K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE

Department of Master of Computer Applications

FIRST SEMESTER SYLLABUS

Course: Programming and Problem-Solving in C		Semester	I
Course Code	**25MMC101**	CIE Marks	50
Teaching Hours/Week (L:P:T)	3:2:0	SEE Marks	50
Total Hours of Pedagogy	40(Theory)+10(Lab)	Total Marks	100
Credits	04	Exam Hours	03
Examination type (SEE)	**Theory**		

Course Learning objectives:

1. Implement the constructs of C Language.
2. Construct C Programs using basic programming constructs
3. Develop C programs using arrays and strings
4. Organize modular applications in C using functions
5. Integrate pointers and structures in C applications and Execute input/output and file handling in C

Module-1

BASICS OF C PROGRAMMING Introduction to programming paradigms Applications of C Language - Structure of C program - C programming: Data Types - Constants – Enumeration Constants - Keywords Operators: Precedence and Associativity - Expressions – Input / Output statements, Assignment statements Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

Number of Hours:8

Module-2

ARRAYS AND STRINGS Introduction to Arrays: Declaration, Initialization – One dimensional array – Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

Number of Hours:8

Module-3

FUNCTIONS AND POINTERS Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) Recursion, Binary Search using recursive functions –Pointers Pointer operators Pointer arithmetic Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

Number of Hours:8

Module-4

STRUCTURES AND UNION Structure -Nested structures–Pointer and Structures –Array of Structures Self-referential structures dynamic memory allocation - Singly linked list typedef Union-Storage classes and Visibility

Number of Hours:8

Module-5

FILE PROCESSING Files Types of file processing: Sequential access, Random access Sequential access file - Random access file - Command line arguments.

Number of Hours:8

SL No	Experiments
1	Simulation of a Simple Calculator.
2	An electricity board charges the following rates for the use of electricity: for the first 200 units 80 paise per unit for the next 100 units 90 paise per unit: beyond 300 units Rs 1 per unit. All users are charged a minimum of R 100 as meter charge. If the total amount is more than Rs 400, then an additional surcharge of 15% of total amount is charged. Write a program to read the name of the user, number of units consumed and print out the charges.
3	Implement Binary Search & Linear Search on Integers
4	Sort the given set of N numbers using Bubble sort.
5	Implement Matrix multiplication and validate the rules of multiplication.
6	Write functions to implement string operations such as compare, concatenate, and find string length. Use the parameter passing techniques.
7	Implement using functions to check whether the given number is prime and display appropriate messages. (No built-in math function)
8	Develop a program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of n real numbers
9	Implement structures to read, write and compute average- marks of the students, list the students scoring above and below the average marks for a class of N students.
10	Write a C program to copy a text file to another, read both the input file name and target file name.

Course outcome (Course Skill Set):

At the end of the course the student will be able to:

CO1: Develop simple applications in C using basic constructs

CO2: Design and implement applications using arrays and strings

CO3: Develop and implement modular applications in C using functions and pointers.

CO4: Develop and implement applications in c using structures

CO5: Develop applications in C using files.

Suggested Learning Resources:

TEXT BOOKS:

1. Reema Thareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie, D.M, "The C Programming language", Second Edition ,Pearson Education, 2015.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eight edition Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottried, "Schaum's Outline of Theory and Problems of Programming with McGraw-Hill Education, 1996.
4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second 5. Edition. Oxford University Press, 2013. Pearson Education, 2013
5. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition.

Teaching-Learning Process (Innovative Delivery Methods)

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes.

1. Lectures with PowerPoint presentations, Interactive discussions and problem-solving sessions, Assignments and quizzes for assessment

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

CIE for the theory component of IPCC

1.Three Tests each of 25 Marks (scaled down to 25)

2.Two assignments each of 10 Marks/One Skill Development Activity of 20 marks (scaled down to 5 marks)

3. Total Marks of three tests and two assignments/one Skill Development Activity added will be CIE for 30 marks.

CIE for the practical component of IPCC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The 10 marks are for conducting the experiment and preparation of the laboratory record,
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks.
- The Two laboratory test at the end /after completion of all the experiments shall be conducted for 50 marks. The test marks will be scaled down to 10 marks. Sum of Observation and Lab test will be the CIE marks for the laboratory component of IPCC for 20 marks.

SEE for IPCC

- The question paper will be set for 100 marks and marks scored will be scaled down proportionately to 50 marks.
- The question paper will have 2 Parts: Part A and Part B. In part B, each question is set for16 marks.
- There will be 2 questions from each module in Part A. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.
- The students have to answer 5 full questions in Part B, selecting one full question from each module.

The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper shall include questions from the practical component).

- The minimum marks to be secured in CIE to appear for SEE shall be the 15 (50% of maximum marks-30) in the theory component and 10 (50% of maximum marks -20) in the practical component. The laboratory component of the IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 04/05 questions to be set from the practical component of IPCC, the total marks of all questions should not be more than the 20 marks.
- SEE will be conducted for 100 marks and students shall secure 40% of the maximum marks to qualify in the SEE. Marks secured will be scaled down to 50. (Student has to secure an aggregate of 50% of maximum marks of the course (CIE+SEE)

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Department of Master of Computer Applications

FIRST SEMESTER SYLLABUS

Course: Mathematical Foundation for Computer Applications		Semester	I
Course Code	**25MMC102**	CIE Marks	50
Teaching Hours/Week (L:P:T)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Examination type (SEE)	**Theory**		

Course Learning objectives:

1. Apply basic concepts of mathematical logic for analyzing propositions and proving theorems.
2. Apply sets and their operations algebraically to solve real-world problems.
3. Examine the basics of graph theory and their various properties.
4. Apply Probability Theory to solve computational problems.
5. Analyze real-world applications using statistical methods.

Module-1

Basic Structures: Sets: Basic definitions, Venn diagrams and set operations, Laws of set theory, Principle of inclusion and exclusion and Pigeonhole principle

Relations: Properties of relations, Matrices of relations, Equivalence relations and partitions

Functions and Matrices: Injective, subjective and bijective, Function compositions and Inverse functions and Eigenvalues and Eigenvectors.

Number of Hours:8

Module-2

Logic: Basic connectivity and Truth table, Logical equivalence, logical implications, Quantifiers – Predicates: Predicative logic, Free and Bound variables, Rules of inference, Consistency. Proofs of theorems-direct, indirect, and proof by contradiction.

. **Number of Hours:8**

Module-3

Statistics and Probability theory:

Curve fitting by method of least squares, fitting of curves – polynomial, (exponential, power function). Correlation and linear regression analysis. Basic concepts of probability, conditional probability, Baye's theorem.

Number of Hours:8

Module-4

Probability Distributions: Random variables- discrete and continuous, probability mass function, probability density function, and cumulative density function. Binomial distribution, Poisson distribution, Exponential distribution, and Normal distribution.

Number of Hours:8

Module-5

Graph Theory: Definition and examples of graphs, properties of a graph, sub graphs, regular graphs, bipartite graphs, paths and cycles, operations on graphs (union, intersection, Cartesian product), isomorphism of graphs. Eulerian graphs, Hamiltonian graphs, directed graphs, in degrees and out degrees in digraphs. Travelling salesman problem.

Number of Hours:8

Course outcome (Course Skill Set):

At the end of the course the student will be able to:

CO1: Make use of sets and its operations for solving real world problems.

CO2: Make use of basic concepts of mathematical logic for solving propositions

CO3: Apply Probability Theory to solve computational problems

CO4: Apply a variety of statistical methods to address real-world problems.

CO5: Apply concepts of graph theory to solve real world problems

Suggested Learning Resources:

Text Books:

1. Kenneth H Rosen, "Discrete Mathematics & its Applications", Mc Graw Hill publications 7th edition.
2. Narsingh Deo, Graph theory with the applications to engineering & Computer Science, Dovers Publications, 2016
3. J.A. Bondy and U.S.R. Murty. Graph theory with Applications, Springer, 1 st edition, 2008

References Books

1. J.K Sharma "Discrete Mathemathics', Mac Millan Publishers India, 3rd edition, 2011.
2. Garry Chartand and Ping Zhang, Introduction to Graph Theory, Tata McGraw-Hill, 2006.
3. Frank Harary, Graph Theory, Narosa Publishing House, Latest edition.
4. Theory and Problems of Probability, Seymour Lipschutz and Marc lars Lipson, 2 nd Edition Schaum's Outline Series, ISBN: 0-07-118356-6.

Web links and Video Lectures (e-Resources):

1. https://archive.nptel.ac.in/courses/111/106/111106086/
2. https://onlinecourses.nptel.ac.in/noc20_cs82/preview

Teaching-Learning Process (Innovative Delivery Methods)

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes.

1. Lectures with PowerPoint presentations, Interactive discussions and problem-solving sessions, Assignments and quizzes for assessment.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Three Unit Tests each of 25 Marks (scale down to 25 Marks)
2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs which will be scale down to 25 marks.

The sum of **three**-unit tests, two assignments/Skill Development Activities (CIE), will be 50 marks.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper consists of Part A and Part B. Part A consists of 10 questions from 5 modules, each carrying 2 marks.

3. Part B consists of 10 questions. Each full question is for 16 marks. There will be two full questions (with a maximum of three sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

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FIRST SEMESTER SYLLABUS

Course: Database Management Systems (DBMS)		Semester	I
Course Code	**25MMC103**	CIE Marks	50
Teaching Hours/Week (L:P:T)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Examination type (SEE)	**Theory**		

Course Objectives (Course Skill Set)

- Analyze the basic concepts and the applications of database systems.
- Evaluate the different issues involved in the design and implementation of Database System.
- Explain the basic concepts of relational data model, entity relationship model, relational database design, relational algebra and database language SQL and Postgre SQL.
- Design and build a simple database system and demonstrate competence with the fundamental tasks involved with modelling, designing, and implementing a DBMS.

Module-1

Introduction: Purpose of Database System, Views of data, data models, database management system, three- schema architecture of DBMS, components of DBMS. E/R Model - Conceptual data modelling - motivation, entities, entity types, attributes relationships, relationship types, E/R diagram notation, examples.

Data Models: Introduction to the Relational Model – Structure – Database Schema, Keys – Schema Diagrams. Database design Other Models, ER diagrams ER Model - Entities, Attributes and Entity sets Relationships and Relationship sets – ER Design Issues – Concept Design – Conceptual Design with relevant Examples. Relational Query Languages, Relational Operations.

Number of Hours:8

Module-2

Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple Relational Calculus (TRC) – Domain relational calculus (DRC).

Overview of the SQL Query Language – Basic Structure of SQL Queries, Data types, Creating a database, create a table, drop the database, drop table, select table, insert a record, update record, delete a record, order by, group by, triggers, Set Operations, Aggregate Functions , Windows functions, Nested Sub queries, Views, Procedures.

Number of Hours:8

Module-3

Normalization – Introduction, Non loss decomposition and functional dependencies, First, Second, and third normal forms – dependency preservation, Boyce/Codd normal form.

Higher Normal Forms - Introduction, Multi-valued dependencies and Fourth normal form, Join dependencies and Fifth normal form.

Number of Hours:8

Module-4

Transaction Concept- Transaction State- Implementation of Atomicity and Durability Concurrent Executions Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols Multiple Granularity.

Recovery and Atomicity Log Based Recovery, Recovery with Concurrent Transactions Check Points - Buffer Management Failure with loss of nonvolatile storage.

Number of Hours:8

Module-5

NOSQL Databases and Big Data Storage Systems: Introduction to NOSQL Systems, The CAP Theorem, Document- Based NOSQL Systems and MongoDB, NOSQL Key-Value Stores, Column-Based or Wide Column NOSQL Systems, NOSQL Graph Databases and Neo4. CRUD Operations.

Number of Hours:8

Course outcome (Course Skill Set)

At the end of the course, the student will be able to:

CO1: Demonstrate the basic elements of a relational database management system and identify the data models for relevant problems.

CO2: Design and convert entity relationship diagrams into Schema and formulate SQL queries on the respect data.

CO3: Analyze the database design and justify the same using normalization

CO4: Apply the principles of database transaction management to real world applications.

CO5: Apply NoSQL database models to design and implement solutions for unstructured data.

Suggested Learning Resources:

Books (Name of the author/Title of the Book/Name of the publisher/Edition and Year) Text Books:

1. Fundamentals of Database Systems, Elmasri and Navathe, 7th Edition, 2011, Pearson Education, ISBN-13: 978-0136086208
2. Database System Concepts, Silberschatz, Korth, Mc Graw hill, 7th edition.
3. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition.

Reference Books:

1. An Introduction to Database systems, C.J. Date, A. Kannan, S. Swami Nadhan, Pearson, Eight Edition.
2. Rob, Coronel, "Database Systems', Seventh Edition, and Cengage Learning.
3. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.
4. Oracle for Professionals, the X Team, S. Shah and V. Shah, SPD.

Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL,Shah, PHI.

Web links and Video Lectures (e-Resources):

- dev.mysql.com
- Www. Postgressql.org.
- https://www.w3schools.com/mysql/mysql_rdbms.asp
- https://www.w3schools.in/dbms/intro

Teaching-Learning Process (Innovative Delivery Methods)

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes.

Lectures with theoretical concepts and principles, PowerPoint presentations, Hands-on labs, Mini-projects, Assignments and quizzes for assessment.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Three Unit Tests each of 25 Marks (scale down to 25 Marks)
2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs which will be scaled down to 25 marks.

The sum of **three**-unit tests, two assignments/Skill Development Activities (CIE), will be 50 marks.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper consists of Part A and Part B. Part A consists of 10 questions from 5 modules, each carrying 2 marks.
3. Part B consists of 10 questions. Each full question is for 16 marks. There will be two full questions (with a maximum of three sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

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FIRST SEMESTER SYLLABUS

Course: Operating System		Semester	I
Course Code	**25MMC104**	CIE Marks	50
Teaching Hours/Week (L:P:T)	2:0:2	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Examination type (SEE)	**Theory**		

Course Learning objectives:

- Explain the need and services of the operating system
- Explore how the operating system handles processes and manages memory.

Module-1

Introduction to Operating Systems: System Structure What operating systems do, Operating System Operations, Computing Environments, Operating System Services, System Calls, Types of System Calls, System Programs, Operating System Structure, System Boot Process Concept, Process Scheduling, Inter process Communication, Introduction to DevOps.

Number of Hours:8

Module-2

Process Scheduling Basic Concepts: Scheduling Criteria, Scheduling Algorithms, Synchronization Background, The Critical Section Problem, Mutex Locks, Semaphores, Classic Problems of Synchronization: Readers-Writers Problem, Dining Philosophers Problem using Semaphores

Number of Hours:8

Module-3

Deadlocks: System model, Deadlock Characterization, Methods for handling deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock

Number of Hours:8

Module-4

Memory Management Strategies: Basic Hardware, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Virtual Memory Management Background, Demand Paging, Page Replacement

Number of Hours:8

Module-5

File System File concept: Access methods, Directory overview Implementing File System Allocation methods, Free Space Management

Number of Hours:8

Course outcome (Course Skill Set)

At the end of the course the student will be able to

CO1: Apply the concepts of operating system elements and functionalities to solve real world problems

CO2: Apply scheduling algorithms to solve real world problems.

CO3: Examine and compare different memory management strategies.

CO4: Apply the techniques of process management and demonstrate process Synchronization deadlock handling.
CO5: Examine and compare different file system allocation strategies.

Suggested Learning Resources:

Text Books

- Abraham Silberschatz, Peter Baer Galvin, Greg Gagne: Operating Systems Principles, 10th Edition, Wiley – India, 2019.

Reference Books:

1. D M Dhamdhere: Operating Systems A Concept Based Approach, 3rd Edition, Tata McGraw Hill, 2017.
2. Harvey M Deitel: Operating Systems, 3rdEdition, Addison Wesley, 1990.

Web links and Video Lectures (e-Resources):

1. .https://www.google.com/search?q=Abraham+Silberschatz%2C+Peter+Baer+Galvin%2C+Greg+Gagne%3A+Operating+Systems+Principles%2C+10th+Edition%2C+Wiley+%E2%80%93+India%2C+2019.&oq=Abraham+Silberschatz%2C+Peter+Baer+Galvin%2C+Greg+Gagne%3A+Operating+Systems+Principles%2C+10th+Edition%2C+Wiley+%E2%80%93+India%2C+2019.&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBCDEw OTJqMGo3qAIAsAIA&sourceid=chrome&ie=UTF
2. https://www.youtube.com/results?search_query=Harvey+M+Deital%3A+Operating+Systems%2C+3rdEdition%2C+Addison+Wesley%2C+199

Teaching-Learning Process (Innovative Delivery Methods)

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching-learning process and facilitate the achievement of course outcomes.

1. Lectures with PowerPoint presentations, Interactive discussions and problem-solving sessions, Assignments and quizzes for assessment.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Three Unit Tests each of 25 Marks (scale down to 25 Marks)
2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs which will be scale down to 25 marks.

The sum of **three**-unit tests, two assignments/Skill Development Activities (CIE), will be 50 marks.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper consists of Part A and Part B. Part A consists of 10 questions from 5 modules, each carrying 2 marks.
3. Part B consists of 10 questions. Each full question is for 16 marks. There will be two full questions (with a maximum of three sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module.

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FIRST SEMESTER SYLLABUS

Course : Web Application Development		Semester	I
Course Code	**25MMC105**	CIE Marks	50
Teaching Hours/Week (L:P:T)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Examination type (SEE)	**Theory**		

Course Objectives (Course Skill Set)

1. To understand the fundamental concepts and technologies of web application development.
2. To gain proficiency in front-end and back-end web development.
3. To learn and apply modern web frameworks and libraries.
4. To develop skills in creating responsive and dynamic web applications.
5. To prepare students for industry roles requiring expertise in Web development.

Module-1

Introduction to Web Development and HTML5:

Web Development Basics: Introduction to web technologies and protocols, Client-server architecture, Overview of front-end and back-end development, Basic syntax and structure, text markups, images, lists, tables.

HTML5 Fundamentals: HTML5 elements and attributes, Semantic HTML5 tags, Forms and input types, Multimedia elements (audio, video)

Advanced HTML5: Canvas and SVG for graphics, HTML5 APIs (Geolocation, Web Storage, WebWorkers), Offline web applications using AppCache. **Number of Hours:8**

Module-2

CSS3 and Responsive Web Design:

CSS3 Basics: Introduction to CSS3, Selectors, properties, and values, Box model, layout, and positioning, Flexbox and Grid layouts.

Responsive Web Design: Media queries, Responsive design principles, Fluid grids and flexible images, Mobile-first design approach.

CSS Frameworks: Introduction to Bootstrap, Bootstrap components and utilities, Customizing Bootstrap with Sass. **Number of Hours:8**

Module-3

JavaScript and DOM Manipulation:

JavaScript Basics: Introduction to JavaScript, Variables, data types, and operators, Control structures (if- else, loops), Functions and scope

Document Object Model (DOM): DOM structure and manipulation, Event handling and event listeners, Creating and modifying DOM elements, Form validation using JavaScript

Advanced JavaScript: Asynchronous JavaScript (callbacks, promises, async/await), AJAX and Fetch API, Introduction to JavaScript libraries (e.g., jQuery).

Number of Hours:8

Module-4

Front-End Frameworks and AngularJS:

Introduction to Front-End Frameworks: Importance of front-end frameworks, Overview of popular frameworks (React, Angular, Vue)

AngularJS Basics: Introduction to AngularJS, Modules, controllers, and scope, Directives, expressions, and filters

Advanced AngularJS: Services and dependency injection, Routing and single-page applications (SPAs), Data binding and form handling, Custom directives and components.

Number of Hours:8

Module-5

Back-End Integration and Deployment:

Back-End Development: Introduction to server-side programming, Overview of server-side languages (Node.js, PHP, Python), RESTful web services and APIs, Database integration (SQL, NoSQL)

Full-Stack Development: Integrating front-end and back-end technologies, Developing full-stack web applications, Case studies on full-stack applications

Deployment and Security: Web application deployment (cloud platforms, hosting services), Security best practices for web applications, Authentication and authorization, Performance optimization.

Number of Hours:8

Course outcome (Course Skill Set)

At the end of the course, the student will be able to:

CO1: Build an understanding of web technologies and protocols.

CO2: Make use of html5, CSS3, java script to develop web applications.

CO3: Apply responsive design principles to develop web applications.

CO4: Construct dynamic web applications using angular java script.

CO5: Integrate front-end and back-end technologies to construct full stack web applications.

Suggested Learning Resources:

1. Web Programming By Chris Bates , Wiley Publications
2. HTML5 Black Book by Dreamtech
3. Angular JS By Krishna Rungta
4. Bootstrap essentials by Snig by Packt-open source.

Teaching-Learning Process (Innovative Delivery Methods)

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes**.**

Teaching Learning Process:

1. Lectures with PowerPoint presentations, Hands-on coding exercises in HTML5, Interactive discussions and problem-solving sessions, Assignments and quizzes for assessment.
2. Practical sessions on CSS3 and responsive design, Interactive coding exercises to implement responsive layouts, Group projects on developing responsive web pages, Continuous assessment through quizzes and assignments.
3. Lab exercises on JavaScript and DOM manipulation, Practical coding sessions with real-time problem-solving, Group projects on creating interactive web applications, Continuous assessment through quizzes and coding challenges.

4. Practical sessions on AngularJS basics and advanced topics, Interactive coding exercises to build AngularJS applications, Group projects on developing single-page applications, Continuous assessment through quizzes and practical tests.

5. Lab exercises on back-end development and integration, Practical sessions on deploying web applications, Group discussions on web application security, Final project presentation and assessment.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Three Unit Tests each of 25 Marks (scale down to 25 Marks)
2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs which will be scale down to 25 marks.

The sum of **three**-unit tests, two assignments/Skill Development Activities (CIE), will be 50 marks.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper consists of Part A and Part B. Part A consists of 10 questions from 5 modules, each carrying 2 marks.
3. Part B consists of 10 questions. Each full question is for 16 marks. There will be two full questions (with a maximum of three sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

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Department of Master of Computer Applications

FIRST SEMESTER SYLLABUS

Course: DBMS and Web Technologies Laboratory		Semester	I
Course Code	**25MML106**	CIE Marks	50
Teaching Hours/Week (L:P:T)	0:2:2	SEE Marks	50
Total Hours of Pedagogy	42	Total Marks	100
Credits	02	Exam Hours	03
Examination type (SEE)	**Lab**		

Course objective:

- Create SQL queries for the small projects.
- Create database objects that include tables, constraints, indexes, and sequences.

Sl.NO	Experiments
1	Create the following tables with properly specifying Primary keys, Foreign keys and solve the following queries. BRANCH (Branchid, Branchname, HOD) STUDENT (USN, Name, Address, Branchid, sem) BOOK (Bookid, Bookname, Authorid, Publisher, Branchid) AUTHOR (Authorid, Authorname, Country, age) BORROW (USN, Bookid, Borrowed_Date) Execute the following Queries: i. List the details of Students who are all studying in 2nd sem MCA. ii. List the students who are not borrowed any books. iii. Display the USN, Student name, Branch_name, Book_name, Author_name, Books_Borrowed_Date of 2nd sem MCA Students who borrowed books. iv. Display the number of books written by each Author. v. Display the student details who borrowed more than two books. vi. Display the student details who borrowed books of more than one Author .vii.Display the Book names in descending order of their names. viii.List the details of students who borrowed the books which are all published by the same publisher.
2	The following relations keep track of airline flight information: FLIGHTS (no: integer, from: string, to: string, distance: integer, Departs: time, arrives: time, price: real) AIRCRAFT (aid: integer, aname: string, cruisingrange: integer) CERTIFIED (eid: integer, aid: integer) EMPLOYEES (eid: integer, ename: string, salary: integer) Note that the Employees relation describes pilots and other kinds of employees as well; Every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL. i. Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80, 000. ii. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruisingrange of the aircraft for which she or he is certified. iii. Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru to Frankfurt. iv. For all aircraft with cruisingrange over 1000 Kms, .find the name of the aircraft and the average salary of all pilots certified for this aircraft. v. Find the names of pilots certified for some Boeing aircraft. vi. Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.
3	Design an ER-diagram for the following scenario, Convert the same into a relational model and then solve the following queries. Consider a Cricket tournament "ABC Cup" organized by an organization. In the tournament there are many teams are contesting each having a Teamid,Team_Name, City, a coach. Each team is uniquely identified by using Teamid. A team can have many Players and a captain. Each player is uniquely identified by Playerid, having a Name, and multiple phone numbers,age. A player represents only one team. There are many Stadiums to conduct matches. Each stadium is identified using Stadiumid, having a stadium name,Address (involves city,area name,pincode). A team can play many matches. Each match

	played between the two teams in the scheduled date and time in the predefined Stadium. Each match is identified uniquely by using Matchid. Each match won by any of the one team that also wants to record in the database. For each match man_of_the match award given to a player. Execute the following Queries: i. Display the youngest player (in terms of age) Name, Team name, age in which he belongs of the tournament. ii. List the details of the stadium where the maximum number of matches were played. iii. List the details of the player who is not a captain but got the man_of _match award at least in two matches. iv. Display the Team details who won the maximum matches. v. Display the team name where all its won matches played in the same stadium.
4	A country wants to conduct an election for the parliament. A country having many constituencies. Each constituency is identified uniquely by Constituency_id, having the Name, belongs to a state,Number_of_voters. A constituency can have many voters. Each voter is uniquely identified by using Voter_id, having the Name, age, address (involves Houseno,city,state,pincode). Each voter belongs to only one constituency. There are many candidates contesting in the election. Each candidates are uniquely identified by using candidate_id, having Name, phone_no, age, state. A candidate belongs to only one party.Thereare many parties. Each party is uniquely identified by using Party_id, having Party_Name,Party_symbol. A candidate can contest from many constituencies under a same party. A party can have many candidates contesting from different constituencies. No constituency having the candidates from the same party. A constituency can have many contesting candidates belongs to different parties. Each voter votes only one candidate of his/her constituencty. Queries: i. List the details of the candidates who are contesting from more than one constituencies which are belongs to different states. ii. Display the state name having maximum number of constituencies. iii. Create a stored procedure to insert the tuple into the voter table by checking the voter age., if voter age is atleast 18 years old then insert a row in the voter table else display “Not eligible to vote” message. iv. Create a stored procedure to display the number_of_voters in the specified constituency. Where the constituency name is passed as an argument to the stored procedure. v. Create a TRIGGER to UPDATE the count of Number of Voters of the respective constituency in constituency table , AFTER inserting a tuple into the Voter table.
5	Consider the following database of student enrollment in courses and books adopted for each course.STUDENT (regno#: string, name: string, major: string, bdate: date) COURSE (course#: int, cname: string, dept: String) TEXT (book_ISBN#: int, book_title: string, publisher: string, author: string) ENROLL (regno#: string, course#: int, sem: int, marks: int) BOOK_ADOPTION (course#: int, sem: int, book_ISBN: int) Create the above tables by properly specifying the primary keys and the foreign keys Enter at least 7 to 10 records to each table. Execute SQL queries for the following requirements: 1) List out the student details, and their course details. The records should be ordered in a semester wise manner. 2) List out the student details under a particular department whose name is ordered in a semester wise 3) List out all the book details under a particular course 4) Find out the Courses in which number of students studying will be more than 2. 5) Find out the Publisher who has published more than 2 books.
6	Create an XHTML page that provides information about your department. Your XHTML page must use the following tags: a) Text Formatting tags b) Horizontal rule c) Meta element d) Links e) Images f) Tables (Use of additional tags encouraged).

7	Develop and demonstrate a XHTML file that includes Javascript script for the following problems: a) Input : A number n obtained using prompt Output : The first n Fibonacci numbers b) Input : A number n obtained using prompt Output : A table of numbers from 1 to n and their squares using alert
8	Develop and demonstrate, using JavaScript script, a XHTML document that contains three short paragraphs of text, stacked on top of each other, with only enough of each showing so that the mouse cursor can be placed over some part of them. When the cursor is placed over the exposed part of any paragraph, it should rise to the top to become completely visible. Modify the above document so that when a text is moved from the top stacking position, it returns to its original position rather than to the bottom
9	Develop, test and validate an XHTML document that has checkboxes for apple (59 cents each), orange (49 cents each), and banana (39 cents each) along with submit button. Each check boxes should have its own onclick event handler. These handlers must add the cost of their fruit to a total cost. An event handler for the submit button must produce an alert window with messae "Your total cost is $XXX", where XXX is the total cost of the chosen fruit inclusdinh 5% sales tax. This handler must return false (to avoid actual submission of the form data). Modify the document to accept quantity for each item using textboxes
10	a. Execute the Commands of MongoDB and operations in MongoDB: Insert, Query, Update, Delete and Projection. (Note: use any collection) b. Illustration of Where Clause, AND, OR operations in MongoDB

Course outcome (Course Skill Set)

At the end of the course, the student will be able to:

CO1: Design entity-relationship diagrams to solve given database applications.

CO2: Construct SQL queries for a given problem..

CO3: Make use of MongoDB commands and queries.

CO4: Construct web pages for real world problems.

CO5: Take part in a project work by incorporating team spirit and professional attitude.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. The student has to secure not less than 40%of maximum marks in the semester- end examination(SEE). In total of CIE and SEE student has to secure 50% maximum marks of the course.

Continuous Internal Evaluation (CIE):

CIE marks for the practical course is 50 **Marks**.

The split-up of CIE marks for record/ journal and test are in the ratio **60:40**.

Each experiment to be evaluated for conduction with observation sheet and record write- up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments designed by the faculty who is handling the laboratory session and is made known to students at the beginning of the practical session. 10 marks will be allocated for mini project.

Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.

Total marks scored by the students are scaled downed to 30 marks (60% of maximum marks).

Weightage to be given for neatness and submission of record/write-up on time. Department shall conduct 02 tests for 50 marks each, In each test, test write-up, conduction of experiment, acceptable

result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.

The suitable rubrics can be designed to evaluate each student's performance and learning ability. The average of 02 tests is scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and average marks of two tests is the total CIE marks scored by the student.

Semester End Evaluation

SEE marks for the practical course is 100 marks scaled down to 50 Marks.

SEE shall be conducted jointly by the two examiners. (One Internal and One External)

All laboratory experiments are to be included for practical examination.

(Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. **OR** based on the course requirement evaluation rubrics shall be decided jointly by examiners.

Students can pick one question (experiment) from the questions lot prepared by the internal /external examiners jointly.

Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners. General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Change of experiment is allowed only once and 10% Marks allotted to the procedure part to be made zero.

The duration for SEE is 03 hours.