Scheme of Examination of B.E. in Computer Science & Engineering

Fourth Year - Seventh Semester

		Schedule of Teaching					Scheme of Examination Theory / Practical		
Ref. No	**Subject**	**L**	**T**	**P**	**Total**		**Sess.**	**Paper / Viva**	**Total**
CSE701	Compiler Design	3	1	0	4		50	100	150
CSE751	Compiler Design (Practical)	0	0	3	3		75	75	150
CSE702	Multimedia System Design	3	1	0	4		50	100	150
CSE703	Software Testing & Quality Assurance	3	1	0	4		50	100	150
CSE753	Software Testing & Quality Assurance (Practical)	0	0	3	3		75	75	150
CSE704	Information Security	3	0	0	3		50	100	150
	OR								
CSE705	Computer Architecture & Parallel Processing								
	OR								
CSE706	Mobile Computing								
CSE757	Project – I	0	0	8	8		200	100	300
CSE708	Seminar	0	0	2	2		50	-	50
CSE709	Industrial Training (After 6th Semester)	-	-	-	-		50	-	50
	Total	**12**	**3**	**16**	**31**		**650**	**650**	**1300**

Fourth Year - Eighth Semester

		Schedule of Teaching					Scheme of Examination Theory / Practical		
Ref. No	**Subject**	**L**	**T**	**P**	**Total**		**Sess.**	**Paper / Viva**	**Total**
CSE801	Advanced Database Systems	3	0	0	3		50	100	150
CSE802	Digital Image Processing & Computer Vision	3	1	0	4		50	100	150
CSE852	Digital Image Processing & Computer Vision (Practical)	0	0	3	3		75	75	150
CSE803	Network Programming	3	1	0	4		50	100	150
CSE853	Network Programming (Practical)	0	0	3	3		75	75	150
	OR								
CSE804	Visual Programming								
CSE854	Visual Programming(Practical)								
	OR								
CSE805	Java Technologies								
CSE855	Java Technologies (Practical)								
CSE806	Soft Computing	3	1	0	4		50	100	150
	OR								
CSE807	Embedded Systems								
CSE858	Project – II	0	0	8	8		200	100	300
	Total	**12**	**3**	**14**	**29**		**550**	**650**	**1200**

SYLLABUS FOR
BACHELOR OF ENGINEERING (COMPUTER SC. & ENGG.)

EIGHTH SEMESTER

Paper Title: ADVANCED DATABASE SYSTEMS

Paper Code: CSE801

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50

Time: 3 Hours
Total Lectures: 45

Note: Examiner will set eight questions covering four questions from each section. Candidates will be required to attempt five questions, selecting at least two from each section.

Objectives: This course offers a good understanding of advanced database concepts and technologies. It prepares the student to be in a position to use and design databases for a variety of applications.

SECTION – A

Introduction to Database Systems:
Database System Concepts and Architecture, Data Models, Data Independence, SQL: DDL, DML, DCL, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF. **(06)**

Query Processing and Optimization:
Query Processing, Syntax Analyzer, Query Decomposition, Query Optimization, Heuristic Query Optimization, Cost Estimation, Cost Functions for Select, Join, Query Evaluation Plans. **(06)**

Transaction Processing and Concurrency Control:
Transaction Processing Concepts, Concurrency Control Techniques: Two-phase Locking, Timestamp Ordering, Multiversion, Validation, Multiple Granularity Locking. **(05)**

Object Oriented and Object Relational Databases:
Object Oriented Concepts, Object Oriented Data Model, Object Definition Language, Object Query Language, Object Relational Systems, SQL3, ORDBMS Design. **(05)**

SECTION – B

Distributed Databases:
Distributed Database Concepts, Advantages and Disadvantages, Types of Distributed Database Systems, Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design, Five Level Schema Architecture, Query Processing, Concurrency Control and Recovery in Distributed Databases. **(06)**

Backup and Recovery:
Types of Database Failures, Types of Database Recovery, Recovery Techniques: Deferred Update, Immediate Update, Shadow Paging, Checkpoints, Buffer Management. **(05)**

Introduction to Data Warehousing and Data Mining:
Introduction to OLAP, OLTP, Data Warehouse, Data Marts, Data Mining, Data Mining Process. **(05)**

Commercial Databases:
Commercial Database Products, Familiarity with IBM DB2 Universal Database, Oracle, Microsoft SQL Server, MySQL, their features. **(07)**

Text Book:

1. Ramez Elmasri, Shamkant Navathe : Fundamentals of Database Systems, Fifth Edition, Pearson Education, 2007.

References:

1. Raghu Ramakrishnan, Johannes Gehrke : Database Management Systems, Tata McGraw-Hill.

2. C.J. Date : An Introduction to Database Systems, Eighth Edition, Pearson Education.
3. Alexis Leon, Mathews Leon : Database Management Systems, Leon Press.
4. Abraham Silberschatz, Henry F. Korth, S. Sudarshan : Database System Concepts, Tata McGraw-Hill.
5. S. K. Singh : Database Systems Concepts, Design and Applications, Pearson Education.

Paper Title: DIGITAL IMAGE PROCESSING & COMPUTER VISION

Paper Code: CSE802 | **Max. Marks (Final Exam): 100** | **Time: 3 Hours**
Max. Marks (Sessional Exam): 50 | **Total Lectures: 45**

Note: Examiner shall set eight questions covering four questions from each section. Candidate will be required to attempt five questions, at least two from each section.

Objectives: To introduce the various image processing techniques and their applications in different domains. To get students acquainted with computer vision.

SECTION – A

Introduction to Image Processing:
Digital Image representation, Sampling & Quantization, Steps in image Processing, Image acquisition, color image representation, color models **(4)**

Image Transformation & spatial Filtering:
Intensity transform functions, histogram processing, Spatial filtering, fourier transforms and its properties, Walsh transform, Hotelling transforms, Haar and slant transforms, Hadamard transforms, frequency domain filters, Homomorphic Filtering, Pseudo coloring, color transforms **(6)**

Image Restoration:
Image degradation and restoration process, Noise Models, Noise Filters, degradation function, Inverse Filtering **(4)**

SECTION – B

Image Compression:
Coding redundancy, Interpixel redundancy, Psychovisual redundancy, Huffman Coding, Arithmetic coding, Lossy compression techniques, JPEG Compression **(6)**

Image Segmentation & Representation:
Point, Line and Edge Detection, Thresholding, Edge and Boundary linking, Hough transforms, Region Based Segmentation, Boundary representation, Boundary Descriptors, Regional Descriptors **(12)**

Computer Vision:
The role of Computer Vision, applications, Exemplars: Face Recognition, Medical Image Analysis, Recognizing man-made objects, representing knowledge of expected image contents. Matching models to image data **(6)**

Text Book:

1. Gonzalez and Woods : Digital Image Processing ISDN 0-201-600- 781, Addison Wesley 1992.
2. Boyle and Thomas : Computer Vision - A First Gurse 2nd Edition, ISBN 0-632-028-67X, Blackwell Science 1995

References:

1. Trucco & Verri : Introductory Techniques for 3-D Computer Vision, Prentice Hall, Latest Edition
2. Low : Introductory Computer Vision and Image Processing, McGraw-Hill 1991, ISBN 0-07-707403-3
3. Jain, Kasturi and Schunk : Machine Vision, McGraw-HiII. 1995 ISBN 0070320187.
4. Sonka, Hlavac, Boyle : Image -Processing, Analysis and Machine Vision 2nd ed. ISBN 0-534-95393-X, PWS Publishing,1999

Paper Title: DIGITAL IMAGE PROCESSING & COMPUTER VISION (Practical)

Paper Code: CSE852

MM (External):50
MM (Internal): 50

Note: Students are required to complete all the practical by implémenting them in any of the programming language such as Java, C/C++, C#, MATLAB

1. Reading and displaying images in different formats using different color models.
2. Converting color images into monochrome images.
3. Understanding brightness, contrast and intensity concept of images
4. Images enhancements using grey level transformations
5. Image enhancements using spatial filters
6. Image enhancements in frequency domain
7. Homomorphic Filtering
8. Image Noise removal and inverse filtering of images
9. Image color enhancements using pseudo coloring techniques
10. Point, Line, Edge and Boundary Detections in images
11. Histogram Matching and specification on images
12. Boundary Linking techniques on images
13. Thresholding of Images
14. Magnification of Images
15. Image representation and Description techniques

Paper Title: NETWORK PROGRAMMING

Paper Code: CSE803

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50

Time: 3 Hours
Total Lectures: 45

Note: Examiner shall set eight questions covering four questions from each section. Candidate will be required to attempt five questions, at least two from each section.

Objectives: To familiarize students with advanced concepts of networks, network programming in UNIX environment.

SECTION – A

1. OSI model, client server model, TCP/IP protocols, Introduction to Unix; Process, groups, job control and non-job control shells, reliable and unreliable signals, shell Programming. **6**

2. Inter process communication in Unix, pipes, half duplex and full duplex pipes, FIFOs, properties of pipes and FIFOs, POSIX message queues, system V message queues, semaphores, shared memory, mmap function and its use, RPC, authentication, timeout and retransmission, call semantics, XDR. **10**

3. Communication Protocol – Introduction, TCP, IP, XNS, SNA, NetBIOS, OSI protocols, comparisons. **5**

SECTION – B

4. Introduction to Berkeley sockets, socket addressing, TCP and UDP socket functions, sockets and Unix signals, socket implementation, client and server examples for TCP and UDP and their behavior under abnormal conditions. **10**

5. Socket options, IPv4, IPv6, TCP, I/O multiplexing, Unix I/O models, select and poll functions **5**

6. System V Transport Layer, interface – Introduction Transport End Point address, TLI. **5**

7. Overview of Ping – Routines, FTP, Remote Login **4**

Text Book:

1. W. R., Stevens, B. Fenner and A. M., Rudoff : Unix Network Programming, Vol. I, 3rd Ed., Pearson Education

References:

1. W. R., Stevens : Unix Network Programming, Vol. II, 2nd Ed., Pearson Education
2. W. R., Stevens : Advanced Programming in Unix Environment, Pearson Education

Paper Title: NETWORK PROGRAMMING (Practical)

Paper Code: CSE853 **Max. Marks: 75**
Sessional Marks: 75

Note: Students will learn to implement programs in UNIX.

1. To study and implement various network commands like telnet, ftp, etc.
2. To study various system calls.
3. Programs related to interprocess communication
4. Programs related to message queues
5. Programs related to pipes
6. Programs related to file handling
7. Programs related to process control
8. Programs using Socket Programming

Paper Title: VISUAL PROGRAMMING

Paper Code: CSE804 **Max. Marks (Final Exam): 100** **Time: 3 Hours**
Max. Marks (Sessional Exam): 50 **Total Lectures: 45**

Note: Examiner will set eight questions covering four questions from each section. Candidates will be required to attempt five questions, selecting at least two from each section.

Objectives: This course offers a good understanding of Visual Programming concepts and prepares students to be in a position to write GUI applications.

SECTION – A

Introduction:

Introduction to Programming: Variables, Functions, Visual Programming, Object Oriented Concepts: Abstraction, Inheritance, Polymorphism, Classes, Collections, Debugging. **(08)**

Graphical User Interface Concepts - I:
Windows Forms, Control Properties and Layout, Using Common Dialogs, Event Handling: Mouse and Keyboard, Labels, Textboxes, Buttons, GroupBoxes, Panels, CheckBoxes and RadioButtons, PictureBoxes, ToolTips. **(05)**

Graphical User Interface Concepts - II:
Menus, Controls: MonthCalendar, DateTimePicker, LinkLabel, ListBox, CheckedListBox, ComboBox, TreeView, ListView, Datagrid, Gridview, TabControl, Multiple Document Interface (MDI) Windows. **(04)**

Multithreading and Exception Handling:
Thread States, Lifecycle of a Thread, Thread Priorities and Scheduling, Creating and Executing Threads, Thread Synchronization and Class Monitor, Exception Handling. **(05)**

SECTION – B

Graphics and Multimedia:
Drawing Classes and the Coordinate System, Graphics Contexts and Graphics Objects, Color and Font Control, Drawing Lines, Rectangles, Ovals, Arcs, Loading, Displaying and Scaling Images, Animating a Series of Images. **(05)**

File Processing and Streams:
Data Hierarchy, Files and Streams, Classes File and Directory, Reading and Writing Sequential Access Files, Serialization. **(05)**

Data Access:
Data Access Techniques, XML, LINQ, SQL, ADO.NET Object Model, LINQ to SQL, ADO.NET and LINQ, LINQ to XML. **(08)**

Additional Techniques:
XML Documentation, Networking, Security, Web Services, Introduction to GDI+. **(05)**

Text Book:

1.	Deitel	:	Visual C# 2005 How to Program, Second Edition, Deitel.

References:

1.	Karli Watson, Christian Nagel, Jacob Hammer, et al.	:	Beginning Microsoft Visual C# 2008, Wrox.
2.	Christian Nagel, Bill Evjen, Jay Glynn, Morgan Skinner, Karli Watson	:	Professional C# 2008, Wrox.

Paper Title: VISUAL PROGRAMMING (Practical)

Paper Code: CSE854 **Max. Marks: 75**

Note: The practical will enable students to write visual applications in .NET environment.

1. Writing basic C# programs demonstrating the concepts of functions, arrays, classes, inheritance, polymorphism etc.
2. Writing graphical programs demonstrating the concepts of event handling, Labels, Textboxes, Buttons, GroupBoxes, Panels, CheckBoxes and RadioButtons, PictureBoxes, ToolTips.
3. Writing MDI Applications and demonstration of controls like: MonthCalendar, DateTimePicker, LinkLabel, ListBox, CheckedListBox, ComboBox, TreeView, ListView, TabControl.
4. Writing programs demonstrating the concepts of Multithreading and Exception Handling.
5. Writing programs demonstrating Graphics and Multimedia concepts.
6. Writing programs for reading and writing text files.

7. Writing programs demonstrating Database Access, Networking and Security.

8. Writing Web Services.

Paper Title: JAVA TECHNOLOGIES

Paper Code: CSE805 | **Max. Marks (Final Exam): 100** | **Time: 3 Hours**
Max. Marks (Sessional Exam): 50 | **Total Lectures: 45**

Note: Examiner shall set eight questions covering four questions from each section. Candidate will be required to attempt five questions, at least two from each section.

Objectives: Objective This course will provide the in-depth knowledge of Java and J2EE technology.

SECTION – A

Java Methods, Classes and Inheritance:
Introduction; classes; methods; constructors; overloading methods; arrays; recursion; passing arrays and objects to methods; Inheritance; method overriding; abstract classes; using final; packages; interfaces. **8**

I/O, Applets and Graphics:
I/O basics; stream classes; byte and character streams; reading and writing files; Applet fundamentals; Applet class; Applet initialization and termination; event handling; keyboard and mouse events; AWT class; Layout managers; panels; canvases; Frame windows; drawing lines, rectangles, ellipses. **8**

Exceptional Handling and Multithreaded Programming:
Exception handling fundamentals; exception types; uncaught exceptions; try and catch; creating exception classes; throwing exceptions; Java thread model; thread priorities; creating a thread; inter-thread communication; thread synchronization; suspending, resuming and stopping threads; **8**

SECTION – B

Overview of J2EE and working with JDBC:
What is J2EE, component based architecture of J2EE: Web, Business and Application component, commonly used classes and interfaces of java.sql package, connecting java application to a database, prepared statements. **7**

Servlets and JSP:
Java Servlets, compilation, deployment, and testing a servlet, session management, request dispatching, Java Server Pages, deploying and testing a JSP, using java beans in JSP. **7**

Enterprise Java Beans(EJB):
Architecture of EJB, creating a stateless-session EJB, statefull-session bean, Life Cycle of session beans, Entity beans, life cycle of entity beans. **7**

Text Book:

1. Deitel and Deitel : Java: How to Program, 6th Edition, Pearson Education.
2. Herbert Schildt : The Complete Reference Java2, TMH
3. James Edward Keogh, Jim Keogh : J2EE: The complete Reference, McGraw-Hill

References:

1. Author Name : Book Title, Edition, Publisher (Justified)
2. Author Name : Book Title, Edition, Publisher (Justified)

Paper Title: JAVA TECHNOLOGIES (PRACTICAL)

Paper Code: CSE855 | **Max. Marks(Final):75**
Max.Marks(Sessional):75

Note: Students have to perform the following experiments

1. Implementation of classes, inheritance, overloading.
2. Implantation of packages and interfaces
3. Implantation of threads.
4. Implementation of Applets, mouse events, and keyboard events.
5. Connecting to Database using JDBC.
6. Deployment of Servlets, JSP and EJB.

Paper Title: SOFT COMPUTING

Paper Code: CSE806

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50

Time: 3 Hours
Total Lectures: 45

Note: Examiner shall set eight questions covering four questions from each section. Candidate will be required to attempt five questions, at least two from each section.

Objectives: : To get basic knowledge of different soft computing techniques. Different problem solving techniques and their implementations and applications are explained. Intelligent systems and learning **techniques are** introduced.

SECTION – A

Intelligent Agents:
Agents Behavior and Environments, Structure of Agents, Planning Problem, Planning with state Space Search, Partial order Planning, GRAPHPLAN, Planning in logic, Planning in non-deterministic domains, hierarchical task planning, Multi agent planning, execution. **(9)**

Probabilistic Reasoning Fuzzy Logic: **(12)**
Knowledge representation under uncertainty, Bayesian theorem, Bayesian Networks, Dempster Shafer theory, Representing vagueness, Fuzzy sets, operation on fuzzy sets, reasoning with fuzzy logic, Fuzzy Automata, Fuzzy Control methods, Fuzzy decision making, inference in temporal models, Hidden Markov Models, Kalman Filters

SECTION – B

Neural Networks:
Basic concepts, Single layer perception, Multilayer Perception, Supervised and Unsupervised learning - Backpropagation networks - Kohnen's self organizing networks - Hopfield network. **(16)**
Introduction to Artificial Neural Systems - Perceptron - Representation - Linear separability - Learning – Training algorithm -Adaptive networks based Fuzzy interface systems - Classification and Regression Trees - Data clustering algorithms - Rule based structure identification - Neuro-Fuzzy controls - Simulated annealing

Genetic Algorithms: **(8)**
Evolutionary computation. Survival of the Fittest - Fitness Computations - Cross over – Mutation, Reproduction - Rank method - Rank space method.

Text Book:

1. Stuart J.Russel, Norvig : AI: A Modern Approach, Pearson Education, Latest Edition
2. Michael Negnevitsky : Artificial Intelligence: A Guide to Intelligent Systems, 2/E, Addison-Wesley, 2005

References:

1. James Freeman A. and David Skapura M : Neural Networks - Algorithms, Applications & Programming Techniques Addison Wesley,1992.
2. Yegnanarayana B : Artificial Neural Networks, Prentice Hall of India Private Ltd., New Delhi, 1999.

3. Hagan, M.T., Demuth, Mark Beale : Neural Network Design By Cengage Learning

4. Goldberg, David E. : Genetic algorithms in search, optimization and machine learning, Latest Edition, Addison Wesley

EMBEDDED SYSTEMS

Paper Code: CSE807

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50

Time: 3 Hours
Total Lectures: 45

Note: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

Objectives: To get the basic knowledge of all the peripheral device controllers and to work on PIC Microcontroller.

SECTION – A

Introduction Review of Embedded Hardware

Memory – Microprocessors – Buses – Direct Memory Access – Interrupts – Built ins on the Microprocessor. Conventions used on Schematic, Microprocessor Architecture – Interrupt Basic – Shared Data Problems – Interrupt Latency. **(10)**

PIC Micro controller & Interfacing

Introduction, CPU Architecture, Register file structure, Instruction Set, Programs, Timers and Interrupts – Interrupt Service Routine – features of Interrupts – Interrupt vector & Priority, Timing Generation & Measurements, Compare mode, Capture mode, Event counter, PWM, Frequency Measurement – Interfacing Methods, I/O Interface, SPI, LCD interfacing, Seven segment interfacing, I^2C Bus, DAC, Serial EEPROM, ADC, UART. **(15)**

SECTION – B

Software Development & Tools: Software architectures, Round – Robin, Round-Robin with Interrupts, Function Queue Scheduling architecture, Introduction to assembler – Compiler –n Cross compilers and Integrated Development Environment IDE, Linker/ Locators, Simulators, Getting Embedded software into target System Debugging Strategies,. **(8)**

Introduction to Real Time Operating Systems: Task And Task States, Tasks and Data, Semaphores and shared data. **(5)**

Operating System Services: Message queues, Mailboxes and Pipes, Timer Function, Events, Memory Management, Interrupt Routines in an RTOS Environment, Basic Design Using RTOS. **(7)**

Text Book:

1. David E. Simon : An Embedded Software Primer, Pearson Education, Latest Edition.

References:

1. John B. Peatman : PIC Microcontroller, Pearson Education, Latest Edition
2. D. D. Gajski, F. Vahid, S. Narayan, J. Gong : Specification and Design of Embedded Systems, Prentice Hall.
3. Steve Heath : Embedded systems design, Newnes, 1997.
4. F. Balarin, Chiodo : Hardware Software Co-design of Embedded Systems, et al., Kluwer Academic Publishers, May 1997