

II Year

II Semester

COMPUTER ORGANIZATION AND ARCHITECTURE

Subject Code: UGCS4T0120

II Year / II Semester

L T P C

3 0 0 3

Prerequisites: Familiarity with Digital Electronics.

Course Objectives: Main objective of the course is to familiarize students about hardware design including logic design, basic structure and behavior of the various functional modules of the modern computer and how they interact to provide the processing needs of the user. It will cover machine level representation of data, instruction sets, computer arithmetic, CPU structure and functions, memory system organization and architecture, system input/output, multiprocessors, and digital logic.

Syllabus:

UNIT I: (8 Lectures)

Basic Structure of Computers: Computer types, functional unit, basic operational concepts, bus structures. Performance - Processor clock, basic performance equation, Pipe line and super scalar operation, clock rate.

Register Transfer Language and Micro Operations: Register Transfer Language, Register Transfer Bus and memory transfers, Arithmetic Micro operations, logical micro operations, shift micro operations, Arithmetic logic shift unit.

UNIT II: (7 Lectures)

Basic Computer Organization and Design: Instruction codes, Computer Register, Computer Instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input-Output and Interrupt.

UNIT III: (8 Lectures)

Central Processing Unit: General Register Organization, STACK Organization, Instruction formats, Addressing modes, Data transfer and manipulation, Program control, Reduced Instruction Set Computer.

Micro Programmed Control: Control memory, Address sequencing.

UNIT IV: (8 Lectures)

Computer Arithmetic: Addition and subtraction with Signed Magnitude Data - Hardware implementation, Hardware Algorithm, Multiplication Algorithms - Hardware Implementation for Signed-Magnitude Data, Hardware Algorithm, Booth Multiplication Algorithm, Division algorithms - Hardware implementation for Signed-Magnitude data.

UNIT V: (7 Lectures)

The Memory System: Memory Hierarchy, Main memory, Auxiliary memory, Associative memory, Cache memory, Virtual memory.

UNIT VI:**(7 Lectures)**

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of transfer, Priority interrupt - Daisy Chaining Priority, Parallel Priority Interrupt, Direct memory access.

Course Outcomes:

Upon completion of this course, the students will be able to:

CO1: Demonstrate the basic structure, organization and design of a computer.

CO2: Analyze the elements in the RTL and micro operations, CPU organization and micro-programmed controlled unit.

CO3: Experiment with numerous algorithms to perform computer arithmetic and logical operations and propose suitable hardware for them.

CO4: Classify different types of memory structures and organizations.

CO5: Utilize the design characteristics of I/O organization in the modern computer.

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	3	2	3	-	-	-	-	-	-	-	-	-	-
CO3	3	3	3	3	-	-	-	-	-	-	-	-	-	-
CO4	2	3	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	2	2	-	-	-	-	-	-	-	-	-	-

TEXT BOOKS:

1. M. Moris Mano, Computer System Architecture, 3rd ed, Pearson/PHI.
2. William Stallings, Computer Organization and Architecture, 6th ed, Pearson/PHI.

REFERENCE BOOKS:

1. Andrew S. Tanenbaum, Structured Computer Organization, 4th ed. PHI/ Pearson.
2. Sivaraama Dandamudi, Fundamentals of Computer Organization and Design, Springer Int. Edition. John L.Hennessy and David A.Patterson, Computer Organization a quantitative approach, 4th ed, Elsevier.
3. B. Ram, Computer Fundamentals Architecture and Organization, 5th ed., New Age International Publications.
4. Carl Hamacher, Zvonks Vranesic, SafeaZaky, Computer Organization, 5th ed, McGraw Hill.

OPERATIONS RESEARCH

Subject Code : UGBS4T0620
II Year / II Semester

L	T	P	C
3	0	0	3

Course Objectives:

- To define an objective function and constraints function in terms of design variables and then optimization problem.
- To understand the characteristics of different types of decision-making environments and the appropriate decision making approaches.
- To study the multi objective optimization and can be generalization of linear programming
- To ensure a practical objective of simulation, we considered to be the fundamental learning objectives we expected to achieve through the simulation.

Syllabus:

UNIT I: LINEAR PROGRAMMING (12 Hrs)

Mathematical formulation of the problem, Graphical method, Simplex method, Artificial variables techniques-two-phase method, Big-M method.

UNIT II: TRANSPORTATION PROBLEM (10 Hrs)

Basic feasible solution by North-West corner method, Vogel's approximation method. Optimal solution by UV method, degeneracy, unbalanced transportation problem.

Assignment Problem: One-to-one assignment problem, optimal solution, unbalanced assignment problem.

UNIT III: SEQUENCING (10Hrs)

Introduction – Flow –Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through 'm' machines.

REPLACEMENT: Introduction , Replacement of items that deteriorate with time, when money value is not counted and counted, replacement of items that fail completely, group replacement.

UNIT IV: GAME THEORY (8Hrs)

Introduction – Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Rectangular games without saddle points – 2 X 2 games – dominance principle.

UNIT V: QUEUEING THEORY (8Hrs)

Introduction to queueing models, classification-Kendall's Notation-Single Channel – Poisson arrivals – exponential service times – with infinite population and finite population models.

UNIT VI: PERT and CPM

(10 Hrs)

Arrow (Network) Diagram representation. Rules for constructing an arrow diagram Critical path calculations, earliest start and latest completion times, Determination of critical path, determination of floats, Probability considerations in project, cost considerations in project scheduling, crashing (least cost project scheduling).

Course Outcomes:

Upon completion of this course, the students will be able to:

- CO1:** Formulate a Mathematical Model for a given problem and solve by using linear programming technique.
- CO2:** Evaluate and obtain the optimal solution of a Transportation problem.
- CO3:** Evaluate and obtain the optimal solution of a Assignment problem.
- CO4:** Make use of sequencing techniques to make effective business decisions.
- CO5:** Apply Game theory concepts to solve business problems and other competitive situations
- CO6:** Understand and apply concepts of queueing models in real time problems.
- CO7:** Develop the abilities in project evaluation techniques of Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM).

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	3	3	2	-	-	-	-	-	-	-	3	-	-
CO2	3	3	3	2	-	-	-	-	-	-	-	3	-	-
CO3	3	3	3	2	-	-	-	-	-	-	-	3	-	-
CO4	3	3	3	2	-	-	-	-	-	-	-	3	-	-
CO5	3	3	3	2	-	-	-	-	-	-	-	3	-	-
CO6	3	3	3	2	-	-	-	-	-	-	-	3	-	-
CO7	3	3	3	2	-	-	-	-	-	-	-	3	-	-

TEXT BOOKS:

1. S D Sharma, Kedar Nath, Operations Research, Ram Nath publishing.
2. R. Panner Selvam, Operations Research, PHI Learning pvt. Ltd.
3. Premkumar Gupta, DS Hira, Operartions Research, S. Chand co.

REFERENCE BOOKS:

1. H.A. Taha, "Operations Research: An Introduction", 5th Edition, Macmillan, New York.
2. S.S. Rao, "Engineering Optimization: Theory and Practice", New Age International (P)Ltd., New Delhi.
3. G. Hadley, "Linear programming", Narosa Publishing House, New Delhi.
4. K. Deb, "Optimization for Engineering Design- Algorithms and Examples", Prentice-Hall of India Pvt. Ltd., New Delhi.
5. K. Srinivasa Raju and D. Nagesh Kumar, "Multi-criterion Analysis in Engineering and Management", PHI Learning Pvt. Ltd., New Delhi, India.
6. Hillier, Frederick S. & Lieberman, "Introduction to Operations Research Concepts and Cases", 8 th Ed. TMH
7. N. D. Vohra, "Quantitative Techniques in Management", 4thEd.TMH
8. J.K. Sharma, "Operations Research Theory and Applications,4th Ed. McMillan.

DATABASE MANAGEMENT SYSTEMS

Subject Code: UGCS4T0220

II Year / II Semester

L	T	P	C
3	0	0	3

Prerequisites: Familiarity with data structures, elementary set theory, relations and functions.

Course Objectives:

This course introduces relational data model, entity-relationship modeling, SQL, normalization and database design. This course would examine transaction management, concurrency control, recovery, file organizations and indexing.

Syllabus:

UNIT I: (10 Lectures)

Introduction: Database System Applications, Database System Vs File System, View of Data - Data Abstraction, Instances and Schemas; Data Models, Database Languages - DDL, DML; Database Architecture - Storage Manager & Query Processor, Database Users and Administrator, History of database systems.

Database Design with E-R Model: Database design and ER Diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model.

UNIT II: (8 Lectures)

Relational Model: Introduction, Integrity Constraints over relations, Enforcing Integrity constraints, Querying relational data, Logical database Design, Codd's rules. **Relational Algebra:** Selection and Projection, Set operations, Renaming, Joins, Division, Examples of Algebra queries.

Basic SQL: Data types and DDL, Specifying Constraints, Insert, Delete and Update Statements, Basic Queries in SQL.

UNIT III: (7 Lectures)

Advanced SQL: More Complex SQL Queries - Comparisons involving NULL and Three-Valued Logic, Nested Queries, Tuples, and Set/Multiset Comparisons, Correlated nested Queries, Exists in SQL, Joins, Aggregate functions, Grouping, Introduction to Triggers and Views.

UNIT IV: (7 Lectures)

Schema Refinement: Problems caused by redundancy, Decompositions, Problems related to decomposition, Functional dependencies, Reasoning about FDS, Normal forms - FIRST, SECOND, THIRD Normal forms, BCNF, Properties of Decomposition-Lossless Join Decomposition, Dependency Preserving Decomposition. Multivalued dependencies, Fourth normal form.

UNIT V: (9 Lectures)

Transaction Management: The ACID Properties, Transactions and Schedules, Concurrent Execution of Transactions.

Concurrency Control: Lock Based Concurrency Control, Serializability and Recoverability, Introduction to Lock Management, Dealing with Deadlocks. Concurrency Control without Locking.

Crash Recovery: Introduction to crash recovery and ARIES algorithm.

UNIT VI:

(8 Lectures)

Overview of Indexing: File organizations and Indexing, Primary and Secondary Indexes, Index specification in SQL.

Tree Structured Indexing: Intuitions for tree Indexes, B+ Trees: Format of a Node, Search, Insert and Delete.

Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing, Extendable vs. Linear hashing.

Course Outcomes:

Upon completion of this course, the students will be able to:

CO1: Understand the database system design and its functionality.

CO2: Apply the knowledge of SQL to construct the queries for efficient data access and manipulation.

CO3: Inspect database problems and utilize the normalization theory to refine the database schema.

CO4: Analyse and solve the transaction processing issues through concurrency control and recovery mechanisms.

CO5: Examine different Indexing mechanisms for efficient data access.

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	3	-	3	-	-	-	-	-	-	-	3	-
CO3	3	3	3	3	-	-	-	-	-	-	-	-	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	3	-	3	-	-	-	-	-	-	-	-	-	-

TEXT BOOKS:

1. Silberschatz, Korth, Database System Concepts, TATA McGraw hill.
2. Raghurama Krishnan, Johannes Gehrke, Database Management Systems, 3rd Edition, TATA McGraw hill.
3. Ramez Elmasri, Shamkant B. Navathe, Database Systems : Models, Languages, Design and Application Programming, Pearson Education.

REFERENCE BOOKS:

1. C.J.Date, Introduction to Database Systems, 8th Edition, Pearson Education.
2. Peter ROB and Carlos Coronel, Database System Concepts, Cengage Learning.
3. Ramez Elmasri , Shamkant B. Navathe , Fundamentals of Database Systems, 5th Edition, Pearson Education

WEB TECHNOLOGIES

Subject Code: UGCS4T0320

II Year / II Semester

L	T	P	C
3	0	0	3

Prerequisites: Familiarity with OOPs concepts, core Java concepts and Internet.

Course Objectives: The student will be familiar with client-server architecture and able to develop a web application using HTML, JavaScript, Servlets, JSP and JDBC. Students will acquire the necessary skills and techniques needed for developing Web based Projects.

Syllabus:

UNIT I: (8 Lectures)

HTML Introduction: Elements, Attributes, Headings, Paragraphs, Styles, Text Formatting, Frames, Quotation and Citation Elements, Comments, Colors, Links, Images, tables, lists, classes and id.

HTML Forms: Form Attributes, Form Elements, Input Types, Input Attributes, Input form Attributes.

CSS: Inline, Internal and External Cascading Style Sheets.

UNIT II: (8 Lectures)

Bootstrap: Grid basics, Bootstrap Text/Typography, Tables, Images, Jumbotron, Wells, Alerts, Button groups, Glyphicons, Progress Bars, List Groups, Panels, Dropdowns, Tabs and Pills, Navigation Bar, Forms, input sizing, Media Objects, Carousel Plugin, Popover Plugin, Scrollspy Plugin.

UNIT III: (8 Lectures)

JavaScript: Variables, Operators, Functions, Control structures, Events, Objects, Form validations, Dynamic HTML with JavaScript.

Working with XML: Document type Definition, XML schemas, Document object model, XSLT, DOM and SAX.

UNIT IV: (8 Lectures)

Web Servers and Servlets: Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, and Reading Initialization parameters, The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT V: (9 Lectures)

Introduction to JSP: The Problem with Servlet, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC. **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 Data between Pages, Sharing Session and Application Data.

UNIT VI:**(8 Lectures)**

JDBC Introduction: JDBC Driver, DB connectivity steps, Connectivity with Oracle and MySQL, Access without DSN, Driver Manager, Connection, Statement, ResultSet, storing and retrieving images and files, Studying Javax.sql.* package, Accessing a Database from a Servlets and JSP Page.

Course Outcomes:

Upon completion of this course, the students will be able to:

CO 1. Develop interactive Web pages with improved GUI.

CO 2. Interpret scripting language techniques.

CO 3. Acquire knowledge on server side scripting language.

CO 4. Apply JDBC techniques to access different databases.

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	-	3	3	-	3	-	-	-	3	3	-	-	3	-
CO2	-	3	3	-	3	-	-	-	3	3	-	-	3	-
CO3	3	3	3	-	3	-	-	-	3	3	-	-	3	-
CO4	3	3	3	-	3	-	-	-	3	3	-	-	3	-

TEXT BOOKS:

1. Kogent Learning solutions, Web Technologies – Black Book, Dreamtech press.
2. Jacob Lett, Bootstrap 4 Quick Start: Responsive Web Design and Development Basics for Beginners, Bootstrap Creative.
3. Jeffrey C. Jackson, Web Technologies: A Computer Science Perspective, Pearson.

REFERENCE BOOKS:

1. Uttam K Roy , Web Technologies, Oxford.
2. Wang, Katila, An Introduction to Web Design and Programming, CENGAGE.
3. Dietel and Nieto, Internet and World Wide Web – How to program, PHI/Pearson Education Asia.
4. Wang-Thomson, An Introduction to web Design and Programming.
5. Robert W Sebesta, Programming the World Wide Web – Pearson publications, Fourth edition.
6. Godbole, Atul Kahate , Web Technologies, TCP/IP Architecture and Java programming- 2nd ed, TMH.
7. N P Gopalan, Akhilandeswari, Web Technologies, A developer's Perspective, PHI.

ENGLISH –II
(Common to All Branches)

Subject Code: UGBS4T0120
II Year / II Semester

L	T	P	C
3	0	0	3

Course Objectives:

- To make the learners master the mechanics of writing
- To help students focus on improving effective spoken English skills to enable effective communication

Syllabus:

UNIT-I: BLOOD, TOIL, TEARS AND SWEAT – Winston Churchill

One word substitutes, Précis writing; Extempore speaking.

UNIT-II: DOLLY AT THE DENTIST’S – George Bernard Shaw

Letter writing: Official and Personal letters; Phrasal verbs and idiomatic expressions.

UNIT-III: A DRAWER FULL OF HAPPINESS – Infotech English

Essay writing – Descriptive, Expository, Analytical and Narrative.

UNIT-IV: THE ROAD NOT TAKEN – Robert Frost

Preparing a Resume/ C.V.; Redundancies and clichés in writing.

UNIT-V: NOT JUST ORANGES – Isai Tobolsky

Common errors in English.

UNIT-VI: ON SHAKING HANDS – A G Gardiner

Report Writing; Information Transfer.

Course Outcomes:

Upon the completion of the course, the students will be able to:

CO1: Develop the art of writing and speaking speeches as well as writing precisely in English using 'one word substitutes'.(L3)

CO2: Make use of wit and humour in one's writings, write letters and learn to use phrasal verbs and idioms.(L3)

CO3: Find real cause for being happy and apply it in life as well as produce different essays.(L1)

CO4: Develop an attitude of taking success as well as failure equally in life, write resumes and avoid 'redundancies' & 'clichés' in writing.(L3)

CO5: Discover by observation that forget and forgive is one of the important characteristics of life, and avoid common errors in English.(L4)

CO6: Discover to understand different cultural aspects of the world on 'shaking hands', and learn to write 'short reports' & transfer data into meaningful paragraphs.(L4)

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C01	-	-	-	-	-	-	-	-	-	3	-	3	-	-
C02	-	-	-	-	-	-	-	-	-	3	-	3	-	-
C03	-	-	-	-	-	-	-	-	-	3	-	3	-	-
C04	-	-	-	-	-	-	-	-	-	3	-	3	-	-
C05	-	-	-	-	-	-	-	-	-	3	-	3	-	-
C06	-	-	-	-	-	-	-	-	-	3	-	3	-	-

TEXT BOOKS:

1. Infotech, JNTU K
2. English for Empowerment – Orient Black Swan
3. Selections from English Prose – Oxford University

REFERENCE BOOKS:

1. Fluency Development Course – Kev Nair (Kerala) (the latest edition)
2. The Official Cambridge Guide to IELTS, for Academic & General Training (with DVD-ROM), Student Book with Answers.
3. Verbal Workout – Intensive practice to boost your English Vocabulary-Educational Software Technologies
4. Immortal Speeches, compiled by Harshvardhan Dutta, Unicorn Books Pvt. Ltd., Distributors – Pustak Mahal, Delhi
5. Top Visionaries Who Changed the World – Jaico Publishing House

DATABASE MANAGEMENT SYSTEMS LAB

Subject Code: UGCS4P0420

II Year / II Semester

L	T	P	C
0	0	3	1.5

Prerequisites: Basic knowledge in Programming.

Course Objectives:

The objective of the DBMS lab is to understand the practical applicability of database management system concepts. The students also learn how to design the database and apply various operations on it.

List of Experiments:

Experiment 1: Working with ER Diagrams

Example: ER Diagram for Sailors Database

Entities:

1. Sailors
2. Boats

Relationship: Reserves

Primary Key Attributes:

1. SID (Sailors Entity)
2. BID (Boats Entity)

Experiment 2: Working with DDL, DML, DCL and Key Constraints

Creating, Altering and Dropping of Tables and Inserting Rows into a Table (Use Constraints while Creating Tables), Examples using Select command.

Experiment 3: Working with Queries and Nested Queries

Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION and INTERSECT.

Experiment 4: Working with Queries using Aggregate Operators & Views

Queries using Aggregate Operators (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING, Creation and Dropping of Views.

Experiment 5: Working with different types of Functions

Queries using Conversion Functions (to_char, to_number and to_date), String Functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), Date Functions (Sysdate, next_day, add_months, last_day, months_between), Numerical Functions(least, greatest, trunc, round).

Experiment 6: Working with Loops using PL/SQL

Develop programs using LOOP, WHILE and FOR loops and Nested loops.

Experiment 7: Working with Triggers using PL/SQL

Develop programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.

Experiment 8: Working with Procedures using PL/SQL

Develop programs using Procedures, passing Parameters IN and OUT of Procedures.

Experiment 9: Working with Functions using PL/SQL

Develop programs using Functions and invoke Functions in SQL statements.

Experiment 10: Working with Exception Handling using PL/SQL

Develop programs using ERROR handling, BUILT-IN Exceptions, USER defined Exceptions and RAISE_APPLICATION_ERROR.

Experiment 11: Working with Cursors using PL/SQL

Develop programs using Cursors, parameters in a Cursor, FOR UPDATE Cursor, WHERE CURRENT OF clause and Cursor variables.

Course Outcomes:

Upon completion of this course, the students will be able to:

- CO 1.** Demonstrate the database design using ER Diagrams.
- CO 2.** Develop SQL Queries to manipulate the data in the database.
- CO 3.** Apply Procedural Language constructs to execute a block of SQL statements.
- CO 4.** Inspect and handle errors using exception handling mechanism.

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	-	3	-	3	-	-	-	3	3	-	-	3	-
CO2	3	3	3	-	3	-	-	-	3	3	-	-	3	-
CO3	3	3	3	-	3	-	-	-	3	3	-	-	3	-
CO4	3	3	3	3	3	-	-	-	3	3	-	-	3	-

TEXT BOOKS:

1. Benjamin Rosenzweig, Elena Silvestrova Rakhimov, Oracle PL/SQL by Example, 3rd Edition, Pearson Education.
2. Scott Urman, Ron Hardman, Michael McLaughlin, Oracle Database 10G PL/SQL Programming, Tata Mc-Graw Hill.
3. Dr .P.S. Deshpande, SQL and PL/SQL for Oracle 11g, Black Book.

OBJECT ORIENTED ANALYSIS AND DESIGN LAB

Subject Code: UGCS4P0520

II Year / II Semester

L T P C

0 0 3 1.5

Prerequisites: Basic understanding of Software Engineering and Object Oriented Programming paradigms.

Course Objectives: The focus of the course is to give basic knowledge on the concepts of Object Oriented Analysis & Design and provide deep insight into the importance of Modeling in Software Development Life Cycle. It will facilitate the students to learn Unified Modeling Language that enables to create UML Diagrams to visualize, specify, construct, and document the artifacts of a real world software intensive system in Multiple Views.

List of Case Studies:

- 1) Online Reservation System
- 2) Banking System
- 3) Student Marks Analysis System
- 4) Library Management System
- 5) Real-time Scheduler

List of Experiments:

- 1) Draw Use case diagrams for above case studies.
- 2) Draw Class diagrams for above case studies.
- 3) Draw Object diagrams for above case studies.
- 4) Draw Sequence diagrams for above case studies.
- 5) Draw Collaboration diagrams for above case studies.
- 6) Draw Activity diagrams for above case studies.
- 7) Draw State chart diagrams for above case studies.
- 8) Draw Component diagrams for above case studies.
- 9) Draw Deployment diagrams for above case studies.

Course Outcomes:

Upon completion of this course, the students will be able to:

CO 1. Interpret software requirements of various real-time applications.

CO 2. Construct structural elements of the application in terms of object-oriented-design.

CO 3. Classify the modelling of interaction diagrams of the application to represent functionalities of a software system.

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	3	3	-	3	-	-	-	3	3	-	3	-	-
CO2	3	3	3	-	3	-	-	-	3	3	-	3	-	-
CO3	3	3	3	-	3	-	-	-	3	3	-	3	-	-

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobso, The Unified Modeling Language User Guide, Pearson Education.

REFERENCE BOOKS:

1. Meilir Page-Jones, Fundamentals of Object-oriented Design in UML, Pearson Education.
2. Martina Seidl, Marion Scholz, Christian Huemer, Gerti Kappel, UML@Classroom - An introduction to Object-Oriented Modeling, Springer.

WEB TECHNOLOGIES LAB

Subject Code: UGCS4P0620

II Year / II Semester

L	T	P	C
0	0	3	1.5

Prerequisites: Familiarity with OOPs concepts, core Java concepts and Internet.

Course Objectives: The students will learn to develop web applications using the technologies HTML, Bootstrap, JavaScript, XML, Servlets, JSP and JDBC.

List Of Experiments:

Week-1:

Design the following static web pages required for an online book store website.

1) HOME PAGE:

The static home page must contain three **frames**.

Top frame : Logo and the website name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame: At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link "**CSE**" the catalogue for **CSE** Books should be displayed in the Right frame.

Right frame: The pages to the links in the left frame must be loaded here. Initially this page contains description of the website.

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Website			

2) LOGIN PAGE:

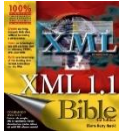

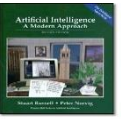





This page looks like below:

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE Civil	<div>Login : <input type="text"/></div> <div>Password: <input type="password"/></div> <div><input type="button" value="Submit"/> <input type="button" value="Reset"/></div>			

3) CATALOGUE PAGE:

The catalogue page should contain the details of all the books available in the Website in a table. The details should contain the following:

1. Snapshot of Cover Page
2. Book Name
3. Author Name
4. Publisher
5. Price
6. Add to cart button

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
CSE		Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	
ECE		Book : AI Author : S.Russell Publication : Princeton hall	\$ 63	
EEE				
CIVIL		Book : Java 2 Author : Watson Publication: BPB Publications	\$ 35.5	
		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	

Note: Week 2 contains the remaining pages and their description.

Week-2:

4) CART PAGE:

The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
CSE	Book name	Price	Quantity	Amount
ECE	Java 2	\$35.0	2	\$70
EEE	XML bible	\$40.5	1	\$40.5
CIVIL	Total Amount -			\$110.5

5) REGISTRATION PAGE:

Create registration form with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)

Week-3:

Design a web page using **CSS (Cascading Style Sheets)** which includes the following:

1) Use different font, styles:

In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles.

For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red. font-size:22px. font-family:arial. text-
decoration:underline}
</style>
</HEAD>
<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}
For example:
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a> <br>
<a href="mypage.htm" class="hlink">HELP LINK</a> </b>
</body>
</html>
<b class="headline">This is headline style bold</b> </BODY>
</HTML>
```

2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif).}
```

3) Control the repetition of the image with the background-repeat property. As background-repeat tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

4) Define styles for links as

A:link
A:visited
A:active
A:hover

Example:

```
<style type="text/css">  
A:link {text-decoration: none}  
A:visited {text-decoration: none}  
A:active {text-decoration: none}  
A:hover {text-decoration: underline. color: red.} </style>
```

5) Work with layers:

For example:

LAYER 1 ON TOP:

```
<div style="position: relative. font-size:50px. z-index:2.">LAYER 1</div> <div  
style="position: relative. top:-50. left:5. color: red. font-size:80px.z-index:1">LAYER  
2</div>
```

LAYER 2 ON TOP:

```
<div style="position: relative. font-size:50px. z-index:3.">LAYER 1</div> <div  
style="position: relative. top:-50. left:5. color: red. font-size:80px.z-index:4">LAYER  
2</div>
```

6) Add a customized cursor:

Selector {cursor:value}

For example:

```
<html>  
<head>  
<style type="text/css">  
.xlink {cursor:crosshair}  
.hlink{cursor:help}  
</style>  
</head>  
  
<body>  
<b>  
<a href="mypage.htm" class="xlink">CROSS LINK</a> <br>  
<a href="mypage.htm" class="hlink">HELP LINK</a> </b>  
</body>  
</html>
```

WEEK 4:

VALIDATION:

Write JavaScript to validate the following fields of the above registration page.

1. Name (Name should contains alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

Week-5:

Write an XML file which will display the Book information which includes the following:

- 1)Title of the book
- 2)Author Name
- 3)ISBN number
- 4)Publisher name
- 5)Edition
- 6)Price

Write a Document Type Definition (DTD) to validate the above XML file.

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.

Hint: You can use some xml editors like XML-spy.

Week-6:

Design a static web page and make the screen responsive using bootstrap.

Week-7:

1. Install TOMCAT web server and APACHE.

While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

2. Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root. Access the pages by using the urls : <http://localhost:4040/rama/books.html> (for tomcat)

Week-8:

User Authentication:

Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.

2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies. If he is a valid user (i.e., user-name and password match) you should welcome him by name(user-name) else you should display " You are not an authenticate Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

Week-9:

Install a database (Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number (these should hold the data from the registration form).

Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

Week-10:

Write a JSP which does the following job:

Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to week8 instead of cookies).

Week-11:

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount) of each category. Modify your catalogue page (week 2) in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

Course Outcomes:

Upon completion of this course, the students will be able to:

CO 1. Analyze and apply the scripting languages for developing web applications.

CO 2. Create dynamic web applications using server side scripting programs.

CO 3. Design database connectivity for different data sources.

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	-	3	3	-	3	-	-	3	3	3	3	-	3	-
CO2	-	3	3	-	3	-	-	3	3	3	3	-	3	-
CO3	-	3	3	-	3	-	-	3	3	3	3	-	3	-

TEXT BOOKS:

1. Achyut S Godbole and Atul Kahate, "Web Technologies", Second Edition, Tata McGraw Hill.
2. HTML 5, Black Book, Dreamtech Press.
3. Jacob Lett, Bootstrap 4 Quick Start: Responsive Web Design and Development Basics for Beginners, Bootstrap Creative.
4. Herbert Schildt , The Complete Reference Java, 7th edition, Tata McGraw Hill.
5. Hans Bergsten, Java Server Pages, SPD O'Reilly.

REFERENCE BOOKS:

1. David Flanagan, "JavaScript: The Definitive Guide, Sixth Edition", O'Reilly Media.
2. Chris Bates , Web Programming , building internet applications, 2nd edition, Wiley Dreamtech.
3. Beginning PHP and MySQL: From Novice to Professional, Fourth Edition, Dreamtech Press.

JULIA PROGRAMMING

Subject Code: UGCS4K0720

II Year / II Semester

L	T	P	C
1	0	2	2

Prerequisites: Familiarity with programming language constructs of C and Python.

Course Objectives:

This course teaches the best features of mathematics, engineering, and natural science by Using Julia Programming. While it is a general-purpose language and can be used to write any application, many of its features are well suited for numerical analysis and computational science.

Syllabus:

Introduction to Julia: The Way of the Program, what is a Program, Running Julia, The First Program, Arithmetic Operators, Values and Types.

Variables, Expressions and Statements: Assignment Statements, Variables Names, Expressions and Statements.

Functions: Basic Function Definitions and Uses, Flow of Execution, Parameters and Arguments.

Interface Design: Turtles, Simple repetition, Exercises, Encapsulation, Generalization, Interface Design, Conditionals and Recursion

Strings, Arrays, Map, Filter and Reduce.

Dictionaries, Tuples: Arrays and Tuples, Dictionaries and Tuples.

Experiments:

1. Program to print a string on the screen.
2. Program to demonstrate Assignment Statements.
3. Program to use Variable names, Expressions and Script Mode.
4. Program to demonstrate Math Functions.
5. Program to use a Simple Function.
6. Program to add User Defined Functions.
7. Program to use Fruitful Functions and Void Functions.
8. Programs on repetition.
9. Program to demonstrate Encapsulation.
10. Program to use Generalization.
11. Program to design an Interface
12. Programs to demonstrate Floor Division, Modulus Division and Boolean Expressions.
13. Programs on Logical Operators.

14. Programs on Conditional Expressions.
15. Program to demonstrate Recursion.
16. Programs to demonstrate Input and Output.
17. Program to demonstrate While, break and Continue.
18. Programs on String Basics.
19. Programs on String Converting and Formatting.
20. Programs on String Manipulations.
21. Programs to demonstrate Arrays and its manipulations.
22. Programs to demonstrate Dictionaries.
23. Programs to demonstrate Tuples.

Course Outcomes:

Upon completion of this course, the students will be able to:

CO 1. Implement the basic programming constructs using Julia.

CO 2. Apply the concepts multiple dispatch and Dynamic programming.

CO 3. Develop applications by using concepts of arrays, strings and Dictionaries.

Mapping of COs to POs:

POs/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	3	3	-	-	-	-	3	3	-	-	3	3	-
CO2	3	3	3	-	-	-	-	3	3	-	-	3	3	-
CO3	3	3	3	-	-	-	-	3	3	-	-	3	3	-

TEXT BOOKS:

1. Ben Lauwens, Allen Downey, "Think Julia: How to Think Like a Computer Scientist", 1st Edition, O'reilly
2. Malcolm Sherrington, "Mastering Julia 1.0", 1st Edition, Packt.

REFERENCE BOOKS:

1. Sandeep Nagar, "Beginning Julia Programming" : For Engineers and Scientists, 1st Edition, Apress.