

S-25 March, 2013 AC after Circulars from Circular No.153 &amp; onwards

- 60 -

**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY**  
**CIRCULAR NO. ACAD / NP / T.Y. B.Tech. / Syllabi/184/2013**

It is hereby informed to all concerned that, the syllabus prepared by the Boards of Studies, Committee and recommended by the Faculty of Engineering and Technology, the Hon'ble Vice-Chancellor has accepted the following **REVISED SYLLABI** in all Braches of **T.Y. B.TECH.** on behalf of the **Academic Council Under Section-14(7) of the Maharashtra Universities Act, 1994** as appended herewith :-

Sr. No.	Revised Syllabi
[1]	Third Year B.Tech. [ CIVIL ],
[2]	Third Year B.Tech. [ MECHANICAL ],
[3]	Third Year B.Tech. [ ELECTRONICS & TELECOMMUNICATION ENGINEERING ],
[4]	Third Year B.Tech. [ COMPUTER SCIENCE & ENGINEERING ],
[5]	Third Year B.Tech. [ AGRICULTURAL ENGINEERING ],
[6]	Third Year B.Tech. [ PLASTICS AND POLYMER ENGINEERING ],
[7]	Third Year B.Tech. [ INSTRUMENTATION & CONTROL ENGINEERING ],
[8]	Third Year B.Tech. [ PRODUCTION ],

This is effective from the Academic Year 2013-2014 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,  
 Aurangabad-431 004.  
 REF.NO. ACAD/ NP/ T.Y.B.TECH./  
 2013/14059-67

Date:- 15-06-2013.

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*Alankar*  
 Director, 15-06-2013

**Board of College and  
 University Development.**

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**Copy forwarded with compliments to :-**

- 1] The Principals, affiliated concerned Colleges,  
 Dr. Babasaheb Ambedkar Marathwada University.
- 2] The Director, University Network & Information Centre, UNIC, with a request to upload the above all syllabi on University Website [www.bamu.net].

**Copy to :-**

- 1] The Controller of Examinations,
- 2] The Superintendent, [ Engineering Unit ],
- 3] The Programmer [Computer Unit-1] Examinations,
- 4] The Programmer [Computer Unit-2] Examinations,
- 5] The Superintendent, [ Eligibility Unit ],
- 6] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,  
 Dr. Babasaheb Ambedkar Marathwada University,
- 7] The Record Keeper,  
 Dr. Babasaheb Ambedkar Marathwada University.

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**DR. BABASAHEB AMBEDKAR  
MARATHWADA UNIVERSITY,  
AURANGABAD.**



**Revised Syllabus of**

**THIRD YEAR**

**B.TECH.**

**COMPUTER SCIENCE AND ENGINEERING**

*[ Effective from the Academic Year 2013-14 & onwards ]*

**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**Proposed Structure [Third Year Computer Science & Engineering]**

Sub Code	SEMESTER-V				Contact Hrs / Week				Examination Scheme				
	Subject	L	T	P	Total	CT	TH	TA	PR	Total	Credits	Duration of Theory Exam	
CSE301	Theory of Computation	3	1	--	4	20	80	--	--	100	4	3 Hrs	
CSE302	Design and Analysis of Algorithm	3	1	--	4	20	80	--	--	100	4	3 Hrs	
CSE303	Relational Database Management Systems	3	1	--	4	20	80	--	--	100	4	3 Hrs	
CSE304	Operating System	4	--	--	4	20	80	--	--	100	4	3 Hrs	
CSE305	Advanced JAVA	4	--	--	4	20	80	--	--	100	4	3 Hrs	
CSE306	System Software	2	--	--	2	10	40	--	--	50	2	2 Hrs	
CSE321	Lab-I Design and Analysis of Algorithm	--	--	2	2	--	--	25	25	50	1		
CSE322	Lab-II Relational Database Management Systems	--	--	2	2	--	--	25	25	50	1		
CSE323	Lab-III Operating System	--	--	2	2	--	--	25	25	50	1		
CSE324	Lab-IV SDL-I ( Advanced JAVA)	--	--	2	2	--	--	50	--	50	1		
CSE325	Lab-V Seminar	--	--	2	2	--	--	50	--	50	1		
	<b>Total</b>	<b>19</b>	<b>3</b>	<b>10</b>	<b>32</b>	<b>110</b>	<b>440</b>	<b>175</b>	<b>75</b>	<b>800</b>	<b>27</b>		
Sub Code	SEMESTER-VI				Contact Hrs / Week				Examination Scheme				
	Subject	L	T	P	Total	CT	TH	TA	PR	Total	Credits	Duration of Theory Exam	
CSE351	Data Mining and Warehousing	4	--	--	4	20	80	--	--	100	4	3 Hrs	
CSE352	Digital Image Processing	3	1	--	4	20	80	--	--	100	4	3 Hrs	
CSE353	Principles of Compiler Design	3	1	--	4	20	80	--	--	100	4	3 Hrs	
CSE354	LINUX Operating System	3	1	--	4	20	80	--	--	100	4	3 Hrs	
CSE391-93	Elective-I	4	--	--	4	20	80	--	--	100	4	3 Hrs	
CSE355	Professional Ethics and Cyber Security	2	--	--	2	10	40	--	--	50	2	2 Hrs	
SE371	Lab-VI Digital Image Processing	--	--	2	2	--	--	25	25	50	1		
CSE372	Lab-VII Principles of Compiler Design	--	--	2	2	--	--	25	25	50	1		
CSE373	Lab-VIII LINUX Operating System	--	--	2	2	--	--	25	25	50	1		
CSE374	Lab-IX SDL-II ( ASP.NET)	--	--	2	2	--	--	50	--	50	1		
CSE375	Lab-X Project Part-I	--	--	2	2	--	--	50	--	50	1		
	<b>Total</b>	<b>19</b>	<b>3</b>	<b>10</b>	<b>32</b>	<b>110</b>	<b>440</b>	<b>175</b>	<b>75</b>	<b>800</b>	<b>27</b>		
	<b>Grand Total of V &amp; VI SEMESTER</b>	<b>38</b>	<b>6</b>	<b>20</b>	<b>64</b>	<b>220</b>	<b>880</b>	<b>350</b>	<b>150</b>	<b>1600</b>	<b>54</b>		

L: Lecture hours per week    T: Tutorial hours per week    P: Practical hours per week    CT: Class Test  
 TH: University Theory Examination    TA: Teachers assessment    PR: Practical/Oral Examination

**Elective-I:** 1. CSE391 - Object Oriented Analysis and Design

2. CSE392 - Artificial Intelligence

3. CSE393 - Industrial Management

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-V	
<b>Course Code: CSE301</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 03Hrs/week</b> <b>Tutorial: 01 Hr/week</b> <b>Credits: 04</b>	<b>Title: Theory Of Computation</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. To introduce a sound understanding of the fundamental mathematical and computational principles such as Turing machines, Automata, grammars and formal languages, those are the foundation of computer science. 2. To understand the conceptual tools that practitioner's use in compiler and programming language development, data mining and algorithms so as theory will likely provide the answers for today's open problems. 3. To give you a sense of how to reason formally about computing, how to prove theorems about computation, and how to tell a rigorous proof from wishful thinking.
<b>Unit-I</b>	: <b>Finite Automata:</b> Preliminaries: Symbol, Alphabet, String, Prefix & Suffix of Strings, Sets, Operations on sets, Finite & infinite sets, Relation, Equivalence Relation, (reflexive, transitive and symmetric, closures), Principle of Induction. Finite Automata: Finite State Machine, Deterministic finite Automaton, DFA as language recognizer, Nondeterministic finite automaton, Conversion of NFA TO DFA. Finite automaton with output – Mealy and Moore machine-Definition and conversion. Minimization of DFA, Applications of Finite automata.  <b>Tutorials:</b> <ol style="list-style-type: none"> <li>1. Construct a TG for FA to accept a language L over <math>\Sigma^*</math> where <math>\Sigma^* = \{a,b\}</math> &amp; consisting of strings that always begin with aa.</li> <li>2. Construction of NFA with <math>\epsilon</math>- transitions. <span style="float: right;">(10 Hrs)</span></li> </ol>
<b>Unit-II</b>	: <b>Regular Expressions:</b> Definition & Example, Regular Expressions Identities, Regular expression and NFA, Equivalence of FA and RE ( RE To FA), Arden's theorem. Regular Languages: Pumping lemma for regular languages, Closure properties of regular Languages (Union, concatenation, Intersection and Kleene closure), Applications of regular expressions.  <b>Tutorials:</b> <ol style="list-style-type: none"> <li>1. Construct a DFA for given Regular expression <math>b^*(ab+b)^+ ab^*</math>.</li> <li>2. Check whether the language over L1: All words of two/more letters that begin and end with same letter, L2: All words that contain a substring aba over <math>\Sigma = \{a,b\}</math> satisfies the closer properties (L1+L2) and (L1.L2). <span style="float: right;">(10 Hrs)</span></li> </ol>
<b>Unit-III</b>	: <b>Context Free Grammar:</b> Chomsky Hierarchy, CFG : Definition & examples, Derivation: LMD, RMD, Derivation Tree, Ambiguous Grammar : Concept & Examples, Removal of ambiguity. Simplification of CFG: Removing Useless Symbols, Removing unit productions, Removing $\epsilon$ productions & Nullable symbols.  <b>Tutorials:</b> <ol style="list-style-type: none"> <li>1. Find the CFG for the language over <math>\Sigma = (a,b)</math> containing words that have different first and last letters.</li> <li>2. Elimination of <math>\epsilon</math>-production from CFG. <span style="float: right;">(10 Hrs)</span></li> </ol>

<b>Unit-IV</b>	<p><b>:</b> <b>Context Free Languages:</b> Normal Forms: Chomsky Normal Form (CNF), Greibach Normal form (GNF). Regular Grammar: Definition, Equivalence of FA &amp; Regular Grammar. Construction of regular grammar equivalent to a given DFA, Construction of a FA from the given right linear grammar, Pumping lemma for context free languages, Decision algorithm of CFL's.</p> <p><b>Tutorials:</b></p> <ol style="list-style-type: none"> <li>1. Equivalence of right linear grammar and left linear grammar.</li> <li>2. Construction of regular expression from regular grammar. <span style="float: right;">(10 Hrs)</span></li> </ol>
<b>Unit-V</b>	<p><b>:</b> <b>Push Down Automata:</b> Definition: DPDA, NPDA, Acceptance by PDA, PDA and FA, PDA and context free languages, Applications of PDA. Parsing techniques: Top-down parsing, bottom-up parsing. LR grammar, Properties of LR grammar, Recursive &amp; recursively enumerable languages. Post machine, Markov algorithm.</p> <p><b>Tutorials:</b></p> <ol style="list-style-type: none"> <li>1. Construct PDA accepting language consisting of even palindrome string of a's and b's.</li> <li>2. Write the PMT system 'T' for the well formedness of paranthesis to Check "((((( )))". <span style="float: right;">(10 Hrs)</span></li> </ol>
<b>Unit-VI</b>	<p><b>:</b> <b>Turing Machine:</b> TM model, Instantaneous description of TM, Language acceptability by TM, Design of TM, church's turing hypothesis, Universal TM, Model of Linear bounded automata, halting problem of TM.</p> <p><b>Tutorials:</b></p> <ol style="list-style-type: none"> <li>1. Study of types of turing machine. Design a turing Machine for palindrome strings.</li> <li>2. Study of applications of turing Machine. <span style="float: right;">(10 Hrs)</span></li> </ol>
<b>Reference Books:</b>	<p><b>:</b></p> <ol style="list-style-type: none"> <li>1. "Theory of computer science", BY K L P Mishra, N Chandrashekharan.</li> <li>2. "Introduction. To Automata theory Languages and computation", BY Hopcraft, Ullman -Narosa.</li> <li>3. "Theory of computer science", BY E V Krishnamurthy, EWP.</li> <li>4. "Elements of theory of computer science", BY Lewis, Papadimitriou -PHI.</li> </ol>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester-V	
<b>Course Code: CSE302</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 03 Hrs/week</b> <b>Tutorial: 01 Hr/week</b> <b>Credits:04</b>	<b>Title: Design and Analysis of Algorithm</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. To learn the concept of Algorithm. 2. To learn the concept of efficiency and performance of algorithm. 3. To learn the different criteria to determine best solution for a given problem. 4. To learn the various techniques of writing algorithm. 5. To apply these concepts to various areas of computer science.
<b>Unit-I</b>	: <b>Introduction:</b> What is algorithm? Algorithm Specification-Pseudo code, Conventions, Performance Analysis- space and time complexities, Code Tuning techniques. <b>Tutorial:</b> Examples of finding time and space complexities. <span style="float: right;"><b>(10Hrs)</b></span>
<b>Unit-II</b>	: <b>Divide And Conquer:</b> General method, Binary search, Finding maximum and minimum, Merge sort, Quick sort, Selection, Insertion sort, Strasson's Matrix multiplication. <b>Tutorials:</b> 1. Program for Insertion sort. 2. Program for Quick sort. <span style="float: right;"><b>(10Hrs)</b></span>
<b>Unit-III</b>	: <b>The greedy Method :</b> General method, Optimal storage on tape, Knapsack problem ,Job sequencing with deadlines, Optimal merge patterns, minimum spanning tree, Single source shortest path, Activity Selection Problem <b>Tutorial:</b> Program for activity selection problem. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-IV</b>	: <b>Dynamic programming :</b> General method, Multistage graph, All pair shortest path, Optimal binary search tree, String Editing, 0/1 knapsack, reliability design, flow shop scheduling, traveling sales person problem, longest increasing subsequences <b>Tutorial:</b> Program for All pairs shortest path. <span style="float: right;"><b>(10Hrs)</b></span>
<b>Unit-V</b>	: <b>Basic search and traversing techniques:</b> The techniques for Binary tree and Graphs, Code optimization, connected components and Spanning tree, Bi-connected components and DFS. <b>Tutorial:</b> Examples of finding spanning tree using graph traversal Techniques. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-VI</b>	: <b>Backtracking:</b> General method , 8 queen problem, sum of subsets, graph coloring, Hamiltonian cycle, <b>Class -p, Class - NP problems:</b> Introductions and definition <b>Tutorial:</b> 1. Program for Hamiltonian Cycle. 2. Study of examples of NP class problems. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Reference Books:</b>	: 1. "Fundamentals of Computer Algorithm", BY Elias Horwiths, Sartaj Sahani, Galgotia Publication. 2. "The Design and analysis of Computer Algorithm", BY Aho,Hopcroft Ullman, Addison's Wesley. 3. "Introduction to Algorithms", BY Thomas H. Cormen, Charles E. Leiserson,Ronald L. Rivest, Clifford Stein, McGraw-Hill.

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

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**For 80 marks Paper:**

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science & Engineering) Semester-V	
<b>Course Code: CSE303</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 03 Hrs/week</b> <b>Tutorial: 01 Hr/week</b> <b>Credits: 04</b>	<b>Title: Relational Database Management Systems</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	1. To implement an entity relationship diagrams (ERD) to express requirements and demonstrates skills to model data requirements and create data models in to normalized designs. 2. To develop understanding of database systems theory in order to apply that knowledge to any particular database implementation using SQL. 3. To learn and understand various Database Architectures and Applications.
<b>Unit-I</b>	<b>Introduction :</b> Introduction to database, database users, advantages of a database system over file system, view of data: 1) Data abstraction 2) Instance & schema 3) Data models, Data independences, Components of a DBMS and overall structure of a DBMS. <b>Data Modeling:</b> Basic Concepts, entity, attributes, relationships, constraints, keys, E-R and EER diagrams: Components of E-R Model, conventions, converting E-R diagram into tables, EER Model components, converting EER diagram into tables.  <b>Tutorials:</b> 1. Draw ER diagram for given schema. 2. Reduction of an E-R Schema to Tables. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-II</b>	<b>Relational Algebra &amp; SQL:</b> <b>Introduction to SQL:</b> Characteristics and advantages, SQL Data Types and Literals, DDL, DML, SQL Operators, Tables: Creating, Modifying, Deleting, Views: Creating, Dropping, Updating using Views, Indexes, Nulls. <b>SQL DML Queries:</b> SELECT Query and clauses, Set Operations, Predicates and Joins, Set membership, Tuple Variables, Set comparison, Ordering of Tuples, Aggregate Functions, Nested Queries, Database Modification using SQL Insert, Update and Delete Queries, concept of Stored Procedures, Cursors, Triggers, roles and privileges Programmatic SQL: Embedded SQL.  <b>Tutorials:</b> 1. Implement SQL commands on Set operations. 2. Implement SQL commands on Views and indexes . <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-III</b>	<b>Relational Database Design:</b> Purpose of Normalization, Data Redundancy and Update Anomalies, Functional Dependencies: Basic concepts, closure of set of functional dependencies, closure of attribute set, Decomposition: lossless join decomposition and dependency preservation, The Process of Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.  <b>Tutorials:</b> 1. Identify functional dependencies and Implement 1NF, 2NF, 3NF for given tables. 2. Implement on BCNF, 4NF, 5NF for given tables. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-IV</b>	<b>File Systems &amp; Query Processing:</b> File Organization, Organization of records in files, Indices, Static and Dynamic Hashing, B-trees and B+ Trees <b>Introduction to Query Processing:</b> Overview, Measures of query cost, Selection and join operations, Evaluation of Expressions, Introduction to Query Optimization, Estimation, Transformation of Relational Expressions  <b>Tutorials:</b> 1. Introduction to Query processing, optimization. 2. Indexing techniques. <span style="float: right;"><b>(10 Hrs)</b></span>



<b>Unit-V</b>	:	<p><b>Transactions:</b> Transaction concept, transaction state, Implementation of atomicity &amp; durability, concurrent executions, serializability, recoverability.</p> <p><b>Concurrency control :</b> Lock based protocols, time-stamp based protocols, validation based protocols, deadlock handling.</p> <p><b>Recovery system:</b> Failure Classification, storage structure, different crash recovery methods: log based recovery, shadow paging. Recovery with Concurrent Transactions, Advanced Recovery Techniques &amp; remote backup system.</p> <p><b>Tutorial:</b> Show transaction rollback and commit. <span style="float: right;">(10 Hrs)</span></p>
<b>Unit-VI</b>	:	<p><b>Object-Oriented Databases, Distributed databases and Database Architectures:</b> OODBMS Concept, Introduction to distributed database system, database on word wide web. ODBC, JDBC</p> <p><b>Database Architectures:</b> Centralized and Client-Server Architectures, 2 Tier and 3 Tier Architecture Concept of OLAP ( Difference between OLTP and OLAP, Data Warehouse)</p> <p><b>Tutorial:</b> ODBC. <span style="float: right;">(10 Hrs)</span></p>
<b>Reference Books:</b>		<ol style="list-style-type: none"> <li>1. "Database System Concepts", BY Silberschatz A., Korth H., Sudarshan S., 5th Edition, McGraw Hill Publishers, 2002, ISBN 0-07-120413-X.</li> <li>2. "Fundamentals of Database Systems", BY Elmasri R., Navathe S., 4* Edition, Pearson Education, 2003, ISBN 8129702282.</li> <li>3. "Database Systems Design, Implementation and Management", BY Rab P. Coronel C, 5<sup>th</sup> Edition, Thomson Course Technology, 2002, ISBN 981-243-135-7.</li> <li>4. "Database Systems", BY Connally T., Begg C., 3rd Edition, Pearson Education, 2002, ISBN 81-7808-861-4.</li> <li>5. "An Introduction to Database Systems", BY Date C., 7th Edition, Pearson Education, 2002, ISBN 81 - 7808-231- 4.</li> <li>6. "Database Management Systems", BY Ramkrishna R., Gehrke J., 3rd Edition, McGraw-Hill, 2003, ISBN 0-07- 123151 -X.</li> <li>7. "Introduction to Database Management System", BY Atul Kahate, 3rd Edition, Pearson Education 2009, ISBN 978-81-317-0078-5.</li> </ol>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
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<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science & Engineering) Semester-V	
<b>Course Code: CSE304</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 04Hrs/week</b> <b>Tutorial: --</b> <b>Credits: 04</b>	<b>Title: Operating System</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: To get the thorough knowledge of different elements of operating system such as Process, memory management and real time systems.
<b>Unit-I</b>	: <b>OS Overview:</b>  Operating System Objectives and Functions: Resource manager, User interface, Microsoft windows overview: History, Single-User Multitasking, Architecture, Client/Server Model. <b>(10 Hrs)</b>
<b>Unit-II</b>	: <b>Process:</b>  Process States: A two-state process model, The creation and termination of processes, Five-state model Suspended Processes. <b>(10 Hrs)</b>
<b>Unit-III</b>	: <b>Deadlock:</b>  Deadlocks: Resources, Deadlock modeling, The ostrich algorithm, Deadlock detection & recovery, Deadlock prevention, Deadlock avoidance. <b>(10 Hrs)</b>
<b>Unit-IV</b>	: <b>Memory Management:</b>  Memory management without swapping or paging, Use of multiprogramming, Swapping: Multiprogramming with variable partition, Virtual Memory: Paging, Page replacement algorithms Segmentation. <b>(10 Hrs)</b>
<b>Unit-V</b>	: <b>File System:</b>  The user view of the file system: File basics, directories. File system design: Disk space management, file storage, Directories structures, Shared files, File system reliability & performance. Security: Security environment Famous security flaws, Generic security attacks, User authentication, Design principles of security. <b>(10 Hrs)</b>
<b>Unit-VI</b>	: <b>Advanced Trends in Operating System:</b>  Embedded OS: Introduction, Characteristics: Adapting an Existing Commercial Operating System. Real Time Scheduling: Background, Characteristics, Real-Time Scheduling, Deadline Scheduling. <b>(10 Hrs)</b>
<b>Reference Books:</b>	:  1. "Operating Systems", BY William Stallings: 6 <sup>th</sup> Edition. 2. "Operating Systems: Design & Implementation", BY Andrew S. Tanenbaum. 3. "Operating System Concepts", BY Abrahm Silberschaz, Peter Galvin. 4. "Operating System", BY Achyut Godbole.

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B.Tech. (Computer Science and Engineering) Semester- V	
<b>Course Code: CSE305</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 04 Hrs/week</b> <b>Tutorial: --</b> <b>Credits:04</b>	<b>Title: Advanced Java</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. To design and develop GUI applications using Swing. 2. To design and develop client/server systems using sockets, RMI. 3. To design and develop Web applications using servlets or JSP. 4. To understand the issues in enterprise applications development.
<b>Unit-I</b>	: <b>Swing:</b> JApplet, Icons and Labels, Text Fields. Buttons, Combo Boxes, Tabbed panes, Scroll Panes, Trees, Tables. <div style="text-align: right;"><b>(10 Hrs)</b></div>
<b>Unit-II</b>	: <b>Networking Basics and RMI:</b> Socket overview, Client/Server, Reserved Sockets, Proxy servers, Internet addressing, TCP/IP client Sockets, Datagrams, RMI overview, RMI architecture, Example demonstrating RMI. <div style="text-align: right;"><b>(10 Hrs)</b></div>
<b>Unit-III</b>	: <b>Java Beans:</b> What is a Java bean ? Advantage of Java Beans, Application Builder tools, Using the Bean Developer kit, JAR files, Introspection, Developing a simple bean using the BDK, Using Bound properties, Using the Bean Info interface, Constrained properties, Persistence, Customizers, The Java Beans API. <div style="text-align: right;"><b>(10 Hrs)</b></div>
<b>Unit-IV</b>	: <b>Servlets:</b> The life cycle of a servlet, Working with ServletConfig and ServletContext Objects, Reading Servlet parameters, Working with the HttpServletRequest and HttpServletResponse Interfaces, Handling HTTP GET requests, POST requests. <div style="text-align: right;"><b>(10 Hrs)</b></div>
<b>Unit-V</b>	: <b>Java Server Pages:</b> Basic JSP Architecture, Life Cycle of JSP, JSP Tags and Expressions, JSP with Database, Implicit Objects, Tag Libraries, JSP Expression Language (EL), Using Custom Tag, JSP Capabilities: Exception Handling, Session Management, Handling cookies, Directives, JSP with Java Bean. <div style="text-align: right;"><b>(10 Hrs)</b></div>
<b>Unit-VI</b>	: <b>Enterprise JAVA Beans:</b> Enterprise Bean overview, Types of enterprise beans, Advantages of enterprise beans, The Life Cycle of Enterprise Beans, Working with Session Beans, Stateful vs. Stateless Session Beans, Working with Entity Beans, Message Driven Beans. <div style="text-align: right;"><b>(10 Hrs)</b></div>

<b>Reference Books:</b>	: <ol style="list-style-type: none"> <li>1. "COMPLETE REFERENCE: JAVA2", BY Herbert Schildt, Fifth Edition, Tata McGraw-Hill, 2003.</li> <li>2. "<i>Advanced Java 2 Platform: How to Program</i>", BY Deitel, H M, Deitel, P J and Santry, Prentice Hall.</li> <li>3. "Java Network Programming", BY Elliott Rusty Harold, O'Reilly publishers, 2000.</li> <li>4. "Head First JSP and Servlets", BY Kathy Sierra and Bert Bates, O'reilly Publication.</li> <li>5. "Mastering Enterprise Java Beans", BY Ed Roman, John Wiley &amp; Sons Inc., 1999.</li> <li>6. "CORE JAVA 2 ADVANCED FEATURES, VOL II", BY Hortsman &amp; Cornell, Pearson Education, 2002.</li> <li>7. "Core Java Vol 1 and Vol 2", BY Gary Cornell and Cay S. Horstmann, Sun Microsystems Press, 1999.</li> <li>8. "Developing Java Enterprise Applications", BY Stephen Asbury, Scott R. Weiner, Wiley, 1998.</li> <li>9. "J (2007) <i>Professional Java</i>, Richardson", BY C Y, Avondolio, D, Schrage, S, Mitchell, M W and Scanlon, <i>JDK</i>, 6th edition, Wiley.</li> <li>10. "H M (2007) <i>Java: How to Program</i>", BY Deitel, P J and Deitel, 7th edn, Prentice Hall.</li> <li>11. "B (2006) <i>Thinking in Java</i>", BY Eckel, 4th edition, Prentice Hall.</li> </ol>
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**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester-V	
<b>Course Code: CSE306</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Theory: 02 Hrs/week</b> <b>Tutorial: --</b> <b>Credits: 02</b>	<b>Title: System Software</b> <b>Class Test: 10 Marks</b> <b>Theory Examination (Duration): 02 Hrs</b> <b>Theory Examination (Marks): 40</b>
<b>Objectives</b>	: To understand the internal organization of a system.
<b>Unit-I</b>	: <b>Introduction:</b> System software, Need, Types, Components. <span style="float: right;"><b>(5 Hrs)</b></span>
<b>Unit-II</b>	: <b>Elements:</b> Assemblers, Loader, Linker, Translator, Compiler. <span style="float: right;"><b>(5 Hrs)</b></span>
<b>Unit-III</b>	: <b>Assembler:</b> Functions, Machine dependent and Machine independent assembler, Design. <span style="float: right;"><b>(5 Hrs)</b></span>
<b>Unit-IV</b>	: <b>Compiler:</b> General model, introduction to various phases of compilers. <span style="float: right;"><b>(5 Hrs)</b></span>
<b>Unit-V</b>	: <b>Software Tools:</b> Spectrum of software tools, text editors, interpreters, Program generators debug monitors. <span style="float: right;"><b>(5 Hrs)</b></span>
<b>Unit-VI</b>	: <b>Modern Trends:</b> New system software's, Design principles. <span style="float: right;"><b>(5 Hrs)</b></span>
<b>Reference Books:</b>	: <ol style="list-style-type: none"> <li>1. "System programming and operating system", BY Dhamdhare D. M. -TMH.</li> <li>2. "Introduction to system software", BY Dhamdhare D. M – TMH.</li> <li>3. "System programming", BY J. J. Donovan –McGraw Hill.</li> </ol>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 40 marks Paper:**

1. Minimum eight questions.
2. Four questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and engineering) Semester-V	
<b>Course Code: CSE321</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits:01</b>	<b>Title: Lab I : Design and Analysis of Algorithm</b> <b>Teachers Assessment : 25 Marks</b> <b>Practical/Oral Examination: 25 Marks</b> <b>Total Examination (Marks): 50</b>
<b>Objectives</b>	: 1. To understand the concepts of Object oriented Programming. 2. To write simple applications using Java. 3. To develop programming skills and to solve engineering related problems using java.
<b>List of Practicals (Minimum ten experiments to be performed)</b>	: 1. Study of various code tuning techniques. 2. Program for Binary Search. 3. Program for finding maximum and minimum number using Divide and conquer. 4. Program for merge sort. 5. Program for Knapsack problem. 6. Program for Job sequencing with deadlines. 7. Program for single source shortest path. 8. Program for Multistage Graph. 9. Program for N-Queen Problem. 10. Program for sum of subsets
<b>Reference Books</b>	: 1. "Fundamentals of Computer Algorithm", BY Elias Horwiths, Sartaj Sahani, Galgotia, Publication. 2. "The Design and analysis of Computer Algorithm", BY Aho,Hopcroft Ullman, Addison's Wesley. 3. "Introduction to Algorithms", BY Thomas H. Cormen, Charles E. Leiserson,Ronald L. Rivest, Clifford Stein, McGraw-Hill.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester- V	
<b>Course Code: CSE322</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits: 01</b>	<b>Title: Lab II: Relational Database Management Systems</b> <b>Teachers Assessment : 25 Marks</b> <b>Practical/Oral Examination : 25 Marks</b> <b>Total Examination (Marks): 50</b>
<b>Objectives</b>	: 1. Demonstrates skills to model data requirements. 2. Extract required data using DDL, DML commands. 3. To understand real-world examples of data modelling. 4. To learn design and management of data in database. 5. To create data models in to normalized designs.
<b>List of Practical's (Minimum ten experiments to be performed)</b>	: 1. <b>Creation of Database from ER Model.</b> 2. <b>Data Definition and Modification.</b> 3. <b>DCL Commands.</b> (Grant and Revoke) 4. <b>Simple SQL queries.</b> 1. Make use of different operators (relational, logical) 2. Pattern matching. 5. <b>Advanced SQL Queries - 1.</b> 1. Group by, Having clause 2. aggregate function 6. <b>Advanced SQL Queries - 2.</b> 1. To study sub queries. (inner queries and correlated queries) 2. Nested queries: in, not_in, exists, not exists and any, all. 7. <b>Advanced SQL Queries - 3.</b> 1. Join (Inner & Outer) 2. Exists & Union 8. <b>Implementation of views.</b> 1. Creation of views 2. Usage of views 3. Drop view 9. <b>Implementation of triggers.</b> 10. <b>Implementation of procedures.</b>
<b>Reference Books</b>	: 1. "Database System Concepts", BY Silberschatz A., Korth H., Sudarshan S., 5th Edition, McGraw Hill Publishers, 2002, ISBN 0-07-120413-X. 2. "Fundamentals of Database Systems", BY Elmasri R., Navathe S., 4* Edition, Pearson Education, 2003, ISBN 8129702282.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.



<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester- V	
<b>Course Code: CSE323</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits: 01</b>	<b>Title: Lab III: Operating System</b> <b>Teachers Assessment : 25 Marks</b> <b>Practical/Oral Examination : 25 Marks</b> <b>Total Examination (Marks):50</b>
<b>Objectives</b>	: To Study various algorithms & case studies through specific programming language & research papers.
<b>List of Practicals (Minimum ten experiments to be performed)</b>	: <ol style="list-style-type: none"> <li>1. Write a program to read a data from one file and copy it into another file using command line arguments.</li> <li>2. Write a program to read the contents of a file and display it on the screen using command line arguments.</li> <li>3. Write a program for the Producer &amp; Consumer problem.</li> <li>4. An implementation of FCFS scheduling algorithm.</li> <li>5. An implementation of SJF scheduling algorithm.</li> <li>6. An implementation of Memory Management algorithms such as Best Fit, First Fit &amp; Worst Fit.</li> <li>7. An implementation of Disk arm scheduling algorithm (Shortest Seek First- SSF ).</li> <li>8. A case study on Novell Netware.</li> <li>9. A case study on Windows NT.</li> <li>10. To study GATE questionnaire for OS.</li> </ol>
<b>Reference Books</b>	: <ol style="list-style-type: none"> <li>1. "Let Us C", BY Yashwant Kanetkar</li> <li>2. "Introduction to Operating System", BY Galvin.</li> </ol>

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and engineering) Semester- V	
<b>Course Code: CSE324</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits:01</b>	<b>Title: Lab IV: SDL - I ( Advanced JAVA)</b> <b>Teachers Assessment: 50 Marks</b>
<b>Objectives</b>	: 1. To design and develop GUI applications using Swing. 2. To design and develop client/server systems using sockets, RMI. 3. To design and develop Web applications using servlets or JSP. 4. To understand the issues in enterprise applications development.
<b>List of Practicals (Minimum ten experiments to be performed)</b>	: 1. Program using Swing. 2. Program using sockets. 3. Program using RMI. 4. Developing a simple bean using BDK. 5. Program for reading servlet Parameters. 6. Program for GET and POST methods in servlets. 7. Program using <jsp: useBean> tag in JSP. 8. Program for Session Management using JSP. 9. Program for setting and retrieving a cookie in JSP. 10. Program using stateless session bean in EJB.
<b>Reference Books</b>	: 1. "COMPLETE REFERENCE: JAVA2", Herbert Schildt, Fifth Edition, Tata McGraw-Hill, 2003. 2. " Advanced Java 2 Platform: How to Program", Deitel, H M, Deitel, P J and Santry, Prentice Hall. 3. "Java Network Programming", Elliott Rusty Harold, O'Reilly publishers, 2000. 4. "Mastering Enterprise Java Beans", Ed Roman, John Wiley & Sons Inc., 1999. 5. "Head First JSP and Servlets", Kathy Sierra and Bert Bates, O'reilly Publication.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and engineering) Semester- V	
<b>Course Code: CSE325</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits: 01</b>	<b>Title: Lab V: Seminar</b> <b>Teachers Assessment : 50 Marks</b>
<b>Course Objectives</b>	: <ol style="list-style-type: none"> <li>1. To create awareness amongst pre final year students for latest technological Aspects.</li> <li>2. To improve presentation and communication skills.</li> <li>3. To inculcate qualities of team work and team spirit.</li> <li>4. To motivate for research work in the respective areas.</li> <li>5. To have common platform where interaction between various groups of students will take place on the various advanced and emerging topics of technology.</li> <li>6. To improve skills related to search on the internet.</li> <li>7. To realize importance of basic technological aspects.</li> </ol>

#### Guidelines for students and faculty

1. Seminar topics may be chosen by the students with advice from the guide/Industry persons, which shall be finalized by guide and approved by concerned head of the department. Students are to be exposed to the following aspects of the seminar presentation.
  - a. Literature Survey / Review
  - b. Organization of the material
  - c. Preparing for presentation
  - d. Technical writing
2. Each student is required to-
  - a. Submit one page synopsis before the seminar talk for display on the notice board and
  - b. Give a 20 minutes presentation through OHP, PC, and Slide projector followed by a 10 minute question answer session.
3. For award of Sessional marks:
  - a. 25 marks - based on the assessment done by internal guide during semester and the involvement of student in the work assigned related to the seminar topic
  - b. Remaining 25 marks based on the examination at final presentation. Student is to be examined on the basis of an oral and written presentation by at least two examiners, one of them shall be guide and other as an external examiner appointed by the principal of the institute.

***Seminar Report Format***

1. The Seminar Report shall be typed on A-4 size white bond paper.
2. Typing shall be with spacing of 1.5 using one side of the paper.
3. Margins :-
  - (i) Left 37.5 mm.
  - (ii) Right, top and bottom 25 mm.
4. Binding: - Hard with golden embossing on the front cover of brown colour
5. Front cover of hard bound report:- It should be identical to first title page.
6. Default font size TNR-12
7. Format for title page (First Page) (Centre justified)

Report of Seminar (TNR-14, Bold)

In (TNR-12)

{Title}(TNR-18, Bold)

By (TNR-12)

{Name of student}(TNR-16, Bold)

(Roll No:     ) (TNR-12)

Submitted in partial fulfillment of the requirement for (TNR-12)

Degree of Bachelor of Technology (Branch Name) (TNR-14, Bold)

of (TNR-12)

Dr. Babasaheb Ambedkar Marathwada University,

Aurangabad. (TNR-14, Bold)

Department of \_\_\_\_\_Engineering, (TNR-14, Bold)

Maharashtra Institute of Technology, (TNR-16, Bold)

Aurangabad. (TNR-14, Bold)

200 - 200 (Academic Year) (TNR 14)

**Format for Certification page (Second page)****CERTIFICATE (TNR-16, Bold)**

This is to certify that the Seminar Report (TNR-12)

Submitted by (TNR-12)

(Name of Student) (TNR-14, Bold)

(Roll No: \_\_) (TNR-12)

Is completed as per the requirement of the Dr. Babasaheb Ambedkar Marathwada University, Aurangabad in partial fulfillment of (TNR-12)

Degree of Bachelor of Technology (Branch Name) (TNR-14, Bold)

For the academic Year 20\_\_ - 20\_\_(TNR-12)

(Name)

(Name)

(Name)

Guide

Head of Department

Principal (TNR -12, Bold)

8. The third page will be certificate issued by the industry regarding the completion of Seminar if applicable.
9. The fourth page would be for acknowledgement, which would be followed by index page (Fifth page).
10. Sketches should be drawn on separate sheet (minimum A4 size) and be inserted at proper places. The sketches should be drawn in black ink and be numbered.
11. Tables should preferably type in the text only.
12. The mathematical symbol should be typed or neatly written so as to match darkness of the text.
13. The last item on the index should be references.
14. Page number must appear on the right hand top corner of each page starting after index page.
15. The contents of the seminar can be decided by the internal guide / department and student.
16. Minimum number of copies = 5 Copies (Central Library + Department + Internal Guide + External Examiner + Student).  
The copy of External Examiner will be submitted by the student after completion of Seminar.

# SAMPLE COPY

**Report of Seminar**

in

**Remote Sensing through Satellite System**

by

**Mr. Ram K Kanhe**

(Roll No: T3103)

Submitted in partial fulfillment of the requirement for

**Degree of Bachelor of Technology (Instrumentation and Control Engineering),**

of

**Dr. Babasaheb Ambedkar Marathwada University**

**Aurangabad**

**Department of Instrumentation and Control Engineering,**

**Maharashtra Institute of Technology,**

**Aurangabad.**

**2013 - 2014**

# SAMPLE COPY

**CERTIFICATE**

This is to certify that the Seminar Report

Submitted by

**Mr. Ram K. Kanhe patil**

(Roll No: T3103)

Is completed as per the requirement of the Dr. Babasaheb Ambedkar Marathwada University, Aurangabad in partial fulfillment  
of

**Degree of Bachelor of Technology**

**(Instrumentation and Control Engineering)**

For the academic Year 201 -1

**(Name)**

**(Name)**

**(Name)**

**Guide**

**Head of Department**

**Principal**

### **General Attributes**

- Chapter heading -All Capital—TNR 14 Font (Bold)
- Heading –All Capital- TNR 12 Font (Bold)
- Subheading–Title case- TNR12 Font (Bold)
- Text – TNR11 Font
- Title of the Report should not be more than two lines
- Page numbers are at right hand corner at ½ inch from right and top side.
- Page number should be allotted only from Chapter no. 1 onwards.

### **References**

Last chapter of the report is references including the addresses of websites.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (Internally) on the syllabus and term work mentioned above.



<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science & Engineering) Semester-VI	
<b>Course Code: CSE351</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 04 Hrs/week</b> <b>Tutorial: --</b> <b>Credits:04</b>	<b>Title: Data Mining and Warehousing</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. To familiarize with the fundamental concepts of Data warehousing and OLAP. 2. To develop the concepts of data mining methods in database management skills.
<b>Unit-I</b>	: <b>Introduction to Data Warehousing:</b> Introduction to Decision Support System: DSS Definition, History of DSS, Ingredients of DSS, Data and Model Management, DSS Knowledge base, User Interfaces, The DSS Users, Need for data warehousing, Operational & informational data, Data Warehouse definition and characteristics, Operational Data Stores. <b>(10 Hrs)</b>
<b>Unit-II</b>	: <b>Data warehouse Components:</b> Architectural components: ETL Process , 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. <b>(10 Hrs)</b>
<b>Unit-III</b>	: <b>OLAP in the Data Warehouse :</b> 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. <b>(10 Hrs)</b>
<b>Unit-IV</b>	: <b>Introduction to Data Mining:</b> Definition of data mining, Data Mining Applications, Data Mining tools, Mining Frequent Patterns, Associations, Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web. <b>(10 Hrs)</b>
<b>Unit-V</b>	: <b>Classification and Prediction:</b> Introduction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation, Support Vector Machines, Classification by Association Rule Analysis, Prediction. <b>(10 Hrs)</b>
<b>Unit-VI</b>	: Cluster Analysis, Mining Stream, Time-Series, and Sequence Data What Is Cluster Analysis?, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Outlier Analysis, Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Transactional Databases, Mining Sequence Patterns in Biological Data. <b>(10 Hrs)</b>
<b>Reference Books:</b>	: 1. "Data Mining Concepts and Techniques", BY Han, Kamber, Morgan Kaufmann . 2. "Data Mining: Concepts and Techniques", BY Margaret Dunham, Morgan Kaufmann Pub. 3. "Data Warehousing Fundamentals", BY Paul Punniann, John Wiley Pub. 4. "Data Warehousing, Data Mining and OLAP", BY Alex Berson, S.J. Smith, Tata McGraw Hill 5. "The Data Warehouse Lifecycle toolkit", BY Ralph Kimball, John Wiley. 6. "Data Mining: Concepts and Techniques", BY Jiawei Han, Micheline Kamber, 2nd edition, Morgan Kaufmann, ISBN 1558609016, 2006. 7. "Data Mining: Methods and Techniques", BY A B M Shaukat Ali, Saleh A Wasimi, Cengage Learning Pub. 8. "Practical Machine Learning Tools and Techniques with Java Implementations", BY Ian Witten and Eibe Frank, Data Mining, Morgan Kaufman, ISBN 1558605525, 1999.

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-VI	
<b>Course Code: CSE352</b> <b>Teaching Scheme: 04Hrs/week</b> <b>Theory: 03Hrs/week</b> <b>Tutorial: 01Hr/week</b> <b>Credits:04</b>	<b>Title: Digital Image Processing</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. To train the students for Image processing fundamentals. 2. To train the students for processing using related software. 3. To train the students for color image processing.
<b>Unit-I</b>	: <b>Fundamentals of Image Processing:</b> Image Acquisition, Image Model, Sampling, Quantization, and Relationship between pixels and distance measurement, connectivity, Image Geometry, Photographic film. Histogram: Definition, Decision of Contrast biasing on histogram, Operations based on histograms like image stretching, Image classification. Definition and Algorithm of Histogram equalization  <b>Tutorial: Study of image processing toolbox in MATLAB. (10Hrs)</b>
<b>Unit-II</b>	: <b>Image Transforms:</b> Introduction to Fourier Transform, The Discrete Fourier Transform, Properties of two dimensional Fourier transform, Fast Fourier Transform, WALSH Transformation, HADAMARD Transformation, DCT  <b>Tutorial: MATLAB/C based program to generate basis function for HADAMARD and WALSH transformation of an image. (10Hrs)</b>
<b>Unit-III</b>	: <b>Image Enhancement:</b> <b>Image Enhancement (by Spatial Domain Methods):</b> Arithmetic and Analytical operations, pixel or point operations, size operations) Smoothing filters – Mean, Median, Low pass filters, high pass filters, sharpening filters. <b>Image Enhancement: (by Frequency Domain Method):</b> Design of Low Pass, High Pass, Edge enhancement, Sharpening filters in frequency domain. Butterworth Filter, Homomorphic filters in frequency domain and spatial domain  <b>Tutorial: MATLAB/C program for contrast stretching and gray level slicing. (10Hrs)</b>
<b>Unit-IV</b>	: <b>Image Compression:</b> Fundamentals: Coding redundancy, interpixel redundancy, psychovisual redundancy, Fidelity criterion: MSE, PSNR, Compression ratio, Lossless compression: Variable length coding, LZW coding, Lossy compression: transform coding, wavelet coding, Image Compression standards, Image File formats: bmp format, Graphics Interchange format, Tagged Image File Format. <b>Tutorial: MATLAB/C based program for run length coding. (10Hrs)</b>
<b>Unit-V</b>	: <b>Image Segmentation:</b> Definition, Characteristics of segmentation, Detection of Discontinuities, Thresholding, Pixel based segmentation method, Region based segmentation methods – segmentation by pixel aggregation, segmentation by sub region aggregation, and histogram based segmentation, split and merge technique  <b>Tutorial: MATLAB/C based program for Image segmentation. (10 Hrs)</b>

<b>Unit-VI</b>	:	<b>Morphological Image Processing:</b> Dilation and erosion, Opening and closing, The Hit or Miss transformation, Basic Morphological algorithms: Boundary extraction, region filling, Applications of Gray-scale morphology. <b>Color Image Processing:</b> Color fundamentals, color models (RGB, CMY, HIS), Color transformations: formulation, color complements, color slicing, tone and color corrections.  <b>Tutorial:</b> MATLAB/C based program for color image processing. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Reference Books:</b>	:	<ol style="list-style-type: none"> <li>1. "Digital Image Processing", BY Rafael C Gonzalez, Richard E Woods, Pearson Education.</li> <li>2. "Digital Image Processing using MATLAB", BY Rafael C Gonzalez, Richard E Woods, Eddins, Pearson Education.</li> <li>3. "Fundamentals of Digital Image Processing", BY Anil K Jain, PHI.</li> <li>4. "Digital image processing", BY William K., Mc Graw Hill 1997.</li> </ol>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester- VI	
<b>Course Code: CSE353</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 03 Hrs/week</b> <b>Tutorial: 01Hr/week</b> <b>Credits:04</b>	<b>Title: Principles Of Compiler Design</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. An ability to use of formal attributed grammars for specifying the syntax and semantics of programming languages. 2. Working knowledge of the major phases of compilation, particularly lexical analysis, parsing, semantic analysis, and code generation. 3. An ability to design and implement a significant portion of a compiler for a language chosen by the instructor.
<b>Unit-I</b>	: <b>Introduction to compilers:</b> Translator, Interpreter, Compiler, Phases of compiler, compiler writing tools, bootstrapping. <b>Finite automata and lexical analysis</b> The role of lexical analyzer, design of lexical analyzer, Implementation of transition diagram, Regular expressions , definition of regular expressions , A LEX, Implementation of lexical analyzer . Implementing look ahead operator, Finite Automata-Non deterministic and deterministic, Algorithms for Construction of DFA from NFA, construction of NFA from regular expression.  <b>Tutorial:</b> Examples on Regular expression to NFA and NFA TO DFA. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-II</b>	: <b>Basic parsing techniques:</b> Review of context free grammar, Parsers ,Shift reduce parsing, Operator precedence parsing, Top down parsing, Recursive descent parsing, Left Factoring, Predictive parser, FIRST and FOLLOW, construction of parsing table, LL(1) Grammars.  <b>Tutorial:</b> Example on FIRST AND FOLLOW and Operator precedence parsing. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-III</b>	: <b>Automatic construction of efficient parsers:</b> LR Parsers, LR Grammars, The canonical collection of LR (0) Items ,Construction of SLR Parsing Tables ,Constructing canonical LR parsing Tables, Constructing LALR parsing Table. using Ambiguous grammars, Automatic Parser Generator, Implementation of LR Parsing Tables. Constructing LALR Sets of Items.  <b>Tutorial:</b> Example on LALR parser and YACC tool. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-IV</b>	: <b>Syntax Directed Translation(SDT):</b> SDT Schemes, Implementation of syntax directed Translators, Intermediate code ,Post fix notation , Control flow in postfix code, Syntax directed translation to postfix code, Parse trees and syntax trees, Three Address code, Quadruples and triples, Translation of assignment statements, Boolean expressions, Postfix Translations. <b>Tutorial:</b> Example on Translation of assignment statements and Boolean expression . <span style="float: right;"><b>(10 Hrs)</b></span>

<b>Unit-V</b>	:	<p><b>Symbol Table:</b> The contents of a symbol table, reusing symbol -table space, Array names, Storage allocation information, Data Structures for symbol table, Representation scope information.</p> <p><b>Run Time Storage Administration</b> Implementation of a Simple Stack -Allocation Scheme, Implementation of Block structural Languages.</p> <p><b>Tutorial:</b> Example on representing scope information in various languages. (10 Hrs)</p>
<b>Unit-VI</b>	:	<p><b>Error Detection and Recovery:</b> Errors, Lexical phase errors, Syntactic phase errors, Error Recovery in LR Parsing, Automatic Error Recovery in YACC.</p> <p><b>Code optimization and code generation</b> The Principal sources of optimization, Loop Optimization, The DAG representation of Basic Blocks. Code generation- Object programs Problems in code generation, A simple code generator, Code generation from DAG's .</p> <p><b>Tutorial:</b> To study DAG representation. (10 Hrs)</p>
<b>Reference Books:</b>	:	<ol style="list-style-type: none"> <li>1. "Principles of Compiler Design", BY Aho, Ullman ,Narosa Publishing House, 1989.</li> <li>2. "Modern Compiler Design", BY David Galles, Pearson Education Asia, 2007</li> <li>3. "Advanced Compiler Design &amp; Implementation", BY Steven S. Muchnick, Morgan, Kaufmann Publishers, 2000.</li> <li>4. "Crafting a Compiler with C", BY C. N. Fisher and R. J. LeBlanc Pearson Education,</li> <li>5. "Compilers: Principles, techniques and tools", BY Aho, Sethi, Ullman Wesley 1988.</li> <li>6. "Compiler Construction: Theory &amp; Practice", BY Barrat, Eates, Cought Galgotia 1988.</li> </ol>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester-VI	
<b>Course Code: CSE354</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 03 Hrs/week</b> <b>Tutorial: 01 Hr/week</b> <b>Credits: 04</b>	<b>Title: Linux Operating System</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. To learn the concept and Architecture of Linux Operating System and its application 2. To learn configuration of different servers. 3. To learn various system administration commands. 4. To apply these concepts to various areas of computer science.
<b>Unit-I</b>	: <b>Introduction:</b> History of Linux, Flavors of Linux, Architecture of Linux Operating System, Overview of Linux Kernel, Linux kernel versions, Synchronization and concurrency, Overview of shells.  <b>Linux commands:</b> Login session commands-login, logout, su, tty, shutdown, init 0, init 6, poweroff, startx, who, who am i, cal, date, Getting help-man, info, whatis, /boot/grub/grub.conf-file  <b>Tutorial:</b> Installation of Linux operating system. <span style="float: right;"><b>(10Hrs)</b></span>
<b>Unit-II</b>	: <b>File System:</b> Common File system Interface, File system Structure, File system Layout, The Inode object, Assigning and releasing Inode, data structure associated with file systems, File systems in Linux, File Permissions.  <b>Tutorial:</b> Installation of Open office. <span style="float: right;"><b>(10Hrs)</b></span>
<b>Unit-III</b>	: <b>File System commands:</b> cd, dir, ls, dir, mkdir, rmdir, cp, cat, rm, mv, touch, umask, wc, ln, chmod, chown, od, cmp, diff, more, less Filter commands- head, tail, grep, find, cut, paste, sort, uniq, nl, grep, fgrep, sed, tr, awk, pipe, tee, mkfs, fsck, NFS, Special file permissions-suid, guid, sticky bit,  <b>Tutorial :</b> 1. Create two Directory CSE, MIT. Create 5 files in each. Remove two files from cse, and one from MIT, change the permission of one file from MIT and set to 555. Set umask such that when u create new file in CSE the default permission of it should be 444. Then reset umask to its original value.  2. Add some text to one file in CSE containing information about linux operating system. Find a word "open source" in that.  3. Use "grep to display the line for any account that starts with the letter 'g'. <span style="float: right;"><b>(10 Hrs)</b></span>
<b>Unit-IV</b>	: <b>System Calls:</b> Process Management System Calls like fork(), Files Management System Calls like-read(), write(), open(), close(), create(), lseek(), dup(), Memory Management System Calls like-kmalloc(), kfree(), <b>Tutorial :</b> How to run C and java program on Linux. <span style="float: right;"><b>(10Hrs)</b></span>

<b>Unit-V</b>	<p><b>: System administration:</b> User and Group administration-useradd, userdel, usermod, groupadd, groupdel, groupmod, passwd, chgrp, chage, /etc/passwd-file, /etc/shadow-file, Package management- rpm, yu, ssh, LVM, RAID, fdisk, mount, umount, /etc/fstab-file, e2label, blkid, partprobe, Quota, Backup: cpio, tar, gzip, dump, dd, crontab,</p> <p><b>Network Configuration:</b> system-config-network-tui/gui, hostname, ip link, ip addr, mii-tools, ping, ifconfig, ifup, ifdown, virtual ip, /etc/sysconfig/network-scripts-file, /etc/resolv.conf-file, /etc/hosts-file, dig, traceroute,</p> <p><b>Security:</b> Assigning password to GRUB, changing root password in single user mode, runlevels, /etc/hosts.allow file, /etc/hosts.deny file, selinux, Netfilters, Access Control list,</p> <p><b>Tutorial :</b></p> <ol style="list-style-type: none"> <li>1. Add two groups as follows: <ol style="list-style-type: none"> <li>a. Salesgrp: ID =2000 user: tom,Ram,joy</li> <li>b. Fingrp: ID = 3000 user : Ali,Shyam</li> </ol> </li> <li>2. Create users with following Specifications <ol style="list-style-type: none"> <li>a. Ali with user id 3001</li> <li>b. Tom with comment "manager of sales dept"</li> <li>c. Ram with home directory /salesdept</li> <li>d. Shyam with login shell /bin/ksh</li> <li>e. Joy with group id 2000/salesgrp</li> </ol> </li> <li>3. Delete user tom , modify group id of Salesgrp to 4000. <span style="float: right;"><b>(10 Hrs)</b></span></li> </ol>
<b>Unit-VI</b>	<p><b>: Shell Script:</b> Editors-vi, vim, Introduction to shell scripts and related commands, shell variables, read, if, case, while, for statements, logical operators.</p> <p><b>Tutorial:</b></p> <ol style="list-style-type: none"> <li>1. Write a shell script to find inode of a file</li> <li>2. Write shell script to display greeting according to time.</li> <li>3. Write a shell script that will write the contents of all files starting with a to a new file. <span style="float: right;"><b>(10 Hrs)</b></span></li> </ol>
<b>Reference Books:</b>	<p><b>:</b></p> <ol style="list-style-type: none"> <li>1. "Linux Commands Instant Reference", BY Bryan Pfaffenberger, BPB.</li> <li>2. "Linux Kernel Development", BY Robert Love, Pearson.</li> <li>3. "Unix Concepts And Applications", BY Sumitabha Das, Tata McGraw-Hill Education.</li> <li>4. "The Design of Unix Operating system", BY Maurice J. Batch, Prentice-Hall.</li> <li>5. "The Complete Reference Linux", BY Richard Peterson, Tata McGraw-Hill Education.</li> </ol>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.



<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-VI	
<b>Course Code: CSE391</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 04 Hrs/week</b> <b>Tutorial: --</b> <b>Credits:04</b>	<b>Title: EI-I: Object Oriented Analysis and Design</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. To provide a sound understanding of the fundamental concepts of the object model. 2. To teach how large, complex software systems are developed using modern software Engineering methods and models. 3. To teach the realistic application of object oriented development within a variety of Problem domains.
<b>Unit-I</b>	: <b>Introduction:</b> The inherent Complexity of software, The Structure of Complex Systems, Bringing Order to Chaos, On Designing Complex Systems, Categories of Analysis and Design Methods. <b>(10 Hrs)</b>
<b>Unit-II</b>	: <b>Object Model:</b> 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. <b>(10 Hrs)</b>
<b>Unit-III</b>	: <b>Relationship of classes:</b> 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, Elements of the Notation. <b>(10 Hrs)</b>
<b>Unit-IV</b>	: <b>The Notation and the Process:</b> Elements of the Notation, Class Diagram, State Transition Diagrams, Object Diagrams, Intersection Diagram, Module Diagrams, and Process Diagrams, Applying the Notation, First Principles, The Micro Development process, and The Macro Development process. <b>(10 Hrs)</b>
<b>Unit-V</b>	: <b>Pragmatics:</b> 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. <b>(10 Hrs)</b>
<b>Unit-VI</b>	: <b>Applications:</b> Data Acquisition: Weather Monitoring System, Frameworks: Foundation Class Library, Client Server Computing: Inventory Tracking, Command and Control: Traffic Management. <b>(10 Hrs)</b>

<b>Reference Books:</b>	:	<ol style="list-style-type: none"><li>1. "Object oriented analysis and Design with applications", BY Grady Booch, Second Edition, Pearson application.</li><li>2. "Object oriented analysis and Design with Unified Process", BY J.W. Satzinger, Robert B.Jackson, Stephen D. Burd, Cengage Learning Pub.</li><li>3. "The Unified Modeling Language User Guide", BY Grady Booch, James Rumbaugh, Ivar Jacobson, (Addison Wesley Object Technology Series).</li><li>4. "UML and C++ A practical guide to object oriented development", BY Richard Lee, William M.Tepfenhart, Second edition.</li></ol>
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**Pattern of Question Paper:**

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**For 80 marks Paper:**

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2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and Should cover complete syllabus of the respective section and should be set for ten marks each.
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<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T.Y. B. Tech. (Computer Science and Engineering) Semester- VI	
<b>Course Code: CSE392</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 04 Hrs/week</b> <b>Tutorial: --</b> <b>Credits: 04</b>	<b>Title: EI-I: Artificial Intelligence</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	: 1. To understand human cognition 2. To understand cost-effective automation. 3. General problem solving solves broad range of problems.
<b>Unit-I</b>	: <b>Introduction :</b> Definition of AI, AI problems, AI technique, level of model. Criteria for success. Problems problem space & search: Defining problem space, production system, problem characteristics, production system characteristics, Issues in the design of search process. <b>(10Hrs)</b>
<b>Unit-II</b>	: <b>Heuristic search technique:</b> Generate & test, hill climbing, best first search, problem reduction, constraint satisfaction, mean-ends analysis.  <b>AI programming language:</b>  Prolog, introduction to prolog, concepts & programming. <b>(10Hrs)</b>
<b>Unit-III</b>	: <b>Knowledge Representation(KR):</b>  Representation & mapping, approaches to KR, issue in the frame problem.  <b>Predicate logic:</b>  Representation simple facts, its relationship, propositional logic, predicate logic, quantities, resulting natural deductions. <b>(10Hrs)</b>
<b>Unit-IV</b>	: <b>Knowledge Representation using rules:</b>  Procedural vs. declarative knowledge, logic programming, forward Vs backward searching, Matching, control Knowledge. <b>(10Hrs)</b>
<b>Unit-V</b>	: <b>Symbolic reasoning under uncertainty:</b>  Non monotonic reasoning, logic for non-monotonic reasoning, implementation issue, augmenting a problem solve, implementation by (1) depth-first search, (2) breadth search. <b>(10Hrs)</b>
<b>Unit-VI</b>	: <b>Statistical reasoning:</b>  Probability & Bayer's theorem, Certainty factors & rule systems, Bayesian n/w, Demster Shafer theory, Fuzzy logic. <b>(10Hrs)</b>
<b>Reference Books:</b>	: 1. "Artificial Intelligence", BY Elaine Rich, Keirn Knight, TMH. 2. "Introduction to AI & expert system", BY Dan W. Platorjon, PHI. 3. "Introduction to AI", BY Rajendra Akerkar.

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T.Y. B. Tech.(Computer Science and Engineering) Semester- VI	
<b>Course Code: CSE393</b> <b>Teaching Scheme: 04 Hrs/week</b> <b>Theory: 04 Hrs/week</b> <b>Tutorial: --</b> <b>Credits: 04</b>	<b>Title: EI-I: Industrial Management</b> <b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 03 Hrs</b> <b>Theory Examination (Marks): 80</b>
<b>Objectives</b>	1. To learn fundamentals of Industrial Management, Economics and Organization. 2. To learn quality concept of project management. 3. To learn the concept of communication.
<b>Unit-I</b>	<b>Basic concept of management:</b> Management, Administration and Organization concepts. Management principles, management and Engineering studies, meaning and types of management, functions of management, The concept of scientific management- F. W. Taylor and Henry Fayol's contribution to management , Role and importance of management in modern society. <b>(10 Hrs)</b>
<b>Unit-II</b>	<b>Business Organization:</b> Forms of Business organization, Individual proprietorship, partnership, Joint stock Company, Co-operative enterprise and public sector undertakings. Organization structure in industry, line organization, functional organization, line and staff organization, committee organization, project organization, matrix organization. <b>(10 Hrs)</b>
<b>Unit-III</b>	<b>Nature and scope of Economics:</b> Basic economic concepts, human wants- economic goods, utility, value, price, cost, wealth and capital. Demand supply, elasticity of demand and supply, Concept of Profit and Revenue. Special significance of Economics to Engineers, Production : Factors of production, Laws of return, Various Economic systems. <b>(10 Hrs)</b>
<b>Unit-IV</b>	<b>Financial Management:</b> Concept of financial management accounting system, financial accounting and cost accounting system, Sources of industrial finance, Sales Organization of firm, Management of sales, and advertisement, Market research, Management and productivity. <b>(10 Hrs)</b>
<b>Unit-V</b>	<b>Personnel management:</b> Man Power, Sources of recruitment , selection and training, Job Evaluation, performance appraisal , wages and Incentives, self and time management, Communication: Definition, Elements, Principles of communication, barriers in communication, oral and written communication. <b>(10 Hrs)</b>
<b>Unit-VI</b>	<b>Project Management:</b> Concepts and importance of project, Project implementation, MIS.MIS meaning and objectives. Types of data, methods of data collection, analysis and presentation of data. Editing, reporting and presentation of data, Decision options. Industrial act: Industrial, factories act, pollution control, industrial safety, Introduction, causes of accidents, safety, accident prevention techniques, and related legal provisions. Quality Management: concept and importance of quality circles, and total Quality management, (TQM) ISO9000, Patent procedure. <b>(10 Hrs)</b>
<b>Reference Books:</b>	1. "Industrial Organization and Management", BY O.P.Khanna. 2. "Principles of Management", Knootz and O'Donnell. 3. " Indian Economy, Problem of Development and Planning", A. N. Agrawal (Wiley Eastern Ltd), New Delhi" 4. "Indian Economy, Its Development Experience", S. K. Mishra.

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section a questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and Should cover complete syllabus of the respective section and should be set for ten marks each.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 40 marks Paper:**

1. Minimum eight questions.
2. Four questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. ,
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and engineering) Semester- VI	
<b>Course Code: CSE371</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits: 01</b>	<b>Title: Lab VI : Digital Image Processing</b> <b>Teachers Assessment: 25 Marks</b> <b>Practical/Oral Examination : 25 Marks</b> <b>Total Examination (Marks): 50</b>
<b>Course Objectives</b>	: 1. To understand the concepts of Digital Image Processing. 2. To write simple applications using MATLAB. 3. To develop programming skills using tools given in MATLAB.
<b>List of Practicals (Minimum ten experiments to be performed)</b>	: 1. To study MATLAB environment. 2. Write a program in MATLAB for arithmetic operations on images. 3. Write a program in MATLAB for logical operations on images. 4. Write a program in MATLAB to perform translation and rotation of images. 5. Write a program in MATLAB to compute Discrete Cosine transform. 6. Write a program in MATLAB for low pass filter, median filter and high pass filter in spatial domain. 7. Write a program in MATLAB for histogram. 8. Write a program in MATLAB for gray level 9. Write a program in MATLAB for edge detection. 10. Write a program in MATLAB for image enhancement. 11. To study morphological operations on image.
<b>Reference Books</b>	: 1. "Digital Image Processing", BY Rafael C Gonzalez, Richard E Woods, Pearson Education. 2. "Digital Image Processing using MATLAB", BY Rafael C Gonzalez, Richard E Woods, Eddins, Pearson Education.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.



<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester- VI	
<b>Course Code: CSE372</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits:01</b>	<b>Title: Lab VII : Principles of Compiler Design</b> <b>Teachers Assessment : 25 Marks</b> <b>Practical/Oral Examination : 25 Marks</b> <b>Total Examination (Marks): 50</b>
<b>Course Objectives</b>	: 1. Students will understand the phases of the compilation process and be able to describe the purpose and implementation approach of each phase. 2. Give students practical exposure to aspects of theoretical computer science including Languages, Grammars, and Machines.
<b>List of Practicals (Minimum ten experiments to be performed)</b>	: <ol style="list-style-type: none"> <li>1. To study of compiler phases.</li> <li>2. Write a program in C or C++ to implement lexical analyzer.</li> <li>3. To study LEX tool and implementation of lexical analyzer using LEX tool.</li> <li>4. Write a program in C or C++ to implement stack allocation Shift reduce parser.</li> <li>5. Write a program in C or C++ to implement Predictive parser.</li> <li>6. Write a program in C or C++ to implement operator precedence parser.</li> <li>7. To study of YACC tool and implement simple YACC calculator.</li> <li>8. Write a program in C or C++ to implement infix notation to postfix notation.</li> <li>9. Write a program in C or C++ to implement three address code notations for relational operator.</li> <li>10. To study code generation and code optimization techniques.</li> </ol>
<b>Reference Books</b>	: <ol style="list-style-type: none"> <li>1. "Lex &amp; Yacc", BY John R. Levine, Tony Mason, Doug Brown Paperback - 366 pages 2nd/updated edition (October 1992)O'Reilly &amp; Associates ISBN: 1565920007.</li> <li>2. "Modern Compiler Implementation in C", BY Andrew W. Appel, Maia Ginsburg Hardcover - 560 pages Rev expand edition (January 1998),Cambridge University Press ISBN: 052158390X.</li> </ol>

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and engineering) Semester-VI	
<b>Course Code: CSE373</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits: 01</b>	<b>Title: Lab VIII : Linux Operating System</b> <b>Teachers Assessment: 25 Marks</b> <b>Practical/Oral Examination : 25 Marks</b> <b>Total Examination (Marks): 50</b>
<b>Course Objectives</b>	: 1. To understand Linux as operating system 2. To learn various commands of Linux operating system 3. To learn various system settings.
<b>List of Practicals (Minimum ten experiments to be performed)</b>	: 1. To Study various Linux file system commands in details. 2. To Study various Linux system administration commands in details. 3. To create partition and configure LVM. 4. To create partition and Configure RAID. 5. To Study And Configure NFS Server. 6. To Study rpm and Installation of Package. 7. To study and implement Network Configuration. 8. To Study and Configure ACL and UserQuota. 9. To Study Various Shell Scripts. 10. To study Network Security in Linux.
<b>Reference Books</b>	: 1. "Linux Commands Instant Reference", BY Bryan Pfaffenberger, BPB. 2. "Linux Kernel Development", BY Robert Love, Pearson. 3. "Unix Concepts And Applications", BY Sumitabha Das, Tata McGraw-Hill Education. 4. "The Design of Unix Operating system", BY Maurice J. Batch, Prentice-Hall. 5. "The Complete Reference Linux", BY Richard Peterson, Tata McGraw-Hill Education.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.

<p style="text-align: center;"><b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering &amp; Technology) Syllabus of T. Y. B. Tech. (Computer Science and engineering) Semester- VI</p> <p><b>Course Code: CSE 374</b> <span style="float: right;"><b>Title: Lab IX: SDL- II (ASP.NET)</b></span>  <b>Teaching Scheme: 02 Hrs/week</b> <span style="float: right;"><b>Teachers Assessment:50 Marks</b></span>  <b>Practical: 02 Hrs/week</b>  <b>Credits:01</b></p>		
<b>Course Objectives</b>	:	<ol style="list-style-type: none"> <li>1. Create web based applications</li> <li>2. Use ASP.NET security features for authenticating the web site</li> <li>3. Use different server controls to create rich user interactive web sites</li> <li>4. Access data from the database in data bound controls on the web page</li> <li>5. Apply Master page to different pages in the web site</li> <li>6. Personalize a web page by using web parts</li> </ol>
<b>Unit-I</b>		<p><b>Introducing ASP.NET</b></p> <p><b>ASP.NET Introduction</b> ASP.NET in .Net Framework, Working of ASP.NET application, Features of ASP.NET, Programming models in ASP.NET.</p> <p><b>Setting up Asp.Net and IIS</b> Installing IIS, IIS Manager, Installing ASP.Net.</p>
<b>Unit-II</b>		<p><b>Developing Asp.NET Applications using Visual Studio.Net</b></p> <p>Starting a Visual Studio .NET Projects, Writing Code, Visual Studio .NET Debugging, Responding to Events, Where Does Processing Occur? Cascading Style Sheets, Creating an ASP.NET Web Application.</p>
<b>Unit-III</b>		<p><b>Building Web Forms using Server Controls</b></p> <p><b>Server Controls in ASP.NET</b> Processing of Server Controls in a Web Page, Types of Server Controls, Implementing HTML Server Controls, Web Server Controls, Validation Controls.</p> <p><b>Creating Custom Controls</b> Web User Controls, Custom Controls.</p>
<b>Unit-IV</b>		<p><b>Event Driven Programming &amp; Exception Handling</b></p> <p><b>Event Driven Programming andPostBack</b> HTML events, ASP.NET Page events, ASP.NET Web Control events, Event driven programming and postback.</p> <p><b>Error Handling &amp; Debugging</b> Using Exception Handling, Using Error Pages, Logging Exceptions.</p>
<b>Unit-V</b>		<p><b>Working With data</b></p> <p><b>Data Binding</b> Single Value Data Binding, Multi-Record Data Binding.</p> <p><b>Web Server Control Template</b> Repeater Control, DataList Control, DataGrid Control.</p> <p><b>ADO.NET Data Access</b> The SQL Statements, Creating a Connection, Accessing, Modifying, and updating the disconnected Data.</p>
<b>Unit-VI</b>		<p><b>Deploying an ASP.NET Web Application</b></p> <p>Introduction to Deployment, Creating a web setup project manually &amp; using the setup wizard, working with Deployment Editor.</p>

<b>List of Practicals (Minimum ten experiments to be performed)</b>	:	<ol style="list-style-type: none"><li>1. To Study the ASP.Net Introduction, how to set up the ASP.NET and IIS</li><li>2. Creating a Web Form in ASP.Net</li><li>3. Building Web Forms using Server Controls</li><li>4. Creating a Custom Control</li><li>5. Create Event Driven Programming</li><li>6. Implementing application for Exception handling</li><li>7. Data Binding</li><li>8. Develop a web page to insert, delete &amp; modify information stored in the database.</li><li>9. Deploying an ASP.NET Web application</li><li>10. Create a simple web service</li></ol>
<b>Reference Books</b>	:	<ol style="list-style-type: none"><li>1. The Complete Reference ASP.NET by Matthew MacDonald, TMH</li><li>2. Mastering ASP.Net - BPB Publication</li><li>3. Beginning ASP.NET 3.5, Wrox Publication</li><li>4. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly</li></ol>

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of T. Y. B. Tech. (Computer Science and engineering) Semester- VI	
<b>Course Code: CSE375</b> <b>Teaching Scheme: 02 Hrs/week</b> <b>Practical: 02 Hrs/week</b> <b>Credits:01</b>	<b>Title: Lab X: Project Part-I</b> <b>Teachers Assessment: 50 Marks</b>
<b>Objectives</b>	: The practical implementation of theoretical knowledge gained during your study to till date is important for Engineering Education. The student should be able implement their ideas/real time industrial problem/ current application of their engineering branch which they have studied in curriculum. This will definitely help in building the confidence in the student what he has learnt theoretically. The dependent study of the state of the art topics in a broad area of his/her specialization.

**Guidelines for students and faculty:**

1. Students have to finalize their project title based on Industrial Assignments.
2. The projects selected should be such so as to ensure the satisfaction of the urgent need to establish a direct link between education, national development and productivity and thus reduce the gap between the world of work and the world of study. The term work will consist of a report prepared by the student on the project allotted to them.
3. Project topics may be chosen by the student or group of students (maximum 3 students) with advice from the faculty members.
4. To design a project at adequate scale level for the following applications- It may be based (i) Entirely on study and analysis of a typical Instrumentation and Control System, (ii) Experimental verification, or (iii) Design, fabrication, testing and calibration of an Instrumentation system. The software based project can be considered based on its application for instrumentation and control purpose. The students are required to submit the report based on project work done.
5. Use appropriate tools (Microsoft Word/Latex) for the preparation of the report.
6. Each student/group is required to-
  - a. Submit a one page synopsis before the project talk for display on the notice board in the first week of their academic semester.
  - b. Give a 10 minutes presentation through OHP, PC, and Slide projector followed by a 10 minute discussion in the second week of their academic semester.
  - c. Submit a report on the project topic with a list of required hardware, software or other equipment for executing the project in the third week of their academic semester.
  - d. Start working on the project and submit initial development and CPM/PERT planning drawing in the fourth week of their academic semester.
  - e. Preparation of PCB layout, wiring diagram, purchase of components, software demo, flowchart, algorithm, program/code, assembling, testing, etc. should be submitted by student/s within next five/Six weeks and minimum one page report should be there for each major activity.
  - f. Overall assembling, wiring, code writing, testing, commissioning, should completed within next two weeks.
  - g. At the last but one week of end of academic semester the internal assessment of project will be done by panel of internal faculties and they will decide marks out 25 marks for term work (TA).
  - h. In the last week, student/group will submit final project report to guide and thereafter guide will finalize marks out of the remaining 25 marks for term work (TA).
7. Projects are to be scheduled in the weekly scheduled time-table during the semester and any change in schedule should be discouraged.
8. Every assigned faculty/s should maintain separate file for evaluating progress of each student or group.
9. Award 50 TA, Sessional marks based on the assessment done by internal guide and panel during semester and the involvement of student/group in the work assigned related to the topic and its application.
10. The format and other guidelines for the purpose of the Project Submission in hard bound copies should be as follows,

- Report Structure
  - Index/Contents/Intent
  - List of Abbreviations
  - List of Figures
  - List of Graphs
  - List of Tables
  - and List of if any other inclusion
  - 1. Introduction
  - 2. Literature survey
  - 3. System development
  - 4. Performance analysis
  - 5. Conclusions
  - References

Appendices

Acknowledgement

## 1. INTRODUCTION

### 1.1 Introduction

1.2 Necessity

1.3 Objectives

1.4 Theme

1.5 Organization

## 2. LITERATURE SURVEY

Related information available in standard Books, Journals, Transactions, Internet Websites *etc.* till date (More emphasis on last three to five years)

## 3. SYSTEM DEVELOPMENT

Model Development

Analytical

Computational

Experimental

Mathematical

Statistical

(Out of above methods at least one method is to be used for the model development)

Some mathematical treatment or related information is required to be embodied

#### 4. PERFORMANCE ANALYSIS

Analysis of system developed either by at least two methods depending upon depth of standard

These methods normally used are Analytical /Computational/Statistical/Experimental/ or Mathematical

Results at various stages may be compared with various inputs

Output at various stages with same waveforms or signals or related information/parameters

Comparison of above results by at least two methods and justification for the differences or error in with theory or earlier published results

#### 5. CONCLUSIONS

5.1 Conclusions

5.2 Future Scope

5.3 Applications

Contributions (if any,)

The innovative work/invention/new ideas generated from the analysis of the work which can be taken from the conclusions

References

Author, "Title", Name of Journal/Transactions/ Book, Edition/Volume, Publisher, Year of Publication, page to page (pp. \_\_).

These references must be reflected in text at appropriate places in square bracket

In case of web pages complete web page address with assessing date has to be enlisted

List of references should be as per use in the text of the report

Appendices

Related data or specifications or referred charts, details computer code/program, *etc.*

Page)

(1

Expression of gratitude and thankfulness for helping in completion of the said task with name

Signed by the candidate

- General Guidelines on front and correct side of the watermark on quality bond paper

Text should be printed on 75 to 85 gsm paper

Paper size

Left Margin

Right Margin 3/4"

Top Margin

Bottom Margin 1"

- First page of first chapter need not be printed anywhere, second page onwards at right hand corner at 1/2 inch from right margin. From second chapter onwards starting page number of chapter should be printed at bottom center place report. Break words must be italic

Report Heading -All Capital—16 Font

Chapter heading -All Capital—14 Font

Subchapter -title case-12 Font

Sub-Subchapter -First Alphabet Capital case-12 Font

Page numbers for Index/Contents/Intent should be in roman

Title of the Report should not be more than two lines

Text pages should be in times new roman

The page of the Index/Contents/Intent heading should be below the words for appropriate sub chapter or sub-sub chapter shown in sample copy

Cover page should have (Mission statement of Institute) in inverted commas, Symbol of Institute, Name of Department and Institute

Suitable flap with name of the candidate, Department and Institute name and symbol can be used with nylon strip.

*For more information and sample of hard copy please contact the respective Head of the Department.*