadcasting Standards, Digital Video Standards, Video File Formats- AVI, MOV, MPEG, H.261, H.263, WMV.

Unit 4: Data Compression (8 hrs)
Coding Requirements, Source Coding, Entropy Coding, Hybrid Coding, Major Steps of Data Compression, Basic Compression Techniques, Run Length Coding, Huffman Coding, Transformation Coding, Prediction or Relative Coding, JPEG, Image Preparation, Lossy Sequential DCT-Based Mode, Expanded Lossy DCT-Based Mode, MPEG, Video Encoding, Audio Coding, Data Stream, Comparison Between MPEG-2, MPEG-4 and MPEG-7.

Unit 5: Optical Storage Media (8 hrs)

Basic Technology, Video Discs and WORMs, Compact Disc Digital Audio, Technical Basics, Eight to Fourteen modulation, Error Handling, Frames, Tracks, Areas, and Blocks of a CD-DA, Advantages of CD-DA, Compact Disc Read Only Memory, Modes, Logical File Format, Limitations of CD-ROM, Compact Disc Recordable, Compact Disc Read/Write, Digital Versatile Disc, DVD Standards, DVD-Video: Decoder, DVD-CD Comparison

Text/ Reference Books:

1. Ranjan Parekh, "Principles of Multimedia", Tata McGrawHill
2. Ralf Steinmetz and Klara Nahrstedt, "Multimedia : Computing,Communications and Applications", Prentice- Hall
3. Prabhat K. Andheigh, Kiran Thakrar, "Multimedia System Design " PHI
4. Ze-Nian, Mark S. Drew, "Fundamentals of Multimedia", PHI
5. Koegel Buford, "Multimedia systems" , Pearson Education

Practical Examination:

The term work shall consist of at least **10** experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Suggestive List of Experiments:

1. Image Editing using Image Processing Software- Photobie, Photoshop, CorelDraw
2. Creating a Multimedia Slide Show (Presentation) using Flash Slide Show Maker or alike
3. Audio Editing using Audio Processing Software- CoolEdit, SoundForge XP
4. Video Editing Using Video Processing Software- Adobe Premiere, Windows Movie Maker
5. Animation Creation using- Photobie-GIF Animator, Alice, Macromedia Flash, 3D Studio, MAX, Maya
6. Creating a Theme Movie: Audio-Video Mixing, Music, Narration, Video Effects, Video Transitions, Credits, Titles, etc.
7. For Example: Preparing Documentary, Advertisement, Awareness Program, Presentation CDs, etc.

Elective II - CSE/IT (iii) Bioinformatics

Teaching Scheme:
Lectures: 04 Hours/Week
Practical: 02 Hours/Week

Examination Scheme:
Theory Paper: 03 Hours, 100 Marks
Practical Exam: 50 Marks

Objectives

- To learn and understand the scope of Bioinformatics
- To learn and use tools used for this domain
- To learn the application domain of Bioinformatics

Unit 1 **(8 hrs)**

Introduction: Biology in the computer age, computing changes in biology, Bioinformatics just about building database, Meaning of informatics to biologists, challenges offered by biology to computer scientists, skills required for this field, Available information & software for this domain, use web information, understand sequence alignment data, writing programs to align two biological sequences, predict protein structure from sequence, questions bioinformatics can answer, Watson's Definition, Information Flow, Human Genome project.

Unit 2 **(8 hrs)**

Tools for Bioinformatics: Biological Research on the web, Using search engines, finding scientific articles. Public biological databases, Searching biological databases, Depositing data into the public databases, finding software, Judging the quality of information

Sequence Analysis, Pair-wise alignment& Database searching: Chemical composition of bio-molecules, Composition of DNA & RNA, Watson & Crick Solve structure of DNA, Development of DNA sequencing methods, Gene finders & feature detection in DNA, DNA translation, Pair wise sequence comparison, Sequence queries against biological databases, Multifunctional tools for sequence analysis.

Unit 3 **(8 hrs)**

Multiple sequence Alignments, Trees & profiles: The morphological to the molecular, Multiple sequence alignment, Phylogenic analysis, Profiles & motifs.

Predicting protein structure & function from sequence: Determining the structure of the proteins, Prediction the structure of proteins, from 3D to 1D, Feature detection in protein sequences, Secondary structure prediction, Predicting 3D structure.

Unit 4 **(8 hrs)**

Tools for Genomic & Proteomics: From sequencing genes to sequencing genomes, Sequence assembly, Accessing genome information on the web, Annotating and analyzing whole genome sequences, Functional genomics new data analysis challenges, Proteomics, Biochemical pathway databases, Modeling kinetics & physiology

Visualization and Data Mining: Preparing your data, Viewing graphics, Sequence data visualization, Networks and pathway visualization, working with numerical data, Visualization: summary, Data mining & biological information

Unit 5 **(8 hrs)**

Building a sequence search protocol: Introduction, A practical approach, when to believe a result, Structural and Functional interpretation.
Analysis packages: Introduction - What is in analysis package? Commercial Databases Comprehensive packages, Packages specializing in DNA analysis. Intranet packages, Internet packages, web addresses.

Text / Reference Books:

1. Cynthia Gibas & Per Jambeck , "Developing Bio-informatics computer skills", (O'REILLY)
2. T K Attwood D J Parry-Smith, "Introduction to Bioinformatics", (Pearson Education)
3. Bryan Bergeron M.D. , "Bioinformatics Computing", (Prentice-Hall of India)

Practical Examination:
The term work shall consist of at least 10 experiments/ assignments based on the syllabus above.

The Practical Examination shall consist of an **oral** based on the syllabus as per the journal record.

Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

CSE Project Part –II

Teaching Scheme:
Practical: 6 Hrs. / Week

Examination Scheme:
Term Work: 50 marks
Practical Exam: 100 marks

1. The guide should be internal examiner for oral examination.

2. The external examiner should be from the related area of the concerned project. He should have minimum of five years of experience at degree level / industry.
3. The evaluations at final oral examination should be done jointly by the internal and external examiner.

4. The same project group of Part-I should continue the work in Part – II as well.

The project group should complete the project work taken in Part-I. It should complete the rest of the work from stage III onwards till the conclusion. The performance Analysis chapter should consist of various testing methods used along with sample test cases. It should also include how better the system is performing as compared to other similar systems.

The final examination will consist of the demonstration of work which will be judged by two examiners (one internal and one external) and the marks will be given accordingly.

The **suggestive format** of the report is as follows:
(Only one report should be submitted per group as a part of term work submission.)

Title of the Project:
Names & Roll Nos of the students:
Name of the guide:

Chapter 1: Introduction
Chapter 2: Literature Survey
Chapter 3: System Development
(This chapter will include the entire design process with necessary DFDs, other diagrams, design methodologies and other design and implementation details.)
Chapter 4: Performance Analysis
Chapter 5: Conclusions
(Detailed format of the project report is to be made available by the Dept.)

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