

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY**CIRCULAR NO.SU/Engg./T.Y.B.Tech./63/2018**

It is hereby informed to all concerned that, the syllabi prepared by the Board of Studies & recommended by the Dean, Faculty of Science & Technology, the **Academic Council at its meeting held on 30 June & 02 July 2018 has accepted the following syllabi in accordance with Choice Based Credits & Grading System for all Branches T.Y.B.Tech** under the Faculty of Science & Technology as enclosed herewith.

Sr.No.	Syllabi as per CBC & GS
[1]	Third Year B.Tech.[Civil Engineering],
[2]	Third Year B.Tech. [Mechanical Engineering],
[3]	Third Year B.Tech. [Agricultural Engineering],
[4]	Third Year B.Tech.[Electrical Engineering],
[5]	Third Year B.Tech. [Plastic & Polymer Engineering],
[6]	Third Year B.Tech [Electronics & Telecommunication Engg.],
[7]	Third Year B.Tech. [Computer Science Engineering].

This is effective from the Academic Year 2018-2019 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. SU/T.Y.B.TECH./2018/

Date:- 03-07-2018. /10486-96 *****

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6/7/18
Deputy Registrar,
Syllabus Section.

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 this Circular on University Website.**

Copy to :-

- 1] The Director, Board of Examinations & Evaluation,
- 2] **The Section Officer,[Engineering Unit] Examination Branch,**
- 3] The Section officer, [Eligibility Unit],
- 4] **The Programmer [Computer Unit-1] Examinations,**
- 5] **The Programmer [Computer Unit-2] Examinations,**
- 6] The In-charge, [E-Suvidha Kendra],
- 7] The Public Relation Officer,
- 8] The Record Keeper,

SCHEME AND DETAILED SYLLABUS

Of

T. Y. B. Tech. (CSE)

OF

FOUR YEAR DEGREE COURSE IN SCIENCE AND TECHNOLOGY



FACULTY OF SCIENCE AND TECHNOLOGY
Revised Structure w. e. f. 2018-2019
T.Y. B. Tech. (Computer Science and Engineering)

Course Code / Faculty Name	SEMESTER-V	Contact Hrs / Week				Examination Scheme						
	Subject	L	T	P	Total	CT	TH	TW	P	Total	Credits	Duration of Theory Exam
CSE301	Operating system	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE302	Software Engineering	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE303	Programming in Java	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE304	Design analysis and algorithm	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE305	Theory of Computation	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE341-343	Department Elective II	2	-	-	2	10	40	-	-	50	2	2 Hrs
CSE321	Lab: Design analysis and algorithm	-	-	2	2	-	-	25	25	50	1	
CSE322	Lab: Operating system	-	-	2	2	-	-	25	25	50	1	
CSE323	Lab: Programming in Java	-	-	2	2	-	-	25	25	50	1	
CSE324	Lab: Software Engineering	-	-	2	2	-	-	50	-	50	1	
CSE325	Minor Project	-	-	2	2	-	-	50		50	1	
	Total of semester-V	22	-	10	32	110	440	175	75	800	27	
Course Code / Faculty Name	SEMESTER-VI	Contact Hrs / Week				Examination Scheme						
	Subject	L	T	P	Total	CT	TH	TW	P	Total	Credits	Duration of Theory Exam
CSE351	Principle of Compiler Design	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE352	Computer Network	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE353	Digital Image Processing	4	-	-	4	20	80	-	-	100	4	3 Hrs
BSH354	Industrial Management(All)	4	-	-	4	20	80	-	-	100	4	3 Hrs
*	Open Elective I	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE355	Programming in. net	2	-	-	2	10	40	-	-	50	2	2 Hrs

CSE371	Lab: Principle of compiler Design	-	-	2	2	-	-	25	25	50	1	
CSE372	Lab: Computer Network	-	-	2	2	-	-	25	25	50	1	
CSE373	Lab: Digital image processing	-	-	2	2	-	-	25	25	50	1	
CSE374	Lab: SDL I(.net)	-	-	2	2	-	-	50	-	50	1	
CSE375	Project I	-	-	2	2	-	-	-	50	50	1	
**	#Audit Course I	2										
	Total of semester-VI	24	-	10	32	110	440	125	125	800	27	
	Grand Total of V & VI									1600	54	

L: Lecture hours per week T: Tutorial hours per week P: Practical hours per week CT: Class Test
 TH: University Theory Examination TW: Term Work P: Practical/Oral Examination

Note: Interested students can opt for any one of the audit course offered by various departments.

For Audit course , audit pass(NP) and audit fail(NF) grades will be awarded.

Department Elective II –CSE341-User Interface Technology

CSE342- Fuzzy Control System

CSE343-System Software

*** Open Elective-I Course**

Sr. No.	Name of course	Department	Course code
1	Remote Sensing and GIS	AED	AED381
2	Professional Ethics and Cyber Security	CSED	CSE381
3	Design for Environment	CED	CED381
4	Robotics and Automation	EED	EED381
5	Internet and Things	ETC	ETC381
6	Costing and Financial Management	MED	MED381
7	Introduction to Nano Technology	PPE	PPE381

**** Audit courses**

Sr. No.	Name of course	Department	Course code
1	Japanese Language Module	BSH	BSH801
2	Cyber Crime and Law	CSE	CSE801
3	Road Safety Management	Civil	CED801
4	Value Education	BSH	BSH802
5	Smart Cities	ETC	ETC801
6	Rural Community Engagement	MECH	MED801
7	German Language module	BSH	BSH803

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
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Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-V

Code No.: CSE301

Teaching Scheme: 04 Hours per week

Theory: 04 Hours per week

Tutorial:

Credits: 04

Title: Operating System

Class Test: 20

Theory Examination (Duration): 03

Hrs

Theory Examination (Marks): 80

Prerequisites	Concepts of Computer Hardware/Memory & Computer Organization.	
Objectives	<ol style="list-style-type: none"> 1. To introduce students with the basic concepts of Operating System, its functions and services. 2. To familiarize the students with various views and management policies adopted by Operating system. as pertaining with processes , Deadlock , memory , File and I/O operations. 3. To brief the students about functionality of various OS like UNIX, Linux and Windows XP as pertaining to resource management. 4. To provide the knowledge of basic concepts towards process synchronization and related issues. 	
Outcomes	<p>At the end of the course the students should be able to:</p> <ol style="list-style-type: none"> 1. Understand the role of an operating system as System software and learn Unix Commands. 2. Analyze and Compare various algorithms used for Memory management, CPU scheduling, File handling and I/O operations. 3. Apply various concept related with Deadlock to solve problems related with Resources allocation. 4. To appreciate role of Process synchronization towards increasing throughput of system. 5. Apply various Process scheduling algorithms. 6. Use various memory allocation techniques. 	
Unit-I	<p>: Introduction to OS: An Operating system, Layered Architecture, Objectives and function, Types of OS's, Evolution of OS, OS as a resource Manager, Concept of Kernel, OS as an interface. Case Study: Types of OSs along with their Versions- Windows, Unix, Linux, DOS, Macintosh etc. with basic shell commands.</p>	(08 Hrs)
Unit-II	<p>: The Process: Process concept, operations on process, Process scheduling: basic concepts, scheduling criteria, Scheduling algorithms: Pre-emptive, Non-pre-emptive, FCFS ,SJF ,SRTF, Priority based, Round Robin, Multilevel Queue scheduling. Case Study: Classical problems of Synchronization: The Producer Consumer Problem: Readers writers</p>	(08 Hrs)

	problem, Semaphores, Dining Philosopher Problem.	
Unit-III	: Process Synchronization: Background, the critical section problem, Peterson's Solution, Synchronization Hardware, Semaphores. Deadlock: The Problem, Deadlock Characterization, Deadlock necessary Conditions, Resource Allocation Graph, Deadlock Prevention. Deadlock avoidance, Deadlock recovery, Deadlock Detection. Case Study: Banker's algorithm for single & multiple resources.	(08 Hrs)
Unit-IV	: Memory Management: Memory management strategies: background , swapping , contiguous Memory allocation Techniques- First fit, Best fit, Worst fit, paging , structure of page tables , segmentation.	(08 Hrs)
Unit-V	: Virtual memory management: Paging and Segmentation, Demand paging , copy on write, Page replacement policies: FIFO, Optimal, LRU, LRU Approximation, Counting Based, Allocation of frames , Thrashing.	(08 Hrs)
Unit-VI	: File Management: File Management Subsystem Need, File and Directory structures, blocks and fragments, directory tree, i-nodes, file descriptors. Case Study: UNIX file structure & Windows File Structure.	(08Hrs)
Reference Books:	: 1. "Operating Systems", William Stallings: 6th Edition 2. "Operating Systems: Design & Implementation", Andrew S. Tanenbaum 3. "Operating System Concepts", Abraham Silberschatz, Peter Galvin 4. "Operating System", Achyut Godbole	

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

Pattern of Question Paper:

The six 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. The Question no.1 and 6 should be of objective nature.

Two questions of 15 marks each from remaining questions from each section A and B be asked to solve

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester- V

Code No: CSE302

Title : Software Engineering

Teaching Scheme: 4 Hrs per week

Class Test: 20

Theory : 4 Hrs/week

Theory Examination (Duration) : 03 Hrs

Credits: 4

Theory Examination (Marks): 80

Prerequisites	-	
Objectives	<ol style="list-style-type: none">1. To understand Software Engineering and role of software.2. To understand generic process models and agile development model used for software development.3. Understand software requirements and the SRS documents.4. To understand the concept of software design and different architecture styles.5. To know agile frameworks and why they are used.6. To understand the project planning process and quality concept.	
Outcomes	<ol style="list-style-type: none">1. Identify role of software and Develop software product using different process model.2. Prepare SRS (Software Requirement Specification) document, including FR and NFR.3. Apply the concept of Functional Oriented and Object Oriented Approach for Software Design.4. Design the software product using design engineering concepts and types.5. Estimate the software product by using different software metrics.6. Maintain quality of the product using quality standards.	
Unit-I	: Introduction To Software Engineering Nature of Software, Software Process, Software Myths, Generic Process	(08 Hrs)

	model, Defining a Framework Activity, Identifying a Task Set, Software Process Models: Waterfall Model, Incremental Models, Evolutionary Models.	
Unit-II	: Requirements Analysis and Modelling: Requirement Elicitation (Communication) Techniques for software, The software requirements specification, The Elements of the Analysis Model Data Modelling -Data Objects, Attributes, and Relationships Cardinality and Modality Entity/Relationship Diagrams. Requirements Modelling Strategies, Functional Modelling: Flow-Oriented Modelling, Creating a Data Flow Model, Creating a Control Flow Model, The Control Specification, The Process Specification, Behavioral Modelling: Identifying Events with the Use Case, State Representations, The Data Dictionary.	(08 Hrs)
Unit-III	: Design Concept: Design within the Context of Software Engineering, The Design Process, Software Quality Guidelines and Attributes, Design Concepts, Abstraction, Architecture, Patterns, Separation of Concerns , Modularity, Information Hiding , Functional Independence, Refinement , Aspects , Refactoring . Effective Modular Design: Functional Independence, Cohesion, Coupling. Software Architecture: What Is Architecture? , Why Is Architecture Important? Architectural Descriptions, Architectural Genres, Architectural Styles, A Brief Taxonomy of Architectural Styles.	(08 Hrs)
Unit-IV	: Agile Development: What Is Agility?, Agility and the Cost of Change, What Is an Agile Process: Agility Principles, Human Factors. Extreme Programming: XP Values, The XP Process, Industrial XP. Other Agile Process Models: Adaptive Software Development (ASD), Scrum, Agile Modeling (AM), Agile Unified Process (AUP).	(08 Hrs)
Unit-V	: Software Project Planning: The management Spectrums: The people, the product, the process, the project. Project planning Objectives, The Project Planning Process, Software Scope and Feasibility , Resources , Software Project Estimation, Empirical Estimation Model: The Structure of Estimation Models, The COCOMO Model.	(08 Hrs)

	<p>Software Project Risk Management:</p> <p>Reactive versus Proactive Risk Strategies, Software Risks, Risk Identification: Assessing Overall Project Risk, Risk Components and Drivers, Risk Mitigation, Monitoring and Management, The RMMM Plan.</p>	
Unit-VI	<p>Quality concepts : What Is Quality?,</p> <p>Achieving Software Quality: Software Engineering Methods, Project Management Techniques, Quality Control, and Quality Assurance.</p> <p>Elements of Software Quality Assurance: SQA Tasks, Goals, and Metrics: Goals, Attributes, and Metrics. Formal Approaches to SQA,</p> <p>Statistical Software Quality Assurance: A Generic Example, Six Sigma for Software Engineering, The ISO 9000 Quality Standards, The SQA Plan</p>	(08Hrs)
Reference Books:	<p>1. Roger S Pressman, Software Engineering: A Practitioner’s Approach, McGraw-Hill, ISBN: 0073375977, Seventh or Eighth Edition.</p> <p>2. “Software Engineering, A practitioners approach” ,BY Roger S. Pressman ,Mc-Graw Hill Publication, ISBN 0073655783, Fifth Edition.</p> <p>3. Joseph Phillips, IT Project Management –On Track From Start to Finish, Tata Mc Graw-Hill, ISBN13: 978-0-07106727-0, ISBN-10: 0-07-106727-2</p> <p>4. “Integrated Approach to software engineering” , BY Pankaj Jalote, Narosha publishing house 1997Pankaj Jalote, Software Engineering: A Precise Approach, Wiley India, ISBN: 978812652311</p> <p>5. Marchewka, Information Technology Project Management, Wiley India, ISBN: 9788126543946.</p>	

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

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Dr.Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Science & Technology)

Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-V

Code No.: CSE303

Title: Programming in Java

Teaching Scheme:04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03

Hrs

Tutorial: -

Theory Examination (Marks): 80

Credits:04

Prerequisites	Knowledge of Object Oriented Programming concepts.	
Objectives	<ol style="list-style-type: none"> 1.To recognize the similarities and differences between Java and other programming languages . 2.To develop programs using OOP language constructs . 3.To handle the exceptions and events. 4.To understand and know the importance of OOP in real world problems. 	
Outcomes	<p>Upon completion of the course, the students will be able to:</p> <ol style="list-style-type: none"> 1.Apply the concepts of data abstraction, encapsulation, polymorphism, and inheritance for problem solving in Java. 2. Implement the concepts of packages and interfaces. 3. Develop programs for exception handling and multi threading. 4.Create applets and application programs in Java. 5.Create GUI applications using swing. 6.Establish connectivity between Java and databases. 	
Unit-I	<p>: Introduction to Java and OOP concepts Features of Java, differences between C, C++ and Java, Java Virtual machine, classes and methods, method overloading, string and string buffer methods, vectors, wrapper classes, inheritance, is-A, has A rule, overriding, Final and abstract classes.</p>	(08 Hrs)
Unit-II	<p>: Interfaces and Packages Defining interfaces, extending interfaces, implementing interfaces, Accessing Interface variable. Packages: Putting classes together ,using system package, naming convention, creating Package, accessing a package, using a package, adding a class to a package .</p>	(08 Hrs)
Unit-III	<p>: Exception handling and Multi threading Exception handling fundamentals, Java's built-in exceptions, try catch and finally, throw, throws keywords, user defined exceptions. <small>Page 11 of 83</small> Definition of a Thread, States of a Thread, Common Thread methods</p>	(08 Hrs)

	,creation of a Thread, Creation of multiple threads, Thread priorities, synchronization.	
Unit-IV	: I/O Package and Applets Input streams, Output streams, Reader and writer classes , Object serialization, De serialization, random access files. Local and remote applets, How applets differ from application, Preparing to write applets, Building applet code, Applet life cycle, Creating an Executable Applet, designing a web page, applet tag, adding applet to HTML file, running the applet, passing parameter to an applet .	(08 Hrs)
Unit-V	: Event Handling and GUI Event Classes, Event Listeners, Adapter Classes, Mouse events, Keyboard events. Introduction to Abstract Window Toolkit (AWT),Layout managers, Swing-Labels, Buttons, Check Boxes, Choices, Text Field and Text Area, Lists, Panels, Windows and Frames, Jtab, Menu and Menu Bars.	(10 Hrs)
Unit-VI	: JDBC JDBC architecture, JDBC drivers, Establishing connectivity and working with connection interface ,Working with statements, Creating and executing static and dynamic SQL statements, Working with Result Set.	(06Hrs)
Reference Books:	: <ol style="list-style-type: none"> 1. Java 2 : Complete Reference, Herbert Schildt, Tata McGraw-Hill 2. Java : How to program, Paul Deitel and Harvey Deitel, Pearson Prentice Hall 2014,Tenth Edition 3. Programming with Java,E.Balagurusamy, BPB publication. 4. An Introduction to Object-Oriented Programming,Timothy Budd,Pearson, Third edition 5. Effective Java: A Programming Language Guide,Joshua Bloch,Pearson,Second Edition, 2008. 6. Object Oriented Programming in Java,Dr. G. T. Thampy,Dreamtech Press. 	

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

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(Faculty of Science & Technology)

Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-V

Code No.: CSE304

Title: Design and Analysis of Algorithm

Teaching Scheme:04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03 Hrs

Tutorial: -

Theory Examination (Marks): 80

Credits:04

Prerequisites	Data Structures.
Objective	<ol style="list-style-type: none">1. To learn the concept of Algorithm2. To learn the concept of efficiency and performance of algorithm3. To learn the different criteria to determine best solution for a given problem4. To learn the various techniques of writing algorithm5. To apply these concepts to various areas of computer science
Course Outcome	After completing this course the student will be able to <ol style="list-style-type: none">1. Understand asymptotic notations to analyze the performance of algorithms2. Express the skill & knowledge of various algorithm designing techniques.3. Identify the differences in design techniques and apply to solve optimization problems.4. Apply and implement learned algorithm design techniques and data structures to solve problems.5. Identify the different code tuning techniques and apply to improve performance of a program.6. Identify, model, solve and develop code for various problems.
Unit-I	: Introduction: What is algorithm? Algorithm Specification-Pseudocode, Conventions, Performance Analysis- space and time complexities, Growth of function –

(08 Hrs

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		Big-Oh, Omega, Theta notation. Code Tuning techniques.	
Unit-II	:	Divide And Conquer: General method, Binary search, Finding maximum and minimum, Merge sort, Quick sort, Selection, Insertion sort, Strassen's Matrix multiplication	(08 Hrs)
Unit-III	:	The Greedy Method : 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	(08 Hrs)
Unit-IV	:	Dynamic programming : 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	(08 Hrs)
Unit-V	:	Basic search and traversing techniques: The techniques for Binary tree and Graphs, Code optimization, connected components and Spanning tree, Bi-connected components and DFS.	(08 Hrs)
Unit-VI	:	Backtracking: General method , 8 queen problem, sum of subsets, graph coloring, Hamiltonian cycle Class -p, Class - NP problems: Introductions and definition. polynomial and non-polynomial problems, deterministic and non-deterministic algorithms, NP-Hard, NP-Complete problems	(08 Hrs)
Reference Books:	:	1. "Fundamentals of Computer Algorithm" ,Elias Horwirths,Sartaj Sahani,Galgotia Publication. 2. "The Design and analysis of Computer Algorithm",Aho,Hopcroft Ullman,Addisons Wesely 3. "Introduction to Algorithms",Thomas H. Cormen,Charles E. Leiserson,Ronald L. Rivest,Clifford Stein, McGraw-Hill	

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Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-V

Code No.: CSE305

Title: Theory of Computation

Teaching Scheme:04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03

Hrs

Credits:04

Theory Examination (Marks): 80

Prerequisites	Discrete Mathematics	
Objectives	<ol style="list-style-type: none"> 1. To Study abstract computing models. 2. To learn Grammar and Turing Machine. 3. To learn about the theory of computability and complexity. 4. To create background for designing compiler. 	
Outcomes	<p>At the completion of the course, student will be able to–</p> <ol style="list-style-type: none"> 1. Differentiate various mathematical machines in theory of computation. 2. Transform non deterministic finite automata to deterministic finite automata, mealy to Moore machine and regular expression to finite automata. 3. Create parses tree, context free grammar and regular expression for language accepted by automata. 4. Simplify context free grammar to various normal forms. 5. Construct pushdown automata to describe formal languages. 6. Design Turing machines to describe formal languages. 	
Unit-I	<p>: Formal Language Theory and Finite Automata Introduction to Formal language, Alphabets and strings, Finite representation of language, Finite Automata (FA): An Informal Picture of FA, Finite State Machine (FSM), Language accepted by FA, Definition of Regular Language, Deterministic and Nondeterministic FA DFA and NFA), epsilon- NFA, FA with output: Moore and Mealy machines -Definition, models, inter-conversion. Applications of finite automata. Case Study: FSM for vending machine, spell checker</p>	(08 Hrs)
Unit-II	<p>: Regular Expressions Regular expressions - The Operators of Regular Expressions, Building Regular Expressions, Finite Automata and Regular Expressions, From DFA's to Regular Expressions, Converting DFA's to Regular Expressions by Eliminating States, Converting Regular Expressions to Automata, Applications of Regular Expressions, Regular Expressions in UNIX, Lexical Analysis, Finding Patterns in Text, Algebraic Laws for Regular Expressions, Associativity and Commutativity, Arden's theorem, Closures, Pumping Lemma for regular language.</p>	(08 Hrs)
Unit-III	<p>: Context Free Grammar Chomsky Hierarchy, Context Free Grammars – Definition, Derivations Using a Grammar, The Language of a Grammar, Parse Tress, Constructing Parse Trees, Simplification of CFG: Eliminating unit productions, useless</p>	(08 Hrs)

	production, useless symbols, and epsilon productions ,Normal forms :Chomsky normal form, Greibach normal form, Closure properties of CFL, Applications of Context-Free Grammars, Parsers, The YACC Parser-Generator, Ambiguity in Grammars and Languages, Ambiguous Grammars, Removing Ambiguity From Grammars.	
Unit-IV	: Pushdown automata and parsing Push Down Automata - Definition of the Pushdown Automaton, DPDA,NPDA, Graphical Notation for PDA's, Instantaneous Descriptions of a PDA, The Languages of a PDA, Acceptance by PDA, Acceptance by Final State, Acceptance by Empty Stack, Equivalence of PDA's and CFG's, Closure properties of CFL's, top down parsing, bottom up parsing.	(08 Hrs)
Unit-V	: Turing Machine and Linear bounded automata Turing Machines - Introduction to Turing Machines, Turing Machine, Instantaneous Descriptions for the Turing Machines, Transition Diagrams for Turing Machines, The Language acceptability of a Turing Machine, Design of Turing machine. Turing Storage in the State, Multiple Tracks, Shifting Over, Subroutines, Multiple Turing Machines, Variants of turing machine, Computable Functions. The model of Linear bounded automata, Linear bounded automata and languages.	(08 Hrs)
Unit-VI	: Decidability and recursively enumerable languages Definition of algorithm, Decidability, Decidable language, Undecidable language, Halting problem of Turing machine, Recursive and recursively enumerable languages, Non recursively Enumerable Languages, The diagonalization Language, Universal Language, Post correspondence problem, Undecidable problems for context free grammars, Markvo algorithm.	(08 Hrs)
Reference Books:	: Text Books 1. K.L.P Mishra, N. Chandrashekar "Theory of Computer Science : Automata Languages and Computation, 3 rd edition PHI ISBN:978-81-203-2968-3 2. John E. Hopcroft, Rajeev Motwani, Jeffrey D.Ullman, —Introduction to Automata Theory Languages and Computation, Addison-Wesley, ISBN 0-201-44124-1 3. Vivek Kulkarni —Theory of Computation Oxford University Press, ISBN 0-19-808458 Reference Books: 1 H.L. Lewis, Christos H. Papadimitriou, —Elements of the Theory of Computation, Prentice Hall, ISBN-10: 0132624788; ISBN-13: 978-0132624787 2. Michael Sipser, <i>Introduction to Theory of Computation</i> , 3rd Edition, Course Technology, 2012.	

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

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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. The Question no.1 and 6 should be of objective nature.

Two questions of 15 marks each from remaining questions from each section A and B be asked to solve

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad.

(Faculty of Science & Technology)

Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-V

Code No.: CSE341

Title: Elective II (User Interface Technology)

Teaching Scheme:02 Hours per week

Class Test (Marks) : 10

Theory: 02 Hours per week

Theory Examination (Duration): 02 Hrs

Credits:04

Theory Examination (Marks): 40

Prerequisites	: Basic HTML: Structure and HTML Tags, Images, List, Tables, Anchors and Form Elements CSS : Inline, Internal and External Stylesheet, Borders, Backgrounds, text and margin properties	
Objectives	: 1. To understand the concepts and architecture of the World Wide Web. 2. To understand the Markup Language. 3. To understand and practice Embedded Dynamic Scripting on Client-side Internet Programming. 4. To understand and practice Web Development Techniques on client-side.	
Outcome	: At the end of this course, students will be able to: 1. Acquire knowledge about functionalities of World Wide Web 2. Explore mark-up languages features 3. Create interactive web pages using them HTML, CSS & JavaScript 4. Learn and design Client-side validation using scripting languages 5. Acquire knowledge about Open source JavaScript libraries 6. Design Front-end web page.	
Unit-I	: Introduction to WWW: Introduction to Computer networks - Internet Standards – Introduction to WWW – WWW Architecture – SMTP – POP3 – File Transfer Protocol - Overview of HTTP, HTTP request – response — Generation of dynamic web pages.	(04 Hrs)
Unit-II	: UI Design: HTML5: What is HTML5 - Features of HTML5 – Semantic Tags – New Input Elements and tags - Media tags (audio and video tags) – Designing Graphics using Canvas API - Drag and Drop features. CSS3: What is CSS3 – Features of CSS3 – CSS3 properties for border radius, box shadow, image border, custom web font, backgrounds - Advanced text	(04 Hrs)

	effects(shadow) .	
Unit-III	: Responsive Web Design (RWD): Responsive Design: What is RWD – Introduction to RWD Techniques – Fluid Layout, Fluid Images and Media queries - Introduction to RWD Framework Twitter Bootstrap – Bootstrap Background and Features - Getting Started with Bootstrap.	(04 Hrs)
Unit-IV	: Introduction to JavaScript : Introduction - Core features - Data types and Variables - Operators, Expressions and Statements - Functions & Scope - Objects - Array, Date and Math related Objects - Document Object Model - Event Handling – File Handling & validations.	(04 Hrs)
Unit-V	: Introduction to JSON: Object-Oriented Techniques in JavaScript - Classes – Constructors and Prototyping (Sub classes and Super classes) – JSON – Introduction to AJAX.	(04 Hrs)
Unit-VI	: Introduction to JQuery: Introduction – jQuery Selectors – jQuery HTML - Animations – Effects – Event Handling – DOM – jQuery DOM Traversing, DOM Manipulation.	(04 Hrs)
Reference Books:	: 1) Harvey & Paul Deitel & Associates, Harvey Deitel and Abbey Deitel, “Internet and World Wide Web - How To Program”, Fifth Edition, Pearson Education, 2011. 2) Achyut S Godbole and Atul Kahate, “Web Technologies”, Second Edition, Tata McGraw Hill, 2012. 3) Thomas A Powell, Fritz Schneider, “JavaScript: The Complete Reference”, Third Edition, Tata McGraw Hill, 2013. 4) David Flanagan, “JavaScript: The Definitive Guide, Sixth Edition”, O'Reilly Media, 2011 5) Bear Bibeault and Yehuda Katz, “jQuery in Action”, January 2008 6) Web link for Responsive Web Design - https://bradfrost.github.io/this-is-responsive/ 7) Ebook - https://github.com/jasonzhuang/tech_books/tree/master/js	

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 5 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. The Question no.1 and 5 should be of objective nature.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

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Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-V

Code No.: CSE342

Title: Fuzzy Control System

Teaching Scheme:04 Hours per week

Class Test: 10

Theory: 02 Hours per week

Theory Examination (Duration): 03

Hrs

Tutorial:

Theory Examination (Marks): 40

Credits:02

Prerequisites	None	
Objectives	<ul style="list-style-type: none">• To understand the fundamental theory of fuzzy control• To understand the application of fuzzy logic in computer science• To apply fuzzy logic for solving problems	
Outcomes	After completion of this course the students should be able to: <ol style="list-style-type: none">1. Differentiate between the binary logic and fuzzy logic at the conceptual level2. Apply fuzzy logic for solving problems3. Solve numericals using fuzzy logic4. Identify application areas of fuzzy control system5. Apply DSW Algorithm6. Implement fuzzy system to solve practical problems	
Unit-I	: Introduction: Fuzzy system, history, classic v/s fuzzy logic, chance v/s fuzziness, applications of fuzzy system.	(04 Hrs)
Unit-II	: Fuzzy Sets and Relations: Fuzzy set operations, properties, fuzzy relations- cardinality properties, cartesian product and composition. Tolerance and equivalence relations, - value assignment, cosine amplitude, max – min method. Fuzzification and defuzzification.	(04 Hrs)
Unit-III	: Logic and Fuzzy Systems: Logic: fuzzy logic- approximate reasoning, other forms of implication operations, Fuzzy System: Rule based system, graphical technique of	(04 Hrs)

	inference. Development of membership functions, Automated method for fuzzy system	
Unit-IV	: Fuzzy Control System: Control system, design problem, control surface, assumption in fuzzy, control system design, fuzzy logic controllers, fuzzy engineering process control, fuzzy statistical process and control. Industrial application, fuzzy system simulation.	(04 Hrs)
Unit-V	: Fuzzy Arithmetic and Extension Principle: Extension principle, fuzzy transform, fuzzy arithmetic – interval analysis, approximate methods, vertex method, DSW algorithm, restricted DSW algorithm	(04 Hrs)
Unit-VI	: Implementation and Application: Design of fuzzy system, implementation using google sheets. Fuzzy object-oriented database, Fuzzy SQL. Fuzzy pattern recognition. Industrial Applications	(04 Hrs)
Reference Books:	: 1. Timothy J. Ross, Fuzzy logic with Engineering Applications, McGraw Hill, New York, 1996 2. Fuzzy Sets and Fuzzy Logic: Theory and Applications, George J Klir, Prentice Hall; 1St Edition edition (1995)	

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. The Question no.1 and 6 should be of objective nature.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

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Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester- V

Code No: CSE343
Teaching Scheme: 02Hrs/week
Theory: 02Hrs/week
Tutorial: --
Credits:02

Title: Elective II - System Software
Class Test: 10
Theory Examination (Duration): 02 Hrs
Theory Examination (Marks): 40

Prerequisites	Basic knowledge of computer architecture and C programming.	
Objectives	<ol style="list-style-type: none"> 1. To understand system software and their need 2. To understand internal working of system software- assembler, compiler, interpreter, linker, loader 3. To use software tools like program generators- LEX for developing system software 4. Apply modern system software design principles while developing system software 	
Outcomes	<p>At the end of the course,</p> <ol style="list-style-type: none"> 1. Students will be able to categorize the roles of system software and application software 2. Students will be able to recognize the need of system software & its components 3. Students will be able to Identify various elements of system software such as assembler, compiler, loader & linker 4. Students will be able to analyze basic architectural structure & functions of assembler 5. Students will be able to analyze design & phases of compiler 6. Students will be able to list modern design principles and apply them in system software development 	
Unit-I	: Introduction- System software, Need, Types, Components. Evolution of System Software and Operating System, Foundations of system Programming, Machine Structure	(04 Hrs)
Unit-II	: Elements: Assemblers, Loader, Linker, Translator, Compiler, Text Editor, Debugger, Device Driver, Interpreter.	(04 Hrs)

Unit-III	: Macro Preprocessor:- Macro Instruction Definition and Expansion. One pass, Macro processor Algorithm and data structures, Machine Independent Macro Processor Features, Macro processor design options	(04 Hrs)
Unit-IV	: Assembler: Functions, Machine dependent and Machine independent assembler, Assembler design options- Algorithm for Single Pass assembler, Multi pass assembler,	(04 Hrs)
Unit-V	: Compiler- General model, introduction to various phases of compilers, Expressions and Control Structures	(04 Hrs)
Unit-VI	: Software Tools - Spectrum of software tools, text editors, interpreters, Program generators debug monitors. Modern Trends:- New system software's , Design principles	(04 Hrs)
Reference Books:	: 1. System programming and operating system, Dhamdhare D. M. -TMH. 2. Introduction to system software Dhamdhare D. M – TMH 3. System programming J. J. Donovan –McGraw Hill	

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. The Question no.1 and 6 should be of objective nature.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

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Syllabus of T. Y. B. Tech. (Computer Science and engineering) Semester-I/II

Code No: CSE321

Title: Lab III : Design and Analysis of Algorithm

Teaching Scheme:(02) Hours per week

Term work :25 marks

Practical: 02 Hours per week

Practical :25 marks

Credits:01

Total Examination (Marks):50

Course Objectives	:	<ol style="list-style-type: none"> 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.
List of Practicals	:	<ol style="list-style-type: none"> 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
List of Reference Books	:	<ol style="list-style-type: none"> 1. Fundamentals of Computer Algorithm, Elias Horwiths Sartaj Sahani, Galgotia Publication 2. The Design and analysis of Computer Algorithm, Aho,Hopcroft Ullman, Addison's Wesley 3. Introduction to Algorithms, 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

The assessment of practical examination shall be on the following criteria:

The practical examination shall consist of performing an experiment based on the practical work done during the course, the record of the experiments submitted by the candidate and viva -voce based on the syllabus

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Syllabus of T.Y. B. Tech. (Computer Science and Engineering) Semester-V

Code No.: CSE322

Title: Operating System

Practical: 02 Hours per week

Term work :25 marks

Credits:01

Practical:25 marks

Total Examination (Marks): 50 marks

Objectives	1. To study various File operations. 2. To study Process scheduling algorithms. 3. To study Page replacement algorithms.
List of Practicals (Minimum ten experiments to be performed)	1. Write a program for file handling operations. 2. Write a program for system call implementation. 3. Shell Scripting Techniques 4. Write a program for a deadlock. 5. FCFS scheduling algorithm. 6. SJF scheduling algorithm. 7. Write a program for the implementation of Producer Consumer problem. 8. An implementation of Disk arm scheduling algorithm (Shortest Seek First- SSF). 9. An implementation of Memory Management algorithms-Best Fit, First Fit & Worst Fit. 10. An implementation of FIFO Page replacement algorithm.
List of Reference Books	1. "Operating Systems: Design & Implementation", BY Andrew S. Tanenbaum 2. "Operating System Concepts", BY Peter Galvin

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

The assessment of practical examination shall be on the following criteria:

The practical examination shall consist of performing an experiment based on the practical work done during the course, the record of the experiments submitted by the candidate and viva -voce based on the syllabus

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T.Y. B. Tech. (Computer Science and Engineering) Semester- V

Code No.: CSE323

Title: Programming in Java

Term work :25 marks

Practical: 02 Hours per week

Practical:25 marks

Credits:01

Total Examination (Marks): 50 marks

Objective	:	1.To develop programs using OOP concepts. 2.Implement the concepts of packages and interfaces. 3.Use exception handling ,multi threading and event handling in programs. 4.Create GUI applications using applet ,swing and JDBC.
List of Practicals (Minimum ten experiments to be performed)	:	1. Program using method overloading. 2. Program on interfaces. 3. Program to create user defined packages. 4. Program using inheritance. 5. Program using exception handling mechanism. 6. Program to create threads and assign priorities. d) 7. Program using random access file. 8. Program to design and execute an applet. 9.Program for event handling. 10. Programs using AWT. 11. Programs on swing. 12. Program using JDBC.
List of Reference Books	:	1.Java 2 : Complete Reference,Herbert Schildt,Tata McGraw-Hill 2.Java : How to program,Paul Deitel andHarvey Deitel,Pearson Prentice Hall 2014,Tenth Edition 3. Programming with Java,E.Balagurusamy,BPB publication. 4.Object Oriented Programming in Java,Dr. G. T. Thampy,Dreamtech Press.

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

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

The assessment of practical examination shall be on the following criteria:

The practical examination shall consist of performing an experiment based on the practical work done during the course, the record of the experiments submitted by the candidate and viva -voce based on the syllabus

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- V

Code No.: CSE324

Credits:01

Title: Software Engineering

Term work : 50

Practical: 02 Hours per week

Total Examination (Marks):--50

Objective	: 1. To impart state-of-the-art knowledge on Software Engineering and UML 2. Present case studies to demonstrate practical applications of different concepts.
List of Practicals (Minimum ten experiments to be performed)	: 1) Develop Requirement specification document of the selected / allotted project. (Requirement analysis of any management system.) 2) Design use case diagram for given scenario. 3) Design Activity diagram for the selected / allotted project/ scenario. 4) Develop DFD model (level-0, level-1 DFD and Data dictionary) of selected /allotted project/ scenario. 5) Develop Class diagram for selected / allotted project/ scenario. 6) Develop object diagram for selected / allotted project/ scenario. 7) Design Component Diagram for given scenario. 8) To prepare STATE CHART DIAGRAM for given scenario. 9) Case study of ATM system/ Online ticket reservation system of railway/Course registration System 10) Test case design.
List of Reference Books	: 1. Roger S Pressman, Software Engineering: A Practitioner's Approach, Mcgraw-Hill, ISBN: 0073375977, Seventh or Eighth Edition. 2. "Integrated Approach to software engineering" , BY Pankaj Jalote, Narosha publishing house 1997 3. Pankaj Jalote, Software Engineering: A Precise Approach, Wiley India, ISBN: 9788126523115.

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

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

The assessment of practical examination shall be on the following criteria:

The practical examination shall consist of performing an experiment based on the practical work done during the course, the record of the experiments submitted by the candidate and viva -voce based on the syllabus

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T. Y. B. Tech. (All)

Course Code: CSE325

Course: Minor Project

Practical: 02 Hrs/week

Term Work: 50 Marks

Credits: 02

The course objectives and detailed guidelines for Minor Project are as follows.

Course Objectives:

- To plan for various activities of the project and distribute the work amongst team members.
- To develop the ability to define and design the problem and lead to its accomplishment with proper planning.
- To understand the importance of document design by compiling Technical Report on the Minor Project work carried out.
- To develop student's abilities to transmit technical information clearly and test the same by delivery of Seminar based on the Minor Project.

Guidelines:

1. Students should select a problem which addresses some basic home, office or other real life applications.
2. Projects which will address the social issues will be given due weightage.
3. It is desirable that the systems developed by the students have some novel features.
4. The batch size shall not exceed TWO students per batch.
5. The students have to select a suitable problem, design, prepare the drawings, produce the components, assemble and commission the project.
6. Institute may arrange demonstration with poster presentation of all mini projects developed by the students at the end of semester.
7. At the end of the semester, the students have to prepare and present 20-25 pages project report.
8. Final evaluation shall be based on continuous internal assessment followed by Viva-Voce.

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(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-VI

Course code:CSE351

Title: Principles of Compiler Design

Teaching Scheme:04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03

Hrs

Theory Examination (Marks): 80

Credits:04

Prerequisites	Knowledge of Formal languages and automata, data structures and programming skills.	
Objectives	<ul style="list-style-type: none">• An ability to use of formal attributed grammars for specifying the syntax and semantics of programming languages.• Working knowledge of the major phases of compilation, particularly lexical analysis, parsing, semantic analysis, and code generation.• An ability to design and implement a significant portion of a compiler for a language chosen by the instructor.	
Outcomes	<ol style="list-style-type: none">1. Distinguish the working of each phase of compiler.2. Construct parsing table for various parsing method3. Generate three address codes for programming statements.4. Classify various types of errors in compilation process of high level programming languages.5. Construct directed acyclic graphs for the identified basic blocks.6. Design and Implement small modules for all phases of compiler.	
Unit-I	Introduction to compilers -Introduction to compilation and programming languages, Interpreter, Compiler, Phases of compiler, compiler writing tools. Lexical analysis: The role of lexical analyzer, design of lexical analyzer, Implementation of transition diagram, Regular expressions, definition of regular expressions, finite automata theory. Automatic Recognition of REG (LEX), Limitations of Regular Expressions. Implementation of lexical analyzer.	(08 Hrs)
Unit-II	Basic parsing techniques - Review of context free grammar, Parsers, Shift reduce parsing, Operator precedence parsing, Operator precedence grammar, operator precedence algorithm, Top down parsing, Recursive descent parsing, Left Factoring, Predictive parser, FIRST and FOLLOW, construction of parsing table, LL(1) Grammars. Introduction to YACC tool.	(08 Hrs)
Unit-III	Automatic construction of efficient parsers 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.	(08 Hrs)

Unit-IV	: Syntax Directed Translation(SDT) SDT Schemes, Implementation of SDT, S, L-attributed grammar, Intermediate code, 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.	(08 Hrs)
Unit-V	: Symbol Table The contents of a symbol table, reusing symbol -table space, Array names, Storage allocation information, Data Structures for symbol table, Representation of scope. Code optimization Finding Loops and Loop Invariant Code, Strength Reduction, Constant Propagation and Constant Folding, Basic Induction Variable recognition. The Principal sources of optimization, Loop Optimization, The DAG representation of Basic Blocks.	(08 Hrs)
Unit-VI	: Error Detection and Recovery Errors, Lexical phase errors, Syntactic phase errors, Error Recovery in LR Parsing, Automatic Error Recovery in YACC. Run Time Storage Administration .Implementation of a Simple Stack - Allocation Scheme, Activation Record ,Implementation of Block structural Languages. Code generation -Object programs, Problems in code generation, A simple code generator, The code generation algorithm.	(08Hrs)
Reference Books:	: 1.Compilers: Principles, Techniques and Tool Authors: A. Aho, M. Lam, R. Sethi and J. Ullman Publisher: Addison Wesley 2ndedition ISBN13: 978-0321547989 Year: 2007 2.“Modern Compiler Design”, David Galles, Pearson Education Asia, 2007 3 “Principles of Compiler Design”, Aho, Ullman ,Narosa Publishing House, 1989. 4. “Advanced Compiler Design & Implementation”, Steven S. Muchnick, Morgan, Kaufmann Publisher ,2000. 5. Engineering a Compiler Authors: Keith Cooper and Linda Torczon, Publisher: Morgan-Kaufman Publishers, 2ndedISBN: 1-558600-698 -XYear: 2010 6. “Crafting a Compiler with C”, C. N. Fisher and R. J. LeBlanc Pearson Education. 7. “Compiler Construction: Theory & Practice”, Barrat, Eates, Cought Galgotia 1988.	

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. The Question no.1 and 6 should be of objective nature.

Two questions of 15 marks each from remaining questions from each section A and B be asked to solve

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T. Y. B. Tech. (Computer Science & Engineering) Semester-VI

Code No.: CSE 352

Title: Computer Network

Teaching Scheme: 04Hrs/week

Class Test: 20

Theory: 04Hrs/week

Theory Examination (Duration): 03 Hrs

Tutorial:

Theory Examination (Marks): 80

Credits:04

Prerequisites	NIL	
Objectives	1. To learn the basics of computer networks. 2. To understand the various layers in OSI and TCP/IP model. 3. To study various internet applications.	
Outcomes	1. To learn the concept of computer networks and internet. 2. To study different types of computer networks and network topologies. 3. To learn and understand networking protocols. 4. To learn and understand design issues of various layers of OSI and TCP/IP Models.	
Unit-I	: Introduction: Computer Network, Type of Connections, Physical Topology- Star Topology, Mesh topology, Ring Topology, Bus Topology, Categories of Network- LAN, MAN, WAN, Client server model, Peer to peer Network, Internet.	(08 Hrs)
Unit-II	: Network Models: The OSI Model – Layered Architecture, Peer to Peer Processes, Layers in OSI Model, TCP/IP Model, Comparison of OSI and TCP/IP Model, Addressing – Physical Addresses, Logical Addresses, Port Addresses, Specific Addresses.	(08 Hrs)
Unit-III	: Physical Layer Responsibilities of Physical layer, Performance- Bandwidth, Network latency and Throughput, Simplex, Full Duplex, and Half Duplex Communication, Transmission impairments, Transmission Modes – serial and parallel transmission.	(08 Hrs)
Unit-IV	: Data Link Layer Design Issues, Framing, Error detection and Correction- Types of Errors,	(08 Hrs)

		Block Coding, Hamming Code, Linear Block Codes, Checksum, Data Control Protocols – Simplest, Stop and Wait, Stop and Wait ARQ, Sliding window Protocols-GO back N ARQ, Selective Repeat ARQ	
Unit-V	:	Medium Access Control Sub layer and Network Layer Random Access Protocols-ALOHA, CSMA, Control Access Protocols, Channelization Protocols, Network Layer: Design Issues, IPv4, Internet Control Message Protocol.	(08 Hrs)
Unit-VI	:	The Transport Layer and Application Layer Transport Layer: services, Transport Control Protocol, User datagram Protocol, application layer: File Transfer Protocol, Hyper Text Transfer Protocol, Simple Network Management Protocol, BGP, DHCP, DNS.	(08 Hrs)
Reference Books:	:	1. Behrouz A Forouzan, "Data Communications and Networking", 4th Edition, McGraw Hill Publishers, 2006, ISBN 0-07-063414-9. 2. Andrew Tanenbaum., "Computer Networks", 4 th Edition, Pearson Education, 2003, ISBN 8178087855. 3. Behrouz A Forouzan, "TCP/IP Protocol Suit", 4th Edition, McGraw Hill Publishers, 2010, ISBN 0-07-337604-3.	

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. The Question no.1 and 6 should be of objective nature.

Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
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Syllabus of T.Y. B. Tech. (Computer Science and Engineering) Semester-VI

Code No.: CSE 353

Title: Digital Image Processing

Teaching Scheme: 04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03

Hrs

Tutorial:

Theory Examination (Marks): 80

Credits: 04

Prerequisites	Basic linear algebra and Fourier Transform Basic concepts of Computer Graphics	
Objectives	<ol style="list-style-type: none"> 1. To study the Digital Image Processing concepts. 2. To study the different Image processing algorithms to achieve desired result. 3. To study applications in image processing. 	
Outcomes	<ol style="list-style-type: none"> 1. Define the fundamental steps of digital image processing. 2. Describe the image transformation and filtering. 3. Compare various compression and segmentation methods. 4. Apply segmentation methods for edge detection in image processing. 5. Implement the concepts of color image processing, morphological image processing, representation and description. 6. Develop simple programs for image processing. 	
Unit-I	: Introduction to Image processing Digital image, Fundamental steps in digital image processing, Components of an image processing system, Image sensing and acquisition, Image sampling and quantization, Basic relationship between pixels: Neighbors of a pixel, Adjacency, Connectivity, Regions and Boundaries, Distance Measures.	(08 Hrs)
Unit-II	: Intensity Transformation and Filtering Basics of intensity transformation and filtering, Basic intensity transformation functions, Histogram processing, Histogram equalization, Discrete Fourier transform(DFT), Discrete cosine transform, Fundamentals of spatial filtering, Smoothing spatial filters, Sharpening spatial filters, Basics of filtering in the frequency domain, Image smoothing using frequency domain filters, Image sharpening using frequency domain filters.	(08 Hrs)

Unit-III	: Image Compression Fundamentals: Coding Redundancy, Spatial and temporal Redundancy, Irrelevant Information, Measuring image Information, Fidelity Criteria, Image compression Model, Some Basic Compression Methods: Lossless Compression methods-Huffman coding, LZW coding, Run- Length Coding, Lossy Compression methods: Block Transform Coding, Image File formats: BMP, GIF, TIFF, JPEG, PNG.	(08 Hrs)
Unit-IV	: Image Segmentation Fundamentals : Point , Line and Edge Detection, Detection of Isolated Points, Line Detection, Edge Models, Basic Edge detection, Thresholding, Region-Based Segmentation Methods: Region Growing, Region Splitting and Merging.	(08 Hrs)
Unit-V	: Morphological Image Processing and Color Image Processing Morphological Image Processing: Preliminaries, Erosion and Dilation, Opening and Closing , The Hit-or-Miss Transformation , Basic Morphological Algorithms: Boundary Extraction, Hole Filling. Color Image Processing: Color Fundamentals and Color Models: RGB color model, CMY and CMYK color models, HSI color model, Basics of Full-Color Image Processing, Color Transformations: Formulation, color complements, color slicing, Tone and color corrections.	(08 Hrs)
Unit-VI	: Representation and Description Representation, Boundary Descriptors: Simple descriptors, Shape Numbers, Fourier descriptors, Statistical Moments, Regional Descriptors: Simple descriptors, Topological descriptors.	(08Hrs)
Reference Books:	: 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. 3. “Digital Image Processing”, By Anil K Jain, PHI 4. “ Digital Image Processing”, By William K., Mc Graw Hill 1997. 5. “Digital Image Processing and Analysis”, By B Chanda & D Dutta Majumder , PHI	

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. The Question no.1 and 6 should be of objective nature.

Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Science & Technology)
Syllabus of T. Y. B. Tech. (Computer Science and Engineering) Semester-VI

Code No.: BSH 354

Teaching Scheme: 04 Hrs/week

Theory: 04 Hrs/week

Credits:04

Title: Industrial Management

Class Test (Marks): 20

Theory Examination (Duration): 03 Hours

Theory Examination (Marks): 80

Objectives	:	<ol style="list-style-type: none"> 1. Students should understand concept of management 2. Students should understand human resource management, production management, marketing management, financial management and quality management 3. Students should understand modern management techniques
Unit-I	:	<p>Basics of Management: Introduction: Definition of Management, Characteristics of management, functions of Management – planning, Organizing, Staffing, Directing, Coordinating, Controlling, Motivation, Communication, Decision Making, Principles of management – F. W. Taylor, Henry Fayol, Elton Mayo, Administration and Management, Nature of Management, Levels of Management, Managerial skills, managerial roles, Forms of organization, Line, Line-staff etc. Forms of ownership – Partnership, Proprietorship, joint stock, cooperative society, Government sector etc., concept of globalization.</p> <p style="text-align: right;">[8 Hours]</p>
Unit-II	:	<p>Human Resource Management: Objectives of HRM, Strategic importance of HRM, Challenges to HR Professionals, Roles and responsibilities of HR professionals, Human resources planning, talent acquisition, recruitment and selection, Career Planning & Management, Training & Development, discipline and disciplinary action, executive development, need and benefits of good HR policy</p> <p style="text-align: right;">[8 Hours]</p>
Unit-III	:	<p>Purchase & Stores Management: Materials Function, Purchasing or Procurement, buying techniques, purchase procedure, vendor selection, vendor rating. Stores management: Introduction to Stores Management, Stores and material control, Receipt and issue of Materials, Concept of inventory control & its objectives, EOQ, ABC analysis, Material Requirement Planning.</p> <p style="text-align: right;">[8Hours]</p>
Unit-IV		<p>Production and Quality Management: Types of production, Functions of Production Planning & Control, Plant location and layout, Method Study. Inspection, types of inspection, difference between inspection and quality control, sampling inspection statistical quality control, quality circles, reliability concept.</p>

		[8Hours]
Unit-V		<p>Marketing Management & Financial Management: Marketing Management: Introduction, the sales concept, sales vs marketing, market research, sales forecasting, and channels of distribution, pricing. Financial Management: Introduction to financial management, types of capital, sources of finance, assets and Liabilities, factors affecting requirement of working capital, return on investment.</p> <p style="text-align: right;">[8Hours]</p>
Unit-VI	:	<p>Modern Management Techniques: Kaizen, Flexible Manufacturing System, Just in Time, Lean Manufacturing, Total Productive Maintenance, Supply Chain Management, Agile Manufacturing, Six Sigma, Management Information System.</p> <p style="text-align: right;">[8Hours]</p>
Reference Books:	:	<ol style="list-style-type: none"> 1. O P Khanna, "Industrial Engineering and Management", 2nd Edition, Dhanpat Rai, 2004. 2. Korgaonkar M.G. 'Just In Time Manufacturing', Laxmi Publication. 3. Besterfield Dale H., Besterfield Carol, Total Quality Management 3rd Edn. 4. Chopra Sunil, Meindl Peter, Kalra D.V., Supply Chain Management : Strategy Planning & Operation 6th Edn., Pearson. 5. S. S. Patil & N K Hukeri, Industrial Engineering and Production and Operations Management, Electrotech Publication 6. S. Sadagopan, Management Information System, PHI Learning. 7. Craig W Baird, The six Sigma Manual for small and Medium Business.

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

Pattern of Question Paper:

The six 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. The Question No.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section-**A** and **B**, be asked to solve.

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (All) Semester-VI

Code No.: AED381

Title: Open Elective-I (Remote Sensing & GIS)

Teaching Scheme:04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03

Hrs

Tutorial:

Theory Examination (Marks): 80

Credits:04

Prerequisites	Python Fundamentals, basics of electronics, Networking fundamentals, WWW terminology	
Objectives	1. To develop applications of environmental remote sensing and GIS which can directly enhance service delivery on land use management, ground water management/prospects, agriculture, forestry, food and water security, disaster management. Present subject is designed for fulfillment of following objectives 2. To understand the fundamental principles and applications of Remote Sensing and Geographical Information Systems. 3. To increase awareness about RS and GIS among students for various researches pertaining to watershed management 4. To describe how geographical information is used and managed.	
Outcomes		
Unit-I	: Remote Sensing: Definition, Historical Development, remote sensing system, Multi concept of remote sensing. Advantages and disadvantages in remote sensing, general applications of remote sensing (Descriptive & Analytical)	(08 Hrs)
Unit-II	: Electromagnetic radiation: Electromagnetic energy, energy interaction with atmosphere and earth surface, resolutions in remote sensing	(08 Hrs)
Unit-III	: Sensors and Platforms: Classification, Land observation satellites, Weather satellites, Satellite data reception, transmission and processing, Data products, Standard products, Digital data products, (Descriptive & Analytical)	(08 Hrs)
Unit-IV	: Image interpretation: Procedure, elements, techniques, equipments for image interpretation, basic principles of image interpretation, factors governing the quality of an image, factors governing interpretability, visibility of objects, digital image processing, digital image, steps, remote sensing in agriculture progress and prospects, microwave radiometry for monitoring agriculture crops and hydrologic forecasting, aerial photo interpretation for water resources development and soil Conservation survey. (Descriptive & Analytical)	(08 Hrs)
Unit-V	: Geographical Information System: History of development of GIS definition, basic components, GIS input data and output product, general	(08 Hrs)

	application. (Descriptive & Analytical)	
Unit-VI	: GIS data: type, representation, source, data sets, acquisition, data structure, data base management systems (DBMS), GIS application. (Descriptive & Analytical)	(08 Hrs)
Reference Books:	: 1. Remote sensing and Geographical Information System by A. M. Chandra & S. K. Ghosh, Narosa Publishing House, New Delhi 2. Remote Sensing- Principals and Applications by B. C. Panda, Viva book Publication, New Delhi 3. Basics of Remote Sensing & GIS by S. Kumar, an online book published by Laxmi Publications, New Delhi 4. Remote Sensing & GIS by Basudeb Bhatta, an online book published by OUP India	

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. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (ALL) Semester-VI

Code No.: CSE381

**Title: Open Elective-I Professional Ethics and
Cyber Security**

Teaching Scheme:04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03

Hrs

Tutorial:

Theory Examination (Marks): 80

Credits:04

Prerequisites	None.	
Objectives	<ol style="list-style-type: none">1. To make students familiar with the fundamental concepts of computer ethics.2. To know the linkage between computer, professional ethics and ethical decision making3.To know the ethical concepts and ethical theories4. To Know the privacy and cyberspace5. To know concept of cyber security.6. To know the practice of administrating using Cyber Security.	
Outcomes	<ol style="list-style-type: none">1. Illustrate the fundamental concepts of computer ethics with ethical decision making & give correlation with professional ethics.2. Classify features of intellectual property type with their issues in cyberspace.3. Identify security perspective of hacking4. Apply Ethical Concepts and Ethical Theories to Establishing and Justifying A Moral System5. To develop problem solving abilities using Cyber Security6. Analyze various issues of privacy in cyberspace	
Unit-I	: Introduction: Why Computer Ethics? The Standard Account: New Possibilities, a Vacuum of Policies, Conceptual Muddles• An Update to the Standard Account.	(08 Hrs)

	<p>Ethical Decision making: Ethical dilemma, Guidelines for dilemma (Formal and Informal), Solving ethical dilemma ,</p> <p>Socio technical Computer Ethics, Micro- and Macro-Level Analysis ,</p> <p>Intellectual Property: Copy right, Trade mark, Trade Secret, Patent</p>	
Unit-II	<p>: Professional Ethics, Codes of Conduct, and Moral Responsibility</p> <p>Professional Ethics: Profession, Professional, Computer/ IT Professional ,</p> <p>Computer/IT Professionals Special Moral Responsibilities: Safety-Critical Software, Professional Codes of Ethics and Codes of Conduct: Purpose of Professional Codes, Criticisms of Professional Codes, Defending Professional Codes,</p> <p>Conflicts of Professional Responsibility: Employee Loyalty and Whistle-Blowing , Whistle-Blowing Issues, Strategy for Understanding Professional Responsibility</p>	(08 Hrs)
Unit-III	<p>: Ethical Concepts and Ethical Theories: Establishing and Justifying A Moral System</p> <p>Ethics and Morality: Morality, Rules and Principles of a Moral System, Ethical Theories: Consequence-Based :Utilitarianism , Duty-Based: Deontology, Contract-Based , Rights-Based Contract , Character-Based : Moral Person vs. Following Moral Rules, Acquiring the “Correct” Habits , Integrating Aspects of Classical Ethical Theories into a Single Comprehensive Theory: Moor’s Just-Consequentiality Theory and Its Application to Cyber technology.</p>	(08 Hrs)
Unit-IV	<p>: PRIVACY AND CYBERSPACE</p> <p>Cyber technology Unique or Special, Personal Privacy: Accessibility Privacy, Decisional Privacy, Informational Privacy, Comprehensive Account of Privacy, Privacy as “Contextual Integrity”, Privacy</p> <p>Important: Intrinsic Value, Social Value. Gathering Personal Data: Dataveillance Techniques, Internet Cookies , RFID Technology, Cyber technology and Government Surveillance, Exchanging Personal Data: Merging Computerized Records, Matching Computerized Records .</p> <p>Protecting Personal Privacy in Public Space: Search Engines and the Disclosure of Personal Information, Accessing Online Public Records.</p>	(08 Hrs)
Unit-V	<p>: Security Basics</p> <p>Security Basics: Introduction, Elements of Information security, Security</p>	(08 Hrs)

	Policy, Techniques, steps, Categories, Operational Model of Network Security, Basic Terminologies in Network Security. Intrusion and Firewall: Introduction, Intrusion detection, IDS: Need, Methods, Types of IDS, Password Management, Limitations and Challenges, Firewall Introduction, Characteristics and types, Benefits and limitations. Trusted Systems, Access Control.	
Unit-VI	: Security perspective of Hacking and its counter majors Remote connectivity and VoIP hacking, Wireless Hacking, Mobile Hacking, Hacking Hardware, Application and data Hacking, Mobile Hacking, Counter majors: General Strategies, Example Scenario's: Desktop, Servers, Networks, Web, Database, Mobile.	(08Hrs)
Reference Books:	: 1 . Computer Ethics by Deborah Johnson 4th edition 2. Ethics and Technology Controversies, Questions, and Strategies for Ethical Computing by HERMAN T. TAVANI, 4 th Edition, Wiley publication 3. Dr. V.K. Pachghare, Cryptography and Information Security, PHI, ISBN 978-81-303-5082-3 4. Nina Godbole, Sunit Belapure, Cyber Security, Wiley India, ISBN:978-81-345-2179-1	

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:

Minimum ten questions.

Five questions in each section.

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. The Question no.1 and 6 should be of objective nature.

Two questions of 15 marks each from remaining questions from each section A and B be asked to solve

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of T. Y. B. Tech. (ALL) Semester-VI

Code No.: CED381

Title: Open Elective-I: Design for Environment (All Domain)

Teaching Scheme: 4 hrs/week

Class Test (Marks): 20

Theory: 4 hrs/week

Theory Examination (Duration): 3 hrs

Theory Examination (Marks): 80

Credits:4

Objectives	: This course has been designed to teach about environmental engineering, energy and economy through the use of case studies, computer software tools, and seminars from the point of view of sustainable development and changing societal, industrial demands. Case studies provide the basis for group projects as well as individual theses	
Outcome	By the end of the course, students should be able to formulate and use mathematical models to: <ul style="list-style-type: none"> • Assess human impacts on the environment • Emphasis on pollution control using CDTs • Correlate Environment, Energy and Economy beyond academic to real life examples Assess the economic value of natural resources	
Unit-I	: Review of physical, chemical, ecological, and economic principles used to examine interactions between humans and the natural environment. Modelling concepts, applications in all engineering domains	
Unit-II	: Mass balance concepts are applied to ecology, chemical kinetics, hydrology, and transportation; energy balance concepts are applied to design, ecology, and climate change; and economic and life cycle concepts are applied to resource evaluation and engineering design.	7 hrs
Unit-III	: Design for Environment (DfE) concepts, applications, and Case studies	10 hrs
Unit-IV	: Assessment, Monitoring and control of Rural, Urban and Industrial Pollutions using CDTs	8 hrs
Unit-V	: Numerical models are used to integrate concepts and to assess environmental impacts of human activities. Problem sets involve development of MATLAB and GIS models for engineering applications in all domains.	8 hrs
Unit-VI	: Emphasis on the principles of infrastructure planning with a focus on appropriate and sustainable technologies incorporating technical, socio-cultural, public health, and economic factors into the planning and design of urban, industrial systems.	8 hrs

Reference:	<ol style="list-style-type: none"> 1. Ecological Water Quality (Water Treatment and Reuse) – Kostas Voudouris and Dimitra Voutsas. 2. Wastewater Engineering- Metcalf and Eddy, McGraw Hill Publication. 3. MATLAB for Engineering Application- Williams J. Palm, Tata McGraw Hill Publication. 4. Application of GIS and Remote Sensing in Environmental Management- S. A. Abbasi, DPH Publications. 5. Harte, John "Consider a Cylindrical Cow: More Adventures in Environmental Problem Solving." Mill Valley, CA: University Science Books, 2001. 6. Fay, James A., and Dan S. Golomb. Energy and the Environment. New York, NY: Oxford University Press, 2002 7. Etter, Dolores. Introduction to MATLAB for Engineers and Scientists. Upper Saddle River, NJ: Prentice Hall, 1996
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Section A: - Unit I, II and III

Section B: - Unit IV, V and VI

Pattern of Question Paper:-

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively.

Question paper shall be set having two sections A & B.

Section-A question shall be on first part & section B question on second part. Question paper should cover entire syllabus.

For 40 marks paper:-

1. Minimum eight questions.
2. Four question in each section.
3. Question no.1 from section A & Question no. 5 from section-B made compulsory & should cover complete syllabus of the respective section & should be set for six marks each. The Question no.1 & 5 should be of objective nature.
4. Two question of 07 marks each from remaining question, from each section A & B asked to solve

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of T. Y. B. Tech. (ALL) Semester-VI

Code No.: EED381

Teaching Scheme: 4 hrs/week

Theory: 4 hrs/week

Tutorial:-

Credits:4

Title: Open Elective-I: Robotics and Automation

Class Test (Marks): 20

Theory Examination (Duration): 3 hrs

Theory Examination (Marks): 80

Objectives	:	<ol style="list-style-type: none">1. Describe the history and early beginnings of automated manufacturing & Robotics. Ability to recognize industrial control problems.2. Aims to Develop understanding Robotics Components.3. Apply creative approaches to practical applications, identify technological opportunities in robotics.4. An over view of technology of advanced topics such as CNC Machines, Human Robot Interaction.5. The ability to provide Automation solution.	
Unit-I	:	Introduction to Automation: Types of Automation; Architecture of Industrial Automation Systems, Advantages and limitations of Automation, Effects of modern developments in automation on global competitiveness. Introduction of CNC Machines: Basics and need of CNC machines, NC, CNC and DNC (Direct NC) systems, Structure of NC systems, Applications of CNC machines in manufacturing, Advantages of CNC machines.	(08 hrs)
Unit-II	:	Robotics: Robot anatomy-Definition, law of robotics, History and Terminology of Robotics-Accuracy and repeatability of Robotics-Simple problems Specifications of Robot-Speed of Robot-Robot joints and links-Robot classifications-Architecture of robotic systems-Robot Drive systems Hydraulic, Pneumatic and Electric system.	(08 hrs)
Unit-III	:	Robot Transformation, Sensors & End effectors: Transformation types: 2D, 3D. Translation- Homogeneous coordinates multiple transformation-Simple problems. Sensors in robot – Touch sensors-Tactile sensor – Proximity and range sensors Robotic vision sensor-Force sensor-Light sensors, Pressure sensors End effectors : Mechanical grippers-Slider crank mechanism, Screw type, Rotary actuators, cam type-Magnetic grippers-Vacuum grippers-Air operated grippers-Gripper force analysis-Gripper design-Simple problems	(08 hrs)
Unit-IV	:	Kinematics: Rigid body Kinematics, Inverse Kinematics, Rotation matrix, Homogenous transformation matrix, Denavit - Hartenberg convention, Euler angles, RPY representation, Direct and inverse Kinematics for industrial robots for position and orientation Redundancy, Manipulator, Jacobian Joint, End effector, velocity – direct and inverse velocity analysis. Control: Individual joint computed torque.	(08 hrs)

Unit-V	:	Dynamics: Lagrangian Dynamics, link inertia tensor and manipulator inertia tensor, Newton-Euler Dynamics of Robot, Newton-Euler formulation for RR & RP manipulators, Dynamics of systems of Interacting Rigid Bodies, D-H Convention, Trajectory planning for Flexible Robot, Cubic polynomial linear segments with parabolic blending, static force and moment transformation, solvability, stiffness, Singularities.				(08 hrs)
Unit-VI	:	Robot Control & Applications 6L Control approaches: oscillatory based time varying control law, control law based on vector field orientation approach. Advanced strategies of control: conventional aerial vehicle, Bidirectional X4-flyer. Applications of Fuzzy Logic and Neural network in Robot Control, Neural controllers, Implementation of Fuzzy controllers: Trajectory tracking controller. Applications of Robotic system: complex control system, vision system in complex control system. Human Robot Interaction: Architecture. (8 hrs)				(08 hrs)
Text books	:	Sr. No.	Title	Author	Publication	Edition
		1	Robotics And Automation Handbook	Thomas R. Kurfess,	CRC Press	2004, ISBN 0-8493-1804-1
		2	Robotics: Appin Knowledge Solutions (Firm)		Infinity Science Press ,	2007, ISBN 978-1934015-02-5
Reference Books	:	3	Robot Motion and Control (Recent Developments)	M.Thoma & M. Morari		2018
		4	Welding Robots - Technology, System Issues and Applications	J. Norberto Pires, Altino Loureiro and Gunnar Bölmsjo	Springer-Verlag	2006, ISBN-10:1852339535
		5	Robotics : Designing the Mechanisms for Automated Machinery	Ben-Zion Sandler,	Academic Press,	2nd ed.1999

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

Pattern of Question Paper:

The six 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 10 marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (All) Semester-VI

Code No.: ETC381

Title: Open Elective-I Internet of Things

Teaching Scheme:04 Hours per week

Class Test: 20

Theory: 04 Hours per week

**Theory Examination (Duration): 03
Hrs**

Tutorial:

Theory Examination (Marks): 80

Credits:04

Prerequisites	Python Fundamentals, basics of electronics, Networking fundamentals, WWW terminology	
Objectives	<ul style="list-style-type: none"> • To understand IOT value chain structure (device, data cloud), application areas and technologies involved • To understand IOT sensors and technological challenges faces by IoT devices. • Explore and learn about Internet of things with the help of projects 	
Outcomes	After completion of this course, students should be able to: <ol style="list-style-type: none"> 1. Distinguish between the various elements of IoT 2. Decide which sensors to use based upon given application 3. Decide which protocols to use based upon given application 4. Distinguish between various means of communication 5. Perform data analytics on the data received from IoT based solutions 6. Develop architecture of IoT based application for given problem. 	
Unit-I	Introduction to IoT: Definition of IOT- Evolution of IOT and related terms, hardware, software, network stack for IoT, Business Scope, SAAS Model, Industry 4.0.	(08 Hrs)
Unit-II	Elements of IoT: Introduction to elements of IOT, Basic Architecture of an IOT application sensors, and Actuators – Edge Networking (WSN) – Gateways – IOT Communication Model – WPAN and LPWA, 6LoPAN, Sigfox, Introduction to basis looping and conditional statements, basics of HTML.	(08 Hrs)
Unit-III	IoT Sensors: Node MCU ESP 8266- hardware specification, GPIO programming, WIFI connectivity programming, Access Point Programming.	(08 Hrs)
Unit-IV	Communication and Connectivity Technologies: Introduction to: TCP/IP, UDP, NTP, MQTT, Network and Sockets, WIFI. Cloud Computing in IOT - IOT Communication Model – Cloud Connectivity, Things speak, ‘100’, HCR.	(08 Hrs)
Unit-V	Data Analytics and IOT Platforms: Basics of statistics, Descriptive statistics and probability distributions. Big Data Analytics - Hadoop, Data Visualization – radar charts, – IOT Platforms- Microsoft Azure and Amazon Web Services, IBM Watson, Google Home and Amazon’s Alexa	(08 Hrs)

Unit-VI	: Preparing IoT Projects (Creating the sensor project with Node MCU ESP 8266 - Sensor libraries - Interacting with the hardware, Internal representation of sensor values - Persisting data - External representation of sensor values - Exporting sensor data - Creating the actuator project Hardware - Interfacing the hardware - Creating a controller - Representing sensor values - Parsing sensor data - Calculating control states.	(08Hrs)
Reference Books:	: <ol style="list-style-type: none"> 1. The Internet of Things: Applications and Protocols, Wiley publications. Author(s): Oliver Hersent, David Boswarthick, Omar Elloumi 2. Architecting the Internet of Things, Springer publications. Author(s): Dieter Uckelmann, Mark Harrison, Florian Michahelles 3. Internet of Things with Arduino Cookbook, Packt Publications. Author(s): Marco Schwatz 4. Internet of Things and Data Analytics, Wiley Publications 	

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

Pattern of Question Paper:

The six 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 10 marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (All) Semester-VI

Code No.: MED381

**Title: Open Elective-I Costing and
Financial**

Management

Teaching Scheme: 04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03

Hrs

Tutorial:

Theory Examination (Marks): 80

Credits: 04

Prerequisites	NIL	
Objectives	<ol style="list-style-type: none">1. To understand the basic concepts and processes used to determine product costs,2. To be able to analyze and evaluate information for cost ascertainment, planning, control and decision making.3. To develop ability to analyze and interpret various tools of financial analysis and planning,4. To gain knowledge of management and financing of working capital,5. To understand concepts relating to financing and investment decisions	
Unit-I	: Costing Methods of costing and elements of cost. Material Cost Different methods of pricing of issue of materials. Labour Cost Different methods, wages and incentive plans. Principles of good remunerating system, labour turnover. Depreciation Concept, importance and different methods of depreciation	(08 Hrs)
Unit-II	: Overheads Classification, collection of overheads, Primary and Secondary apportionment of overheads, absorption of overheads- Machine hour and labour hour rate. Under and over absorption of overheads	(08 Hrs)
Unit-III	: Standard costing:	

	<p>Concept, development and use of standard costing, variance analysis.</p> <p>Marginal Costing</p> <p>Use of Marginal Costing in decision-making.</p> <p>Capital Budgeting</p> <p>Control of Capital Expenditure, techniques of capital budgeting –Pay Back Method, Accounting rate of return, Internal Rate of Return, DCF, Net Present Value and profitability index</p>	(08 Hrs)
Unit-IV	<p>: Introduction To Financial Management</p> <p>Concept of business finance, Goals & objectives of financial management, Sources of financing - LONG TERM: shares, debentures, term loans, lease & hire purchase, retained earnings, public deposits, bonds (Types, features & utility), SHORT TERM: bank finance, commercial paper, trade credit & bills discounting, INTERNAL: Retained earnings, Cost of Capital & Means of Finance</p>	(08 Hrs)
Unit-V	<p>: Financial Statement Preparation, analysis & Interpretation</p> <p>Preparation of financial statement and Profit & Loss Account, Balance Sheet.</p> <p>Ratio Analysis</p> <p>Classification, Ratio Analysis and its limitations, Index Statement & Common Size Statement</p>	(08 Hrs)
Unit-VI	<p>: Working Capital Management</p> <p>Concept and design of Working Capital, types of working capital, sources of working capital, Time value of money, definition of cost and capital, Cash management, creditors management, debtors management</p>	(08Hrs)
Reference Books:	<p>:</p> <ol style="list-style-type: none"> 1. Bhattacharya A. K., “Principles and Practice of Cost Accounting”, Prentice Hall India. 2. B K Bhar, “Cost Accounting – Methods and Problems”, Academic Publishers 3. Khan M. Y., Jain P. K., “Financial Management”, Tata McGraw Hill 4. Pariasamy P., “Financial , Cost & Management Accounting”, HH Publication 5. Colin Drury, “Management and Cost Accounting”, English Language Book Society, Chapman and Hall London. 	

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. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (All) Semester-VI

Code No.: PPE381

Title: Open Elective-I: Introduction to Nanotechnology

Teaching Scheme: 04 Hours per week

Class Test: 20

Theory: 04 Hours per week

Theory Examination (Duration): 03 Hrs

Tutorial:

Theory Examination (Marks): 80

Credits: 04

Prerequisites	
Objectives	<ol style="list-style-type: none">1. To study the introduction to nanomaterials and the factors affecting it.2. To study the types and synthesis methods of nanomaterials.3. To study the characterizations and properties of nanomaterials.4. To study the different applications of nanomaterials.
Outcomes	
Unit-I	: Introduction: Introduction to nanotechnology, conventional micro vs. nano-material properties, role of size in properties of nano-materials, length scale and surface to volume concept, and uniqueness of nanostructured materials; health hazards and handling of nanomaterials. (08 Hrs)
Unit-II	: A) Types of Nano-Materials: Montmorillonite, Layer double hydroxide (LDH), Carbon nanofibers (CNFs) – vapour grown carbon fibers (VGCFs), Polyhedral Oligomeric Sisoquioxane (POSS), Carbon nanotubes, Nanosilica, Nanoaluminium oxide, Nanotitanium oxide, Nano-hybrids . (08 Hrs) B) Synthesis: Bottom-up and Top-down approach for nano materials synthesis, Methods: Ball Milling, Chemical vapor deposition, Pressure vapor deposition, Ultrasound assisted, Miniemulsion, Microemulsion, Nanoemulsion, Hydrothermal, Sol-gel, Miscellaneous techniques.
Unit-III	: Properties of Nanomaterials in terms of Structure Property Relationship: Thermal properties, Mechanical properties, Gas barrier properties, Flame retardant properties, Electrical and electrochemical properties, Electronic properties, Optical properties, Magnetic properties, Biodegradable (08 Hrs)

	properties, Antimicrobial properties, Catalytic properties.	
Unit-IV	: Preparation of Polymer Nanocomposites: Solution intercalation, Melt intercalation, Roll Milling, Emulsion Polymerization, In-Situ Polymerization.	(06 Hrs)
Unit-V	: Characterization of Nanomaterials and Nanocomposites: X ray diffraction (XRD), Dynamic light scattering (DLS), Scanning electron microscopy (SEM), Transmission electron microscopy (TEM), Energy dispersive x-ray spectroscopy (EDS), Atomic force microscopy (AFM), Small angle X ray scattering (SAXS), Differential scanning calorimetry (DSC), Thermo gravimetric analysis (TGA).	(10 Hrs)
Unit-VI	: Application of Nanomaterials and Nanocomposites: Biomedical-Drug delivery, Bone replacement; Sensors – gas sensor, Metal adsorption and recovery, Bio-molecule detectors; Energy storage and conversion - Super capacitors, Solar cells, Energy generators; Electronics; Self cleaning & Self healing paints, Nano-engineering of cement-based materials, Agricultural Nanotechnologies	(08Hrs)
Reference Books:	<ol style="list-style-type: none"> 1. Polymer Nanocomposites Processing, Characterization, and Applications, Joseph H. Koo, McGraw-Hill Nanoscience and Technology Series, 1st 2006 2. Encyclopedia of Nanoscience and Nanotechnology, Hari Singh Nalwa, American Scientific publishers Chapter: Advanced Hybrid Nanostructures: 3. Nanoparticle Technology Handbook, M Hosokawa, K Nogi, M Naito, T Yokoyama Elsevier 4. The Science of Nanotechnology: An introductory text, Luanne Tilstra et al, NovaScience Publishers, Inc 5. Polymer-Layered Silicate and Silica Nanocomposites, Y.C. Ke, P. Stroeve, Elsevier,2005. 6. Nanotechnology in concrete – A review, Florence Sanchez, Konstantin Sobolev, Construction and Building Materials, Elsevier, 24 (2010) 2060–2071 7. Agricultural Nanotechnologies: What are the current possibilities? Claudia Parisi et al, Nano Today, Elsevier,2014 	

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

Pattern of Question Paper:

The six 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 10 marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T.Y.B. Tech. (Computer Science and Engineering) Semester-VI

Code No.: CSE355

Title: Programming in .Net

Teaching Scheme:02 Hours per week

Class Test: 10

Theory: 02 Hours per week

**Theory Examination (Duration): 02
Hrs**

Credits:02

Theory Examination (Marks): 40

Objectives	: To learn C# features in console application To understand windows programming using C# To Perform database operations using ADO.Net and exception handling To learn different server controls of asp.net To learn navigation,session ,cookies, event handling To learn web service	
Outcomes	: Write console application based on object oriented concept using C# Create GUI application using .NET basic controls Perform database operations using ADO.Net and exception handling Demonstrate different server controls of asp.net Create web application using session ,cookies, event handling Create web service	
Unit-I	: Introduction to the .NET Framework and C# - .NET Architecture,.NET Class Library , Introduction To Visual Studio IDE, Introduction to C#, Data Types ,Variables and expressions, control statements , functions, namespaces, Assembly, Components of Assembly, Private and Shared Assembly	(04 Hrs)
Unit-II	: Object-Oriented Programming in C# - Classes, Objects, Inheritance, Polymorphism, Abstract Classes, Interfaces	(04 Hrs)

		,Operator Overloading, Delegates, Exception Handling	
Unit-III	:	Windows Programming - TextBox, Label, Buttons, Mouse\Keyboard Event Handling, Check Boxes, RadioButtons, Panel, Tool Tips, List Box, ComboBox, CalenderControl, ListView, TreeView, TabControl, Menu, Multiple document interface	(04 Hrs)
Unit-IV	:	Database Handling - ADO.NET, Static and Dynamic Data Binding , ADO.NET architecture, data control, data source control Introduction to Language Integrated Query (LINQ) , Querying a Database with LINQ, Deployment of windows application	(04 Hrs)
Unit-V	:	Web Application with ASP.NET – Introduction to Web Applocation,ASP.NET page lifecycle. Server Side Controls and Client Side Controls , Basic Controls ,Link button ,Image Button, Image Map. Validation Controls , AdRotator	(04 Hrs)
Unit-VI	:	Web Application with ASP.NET – Navigation Controls, Session Tracking, Cookies, ViewState , Database Handling, Event Handling, Creating and deploying web services .Deployment of Web Application	(04 Hrs)
Referenc e Books:	:	1. C# 2010 Programing, Black Book, Dreamtech Press 2. The complete reference C#2.0 or C#3,0, Herbert Schildt, TMH 3. ASP.NET Unleashed 4, Stephen Walther, NateDudek, Kevin Hoffman, Pearson 4. Beginning Visual C# 2010, Karli Watson, Christian Nagel, Jacob Hammer Pedersen, Jon D. Reid, Morgan Skinner - WILEY 5. Pearson Visual C# 2010 How to program. Prentice-Hall Inc, 2011, Fourth Edition	

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.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of T.Y. B. Tech. (Computer Science and Engineering) Semester- VI Course code:CSE371 Title: Principles of Compiler Design Practical: 02 Hours per week Term work :25 marks Credits:01 Practical:25 marks Total Examination (Marks): 50 marks	
Objectives	: <ul style="list-style-type: none"> • Students will understand the phases of the compilation process and be able to describe the purpose and implementation approach of each phase. • Give students practical exposure to aspects of theoretical computer science including Languages, Grammar and Machines.
List of Practicals (Minimum ten experiments to be performed)	: <ol style="list-style-type: none"> 1. Write a c program to implement lexical analyzer to separate tokens such as identifier, constant, operator and keyword .Test the following sample input but not restricted. 2. Write a program to implement lexical analyzer to separate tokens such as identifier, constant, operator and keyword using Flex Tool. 3. Write lex program is intended to eliminate comments and white spaces from a C program 4. Write a program in c to implement Recursive Descent Parsing method for following grammar but not restricted to $E \rightarrow E+T/T, T \rightarrow T * F / F, F \rightarrow (E) / id$ 5. Write a program in C to implement FIRST in predictive parser. 6. Write a C program to implement shift reduce parser. 7. Write a program in YACC to implement infix to postfix conversion using YACC tool . 8. Write a program in YACC to implement YACC as Calculator 9. Write a 'c' program to generate three address codes for the given set of input expression. Test for the sample input :the three address code for the expression $a + b * c + d$: Output $T_1 = b * c, T_2 = a + T_1, T_3 = T_2 + d, T_1, T_2,$ and T_3 are temporary variables 10. Write a 'c' program to implement any one code optimization technique.
List of Reference Books	: <ol style="list-style-type: none"> 1. "Lex & Yacc", John R. Levine, Tony Mason, Doug Brown Paperback - 366 pages 2nd/updated edition (October 1992) n O'Reilly & Associates ISBN: 1565920007. 2. "Modern Compiler Implementation in C", Andrew W. Appel, Maia Ginsburg Hardcover - 560 pages Rev expand edition (January 1998),Cambridge University Press ISBN: 052158490X

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

The assessment of practical examination shall be on the following criteria:

The practical examination shall consist of performing an experiment based on the practical work done during the course, the record of the experiments submitted by the candidate and viva -voce based on the syllabus

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of S. Y. B. Tech. (Computer Science & Engineering) Semester-VI

Code No.: CSE372

Title: Lab-Computer Network

Teaching Scheme: 02Hrs/week

Term Work: 25 Marks

Practical: 02Hrs/week

Practical: 25 Marks

Credits:01

Total Examination Marks: 50

Objectives	:	<ol style="list-style-type: none">1. To study various networking commands.2. To connect two or more computer to create computer network.3. To share hardware and software resources in computer network4. To implement networking protocols.
List of Practical's (Minimum ten experiments to be performed)	:	<ol style="list-style-type: none">1. To study various networking controlling devices.2. To study network configuration commands3. Connect computers in Local Area Networks.4. To share hardware and software resources in computer network.5. Prepare cross wired cable and straight through cable using crimping tool.6. Remote desktop sharing.7. Implementation of sliding window protocol.8. Write a program to implement hamming codes.9. Write a program to find host name and IP address.10. Write a program to find the domain name of server.
Reference Books	:	<ol style="list-style-type: none">1. Behrouz A Forouzan, "Data Communications and Networking", 4th Edition, McGraw Hill Publishers, 2006, ISBN 0-07-063414-9.2. Andrew Tanenbaum., "Computer Networks", 4th Edition, Pearson Education, 2003, ISBN 8178087855.3. Behrouz A Forouzan, "TCP/IP Protocol Suit", 4th Edition, McGraw Hill Publishers, 2010, ISBN 0-07-337604-3.

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

1. Continuous assessment

2. Performing the experiments in the laboratory
3. Oral examination conducted on the syllabus and term work mentioned above

The assessment of practical examination shall be on the following criteria:

The practical examination shall consist of performing an experiment based on the practical work done during the course, the record of the experiments submitted by the candidate and viva -voce based on the syllabus

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Science & Technology)

Syllabus of T.Y. B. Tech. (Computer Science and Engineering) Semester- VI
Code No.: CSE373 **Title: Lab: Digital Image Processing**
Practical: 02 Hours per week **Term work : 25 marks**
Credits:01 **Practical: 25 marks**
Total Examination (Marks): 50 marks

Objectives	:	<ol style="list-style-type: none"> 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.
List of Practicals (Minimum ten experiments to be performed)	:	<ol style="list-style-type: none"> 1. Write a program in MATLAB to read and display an image. 2. Write a program in MATLAB for arithmetic and logical operations on images. 3. Write a program in MATLAB 1D DCT and 2D DCT.. 4. Write a program in MATLAB to smooth an image using low pass filter. 5. Write a program in MATLAB to sharpen an image using high pass filter. 6. Write a program in MATLAB to remove noise using median filter. 7. Write a program in MATLAB for histogram and histogram equalization. 8. Write a program in MATLAB for bit plane slicing. 9. Write a program in MATLAB for edge detection. 10. Write a program in MATLAB for color image processing. 11. Write a program in MATLAB for morphological operations on image. 12. Write a program in MATLAB for region description and boundary representation.
List of Reference Books	:	<ol style="list-style-type: none"> 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

The assessment of practical examination shall be on the following criteria:

The practical examination shall consist of performing an experiment based on the practical work done during the course, the record of the experiments submitted by the candidate and viva -voce based on the syllabus

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T.Y. B. Tech. (Computer Science and Engineering) Semester- VI

Code No.: CSE374

Title: Software Development Lab- I

Term-Work :50 marks

Practical: 02 Hours per week

Total Examination (Marks): 50 Marks

Credits:01

Course Outcome	: After completing this course the student will be able to:
List of Practical's (Minimum experiments to be performed)	: Console Application Unit I & II - 1. Write a console application using control statements. Write a console application using classes 2. Write a console application using inheritance and abstract class 3. Write a console application using interface and exception handling Windows Application Unit III & IV – 4. Design a Student Option Form by using basic controls and display the information on the new form.(Use labels, Textbox, List, Radio button, etc) 5. Create a MDI form containing 2 menus – Current courses & Upcoming. Current Courses should contain branches as a sub-menus – CSE, ETC and Mechanical . Each submenu opens a form containing some list of specific courses in combo-box. When you select the name of the course, course details such as start date, end date, duration, prerequisite, contents should be displayed. When you click on “Upcoming courses”, it should open a form containing some names of courses in list-box. When user selects course, display its details. 6. Create a MDI form containing 2 menus – Current courses & Upcoming. Current Courses should contain branches as a sub-menus – CSE, ETC and Mechanical . Each submenu opens a form containing some list of specific courses in combo-box. When you select the name of the course, course details such as start date, end date, duration,prerequisite, contents should be displayed. When you click on “Upcoming courses”, it should open a form containing some names of courses in list-box. When user

	<p>selects course, display its details.</p> <p>7. For an Employee table containing EmpNo, EmpName&EmpSal and Leaves Table containing EmpNo, type of leave,from date, to datae number of leaves availed design a form that allows user insert, update and delete employee and leave details .Use data reader to display information of each employee one by one. Provide Search option to find leave record of employee</p> <p>Web Application Unit V & Unit VI –</p> <p>8. Create a signup form user name, password, retype password, address ,gender, age, email id, hobbies, . Use the validator control to validate the information also show it on next web page information.</p> <p>9. Develop a web page for a real estate firm that accepts information of flats to be sold such as City, No. of Rooms, Expected Price and stores it in a database. Another web page that shows a combo box containing the list of cities. When you select a city, show the flats available in that city. [Use data binding and data source]. Show advertisements of any 3 popular products/companies</p> <p>10. Create a web service and use it in web site</p>
<p>List of Reference Books</p>	<ol style="list-style-type: none"> 1. C# 2010 Programing, Black Book, Dreamtech Press 2. The complete reference C#2.0 or C#3,0, Herbert Schildt, TMH 3. ASP.NET Unleashed 4, Stephen Walther,NateDudek, Kevin Hoffman, Pearson 4. Beginning Visual C# 2010, Karli Watson, Christian Nagel, Jacob Hammer Pedersen, Jon D. Reid, Morgan Skinner - WILEY 5. Pearson Visual C# 2010 How to program. Prentice-Hall Inc, 2011, Fourth Edition

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

The assessment of practical examination shall be on the following criteria:

The practical examination shall consist of performing an experiment based on the practical work done during the course, the record of the experiments submitted by the candidate and viva -voce based on the syllabus

Dr.Babasaheb Ambedkar Marathwada University,
Aurangabad (Faculty of Science & Technology) Syllabus of
T. Y. B. Tech. (All) Semester - VI

Code No.:CSE375

Title: Project I

Teaching Scheme: 02 Hrs/week

Practical Examination(Marks): 50

Practical: 02 Hrs/week

Credits:01

Objectives	:	The Projects in the undergraduate study of engineering aims at developing in the student, knowledge and skills to match the current and projected needs of industry, society or user systems and to create social awareness and professional attitudes. Apart from monitoring the engineering processes and maintenance of engineering work, machines and equipments, an engineer has to do investigate survey, collect data, refer handbooks/datasheets, prepare estimates and design the systems.
Outcomes		<p>Upon studying this course student will be able to,</p> <ol style="list-style-type: none"> 1. Conduct surveys and investigate the field situation, collect, analyze and synthesize the data. 2. Apply knowledge to solve real time/field problems 3. Develop inquisitive, innovative skills and confidence to work independently. 4. Work effectively in team. 5. Plan and organize the work properly.
Contents	:	<ul style="list-style-type: none"> • The completion of project is to be carried out in two semesters i.e. in T.Y. Sem. VI and final year B. Tech Sem. VII. • The students shall form project group of maximum 3 students for within department projects and maximum of 6 students in case of interdepartmental projects of their choice. • The students groups shall collect the information on the topic/area of interest and submit brief synopsis to Project Coordinator. • The Project Coordinator shall allot the Project Guide depending upon

	<p>the area or specialization of eligible faculty members from the department.</p> <ul style="list-style-type: none"> • The individual student from the project group shall maintain the project diary and update weekly by taking remark of respective guide. • The industry sponsored projects and inter departmental projects shall be encouraged and in case of inter departmental projects, students of maximum 3 different departments/disciplines shall work together by forming the group. The guide allotment and internal/external assessment of such groups shall be done by the respective departments. • The projects addressing issues related to environmental, rural development and societal issues shall be preferred. • The selected project shall help to promote participation in government approved schemes like Unnat Maharashtra Abhiyaan (UMA) and Unnat Bharat Abhiyaan (UBA). • The students shall aim to promote their project work in project exhibitions/competitions, paper presentation/publication in reputed journals and conferences. • The relevance of project and implementation including details of attainment of POs and PSOs addressed through the projects with justification must be clearly stated. <p>Phases of Project Part- I:</p> <p>Phase I: Problem Identification, Literature survey, data collection, deciding scope of topic and objectives of the project.</p> <p>Phase II: Confirmation of block diagram or layout of the proposed project.</p> <p>Phase III: Submission of small report of project work.</p>
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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (All) Semester-VI

Code No.: BSH801

Title: Audit I: Japanese Language module

Teaching Scheme: 02 Hours per week

Examination Scheme

Theory: 02 Hours per week

Total Marks: 50 (Continuous Assessment)

Objectives	<ul style="list-style-type: none">• Students will be able to apply communicative Japanese Grammar in communication.• Students will be able to enhance the level of Japanese vocabulary.• Students will be able to pronounce and articulate words as well as sentences accurately.• Students will be able to understand and apply Japanese language eventually.• Students will be able to develop Japanese language skills.• Students will be able to manage situational communication in Japanese.
Unit-I	: Kana scripts Hiragana & Katakana [2 Hours]
Unit-II	: Chinese characters Kanji- Pictograms with stroke order [2 Hours]
Unit-III	: Grammar Parts of speech, articles , word order or syntax, demonstratives & interrogatives, counters, verbs and verb conjugation, adjectives, adverbs, comparisons, giving and receiving, requests and commands, potential and conditionals, possessive, direct indirect speech, various other form, etc [8 Hours].
Unit-IV	Vocabulary Nouns, verbs tenses-past and present, adjectives, adverbs, expressions of time ,

	expression and phrases etc. [5 Hours]
Unit-V	Situational conversations and practice drills Self-introduction, numbers, day and date, time, location and presence, possession of objects, time expressions and their usage, visiting people, accepting and receiving objects, hospital, asking direction, asking price of objects etc. [5 Hours]
Unit-VI	Introduction to the history of Japan and its cultural Aspects Ikebana, origami, calligraphy, kabuki etc [2 Hours]

List of Reference	Sr. No.	Title	Author	Publication
Books	1	Japanese Kanji for Beginners	Timothy G. Stout and Kaori Hakone	Tuttle Publishing
	2	Essential Japanese Grammar: A Comprehensive Guide to Contemporary Usage	Masahiro Tanimori and Eriko Sato Ph.D.	Tuttle Publishing
	3	15-Minute Japanese: Learn in Just 12 Weeks	D.K. Goel and Rajesh Goel	Amazon.in
	4	Oxford Japanese Grammar and Verbs (Dictionary)	Bunt Jonathan	Oxford Publication
	5	Read and write Japanese scripts: Teach yourself	Helen Gilhooly	Teach Yourself

	6	<p>Complete Japanese Beginner to Intermediate Book and Audio Course:</p> <p>Learn to read, write, speak and understand a new language with Teach Yourself</p>	Helen Gilhooly	Teach Yourself

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (ALL) Semester - VI

Code No.: CSE801

Title: Cyber crime and law

Teaching Scheme: 02 Hours per week

Examination Scheme

Theory: 02 Hours per week

Total Marks: 50 (Continuous Assessment)

Prerequisites	-	
Objectives	<ol style="list-style-type: none">1. To introduce the cyber world and cyber law in general2. To enhance the understanding of problems arising out of online transactions and provoke them to find solutions3. To examine the effects of cyber crime through the experiences of victims and law enforcement4. To Know the technologies that stand behind certain cyber crimes,5. Students identify and analyze statutory, regulatory, constitutional, and organizational laws that affect the information technology professional.6. Students distinguish enforceable contracts from non - enforceable contracts.	
Outcomes	<ol style="list-style-type: none">1. Understand the structure and evolution of the Internet and its basic operations in the context of the emerging crime threats and trends in cyberspace and law related to that.2. Identify and evaluate the data protection.3. Evaluate approach of E contract and E commerce.4. Analyse the impact of computer crime on government, businesses and individuals and discuss the impact of cybercrime on society.5. To clarify the Intellectual Property issues in the cyber space and the growth and development of the law In this regard6.. Identify and evaluate trends in cyber crime and it's legal framework.	
Unit-I	: Introduction Overview of Computer and Web Technology, Need for Cyber Law, Cyber Jurisprudence at International and Indian Level	(04 Hrs)

Unit-II	: Jurisdictional Aspects in Cyber Law Issues of jurisdiction in cyberspace, Types of jurisdiction, The Test evolved, Minimum Contacts Theory, Sliding Scale Theory, Jurisdiction under IT Act, 2000.	(04 Hrs)
Unit-III	: Cyber Crimes & Legal Framework Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Identity Theft & Fraud, Cyber Terrorism, Right to Privacy and Data Protection on Internet, Different offences under IT Act, 2000	(04 Hrs)
Unit-IV	: Digital signature and Electronic Signature and Data Protection Concept of public key and private key, Certification authorities and their role, Creation and authentication of digital signature, Concept of electronic signature certificates, Electronic Governance	(04 Hrs)
Unit-V	: E Contracting & E Commerce Salient features of E-contract, Formation of E-contract and types, E-mail Contracting, Indian Approach on E-contracts, E-commerce-Salient Features and advantages, Models of E-commerce like B2B, B2C, Indian Laws on E-commerce	(04 Hrs)
Unit-VI	: Intellectual Property Issues in Cyber Space Copyright Law, Patent Law, Trademarks & Domain Names Related issues, Dispute Resolution in Cyberspace	(04 Hrs)
Reference Books:	: Karnika Seth, Computers, Internet and New Technology Laws, Lexis Nexis Butterworths Wadhwa Nagpur. Chris Reed & John Angel, Computer Law, OUP, New York, (2007). Cyber Crime An Introduction by Prasad R.S. Cyber Laws by Ed. Kumar Krishna	

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science and Technology) **Syllabus of Third Year B. Tech. (ALL) Semester - VI**

Code No.: CED801

**Course Title: Road Safety Management
Audit**

Teaching Scheme:

Examination Scheme

Theory: 02 Hrs./ week

**Total Marks: 50 (Continuous
Assessment)**

Course Objective	<p>: To acquire knowledge and understanding of the road environment. To inculcate decision making and behavioural skills necessary to survive in the road environment. To impart knowledge and understanding of the causes and consequences of accidents. To understand roles and responsibilities in ensuring road safety.</p>	
Unit-I	<p>: Introduction to Road Safety & Planning. Road traffic accidents scenario in India and in world. Road Safety and its importance. Traffic Rules and Driving Behaviour. Characteristics of accidents, accidents vs. crash. Need of Road Safety. Awareness about rules and regulations of traffic. Assisting Traffic control authorities. Multidisciplinary approach to planning for traffic safety and injury control. Vulnerable road users: crashes related to pedestrian and bicyclists, their safety, provision for disabled.</p>	(04Hrs)
Unit-II	<p>: Traffic Signs, signals & traffic furniture & Role of traffic signals. Warning, cautioning & Informing sign. Location of Road sign, Traffic signals. Road Marking: Colour of road marking, kerb marking, night driving aid, traffic light signals. Types of Signals. Road safety tips for different categories of Road users. Causes of accidents, prevention & 1st aid to accident victim. Rules on road. Necessity of traffic lights. Major violations leading to accidents.</p>	(04Hrs)
Unit-III	<p>: Responsibility of Road accidents and Safety measures. People responsible for accident prevention: Police, Politicians, Community members, Policy makers, Teachers, Parents, Infrastructure authorities, Drivers and Official road safety body. Reasons of students/ children have accidents. 4 E's of Accidents Prevention: 1. Engineering - by altering the environment 2. Enforcement - by imposing laws 3. Encouragement - by the use of publicity campaigns 4. Education - by gaining and using knowledge.</p>	(04Hrs)

Unit-IV	: Road Safety Education & Events. Introduction to Road Safety Education. 5 P's of Road safety education: 1. Pre-school road safety education 2. Practical rather than theory education 3. Principles of own development about road safety education 4. Presentations on road safety education 5. Place for road safety education in syllabus. Discussions on efforts done by Government on Road Safety. Workshop on Road Safety week/ Organization of seminar on Road Safety.	(04Hrs)
Unit-V	: Traffic Flow Analysis. Macroscopic, Microscopic & Mesoscopic approach Types of Flow, Traffic stream characteristics ,Space, Time diagram, Relationship between speed, flow & density, Level of service & capacity analysis, Shockwave theory.	(04Hrs)
Unit-VI	: Road Safety Audit. Global & Local perspective, Road safety issues, Road safety programmes, types of RSA, planning, design, construction & operation stage audits ,Methodology , Road safety audit measures	(04Hrs)
Text Books	: 1. Traffic Flow Theory & Control- D. R. Drew- McGraw Hill, New York, 1968. 2. Traffic Engineering and Transport Planning- L.R. Kadiyali- Khanna Publishers, New Delhi, 2002. 3. Transportation Engineering-An Introduction- C. J. Khisty- Prentice-Hall, NJ, 2005 4. Traffic Flow Fundamentals- A. D. May- Prentice – Hall, Inc., New Jersey, 1990. 5 Highways- Traffic Planning & Engineering- C. A. O'Flaherty- Edward Arnold, UK 6. Traffic Engineering – Theory & Practice- L. J. Pignataro- John Wiley, 1985. 7. Highway Traffic Analysis and Design, R. J. Salter, N. D. Hounsel- Macmillan, London, 1996. 8. Traffic Engineering & Transport Planning- L. R. Kadiyali- Khanna Publishers, 2003.	

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science and Technology) **Syllabus of Third Year B. Tech. (ALL) Semester - VI**

Code No.: BSH802
Teaching Scheme:
Theory: 02 Hrs./ week

Course Title: Value Education
Examination Scheme:
Total Marks: 50 (Continuous Assessment)

Course Objective	<p>: The students will be able to:</p> <p>Understand the need of values and its classification in contemporary society.</p> <p>Appreciate the values needed for peaceful society like democratic, secular, and socialist etc.</p> <p>Become aware of role of education in building value as dynamic social reality.</p> <p>Know the importance of value education towards personal, national and global development</p>	
Unit-I	<p>: Introduction to Value Education:</p> <p>Value Education, Purpose of Value Education as specifying the present deterioration in the value system in the fast changing world trends.</p>	(04 Hrs)
Unit-II	<p>: Importance of Values in Life:</p> <p>What is a Value system? What kinds of values need to be inculcated? Eg.. Ethical, moral and spiritual instead of materialistic values, value inculcation, trend of values such as a permissive culture.</p>	(04 Hrs)
Unit-III	<p>: Character Building:</p> <p>Advantages of good character, importance of trust, honesty, integrity, morality, and reliability as qualities of a good character.</p> <p>Building Relationship-Group Behaviour, limitations of a relationship.</p> <p>How to be a better person, better manager and better Engineer?</p>	(04 Hrs)
Unit-IV	<p>: The Purpose of Life & Education: Meaning, purpose of one's life, Destination success - why are you here? How to make everyday worth living?</p>	(04 Hrs)
Unit-V	<p>: Values For Personal Life & Professional Life: Self sovereignty- Discernment-Decision making-Self-actualization, Caring-Patience-Honesty-Forgiveness, Competence-Co-operation-Perseverance, Flexibility-Reliability-Tolerance-Unity- Knowledge Thirst, Sincerity in Profession, Regularity, Punctuality, Faith</p>	(04 Hrs)

Unit-VI	: Value Education towards National and Global Development: Constitutional Values: Sovereign, Democracy, Socialism, Secularism, Equality, Justice, Liberty, Freedom, Fraternity Social Values: Pity and Probity, Self-Control, Universal Brotherhood. Religious and Moral Values: Tolerance, Wisdom, character. Aesthetic Values: Love and Appreciation of literature, fine arts and respect for the same. Environmental Ethical Values National Integration and international understanding. Need of Humanistic value for espouse peace in the society Conflict of cross-cultural influences, cross-border education	(04 Hrs)
Text Books	: 1. Sharma, S.P. Moral and Value Education; Principles and Practices, Kanishka publishers, 2013. 2. Kiruba Charles & V. Arul Selvi. Value Education: Neelkamal Publications, New Delhi, 2012. 3. Passi, B.K. and Singh, P. Value Education. National Psychological Corporation, Agra. 2004. 4. Chitakra, M.G.: Education and Human Values, A.P.H. Publishing Corporation, New Delhi. 2003. 5. Monica J. Taylor. Values in Education and Education in Value. Routledge. 1996. 6. Neil Postman. The End of Education: Redefining the Value of School. Vintage publisher. 1996. 7. http://cbseportal.com/exam/e-books/download-free-ncert-e-book-education-for-values-in-school-a-framework 8. http://cbseacademic.in/web_material/ValueEdu/Value%20Education%20Kits.pdf	

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of T. Y. B. Tech. (ALL)

Code No.: ETC801

Title: Audit course : Smart Cities

Teaching Scheme:

Examination Scheme:

Theory: 02 Hrs./ week

Total Marks: 50 (Continuous Assessment)

Objectives	: <ul style="list-style-type: none"> • To identify urban problems. • To study Effective and feasible ways to coordinate urban technologies. • To study models and methods for effective implementation of Smart Cities. • To study new technologies for Communication and Dissemination. • To study new forms of Urban Governance and Organization. 	
Outcomes	<ul style="list-style-type: none"> • Better understanding of the dynamic behavior of the urban system by going beyond the physical appearance and by focusing on representations, properties and impact factors . • Exploration of the city as the most complex human-made organism with a metabolism that can be modeled in terms of stocks and flows . <ul style="list-style-type: none"> • Knowledge about data-informed approaches for the development of the future city, based on crowd sourcing and sensing . • Knowledge about the latest research results in for the development and management of future cities . • Understanding how citizens can benefit from data-informed design to develop smart and responsive cities 	
Unit-I	: Understanding Inclusive Planning Definition and components; urban consultations; basic principles of urban consultation, process of urban consultations; urban strategic planning, good urban governance, subsidiarity, equity, efficiency, transparency and accountability, civic engagement and citizenship, security; valuing difference and working with diversity; livable cities	4Hrs
Unit-II	: Participatory Planning Process and Policies, Programmes and Legislation Methods, role of stakeholders (including civil society organizations), etc.; Related Acts, Five year plans, policies and programmes at various levels	4Hrs
Unit-III	: Smart Cities Innovation economy (Innovation in industries, clusters, districts of a city; Knowledge workforce: Education and employment; Creation of Knowledge-intensive companies)	4Hrs
Unit-IV	: Smart Cities Urban Infrastructure (Transport, Energy/ Utilities, protection of the environment and safety); Governance(Administration services to citizens, participatory and direct democracy, services to the citizen, quality of life)	4Hrs
Unit-V	: Planning interventions –I Inclusive zoning, development and building regulations, Slum Improvement; drafting strategic urban development plans – objectives and key actors; planning framework for actions, process of drafting the plan,	4Hrs

	key considerations.	
Unit-VI	: Planning interventions –II Urban design and decision-making; city transport for all; water supply and sanitation, urban disaster management, management through decentralization	4Hrs
Reference Books:	<p>1. Jo Beall (1997); “A city for all: valuing differences and working with diversity”; Zed books limited,London (ISBN: 1-85649-477-2)</p> <p>2. UN-Habitat; “Inclusive and sustainable urban planning: a guide for municipalities”; Volume 3: Urban Development Planning (2007); United Nations Human Settlements Programme (ISBN: 978- 92-1-132024-4)</p> <p>3. Arup Mitra; “Insights into inclusive growth, employment and wellbeing in India”; Springer (2013), New Delhi (ISBN: 978- 81-322-0655-2)</p> <p>4. William J. V. Neill (2004); “Urban Planning and cultural identity”; Routledge, London (ISBN: 0-415-19747-3)</p> <p>5. John S. Pipkin, Mark E. La Gory, Judith R. Balu (Editors); “Remaking the city: Social scienceperspective on urban design”; State University of New York Press, Albany (ISBN: 0-87395-678-8)</p> <p>6. Giffinger, Rudolf; Christian Fertner; Hans Kramar; Robert Kalasek; Nataša Pichler-Milanovic; Evert Meijers (2007). "Smart cities – Ranking of European medium-sized cities". Smart Cities.Vienna: Centre of Regional Science</p> <p>7. "Draft Concept Note on Smart City Scheme". Government of India - Ministry of Urban Development http://indiainsmartcities.in/downloads/CONCEPT_NOTE_-3.12.2014__REVISED_AND_LATEST_.pdf</p>	

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of T. Y. B. Tech. (ALL)

Code No.: MED801

Teaching Scheme:

Theory: 02 Hrs./ week

Title: Rural Community Engagement

Examination Scheme:

Total Marks: 50 (Continuous Assessment)

Objectives	:	1. To provide practical opportunities for students for participation in rural community mobilization, service engagement and empowerment activities. 2. To promote preparation of strategies for building resilience and community responding system in nutrition, water, food safety and healthcare.	
Unit-I	:	Dynamics Of Rural Society, Panchayat Raj System: Social, Economic, Political and Cultural Community Goal Setting : SAGY, MPLADS and UBA	(4 Hrs)
Unit-II	:	Approaches and Methods, Community Project Proposal and Project Management, Concept and Steps, Thematic Maps, Social Map Transect Walk, Seasonal Map, Natural and Human Resource Mapping and Management, Ethnographic Research	(5 Hrs)
Unit-III	:	Vulnerability, Rural Resilience - Risk Reduction, Role and Responsibilities Rehabilitation: Social, Physical and Psychological Aspect Increasing Efficiency in Water, Energy, Sanitation and Waste (Solid and Liquid) Management	(5 Hrs)
Unit-IV	:	Engagement With School for Competency Enhancement/Health Centre/Panchayat/Gram Sabha/SHGs Awareness: Rural Health Management, Indigenous or Folk Medicine and Hygiene/ Sports/ Rights/ Policies and Programs/ Transparency/Corruption/Social Benefits, addressing Issue In inclusive and Inclusive Identification of Beneficiaries, Improving Implementation Efficiencies While Plugging Leakages In Benefits Scheme, Direct Benefit Transfer	(4 Hrs)
Unit-V	:	Making of Gram Panchayat Development Plan Including Aspects and Process of Preparation of Village Disaster Management Plan	(3 Hrs)
Unit-VI	:	Village Livelihoods, Rural Tourism, Entrepreneurship, Appropriate Technology Access Including Digitized Transaction.	(3 Hrs)
Reference Books:	:	1. Katar Singh “Rural development- Principles, Policies and Management” SAGE Publication 1999. 2. Agoramoorthy Govindaswamy “Sadguru Model of Rural Development: Elevates Food Security and Ease Poverty” Daya Publishing House, a division of Astral International Pvt. Limited, 2016 3. V. Gopalkrishnan Asari “Technological Change for Rural Development in India”. B.R. Publisher 4. B.S. Gautam “Cooperatives And Rural Development In India” Radha Publications	

Outcomes	After completion of the course, the students will be able to: <ol style="list-style-type: none"><li data-bbox="505 142 1442 212">1. Understand the social, economic, political and cultural framework of the rural society<li data-bbox="505 218 1451 287">2. Address the challenges with suitable responses for the identified rural issues<li data-bbox="505 294 1211 325">3. Engage in the management of the rural community
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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of T.Y.B. Tech. (All) Semester-VI

Code No.: BSH803

Title: Audit I: German Language Module

Teaching Scheme: 02 Hours per week

Examination Scheme

Theory: 02 Hours per week

Total Marks: 50 (Continuous Assessment)

Objectives	<ul style="list-style-type: none">• Students will be able to apply communicative German Grammar in communication.• Students will be able to enhance the level of German vocabulary.• Students will be able to pronounce and articulate words as well as sentences accurately.• Students will be able to understand and apply German language eventually.• Students will be able to develop German language skills.• Students will be able to manage situational communication in German. .
Unit-I	: Significance and purpose The Significance of Language study, Speaking and Thinking , Self – discovery, Communication, Language Competence, Language and Culture, Language Changes, Connection with other areas of study, The Mother— language, Other languages and Purpose of Language study [2 Hours]
Unit-II	: Purpose of the Study of the German Language Listening, Speaking, Reading and writing. [2 Hours]
Unit-III	: Grammar Parts of speech, articles , word order or syntax, demonstratives & interrogatives, counters, verbs and verb conjugation, adjectives, adverbs, comparisons, giving

		and receiving, requests and commands, potential and conditionals, possessive, direct indirect speech, various other form, etc. [8 Hours]		
Unit-IV		Vocabulary Nouns, verbs tenses-past and present, adjectives, adverbs, expressions of time , expression and phrases etc. [5Hours]		
Unit-V		Situational conversations and practice drills Self-introduction, numbers, day and date, time, location and presence, possession of objects, time expressions and their usage, visiting people, accepting and receiving objects, hospital, asking direction, asking price of objects etc. [5 Hours]		
Unit-VI		Introduction to the history of German and its cultural Aspects Norms and values, Lifestyles and aims in life, Cultural traditions [2 Hours]		
List of Reference	Sr. No.	Title	Author	Publication
Books	1	German Made Simple: Learn to speak and understand German quickly and easily	Arnold Leitner PhD	Namrata's Amazon.in
	2	The Everything Learning German Book: Speak, write, and understand basic German in no time	Edward Swick	Adams Media
	3	Langenscheidt German in 30 Days	Von Angelika G. Beck	Langenscheidt

	4	<p>Complete German Beginner to Intermediate Book and Audio Course:</p> <p>Learn to read, write, speak and understand a new language with Teach Yourself</p>	<u>Heiner Schenke</u>	The McGraw Hill
	5	<p>German: How to Speak and Write It (Beginners' Guides)</p>	Joseph Rosenberg	Repro Books
	6	<p>Collins Easy Learning – Collins Easy Learning German Grammar and Practice</p>	Collins	Collins