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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
Academic Regulations For The Award Of Full Time M.Tech. P.G. Degree
(WITH EFFECT FROM THE ACADEMIC YEAR 2009-10)

The Jawaharlal Nehru Technological University Anantapur shall confer M.Tech. Post Graduate degree to candidates who are admitted to the Master of Technology Programs and fulfill all the requirements for the award of the degree.

1.0 ELIGIBILITY FOR ADMISSIONS:

Admission to the above programme shall be made subject to the eligibility, qualifications and specialization prescribed by the University for each programme, from time to time.

Admissions shall be made either on the basis of merit rank obtained by the qualified candidates at an Entrance Test conducted by the University or on the basis of GATE / PGECET score, subject to reservations prescribed by the University or Government policies from time to time.

2.0 **COURSE WORK:**

2.1 A Candidate after securing admission must pursue the M.Tech. course of study for Four semesters duration.

2.2 Each semester shall be of 20 weeks duration including all examinations.

2.3 A candidate admitted to a programme should complete it within a period equal to twice the prescribed duration of the programme from the date of admission.

3.0 ATTENDANCE:

3.1 A candidate shall be deemed to have eligibility to write end semester examinations if he has put in at least 75% of attendance on cumulative basis of all subjects/courses in the semester.

3.2 Condonation of shortage of attendance up to 10% i.e., from 65% and above and less than 75% may be given by the college on the recommendation of the Principal.

3.3 Condonation of shortage of attendance shall be granted only on genuine and valid reasons on representation by the candidate with supporting evidence.

3.4 If the candidate does not satisfy the attendance requirement he is detained for want of attendance and shall reregister for that semester. He / she shall not be promoted to the next semester.

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4.0. EVALUATION:

The performance of the candidate in each semester shall be evaluated subject wise, with a maximum of 100 marks for Theory and 100 marks for practicals, on the basis of Internal Evaluation and End Semester Examination.

4.1 For the theory subjects 60% of the marks will be for the External End Examination. While 40% of the marks will be for Internal Evaluation, based on the better of the marks secured in the two Mid Term-Examinations held, one in the middle of the Semester (I-IV units) and another immediately after the completion of instruction (V-VIII) units with Three questions to be answered out of four in 2hours, evaluated* for 40 marks.

*****Note: All the Questions shall be of equal weightage of 10 marks and the marks obtained for 3questions shall be extrapolated to 40 marks, any fraction rounded off to the next higher mark

4.2 For practical subjects, 60 marks shall be for the End Semester Examinations and 40 marks will be for internal evaluation based on the day to day performance.

4.3 For Seminar there will be an internal evaluation of 50 marks. A candidate has to secure a minimum of 50% to be declared successful. The assessment will be made by a board consisting of HOD and two internal experts at the end of IV semester instruction.

4.4 A candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures a minimum of 40% of marks in the End Examination and a minimum aggregate of 50% of the total marks in the End Semester Examination and Internal Evaluation taken together.

4.5 In case the candidate does not secure the minimum academic requirement in any of the subjects (as specified in 4.4.) he has to reappear for the Semester Examination either supplementary or regular in that subject, or repeat the course when next offered or do any other specified subject as may be required.

5.0 RE-REGISTRATION FOR IMPROVEMENT OF INTERNAL EVALUATION MARKS:

Following are the conditions to avail the benefit of improvement of internal evaluation marks.

5.1 The candidate should have completed the course work and obtained examinations results for I & II semesters.

5.2 He should have passed all the subjects for which the Internal evaluation marks secured are more than 50%.

5.3 Out of the subjects the candidate has failed in the examination due to Internal evaluation marks secured being less than 50%, the candidate shall be given one chance for each Theory subject and for a maximum of **three** Theory subjects for Improvement of Internal evaluation marks.

5.4 The candidate has to re-register for the chosen subjects and fulfill the academic requirements.

5.5 For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D. in favour of the

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Registrar, JNTUA payable at Anantapur along with the requisition through the Principal of the respective college.

5.6 In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the End Examinations marks secured in the previous attempt(s) for the reregistered subjects stand cancelled.

6.0 EVALUATION OF PROJECT WORK:

Every candidate shall be required to submit thesis or dissertation after taking up a topic approved by the college/ institute.

6.1 Registration of Project work: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses (theory and practical courses of I & II Sem)

6.2 An Internal Departmental Committee (I.D.C) consisting of HOD, Supervisor and one internal senior expert shall monitor the progress of the project work.

6.3 The work on the project shall be initiated in the penultimate semester and continued in the final semester. The duration of the project is for two semesters. The candidate can submit Project thesis with the approval of I.D.C. after 36 weeks from the date of registration at the earliest and one calendar year from the date of registration for the project work. Extension of time within the total permissible limit for completing the programme is to be obtained from the Head of the Institution.

6.4 The student must submit status report at least in three different phases during the project work period. These reports must be approved by the I.D.C before submission of the Project Report.

6.5 A candidate shall be allowed to submit the thesis / dissertation only after passing in all the prescribed subjects (both theory and practical) and then take viva voce examination of the project. The viva-voce examination may be conducted once in two months for all the candidates submitted during that period.

6.6 Three copies of the Thesis / Dissertation certified in the prescribed from by the supervisor & HOD shall be presented to the H.OD. One copy is to be forwarded to the University and one copy to be sent to the examiner.

6.7 The college shall submit a panel of three experts for a maximum of 5 students at a time. However, the thesis / dissertation will be adjudicated by one examiner nominated by the University.

6.8 If the report of the examiner is favorable viva-voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and the examiner who adjudicated the thesis / dissertation. The board shall jointly report candidates work as:

1.	Very Good	Grade A
2.	Good	Grade B
3.	Satisfactory	Grade C
4.	Not satisfactory	Grade D

If the report of the viva-voce is not satisfactory (Grade D) the candidate will retake the viva-voce examination after three months. If he fails to get a satisfactory report at the second viva-voce examination he will not be eligible for the award of the degree unless the candidate is permitted to revise and resubmit the thesis.

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7.0 AWARD OF DEGREE AND CLASS:

A candidate shall be eligible for the award of respective degree if he satisfies the minimum academic requirements in every subject and secures 'satisfactory' or higher grade report on his thesis/dissertation and viva-voce. Based on overall percentage of marks obtained, the following class is awarded.

First class with Distinction:	70% or more
First class	below 70% but not less than 60%
Second class	below 60% but not less than 50%

8.0 WITH – HOLDING OF RESULTS:

If the candidate has not paid dues to the university or if any case of in-discipline is pending against him, the result of the candidate shall be withheld and he will not be allowed/ promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

9.0 TRANSITORY REGULATIONS:

Candidates who have discontinued or have been detained for want of attendance or who have failed after having undergone the course in earlier regulations and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, subject to 4.5 and 2.3 sections. Whereas they continue to be in the academic regulations they were first admitted.

10.0 GENERAL:

i. **The academic regulations should be read as a whole for purpose of any interpretation**.
ii. **Disciplinary action for Malpractice / improper conduct in examinations is appended**.
iii. **There shall be no places transfer within the constituent colleges and affiliated colleges of Jawaharlal Nehru Technological University Anantapur.**
iv. **Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".**
v. **In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.**
vi. **The University may change or amend the academic regulations or syllabi at any time and the changes or amendments shall be made applicable to all the students on rolls with effect from the dates notified by the University.**

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RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	**Punishment**
	If the candidate	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the University.
3.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.

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4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
6.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.

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7.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the impostor is an outsider, he will be handed over to the police and a case is registered against him.
8.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

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9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.
2. Punishment for institutions : (if the squad reports that the college is also involved in encouraging malpractices)
   (i) A show cause notice shall be issued to the college.
   (ii) Impose a suitable fine on the college.
   (iii) Shifting the examination centre from the college to another college for a specific period of not less than one year.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

Course Structure and Syllabi for M.Tech.

COMPUTER SCIENCE AND ENGINEERING (CSE)

AND COMPUTER SCIENCE (CS)

for affiliated Engineering Colleges 2009-10

I YEAR I SEMESTER

S. No	Course code	Subject	Theory	Lab.	Credits
1.	9D58101	Advanced Data Structures and Algorithms	4		4
2.	9D58102	Discrete Structures	4		4
3.	9D58103	Computer System Design	4		4
4.	9D58104	Java and Web Technologies	4		4
5.	9D58105	Software Engineering	4		4
6.	9D58106a 9D58106b 9D58106c	**Elective-I** a. Advances in Databases b. Distributed Databases c .Computer Vision	4		4
7.	9D58107	Software Lab- 1 (Covering the experiments: Data structures & Algorithms and Web Technologies)		3	2
		contact periods/week	24	3	26
			Total 27		

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2009-10

I YEAR II SEMESTER

S. No	Course code	Subject	Theory	Lab.	Credits
1.	9D58201	Software Quality Assurance and Testing	4		4
2.	9D58202	Object Oriented Analysis and Design	4		4
3.	9D58203	Advanced Computer Networks	4		4
4.	9D58204	Distributed Systems	4		4
5.	9D58205	Data Warehousing and Mining	4		4
6.	9D58206a 9D58206b 9D58206c	**Elective-II** a. Software Architecture b. Software Design c. Design Patterns	4		4
7.	9D58207	Software Lab- 2 (Covering the experiments: OOAD & Data Warehousing and Mining		3	2
		contact periods/week	24	3	26
			Total 27		

II YEAR (III & IV Semesters)

S. No	Course code	Subject		credits
1.	9D58401	Seminar		2
2.	9D58402	Project work		16

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M.Tech. I SEMESTER (CSE & CS) **Th 4** **C 4**

(9D58101) ADVANCED DATA STRUCTURES AND ALGORITHMS

UNIT I : Overview of Data Structures
Review of Arrays, Stacks, Queues, linked lists , Linked stacks and Linked queues, Applications

UNIT II: Algorithm Analysis
Efficiency of algorithms, Apriori Analysis, Asymptotic Notations, Time complexity of an algorithm using O notation, Polynomial Vs Exponential Algorithms, Average, Best, and Worst Case Complexities, Analyzing Recursive Programs.

UNIT III: Trees and Graphs
Introduction, Definition and Basic terminologies of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded binary trees, Graphs-basic concepts, representation and traversals.

UNIT IV: Binary Search Trees, AVL Trees and B Trees
Introduction, Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications. B Trees: Definition, Operations and applications.

UNIT V: Red – Black Trees, Splay Trees and Hash Tables
Red – Black Trees, Splay Trees and its applications. Hash Tables: Introduction, Hash Tables, Hash Functions and its applications.

UNIT VI: Divide – and – Conquer & Greedy Method
General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen's Matrix Multiplication, Greedy Method- General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

UNIT VII: Dynamic Programming
General Method, All Pairs Shortest Path, Single Source Shortest Path, 0 / 1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem.

UNIT VIII: Back Tracking and Branch – and – Bound
General Method, 8 – Queen's Problem, Graph Coloring. Branch – and – Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem.

TEXT BOOKS:
1. Data Structures and Algorithms by G.A.V. Pai, 2009, TMH.
2. Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press.

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REFERENCES:

1. Classic Data Structures by D. Samanta, 2005, PHI
2. Design and Analysis of Computer Algorithms by Aho, Hopcraft, Ullman 1998, PEA.
3. Introduction to the Design and Analysis of Algorithms by Goodman, Hedetniemi, TMG.
4. Design and Analysis of Algorithms by E. Horowitz, S. Sahani, 3rd Edition, Galgotia.
5. Data Structures and Algorithms in C++ by Drozdek 2nd Edition, Thomson.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

M.Tech. I SEMESTER (CSE & CS) **Th 4** **C 4**

(9D58102) DISCRETE STRUCTURES

UNIT I

Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Theory of inference for the statement calculus

UNIT II

Rules of inference, Consistency of premises and indirect method of proof, Automatic Theorem Proving

Predicate calculus: Predicates, statement functions, variables and quantifiers, predicate formulas, free & bound variables, universe of discourse, inference theory of predicate calculus

UNIT III

Set theory & Relations: Introduction, Relations and ordering, Properties of binary Relations, Equivalence, Compatibility Relations, Partial ordering, Hasse diagram.

Functions: composition of functions, Inverse Function, Recursive Functions, Lattice and its Properties, Pigeon hole Principles and its application.

UNIT IV

Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and monoids, groups, sub groups, Definitions, Examples, homomorphism, Isomorphism and related problems.

UNIT V

Elementary Combinatorics: Basis of counting, Enumeration of Combinations & Permutations, Enumerating of Combinations & Permutations with repetitions and constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, principles of Inclusion – Exclusion.

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UNIT VI

Recurrence Relations: Generating Function of Sequences, Calculating Coefficient of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, The method of Characteristic roots, Solution of Inhomogeneous Recurrence Relation.

UNIT VII

Graph Theory: Representation of Graph, Spanning Trees, BFS, DFS, Kruskals Algorithm, Binary trees, Planar Graphs

UNIT VIII

Graph Theory and Applications, Basic Concepts, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to computer science J.P Tremblery, R.Manohar, TMH
2. Discrete Mathematical for computer Scientists & Mathematicians " J.L. Molt, A.Kandel, T.P.Baker, PHI

REFERENCES:

1. Elements of Discrete Mathematics, C L Liu, D P Mohanpatra,TMH
2. Discrete Mathematics, Schaum's Outlines,Lipschutz,Lipson TMH.
3. Discrete Mathematical Structures, Kolman, Busby, Ross, 6th ed., PHI, 2009
4. Discrete Mathematics, Johnsonbaugh, 6th ed., Pearson, 2005
5. Discrete Mathematics, Malik, Sen, 6th ed., Cengage Learning, 2004
6. Discrete Mathematics for computer science, Bogart, Stein and Drysdale, Springer, 2005
7. Discrete Mathematics and Combinatorics, Sengadir, Pearson, 2009
8. Discrete and Combinatorial Mathematics, Grimaldi, Ramana, 5th ed., Pearson. 2006
9. Discrete Mathematics, J K Sharma, 2nd ed., Macmillan, 2005

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M.Tech. I SEMESTER (CSE & CS) **Th 4** **C 4**

(9D58103) COMPUTER SYSTEM DESIGN

UNIT I- Computer structure – hardware, software, system software, Von-neumann architecture – case study. IA -32 Pentium: registers and addressing, instructions, assembly language, program flow control, logic and shift/rotate instructions, multiply, divide MMX, SIMD instructions, I/O operations, subroutines.

UNIT II- Input/Output organization - interrupts, DMA, Buses, Interface circuits, I/O interfaces, device drivers in windows, interrupt handlers

UNIT III- Processing Unit - Execution of a complete instruction, multiple bus organization, hardwired control, micro programmed control.

UNIT IV - Pipelining: data hazards, instruction hazards, influence on instruction sets, data path & control consideration,RISC architecture introduction.

UNIT V- Memory: types and hierarchy, model level organization, cache memory, performance considerations, mapping, virtual memory, swapping, paging, segmentation, replacement policies.

UNIT VI - Processes and Threads: processes, threads, inter process communication, classical IPC problems, Deadlocks.

UNIT VII - File system: Files, directories, Implementation, UNIX file system

UNIT VIII- Security: Threats, intruders, accident data loss, basics of cryptography, user authentication.

TEXT BOOKS:

1. Computer Organization – Car Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI

REFERENCES:

1. Computer Organization and Architecture – William Stallings Sixth Edition, pearson/PHI
2. Morris Mano -Computer System Architecture –3rd Edition-Pearson Education .
3. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley
4. Operating Systems – Internals and Design Principles Stallings, Fifth Edition–2005, Pearson Education/PHI

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M.Tech. I SEMESTER (CSE & CS)	**Th**	**C**
	4	**4**

(9D58104) JAVA AND WEB TECHNOLOGIES

Unit I:

HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets; Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

Unit II: XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

Unit III: Review of Applets, Class, Event Handling, AWT Programming. Introduction to Swing: JApplet, Handling Swing Controls like Icons – Labels – Buttons – Text Boxes – Combo – Boxes – Tabbed Pains – Scroll Pains – Trees – Tables Differences between AWT Controls & Swing Controls Developing a Home page using Applet & Swing.

Unit IV: Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API.

Unit V: Web servers: Tomcat Server installation & Testing.Introduction to Servelets: Lifecycle of a Serverlet, JSDK, The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading initialization parameters.

Unit VI: More on Servlets: The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.
Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC architecture. AJAX.

Unit VII:

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations

Unit VIII:

Database Access: Database Access, Database Programming using JDBC Studying Javax.sql.* package Accessing a Database from a JSP Page Application – Specific Database Actions Deploying JAVA Beans in a JSP Page

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TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT 1,2)
2. The complete Reference Java 2 Fifth Edition ,Patrick Naughton and Herbert Schildt., TMH (Chapters: 25) (UNIT 2,3)
3. Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 3,4,5)

REFERENCES:

1. Programming world wide web-Sebesta, PearsonCore
2. Servlets and Javaserver Pages Volume 1: Core Technologies , Marty Hall and Larry Brown Pearson

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M.Tech. I SEMESTER (CSE & CS) **Th 4** **C 4**

(9D58105) SOFTWARE ENGINEERING

UNIT-I: Software, Software Engineering, and Process: The nature of Software, The unique nature of WebApps, Software engineering- A layered technology, The essence and principles of software engineering practice, Generic process model (framework), Process patterns, Process assessment and improvement, CMMI, Software myths.

UNIT-II: Process Models: Prescriptive process models: The waterfall model, Incremental process models, Evolutionary process models.The Unified process, Aspect oriented software development, Agile development: Agile process, Extreme programming.

UNIT-III: Software Requirements : Introduction to functional and non-functional requirements, Requirements engineering activities, Eliciting requirements, *Requirements modeling*, Requirements validation, Software requirements specification(SRS), Requirements management.
***Requirements modeling*:** Structured view: Data modeling (ERD), Functional modeling(DFD), Behavioral modeling. Object oriented view: Use cases, CRC Modeling, Analysis classes, Collaborations, Responsibilities, Object relationship model, Object behavior model.
Software Project Estimation: Empirical estimation models.

UNIT-IV:Design Concepts: Software design quality guidelines and attributes, Design concepts.
Software Architecture: Architecture and its importance, Architectural Styles, Data design, Architectural design.
Design : Structured view (Traditional view): Architectural mapping using data flow (Call and return architecture), Interface design, Function based component design.
Object oriented view: OO Architecture, Class hierarchies, Message design, Class based component design.

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UNIT-V: Performing User Interface Design: Golden rules, User interface analysis and design,interface analysis, interface design steps.
Pattern Based Design: Design patterns, Pattern based software design, Architectural patterns, Component level design patterns, User interface design patterns.

UNIT-VI: Testing : Software testing strategies: A strategic approach to software testing, Test strategies (Unit testing and integration testing) for conventional and object oriented software, Validation testing, System testing, The art of debugging.

UNIT-VII: Testing Conventional Applications: Software testing fundamentals, White-Box testing: basis path testing, condition (predicate) testing, data flow testing, loop testing, Black box testing: Equivalence partitioning, Boundary value analysis, Graph based testing methods.
Testing Object Oriented Applications: OO testing methods, Testing methods applicable at class level, Interclass test case design.

UNIT-VIII: Umbrella Activities : Risk management, Software quality assurance, Software configuration management, Measurement and metrics: Size oriented metrics, Function oriented metrics, Metrics for software quality, Product metrics: Metrics for the requirements model, Metrics for the design model, Metrics for source code, Metrics for testing, Metrics for maintenance.
Software Reengineering: A software reengineering process model, Software reengineering activities.

TEXT BOOKS:
1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 7th edition. McGrawHill International Edition.
2. Software Engineering- Sommerville , 7th edition, Pearson education.

REFERENCES:
1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age Intnl.Pub.
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
3. Systems Analysis and Design- Shely Cashman Rosenblatt,Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

M.Tech. I SEMESTER (CSE & CS) **Th 4** **C 4**

ELECTIVE-I
(9D58106a) ADVANCES IN DATABASES

UNIT I

Databases and Database Users - Database System Concepts and Architecture, Data Models, Schemas, and Instances, DBMS Architecture and Data Independence, Database Languages and Interfaces - Data Modelling Using the Entity-Relationship Approach, ER Model Concepts, Entity-Relationship (ER) Diagrams - Relational Model Concepts, Relational Integrity Constraints -Functional Dependencies and Normalization for Relational Databases, Functional Dependencies, Normal Forms Based on Primary Keys, General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form (BCNF)

UNIT II

Relational Database Design Algorithms and Further Dependencies, Algorithms for Relational Database Schema Design, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form - Relational Algebra, Relational Operations - SQL - A Relational Database Language, The Relational Calculus, QUEL, Domain Relational Calculus, and QBE

UNIT III

Query Processing and Optimization - Basic Algorithms for Executing Query Operations, Using Heuristics in Query Optimization, Using Cost Estimates in Query Optimization, Semantic Query Optimization - Transactions Processing Concepts, Transaction and System Concepts, Desirable Properties of Transactions, Schedules and Recoverability, Serializability of Schedules.

UNIT IV

Concurrency Control Techniques - Locking Techniques for Concurrency Control, Concurrency Control Techniques Based on Timestamp Ordering, Multiversion Concurrency Control Techniques, Optimistic Concurrency Control Techniques, Granularity of Data Items, Recovery Techniques - Recovery Concepts, Recovery Techniques Based on Deferred Update, Recovery Techniques Based on Immediate Update, Shadow Paging, Database Security and Authorization - Introduction to Database Security Issues - Discretionary Access Control Using Privileges, Mandatory Access Control for Multilevel Security

UNIT V

Advanced Data Modeling Concepts - Enhanced-ER(EER) Model Concepts, EER-to-Relational Mapping, Data Abstraction and Knowledge Representation Concepts, Integrity Constraints in Data Modeling, Conceptual Design of Transactions, Overview of Other Data Models, Object-Oriented Databases, Introduction to Object-Oriented Concepts, Object Identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods, and Persistence, Type and Class

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Hierarchies and Inheritance, Complex Objects, Other OO Concepts, Examples of OODBMSs, OO Database Design by EER-to-OO Mapping.

UNIT VI

Parallel Databases - I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism, Design of Parallel Systems, Distributed databases – Reference Architecture, Data fragmentation, Distribution transparency for read only applications, Distribution transparency for update applications, Access primitives, Integrity constraints.

UNIT VII

Design – database fragments, allocation, Translation of global queries to fragment queries Optimization of Access strategies – Framework, Join queries, - Management of Distributed transactions – Framework – Supporting atomicity for distributed transactions, Concurrency control for distributed transactions, Architectural aspects.

UNIT VIII

Deductive Databases - PROLOG/DATALOG Notation - Interpretation of Rules, Basic Inference Mechanisms for Logic Programs, The LDL System, Other Deductive Database Systems, Advanced Data Types and New Applications - Time in Databases, Spatial and Geographic Data, Multimedia Databases, Mobility and Personal Databases - Advanced Transaction Processing, Transaction-Processing Monitors, Transactional Workflows, E-Commerce, Main-Memory Databases, Real-Time Transaction Systems, Long-Duration Transactions, Transaction Management in Multidatabases

TEXT BOOKS:

1. Ramez Elmasri & Shamkant B. Navethe, “Fundamentals of Database Systems”, fourth Edition, Pearson Education, 2004.
2. Abraham Silberchatz, Henry F. Korth, S.Sudarsan, “Database System Concepts”, Fifth Edition, McGraw-Hill, 2006.
3. Stefano Ceri, Giuseppe Pelagatti, “Distributed Databases Principles and Systems”, McGraw-Hill International Editions, 1985.

REFERENCES:

1. Thomas M. Connolly, Carolyn E. Begg, “ Database Systems – A Practical Approach to Design, Implementation and Management”, Third edition, Pearson Education, 2003.
2. Jefrey D. Ullman, Jenifer Widom, “A First Course in Database Systems”, Pearson Education Asia, 2001.
3. Stefano Ceri, Giuseppe Pelagatti, “Distributed Databases Principles and Systems”, McGraw-Hill International Editions, 1985.
4. Rajesh Narang, “Object Oriented Interfaces and Databases”, Prentice Hall of India, 2002.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

M.Tech. I SEMESTER (CSE & CS) **Th 4** **C 4**

ELECTIVE-1
(9D58106b) DISTRIBUTED DATABASES

UNIT-I: Introduction Features of Distributed databases, Features of Centralized databases, Level of Distributed Transparency, Reference Architecture, Types of Data Fragmentation, Distribution Transparency, access primitives, integrity constraints

UNIT-II: Distributed Database Design A framework for Distributed Database Design, Design of Database Fragmentation, Allocation of fragments

UNIT-III: Global And Fragment Queries Global Queries, fragment Queries, Equivalence Transformations for Queries, transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parameter Queries

UNIT-IV: Optimization Of Access Stratersies Frame Work for Query Optimization, Join Queries, General Queries

UNIT-V: Management Of Distributed Transactions Framework for Transaction Management, Atomicity of Distributed Transactions, Concurrence Control for Centralized Database.

UNIT-VI: Concurrency Concurrency Control for Distributed databases, Foundations, Locking Protocols, Deadlocks, Timestamps.

UNIT-VII: Reliability Basic concepts, Commitment Protocols, reliability and Concurrency Control, Consistent View of Network, detection and Resolution of Inconsistency, Check points and cold restart

UNIT-VIII: Distributed Database Systems Commercial Systems Commercial Systems, Tanden's ENCOMPASS Distributed Database systems, IBM's inter system Communication, features of Distributed, INGRESS HETEREGENEOUS DATABASE : General problems, brief study of MULTIBASE.

TEXT BOOKS:

1. Ceri. S. Pelagatti G, "Distributed Databases : Principles and Systems", 1985, MCG
2. Ozsu, " Principles of Distributed Database Systems" , 1e, 2002, PEA.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

M.Tech. I SEMESTER (CSE & CS) **Th 4** **C 4**

ELECTIVE-I

(9D58106c) COMPUTER VISION

UNIT-1

CAMERAS: Pinhole Cameras, Camera with Lenses, the Human Eye, Sensing.
RADIOMETRY-MEASURING LIGHT: Light in Space, Light at Surfaces, Important Special Cases.

UNIT-2

SOURCES, SHADOWS, AND SHADING: Qualitative Radiometry, Sources and Their Effects, Local Shading Models, Application: Photometric Stereo, Inter reflections: Global Shading Models.

UNIT-3

LINEAR FILTERS: Linear Filters and Convolution, Shift Invariant Linear Systems, Spatial Frequency and Fourier Transforms, Sampling and Aliasing, Filters as Templates, Technique: Normalized Correlation and Finding Patterns, Technique: Scale and Image Pyramids.

UNIT-4

EDGE DETECTION: Noise, Estimating Derivatives, Detecting Edges.
TEXTURE: Representing Texture, Analysis using Oriented Pyramids, Application: Synthesizing Textures for Rendering, Shape for Texture for Planes.

UNIT-5

SEGMENTATION BY CLUSTERING: What is Segmentation, Human Vision: Grouping and Gestalt, Applications: Shot Boundary Detection and Background Subtraction, Image Segmentation by Clustering Pixels, Segmentation by Graph-Theoretic Clustering.

UNIT-6

SEGMENTATION BY FITTING A MODEL: The Hough Transform, Fitting Lines, Fitting Curves, Fitting as Probabilistic Inference Problem, Robustness, Example: Using RANSAC to Fit Fundamental Matrices, Missing Data Problems, the EM Algorithm.

UNIT-7

FINDING TEMPLATES USING CLASSIFIERS: Method for Building Classifiers, Building Classifiers from Class Histograms, Feature Selection, Neural Networks, the Support Vector Machine.

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UNIT-8

RECOGNIZATION BY RELATIONS BETWEEN TEMPLATES: Finding Objects by Voting on Relations between Templates, Relational Reasoning Using Probabilistic Models and Search, Using Classifiers to Prune Search, Hidden Markov Models, Application: HMM and Sign Language Understanding, Finding People with HMM.

TEXT BOOK:

1. David A.Forsyth, Jean Ponce, Computer Vision-A Modern Approach, PHI, 2003.

REFERENCES:

1. Geometric Computing With Clifford Algebras: Theoretical Foundations and Applications in Computer Vision and Robotics , Springer; 1/ e,2001 by Sommer.
2. Digital Image Processing and Computer Vision, 1/e, by Sonka.
3. Computer Vision and Applications: Concise Edition(With CD) by Jack, Academy Press, 2000.

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M.Tech. II SEMESTER (CSE & CS)	**Th**	**C**
	4	**4**

(9D58201) SOFTWARE QUALITY ASSURANCE AND TESTING

UNIT I Software Quality Assurance Framework and Standards SQA Framework: What is Quality? Software Quality Assurance, Components of Software Quality Assurance – **Software Quality Assurance Plan:** Steps to develop and implement a Software Quality Assurance Plan – **Quality Standards:** ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma

UNIT II Software Quality Assurance Metrics and Measurement Software Quality Metrics: Product Quality metrics, In-Process Quality Metrics, Metrics for Software Maintenance, Examples of Metric Programs

UNIT III Software Quality metrics methodology: Establish quality requirements, Identify Software quality metrics, Implement the software quality metrics, analyze software metrics results, validate the software quality metrics – **Software quality indicators** – **Fundamentals in Measurement theory**

UNIT IV Software Testing Strategy and Environment: Establishing testing policy, structured approach to testing, test factors, Economics of System Development Life Cycle (SDLC) Testing

UNIT V Software Testing Methodology

Defects hard to find, verification and validation, functional and structural testing, workbench concept, eight considerations in developing testing methodologies, testing tactics checklist

UNIT VI Software Testing Techniques

Black-Box, Boundary value, Bottom-up, Branch coverage, Cause-Effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JADs, Pareto Analysis, Prototyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Thread Testing, Performance Testing, White-Box Testing

UNIT VII Software Testing Tools

Taxonomy of Testing tools, Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMetra, JUNIT and Cactus.

UNIT VIII Testing Process

Eleven Step Testing Process: Assess Project Management Development Estimate and Status, Develop Test Plan, Requirements Phase Testing, Design Phase Testing, Program Phase Testing, Execute Test and Record Results, Acceptance Test, Report test results, testing software installation, Test software changes, Evaluate Test Effectiveness.

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Testing Specialized Systems and Applications

Testing Client/Server – Web applications, Testing off the Shelf Components, Testing Security, Testing a Data Warehouse

TEXT BOOKS:

1. Effective Methods for Software Testing, 2nd Edition, William E. Perry , Second Edition, Wiley India, 2006.
2. Software Quality, Mordechai Ben-Menachem/Garry S. Marliss, Thomson Learning publication,1997.

REFERENCES:

1. Testing and Quality Assurance for Component-based Software, by Gao, Tsao and Wu, Artech House Publishers
2. Software Testing Techniques, by Bories Beizer, Second Edition, Dreamtech Press
3. Managing the Testing Process, by Rex Black, Wiley
4. Handbook of Software Quality Assurance, by G. Gordon Schulmeyer, James I.McManus, Second Edition, International Thomson Computer Press
5. Software Testing and continuous Quality Improvement, by William E.Lewis, Gunasekaran Veerapillai, Second Edition, Auerbach Publications
6. Metrics and Models for Software Quality Engineering, by Stephen H. Kan, by Pearson Education Publication

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M.Tech. II SEMESTER (CSE & CS) **Th 4** **C 4**

(9D58202) OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT I

Introduction to UML: The meaning of Object Orientation, object identity, Encapsulation, information hiding, polymorphism, generosity, importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture.

UNIT II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.
Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object diagrams.

UNIT III

Collaboration Diagrams: Terms, Concepts, depicting a message, polymorphism in collaboration diagrams, iterated messages, use of self in messages.
Sequence Diagrams: Terms, concepts, depicting asynchronous messages with/without priority, callback mechanism, broadcast messages.

UNIT IV

Basic Behavioral Modeling: Use cases, Use case Diagrams, Activity Diagrams.
Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.
Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT V

The Unified process: use case driven, architecture centric, iterative, and incremental
The Four Ps: people, project, product, and process
Use case driven process: why use case, capturing use cases, analysis, design, and implementation to realize the use cases, testing the use cases
Architecture-centric process: architecture in brief, why we need architecture, use cases and architecture, the steps to architecture, an architecture description.

UNIT VI

Iterative incremental process: iterative incremental in brief, why iterative incremental development? The iterative approach is risk driven, the generic iteration.
The Generic Iteration workflow: phases are the first division workflow, planning proceeds doing, risks affect project planning, use case prioritization, resource needed, assess the iteration and phases

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UNIT VII

Inception phase: early in the inception phase, the archetypal inception iteration workflow, execute the core workflows, requirements to test.

Elaboration Phase: elaboration phase in brief, early in the elaboration phase, the architectural elaboration iteration workflow, execute the core workflows-Requirements to test.

UNIT VIII

Construction phase: early in the construction phase, the archetypal construction iteration workflow, execute the core workflow.

Transition phase: early in the transition phase, activities in transition phase

Case Studies: Automation of a Library, Software Simulator application (2-floor elevator simulator)

TEXT BOOKS :

1 The Unified Modeling Language User Guide By Grady Booch, James Rumbaugh, Ivar Jacobson 2nd Edition, Pearson Education.

2. UML 2 Toolkit By Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado WILEY-Dreamtech India Pvt. Ltd.

3. The Unified Software Development Process By Ivar Jacobson, Grady Booch, James Rumbaugh, Pearson Education

REFERENCES:

1. Fundamentals of Object Oriented Design in UML By Meilir Page-Jones, Pearson Education
2. Object Oriented Analysis & Design By Atul Kahate, The McGraw-Hill.
3. Practical Object-Oriented Design with UML By Mark Priestley, TATA McGrawHill
4. Object Oriented Analysis & Design By Brett D McLaughlin, Gary Pollice and David West, O'REILY .
5. Object-Oriented Analysis and Design using UML By Simon Bennet, Steve McRobb and Ray Farmer, 2nd Edition, TATA McGrawHill.
6. Object-Oriented Analysis and Design with the Unified Process By John W. Satzinger, Robert B Jackson and Stephen D Burd, THOMSON Course Technology.
7. UML and C++,R.C.Lee, and W.M.Tepfenhart,PHI.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

M.Tech. II SEMESTER (CSE & CS) **Th 4** **C 4**

(9D58203) ADVANCED COMPUTER NETWORKS

UNIT I Review of Computer Networks and the Internet: What is the Internet, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones, Delay and Loss in Packet-Switched Networks, History of Computer Networking and the Internet - **Foundation of Networking Protocols:** 5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM

UNIT II Networking Devices: Multiplexers, Modems and Internet Access Devices, Switching and Routing Devices, Router Structure. **The Link Layer and Local Area Networks:** Link Layer: Introduction and Services, Error-Detection and Error-Correction techniques, Multiple Access Protocols, Link Layer Addressing, Ethernet, Interconnections: Hubs and Switches, PPP: The Point-to-Point Protocol, Link Virtualization

UNIT III Routing and Internetworking: Network–Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intradomain Routing Protocols, Interdomain Routing Protocols, Congestion Control at Network Layer. **Logical Addressing:** IPv4 Addresses, IPv6 Addresses - **Internet Protocol:** Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6 – **Multicasting Techniques and Protocols:** Basic Definitions and Techniques, Intradomain Multicast Protocols, Interdomain Multicast Protocols, Node-Level Multicast algorithms

UNIT IV

Transport and End-to-End Protocols: Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Mobile Transport Protocols, TCP Congestion Control **Application Layer:** Principles of Network Applications, The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS), P2P File Sharing, Socket Programming with TCP and UDP, Building a Simple Web Server

UNIT V Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs)

UNIT VI Optical Networks and WDM Systems: Overview of Optical Networks, Basic Optical Networking Devices, Large-Scale Optical Switches, Optical Routers, Wavelength Allocation in Networks, Case Study: An All-Optical Switch

UNIT VII VPNs, Tunneling and Overlay Networks: Virtual Private Networks (VPNs), Multiprotocol Label Switching (MPLS), Overlay Networks – **VoIP and Multimedia Networking:** Overview of IP Telephony, VoIP Signaling Protocols, Real-Time Media Transport Protocols, Distributed Multimedia Networking, Stream Control Transmission Protocol

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UNIT VIII Mobile A-Hoc Networks: Overview of Wireless Ad-Hoc Networks, Routing in Ad-Hoc Networks, Routing Protocols for Ad-Hoc Networks – **Wireless Sensor Networks:** Sensor Networks and Protocol Structures, Communication Energy Model, Clustering Protocols, Routing Protocols

TEXT BOOKS:

1. Computer Networking: A Top-Down Approach Featuring the Internet, *James F. Kurose, Keith W.Ross*, Third Edition, Pearson Education, 2007
2. Computer and Communication Networks, *Nader F. Mir*, Pearson Education, 2007

REFERENCES:

1. Data Communications and Networking, *Behrouz A. Forouzan*, Fourth Edition, Tata McGraw Hill, 2007
2. Guide to Networking Essentials, *Greg Tomsho,Ed Tittel, David Johnson,*Fifth Edition, Thomson.
3. An Engineering Approach to Computer Networking *, S.Keshav*, Pearson Education.
4. Campus Network Design Fundamentals, *Diane Teare, Catherine Paquet*, Pearson Education (CISCO Press)
5. Computer Networks, *Andrew S. Tanenbaum*, Fourth Edition, Prentice Hall.
6. The Internet and Its Protocols,A.Farrel,Elsevier.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

M.Tech. II SEMESTER (CSE & CS)	**Th**	**C**
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(9D58204) DISTRIBUTED SYSTEMS

UNIT-I Introducton Of Distributed System: Goals, Hardware Concepts, Software Concepts, the Client-Server Model.

UNIT-II Communication: Remote Procedure Call, Remote Object Invocation, Message Oriented Communication, Stream-Oriented Communication.

UNIT-III Processes: Threads, Clients, Servers, Code Migration, Software Agents.
NAMING: Naming Entities, Locating Mobile Entities.

UNIT-IV Synchronization: Clock Synchronization, Logical Clocks, Global State, Election Algorithms, Mutual Exclusion, Distributed Transactions.

UNIT-V Consistency And Replication: Introduction, Data-Centric Consistency Models, Client Centric Consistency Models, Distribution Protocols, Consistency Protocols, Examples.

UNIT-VI Fault Tolerance: Introduction to Fault Tolerance, Process Resilience, Reliable Client-Server Communication, Reliable Group Communication, Distributed Commit, Recovery.

UNIT-VII Distributed Object-Based Systems: CORBA, Distributed COM

UNIT-VIII Distributed File Systems: SUN Network File System, The CODA File System, Other Distributed File Systems, Comparison of Distributed File Systems.

Text Books

Andrew S. Tanenbaum, Maarten Van Steen. Distributed Systems – Principles and Paradigms 2/e, PHI, 2004.

REFERENCES:

1. Pradeep K. Sinha, "Distributed Operating Systems Concepts and Design", PHI 2002.
2. Randy Chow Theodore Johnson, "Distributed Operating Systems and Algorithm Analysis", PEA, 2009.
3. George Couloris, Jean Dollimore, Tim Kind berg, "Distributed Systems Concepts and Design", 3/e, PEA, 2002.

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M.Tech. II SEMESTER (CSE & CS) **Th 4** **C 4**

(9D58205) DATA WAREHOUSING AND MINING

UNIT-I:

Introduction : Data Mining, Kinds of Data, Data Mining Functionalities, Classification of Data Mining Systems, Primitives, Major Issues in Data Mining.

UNIT-II:

Data Preprocessing: Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT-III:

Data Warehouse and OLAP Technology: What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehouse to Data Mining.

UNIT-IV:

Mining Frequent Patterns and Associations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining Various Kinds of Association Rules.

UNIT-V:

Classification and Prediction: Issues regarding classification and prediction, classification by decision tree induction, Bayesian classification, Rule based classification, Prediction, Accuracy and Error Measures.

UNIT-VI:

Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density based Methods, Grid based methods, model based clustering methods, Clustering high dimensional data, Outlier analysis.

UNIT-VII:

Mining Stream, Time-Series, and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Biological Data.

UNIT-VIII:

Applications and Trends in Data Mining: Data Mining Applications, : Data Mining for Financial Data Analysis, Data Mining for the Retail Industry, Data Mining for the Telecommunication Industry, Data Mining for Biological Data Analysis, Data Mining in Other Scientific Applications, Data Mining for Intrusion Detection, Social Impacts of Data Mining.

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TEXT BOOKS:

1. Jiawei Han and Micheline Kamber, Data Mining, Concepts and Techniques, Elsevier, II Edition, 2008.

REFERENCES:

1. Margaret H Dunham, Data Mining Introductory and Advanced Topics, Pearson Education, 2e, 2006.
2. Amitesh Sinha, Data Warehousing, Thomson Learning, 2007.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

M.Tech. II SEMESTER (CSE & CS) **Th C**
4 4

ELECTIVE-II
(9D58206a) SOFTWARE ARCHITECTURE

UNIT-I: Introduction To Software Architecture
An Engineering Discipline for Software, Status of S/W Arch. Architecture Business Cycle, Where do Architectures Come from. Software Processes and the Architecture Business Cycle, Features of Good Architecture.

UNIT-II:Architecture Styles
Pipes and Filters, Data Abstraction and Object Oriented organization, Even-based Implicit Invocation, Layered Systems, Registers, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

UNIT-III:Shared Information Systems
Database Integration, Interpretation in Software Development Environments, Architectural Structures for Shared Information Systems.

UNIT-IV:Architectural Design Guidance
Guidance for User Interface Architectures, Case Study in Inter Operability: World Wide Web
.
UNIT-V:Pattern Types
Architectural Patterns, Structural Patterns, Patterns for Distribution, Patterns for Interactive Systems

.**UNIT-VI:Formal Models And Specifications**
Finalizing the Architectural of a Specific System. Architectural Style. Architectural Design Space. Case Study of an Industry Standard Computing. Infrastructure: CORBA

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UNIT-VII:Architectural Description Languages
ADL's today, capturing Architectural Information in an ADL, Application of ADL's in system Development, Choosing an ADL, Example of ADL.

UNIT-VIII: Reusing Architectural Assets Within An Organization
Creating Products and Evaluating a Product Line, Organizational Implications of a Product Line, Component Based Systems. Software Architectures in Figure: Legacy Systems. Achieving an Architecture, from Architecture to System.

TEXT BOOKS:
1. Mary Show, David Garlan, "S/W Arch. Perspective: on an Emerging Discipline", 1996, PHI.
2. Len Bass, Paul Elements, Rick Kazman, "Software Architecture in Practice", 1998, PEA.

REFERENCES:
1. Garmus, Herros, " Measuring the Software Process: A Practical Guide to Functional Measure", 1996, PHI.
2. Florac, Carleton, "Meas. Software Process: Stat. Proce. Cont. for Software process Improvemnts", 1999, PEA.
3. W.Humphery, " Introduction to Team Software Process", 2002, PEA.
4. Peters, "Software Design: Methods and Techniques", 1981, Yourdon.
5. Buschmann, " Pattern Oriented Software Architecture", 1996, Wiley.
6. Gamma et al, "Design Patterns", 1995, PEA.
7. Gamma, Shaw, "An Introduction to Software Architecture", 1995, World Scientific.
8. Shaw, gamma, "Software Architecture", 1996, PHI.

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M.Tech. II SEMESTER (CSE & CS)	**Th**	**C**
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ELECTIVE-II
(9D58206b) SOFTWARE DESIGN

UNIT-I: The Nature of Design Process What is design?, The role of the design activity, Design as a problem-solving process, Design as a 'wicked' problem.
The Software Design Process What is software?, Building models, Transferring design knowledge, Constraints upon the design process and product, Recording design decisions, Designing with others

UNIT-II: Design In The Software Development Process A context for design, Linear development processes, Incremental development processes, Economic factors, The longer term.
Design Qualities
The quality concept, Assessing design quality, Quality attributes of the design product, Assessing the design process.

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UNIT-III: Describing A Design Solution Representing abstract ideas, Design viewpoints for software, Forms of notation.

Transferring Design Knowledge

The need to share knowledge, The architecture concept, Design methods, Design Patterns, A unified interpretation.

UNIT-IV: Some Design Representations A problem of selection, Black box notations, White box notations, Development a diagram.

The Rotionale For Method

What is a software design method? The support that design methods provide, Why methods don't work miracles, Problem domains and their influence.

UNIT-V: Design Process And Design Strategies

The role of strategy in methods, Describing the design process-the D- Matrix, Design by top-down decomposition, Design by composition, Organizational influences upon design.

Design Patterns

Design by template and design reuse, The design patterns, Designing with Patterns, Patterns in the wider design context.

UNIT-VI: Stepwise Refinement The historical role of stepwise refinement, Architecture consequences, Strengths and weaknesses of the stepwise strategy.

Incremental Design

Black box to white box in stages, Prototyping, An example-DSDM.

Structured Systems Analysis And Structured Design

Origins, development and philosophy, Representation forms for SSA/SD, The SSA/SD process, The role of heuristics in SSA/SD, External forms of SSA/SD, SSA/SD: an outline
Example

UNIT-VII:Jackson Structured Programming (JSP) Some background to JSP, JSP representation forms, The JSP process, Some JSP heuristics.

Jackson System Development (JSD)

The JSD model, JSD representation forms, The JSD Process, JSD heuristics

UNIT-VIII: Design With Objects

The 'object concept', Design Practices for the object-oriented paradigm, Object-Oriented frameworks, Object-based design, Object-Oriented design.

Component-Based Design

The component concept, Designing with components, Designing components, At the extremity-COTS.

A Formal Approach to Design

The case for rigour, Model-based strategies, Property-based strategies

TEXT BOOKS:

1. Software Design, by David Budgen 2/e Pearson Education.
2. Software Design Methods for Concurrent and Real-Time Systems, 1/e Pearson Education.

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M.Tech. II SEMESTER (CSE & CS) **Th 4** **C 4**

ELECTIVE-II
(9D58206c) DESIGN PATTERNS

UNIT-I:
Review Of Formal Notations & Foundation Classes In C++
Class diagram, Object diagram, Interaction diagram Examples. List, Iterator, ListIterator, Point, Rect, coding in C++

UNIT-II:
Introduction To Design Patterns
Design Pattern Definition, Design Patterns in Small Talk MVC, Describing Design Patterns, Catalog of Design Patterns, Organizing the Catalog, Solving of Design Problems using Design Patterns, Selection of a Design Pattern, use of Design Patterns.

UNIT-III:
Designing A Document Editor: A Case Study
Design problems, Document structure, Formatting, Embellishing the User Interface, Supporting Multiple Look and Feel standards, Supporting Multiple Window Systems, User Operations, Spelling Checking and Hyphenation.

UNIT-IV:
Design Patterns Catalog
Creational Patterns, Abstract Factory, Builder, Factory Method, Prototype, Singleton. Discussion of Creational Patterns.

UNIT-V:
Structural Patterns-1 Adapter, Bridge, Composite, Decorator.

UNIT-VI:
Structural Patterns-2 & Behavioral Patterns-1
Structural patterns: Façade. Flyweight. Proxy. Discuss of Structural Patterns.
Behavioral Patterns: Chain of Responsibility Command, Interpreter.

UNIT-VII:
Behavioral Patterns-2
Iterator. Mediator. Observer. State. Strategy. Template Method. Visitor. Discussion of Behavioral Patterns.

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UNIT-VIII:

Behavioral Patterns-3

State. Strategy. Template Method. Visitor. Discussion of Behavioral Patterns. Expectations from Design Patterns.

TEXT BOOKS:

1. Gamma, Belm, Johnson, "Design Patterns: Elements of Reusable Object Oriented Software",1995, PEA.

REFERENCES:

1. Cooper, "Java Design Paterns", Pearson.
2. Horstmann, "Object Oriented Design and Pattetrns", Wiley.
3. Ali Bahrami, "Object Oriented Systems Development", 1999, MCG.
4. Larman, "Applying UML Patterns", PEA.

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M.Tech. IV SEMESTER (CSE & CS) **C**
2

(9D58401) SEMINAR

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M.Tech. IV SEMESTER (CSE & CS) **C**
16

(9D58402) PROJECT WORK

The Project Work should be on a contemporary topic relevant to the core subjects of the course. It should be original work of the candidate.

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