MOOGAMBIGAI CHARITABLE AND EDUCATIONAL TRUST

Rajarajeswari College of Engineering

(An Autonomous Institution under Visvesvaraya Technological University, Belagavi)
#14, Ramohalli Cross, Kumbalagodu, Mysore Road, Bengaluru–560074

Master of Computer Applications

II Semester Scheme and Syllabus

(2024 Scheme)

VISION

To empower young minds through technology, research and innovation, to produce technically competent and socially responsible professionals in higher education.

MISSION

1. To deliver excellence in education through innovative teaching, impactful research, and continuous skill development, preparing students to meet global challenges with technical expertise and ethical responsibility.
2. To foster a transformative learning environment that integrates technology, research and practical experience, empowering students to become skilled professionals and socially conscious leaders.
3. To cultivate a culture of lifelong learning and professional excellence by encouraging creativity, research, and community engagement, equipping students with the skills to thrive in a dynamic world.
4. To provide a holistic educational experience that combines advanced technology, hands-on research, and community-focused learning, shaping students into competent, ethical professionals who contribute positively to society.

QUALITY POLICY

Rajarajeswari College of Engineering is committed to imparting quality technical education that nurtures competent, ethical professionals with global relevance. We ensure academic excellence through a dynamic, outcome-based curriculum, experienced faculty, and cutting-edge infrastructure. Continuous improvement is driven by innovation, research and strong industry collaboration. We foster holistic development and a progressive environment that supports lifelong learning, teamwork, and professional growth.

CORE VALUES

Academic Excellence, Integrity, Innovation, Global Competence, Continuous Improvement.

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MOOGAMBIGAI CHARITABLE AND EDUCATIONAL TRUST

Rajarajeswari College of Engineering

(An Autonomous Institution under Visvesvaraya Technological University, Belagavi)

Master of Computer Applications

Scheme of Teaching and Examinations – 2024

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2025-26)

II Semester

S. No	Course Category and Course Code		Course Title	TD/PSB	Teaching Hours/ Week			Examination				
					Lecture	Tutorial/ SDA	Practical/ Seminar	SEE Duration Hours	CIE Marks	SEE Marks	Total Marks	Credits
					L	T/S	P					
1.	PCC	P24MCA201	Artificial Intelligence and Machine Learning	MCA	3	0	0	3	50	50	100	3
2.	IPCC	P24MCA202	Data Analytics using Python	MCA	3	0	2	3	50	50	100	4
3.	PCC	P24MCA203	Web Technologies	MCA	3	0	0	3	50	50	100	3
4.	PCC	P24MCA204	Object Oriented Programming through Java	MCA	3	0	0	3	50	50	100	3
5.	PCC	P24MCA205	Data base Management Systems	MCA	3	0	0	3	50	50	100	3
6.	PEC	P24MCAX216	Professional Elective Course–I	MCA	3	0	0	3	50	50	100	3
7.	PCCL	P24MCAL207	Java Programming Lab	MCA	0	0	2	3	50	50	100	1
8.	PCCL	P24MCAL208	Database Management Systems Lab	MCA	0	0	2	3	50	50	100	1
								TOTAL	400	400	800	21

Note: PCC: Professional core. IPCC-Integrated Professional Core Courses, PEC: Professional Elective Courses, PCCL-Professional Core Course lab: Practical courses whose CIE will be evaluated by the class teacher and SEE will be evaluated by the two examiners. L-Lecture, T/SDA-Tutorial/Skill Development Activities, P-Practical.

Professional Elective Courses -I			
Course Code	**Course Title**	**Course Code**	**Course Title**
P24MCAA216	Data Warehousing & Data Mining	P24MCAB216	Big Data Analytics
P24MCAC216	Enterprise Resource Planning	P24MCAD216	Digital Marketing
P24MCAE216	User Interface Design	P24MCAF216	Cryptography and Network Security

Skill development activities: Under Skill development activities in a concerning course, the students should

1. Interact with industry (small, medium, and large).
2. Involveinresearch/testing/projectstounderstandtheirproblemsandhelpcreativeandinnovativemethodstosolvetheproblem.
3. Involve in case studies and field visits/fieldwork.
4. Accustom to the use of standards/codes etc., to narrow the gap between academia and industry.
5. Handle advanced instruments to enhance technical talent.
6. Gainconfidenceinthemodelingofsystemsandalgorithmsfortransientandsteady-stateoperations, thermal study etc.
7. Work on different software/s (tools) to simulate, analyze and authenticate the output to interpret and conclude. All activities should enhance student's abilities to employment and/or self-employment opportunities, management skills, Statistical analysis, fiscal expertise, etc. Students and the course instructor/s are to be involved either individually or in groups to interact together to enhance the learning and application skills of the study they have undertaken. The students with the help of the course teacher can take up relevant technical –activities that will enhance their skills. The prepared report shall be evaluated for CIE marks.

Dean-Academics **Principal**

SEMESTER-II					
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING **Category: PCC**					
Course Code	:	P24MCA201	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	Gain a historical perspective of AI and its foundations.
2.	Become familiar with basic principles of AI toward problem solving.
3.	Familiarize with the basics of Machine Learning & Machine Learning process, basics of Decision Tree, and probability learning.
4.	Understand the working of Artificial Neural Networks and basic concepts of clustering algorithms.

Module – 1	**No. of Hours**
Introduction to AI and Production Systems: Introduction to AI-Problem formulation, Problem Definition -Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics - Specialized productions system- Problem solving methods – Problem graphs, Matching, Indexing and Heuristic functions -Hill Climbing-Depth first and Br.	9
Module – 2	**No. of Hours**
Representation of Knowledge: Game playing – Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic-Structured representation of knowledge.	9
Module – 3	**No. of Hours**
Knowledge Inference: Knowledge representation -Production based system, Frame based system. Inference – Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning – Certainty factors, Bayesian Theory Bayesian Network-Dempster – Shafer theory.	9
Module – 4	**No. of Hours**
Planning and Machine Learning: Basic plan generation systems – Strips -Advanced plan generation systems – K strips - Strategic explanations -Why, Why not and how explanations. Learning: Machine learning, adaptive Learning.	9
Module – 5	**No. of Hours**
Expert Systems Expert systems – Architecture of expert systems, Roles of expert systems – Knowledge Acquisition – Meta knowledge, Heuristics. Typical expert systems – MYCIN, DART, XOON, Expert systems shells.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Identify problems that are amenable to solution by AI methods.
CO2	Identify appropriate AI Methods to solve a given problem.
CO3	Formalize a given problem in the language/ framework of different AI Methods.
CO4	Implement basic AI Algorithms for the given problem.
CO5	Design and carry out an empirical evaluation of different algorithms on a problem formalization and state the conclusions that the evaluation supports.

Text Books	
1.	Kevin Night and Elaine Rich, Nair B., “Artificial Intelligence (SIE)”, Mc Graw Hill- 2008. (Modules-I,II,VI & V)
2.	Dan W. Patterson, “Introduction to AI and ES”, Pearson Education, 2007. (Module-III).

Reference Text Books	
1.	Elaine Rich, Kevin Knight, Artificial Intelligence, 3rd edition, Tata McGraw Hill,2013
2.	George F Lugar, Artificial Intelligence Structure and strategies for complex, Pearson Education, 5th Edition, 2011

Web links and Video lectures (e-Resources)
• https://onlinecourses.nptel.ac.in/noc24_ce107/preview

- http://www.digimat.in/nptel/courses/video/106106126/L01.html

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	Internal Assessment1	50	30 (Average of Best Two Assessments)	50
	Internal Assessment2	50		
	Internal Assessment3	50		
Self learning	Two Assignments	20	10	
	Seminar Presentation	20	10	
SEE	Semester End Examination	100	50	50
Grand Total				100

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	-	3	-	1	-	1	-	2
CO2	3	3	3	-	2	-	2	-	1	-	2
CO3	3	2	2	-	3	-	1	-	-	2	1
CO4	3	3	3	-	2	-	2	-	1	-	3
CO5	3	2	1	-	3	-	-	-	1	1	1

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
DATA ANALYTICS USING PYTHON **Category: IPCC**					
Course Code	:	P24MCA202	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:2	SEE	:	50 Marks
Total Hours	:	45+ 30	Total	:	100 Marks
Credits	:	4	SEE Duration	:	3Hrs

Course Objectives	
1.	Explain the basic of Python programming.
2.	Design real time application using Python collection Objects and classes.
3.	Familiarize the concept of Data Visualization with NumPy, Seaborn.
4.	Define the Web Scraping and Numerical Analysis.

Module – 1: Python Basic Concepts and Programming	**No. of Hours**
Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type( ) Function and Is Operator, Control Flow Statements, The if Decision Control Flow Statement, The if…else Decision Control Flow Statement, The if…elif…else Decision Control Statement, Nested if Statement, The while Loop, The for Loop, The continue and break Statements, Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.	9
Module – 2: Python Collection Objects, Classes	**No. of Hours**
Strings- Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings, Lists-Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods. Sets, Tuples and Dictionaries. Files: reading and writing files. Class Definition – Constructors – Inheritance – Overloading.	9
Module – 3: Data Pre-processing and Data Wrangling	**No. of Hours**
Acquiring Data with Python: Loading from CSV files, Accessing SQL databases. Cleansing Data with Python: Stripping out extraneous information, Normalizing data AND Formatting data. Combining and Merging Data Sets – Reshaping and Pivoting – Data Transformation – String Manipulation, Regular Expressions.	9
Module – 4: Web Scraping And Numerical Analysis	**No. of Hours**
Data Acquisition by Scraping web applications –Submitting a form - Fetching web pages – Downloading web pages through form submission – CSS Selectors. NumPy Essentials: The NumPy.	9
Module – 5: Data Visualization with NumPy Arrays, Matplotlib, and Seaborn	**No. of Hours**
Data Visualization: Matplotlib package – Plotting Graphs – Controlling Graph – Adding Text – More Graph Types – Getting and setting values – Patches. Advanced data visualization with Seaborn. Time series analysis with Pandas.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Understand and comprehend the basics of Python programming.
CO2	Apply knowledge in real time applications.
CO3	Apply the Data Pre-processing & Data Wrangling.
CO4	Demonstrate the concepts of Web Scraping and Numerical Analysis.
CO5	Demonstrate the concepts of data visualization.

Sl. NO	Experiments
1.	Write a shell script that takes a valid directory name as an argument and recursively discard all the subdirectories, find the maximum length of any file in that hierarchy and write its maximum value to the standard output.
2.	Write a shell script that accepts a pathname and creates all the components in that pathname as directories. for example, if the script it named mpc, then the command mpc a/b/c/d should create directories a,a/b,a/b/c,a/b/c/d..
3.	Write a shell script that accepts two file names as arguments check if the permissions for these files are identical and if the permissions are identical, output common permissions and otherwise output each file names followed by its permissions.
4.	Write a shell script which accepts valid login names as arguments and print their corresponding home directories. if no arguments are specified, print a suitable error message
5.	Create a script file called file properties that reads a filename entered and out its properties.
6.	Write a shell script to implement terminal locking (similar to the lock command).It should prompt the user for a password. After accepting the password enter by the user, it must be prompt again for the matching password as conformation. And it the match occurs, it must lock the keyword until a matching password is enter again by the user. Note that the script must be written to disregard break, Ctrl-D. No time limit need be implemented for the lock duration.
7.	Write a shell script that accepts one or more file name as arguments and convert all of them to uppercase provided they exists in current directory.
8.	Write a shell script that displays all the links to a file specified as the first argument to the script. The second argument, which is optional, can be used to specify in which the search is to begin. If the second argument is not present, the search is to begin in current working directory. In either case the starting directory as well as all its sub- directories at all levels must be searched. The script need not include any error checking.
9.	Write a shell script that accepts as filename as argument and display its creation time if the file exists and if it does not send output error message
10.	Write a shell script to display the calendar for current month with current date replaced by * or ** depending on whether the date has one or two digit.
11.	Write a shell script to find a file/s that matches a pattern given as command line argument in the home directory, display the contents of the file and copy the file into the directory ~/mydir.
12.	Write a shell script to list all the files in a directory whose file name is atleast 10 characters (Use expr command to check the length).
13.	Write an awk script that accepts date argument in the form of DD- MM-YY and displays it in the form if month, day, year. The script should check the validity of the argument and in the case of error, display a suitable message.
14.	Write an awk script to delete duplicated line from a text file. The order of the original lines must be remain unchanged.

Text Books	
1.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist"2nd edition,Updated for Python-3, Shroff/O,,Reilly Publishers, 2016
2.	Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.
3.	Jake Vander plas, "Python Data Science Handbook: Essential tools for working with data", O,,Reilly Publishers, 1ST Edition.

Reference Text Books	
1.	Eric Foster –Johnson, John C Welch, Micah Anderson, "Beginning Shell Scripting", Wrox Publication, 2005
2.	Richard Peterson, "The Complete Reference- Linux",Wiley Publication, 6th Edition, 2017 .
3.	Dhananjay M. Dhamdhere, "Operating Systems – A Concept – Based Approach", Tata McGraw – Hill, 3rd Edition, 2017

Web links and Video lectures (e-Resources)
https://onlinecourses.nptel.ac.in/noc21_cs72/preview

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	**Internal Assessment-1**	**50**	**30 (Average of Best Two Assessments)**	**50/2 = 25**
	Internal Assessment-2	**50**		
	Internal Assessment-3	**50**		
Self Learning	**Two Assignments**	**10+10**	**20**	
Laboratory	**Record & Observation**	**Evaluating each expt. for 10 marks*12 expts.**	**10**	**25**
	Lab Internal Test	**50**	**15**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	-	1	-	-	-	-
CO2	-	-	-	-	-	-	1	-	-	-	1
CO3	3	3	3	3	3	1	1	-	-	-	2
CO4	3	3	3	1	3	1	1	-	-	-	-
CO5	3	3	-	1	3	1	1	-	-	-	-

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
WEB TECHNOLOGIES **Category: PCC**					
Course Code	:	P24MCA203	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	Creating the small web page using html5.
2.	Use different tags of html to create web page.
3.	Use of CSS and JavaScript.
4.	Developing the dynamic document using JavaScript.

Module – 1	**No. of Hours**
Web browsers, web servers, MIME, URL, HTTP Introduction to HTML5 tags, Basic syntax and structure, text markups, images, lists, tables, progress, Media tags-audio and video ,forms, frames. Introduction to CSS, Levels of CSS, Selectors, Font, color and Text Properties, BOX Model, Span and Div tags.	9
Module – 2	**No. of Hours**
Introduction to JavaScript, controls statements, Arrays and functions, Pattern Matching, Element Access, Event Handling	9
Module – 3	**No. of Hours**
Introduction to Bootstrap, First example, containers, Bootstrap elements: colors, tables, images, buttons, button groups, progress bars, Forms, utilities, Classes, alerts, custom forms, Grid System.	9
Module – 4	**No. of Hours**
Introduction to JQuery, Syntax, selectors, events, JQuery HTML, JQuery Effects, JQuery CSS**.**	9
Module – 5	**No. of Hours**
Introduction to Angular, Introduction, Architecture. Components: Interaction, styles, dynamic components, Angular elements, Attribute directives and Pipes. Templates: Displaying Data, Template Syntax, User input, Life Cycle Hooks. Forms: Introduction.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Demonstrate the development of HTML documents using JavaScript and CSS.
CO2	Design and implement user interactive dynamic web based applications.
CO3	Demonstrate applications of Angular and JQuery for the given problem.
CO4	Apply the features JQuery for the given web based problem
CO5	Apply the concept of Angular and Templates

Text Books	
1.	Chris Bates - Web Programming, Wiley Publications
2.	HTML5 Black Book by Dreamtech
3.	Bootstrap essentials by Snig by Packet-open source.
4.	https://v8.angular.io/tutorial

Web links and Video lectures (e-Resources)
http://greenteapress.com/wp/thinkpython/

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	**Internal Assessment1**	**50**	**30 (Average of Best Two Assessments)**	**50**
	Internal Assessment2	**50**		
	Internal Assessment3	**50**		
Self learning	**Two Assignments**	**20**	**10**	
	Seminar Presentation	**20**	**10**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	1	3	-	-	-	-	-	-	-
CO2	1	3	2	-	-	3	-	-	-	-	-
CO3	3	2	3	-	-	-	-	-	-	-	-
CO4	1	2	2	-	3	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
OBJECT ORIENTED PROGRAMMING THROUGH JAVA **Category: PCC**					
Course Code	:	P24MCA204	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	To provide object oriented concepts through which robust, secured and reusable software can be developed.
2.	To understand object oriented principles like abstraction, encapsulation, inheritance, and polymorphism and apply them in solving problems.
3.	To understand the implementation of packages and interfaces.
4.	To understand the concepts of exception handling, multithreading and collection classes.
5.	To understand how to connect to the database using JDBC and design of GUI Using Applet and AWT.

Module – 1	**No. of Hours**
The History and Evolution of Java: Java's Lineage – The Creation of Java–Java and Internet - Java's **Magic:** The Byte code-The Java Buzzwords. **An overview of Java:** Object Oriented Programming – A First Simple Program. **Arrays:** One-Dimensional Arrays - Multidimensional Arrays - Alternative Array Declaration Syntax. **Introducing classes:** Class fundamentals – Declaring objects-Assigning object reference variables Introducing methods – Constructors – The 'this' Keyword-Garbage collection- The finalize () method–A Stackclass.	9
Module – 2	**No. of Hours**
A Closer look at Methods and Classes: Overloading methods - Using objects as parameters - A Closer look at Argument passing - Returning objects - Recursion - Introducing Access control – Understanding static - Introducing final - Arrays Revisited - Introducing Nested and Inner classes - Exploring the Stringclass-Using command line Arguments. **Inheritance** – Inheritance types, super keyword, preventing inheritance: final classes and methods. **Polymorphism** – method overloading and method overriding, abstract classes and methods.	9
Module – 3	**No. of Hours**
Packages- Defining, creating and accessing a package, importing packages. **Interfaces-** Interfaces v/s Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface, inner class. **Exception handling**-Benefits of exception handling, the classification of exceptions – exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses.	9
Module – 4	**No. of Hours**
Multithreading – Differences between multiple processes and multiple threads, thread life cycle, Creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer problem. **Collection Framework in Java** – Introduction to java collections, Overview of java collection framework, Commonly used collection classes- Array List, Vector, Hash table, Stack, Lambda Expressions.	9
Module – 5	**No. of Hours**
Files- Streams- Byte streams, Character streams, Text input/output, Binary input/output, File management using File class. Connecting to Database – JDBC Type 1 to 4 drivers, Connecting to a database, querying a database and processing the results, updating data with JDBC, Data Access Object (DAO). **Applet Fundamentals:** Applet Basics-Applet Architecture-Applet Skeleton–Simple Applet display method. **Introducing the AWT:** AWT classes–Window Fundamentals - Introducing Graphics - Working with Colors - Working with Fonts.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Understand the basics and object oriented concepts of Java
CO2	Recognize methods, classes and inheritance and polymorphism concepts.

CO3	Illustrate the concepts of Packages, Interfaces and Exception
CO4	Apply Multithreading concepts and Collections Framework
CO5	Illustrate the concepts of Files, JDBC, Applets and AWT controls

Text Books	
1.	E Balagurusamy, Programming with Java A primer, 6th Edition, Tata McGraw Hill, 2019.
2.	Herbert Schildt, Java The Complete Reference, 11th Edition, Tata McGraw Hill, 2020.

Web links and Video lectures (e-Resources)
• https://onlinecourses.nptel.ac.in/noc24_ce107/preview • http://www.digimat.in/nptel/courses/video/106106126/L01.html

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	Internal Assessment1	50	30 (Average of Best Two Assessments)	50
	Internal Assessment2	50		
	Internal Assessment3	50		
Self learning	Two Assignments	20	10	
	Seminar Presentation	20	10	
SEE	Semester End Examination	100	50	50
Grand Total				100

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	-	3	-	1	-	1	-	2
CO2	3	3	3	-	2	-	2	-	1	-	2
CO3	3	2	2	-	3	-	1	-	-	2	1
CO4	3	3	3	-	2	-	2	-	1	-	3
CO5	3	2	1	2	3	-	-	-	1	1	1

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
DATABASE MANAGEMENT SYSTEMS **Category: PCC**					
Course Code	:	P24MCA205	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	Provide a strong foundation in database concepts, technology, and practice.
2.	Practice SQL programming through a variety of database problems.
3.	Demonstrate the use of concurrency and transactions in database.
4.	Design and build database applications for real world problems

Module - 1	**No. of Hours**
Introduction to Databases: Introduction, Characteristics of database approach, Advantages of using the DBMS approach, History of database applications. Overview of Database Languages and Architectures: Data Models, Schemas, and Instances. Three schema architecture and data independence, database languages, and interfaces, The Database System environment. Conceptual Data Modeling using Entities and Relationships: Entity types, Entity sets, attributes, roles, and structural constraints, Weak entity types, ER diagrams, Examples	9
Module - 2	**No. of Hours**
Relational Model: Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, transactions, and dealing with constraint violations. Relational Algebra: Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra. Mapping Conceptual Design into a Logical Design: Relational Database Design using ER-to-Relational mapping.	9
Module - 3	**No. of Hours**
SQL: SQL data definition and data types, specifying constraints in SQL, retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL, Additional features of SQL. Advances Queries: More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, Schema change statements in SQL. Database Application Development: Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces, SQLJ, Stored procedures, Case study: The internet Bookshop.	9
Module - 4	**No. of Hours**
Normalization: Database Design Theory – Introduction to Normalization using Functional and Multivalued Dependencies: Informal design guidelines for relation schema, Functional Dependencies, Normal Forms based on Primary Keys, Second and Third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form. Examples on normal forms. Normalization Algorithms: Inference Rules, Equivalence, and Minimal Cover, Properties of Relational Decompositions, Algorithms for Relational Database Schema Design, Nulls, Dangling tuples, and alternate Relational Designs, Further discussion of Multivalued dependencies and 4NF, Other dependencies and Normal Forms.	9
Module - 5	**No. of Hours**
Transaction Processing: Introduction to Transaction Processing, Transaction and System concepts, Desirable properties of Transactions, Characterizing schedules based on recoverability, Characterizing schedules based on Serializability, Transaction support in SQL. Concurrency Control in Databases: Two-phase locking techniques for Concurrency control, Concurrency control based on Timestamp ordering, Multiversion Concurrency control techniques, Validation Concurrency control techniques, Granularity of Data items and Multiple Granularity Locking.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Identify, analyze and define database objects, enforce integrity constraints on a database using DBMS
CO2	Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
CO3	Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database
CO4	Develop application to interact with databases, relational algebra expression.

CO5	Develop applications using tuple and domain relation expression from queries.

Text Books	
1.	Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, 7th Edition, 2017, Pearson.
2.	Database management systems, Ramakrishnan, and Gehrke, 3rd Edition, 2014, McGraw Hill.

Reference Text Book	
1.	Abraham Silberschatz, Henry F. Korth and S. Sudarshan's Database System Concepts 6th Edition Tata Mcgraw Hill Education Private Limited

Web links and Video lectures (e-Resources)
• https://onlinecourses.nptel.ac.in/noc22_cs91/preview

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	**Internal Assessment1**	**50**	**30 (Average of Best Two Assessments)**	**50**
	Internal Assessment2	**50**		
	Internal Assessment3	**50**		
Self learning	**Two Assignments**	**20**	**10**	
	Seminar Presentation	**20**	**10**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	-	3	-	-	-	-	-	-	-	-
CO2	-	2	-	-	3	-	-	-	-	-	-
CO3	3	-	3	-	-	-	-	-	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-	-
CO5	-	3	3	-	-	-	-	-	-	-	-

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
DATA WAREHOUSING & DATA MINING **Category: PEC**					
Course Code	:	P24MCAA216	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	Study data warehouse principles and its working
2.	Learn Data mining concepts and understand Association Rule Mining
3.	Study Classification Algorithms
4.	Gain knowledge of how data is grouped using clustering techniques.

Module – 1	**No. of Hours**
Data warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction-Transformation-Loading, Logical(Multi-Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact-Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture-ROLAP, MOLAP and HOLAP.	9
Module – 2	**No. of Hours**
Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or Data Warehouse System, Major issues in Data Mining. Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration &Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.	9
Module – 3	**No. of Hours**
Association Rules: Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIOIRI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set- Maximal Frequent Item Set, Closed Frequent Item Set.	9
Module – 4	**No. of Hours**
Classification: Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers , Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction ; Naive-Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics. Prediction: Accuracy and Error measures, Evaluating the accuracy of classifier or a predictor, Ensemble methods.	9
Module – 5	**No. of Hours**
Clustering: Clustering Overview, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, , Partitioning Clustering-K-Means Algorithm, PAM Algorithm; Hierarchical Clustering-Agglomerative Methods and divisive methods, Basic Agglomerative Hierarchical Clustering Algorithm, Key Issues in Hierarchical Clustering, Strengths and Weakness, Outlier Detection.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Assess Raw Input Data and process it to provide suitable input for a range of data mining algorithm.
CO2	Design and Modeling of Data Warehouse.
CO3	Discover interesting pattern from large amount of data
CO4	Able to cluster high dimensional Data
CO5	Apply suitable data mining techniques for various real time applications

Text Books	
1.	Data Mining- Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006
2.	Introduction to Data Mining, Psng-Ning Tan, Vipin Kumar, Michael Steinbanch, Pearson education.

Reference Text Book	
1.	Data Mining Techniques, Arun KPujari, 3rd Edition, Universities Press.
2.	Data Warehousing Fundament's, Pualraj Ponnaiah, Wiley Student Edition

Web links and Video lectures (e-Resources)
https://study.com/academy/lesson/video/data-warehousing-and-data-mining-information-for-business-intelligence.html

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	**Internal Assessment1**	**50**	**30 (Average of Best Two Assessments)**	**50**
	Internal Assessment2	**50**		
	Internal Assessment3	**50**		
Self learning	**Two Assignments**	**20**	**10**	
	Seminar Presentation	**20**	**10**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	-	3	-	1	-	1	-	2
CO2	3	3	3	-	2	-	2	-	1	-	2
CO3	3	2	2	-	3	-	1	-	-	2	1
CO4	3	3	3	-	2	-	2	-	1	-	3
CO5	3	2	1	2	3	-	-	-	1	1	1

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
BIG DATA ANALYTICS **Category: PEC**					
Course Code	:	P24MCAB216	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	Elucidate the basic architecture and functionalities of a Computer
2.	Apply programming constructs of C language to solve the real-world problems
3.	Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems
4.	Design and Develop Solutions to problems using modular programming constructs such as functions and procedures

Module – 1	**No. of Hours**
Big Data and Analytics: Example Applications, Basic Nomenclature, Analysis Process Model, Analytical Model Requirements, Types of Data Sources, Sampling, Types of Data Elements, Data Exploration, Exploratory Statistical Analysis, Missing Values, Outlier Detection and Treatment, Standardizing Data Labels, Categorization	9
Module – 2	**No. of Hours**
Introduction to Technology Landscape NoSQL, Comparison of SQL and NoSQL, Hadoop -RDBMS Versus Hadoop - Distributed Computing Challenges – Hadoop Overview - Hadoop Distributed File System - Processing Data with Hadoop - Managing Resources and Applications with Hadoop YARN - Interacting with Hadoop Ecosystem	9
Module – 3	**No. of Hours**
Introduction to MongoDB AND Map Reduce Programming MongoDB: Why Mongo DB - Terms used in RDBMS and Mongo DB - Data Types - MongoDB Query Language MapReduce: Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression.	9
Module – 4	**No. of Hours**
Introduction to Hive and Pig Hive: Introduction – Architecture - Data Types - File Formats - Hive Query Language Statements – Partitions – Bucketing – Views - Sub- Query – Joins – Aggregations - Group by and Having - RCFile Implementation - Hive User Defined Function - Serialization and Deserialization. Pig: Introduction - Anatomy – Features – Philosophy - Use Case for Pig - Pig Latin Overview - Pig Primitive Data Types - Running Pig - Execution Modes of Pig - HDFS Commands - Relational Operators - Eval Function - Complex Data Types - Piggy Bank - User-Defined Functions - Parameter Substitution - Diagnostic Operator - Word Count Example using Pig - Pig at Yahoo! - Pig Versus Hive.	9
Module – 5	**No. of Hours**
Introduction to Data Analytics with R Machine Learning: Introduction, Supervised Learning, Unsupervised Learning, Machine Learning Algorithms: Regression Model, Clustering, Collaborative Filtering, Associate Rule Making, Decision Tree, Big Data Analytics with BigR.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Apply analytical tools to identify and solve the business problem for a given context.
CO2	Analyze various algorithms for handling large volumes of data.
CO3	Analyze the usage of Map-Reduce techniques for solving big data problems
CO4	Apply the architecture of HDFS and explain functioning of HDFS clusters.
CO5	Carryout experiments on various datasets for analysis / visualization.

Text Books	
1.	Seema Acharya, Subhashini Chellappan , “Big Data and Analytics”, Wiley Publications, First Edition,2015

Reference Text Book	
1.	Judith Huruwitz, Alan Nugent, Fern Halper, Marcia Kaufman, “Big data for dummies”, John Wiley & Sons, Inc.(2013)
2.	Tom White, “Hadoop The Definitive Guide”, O’Reilly Publications, Fourth Edition,2015

Web links and Video lectures (e-Resources)
https://archive.nptel.ac.in/courses/106/104/106104189/

ASSESSMENT DETAILS (BOTH CIE AND SEE)

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CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	**Internal Assessment1**	**50**	**30 (Average of Best Two Assessments)**	**50**
	Internal Assessment2	**50**		
	Internal Assessment3	**50**		
Self learning	**Two Assignments**	**20**	**10**	
	Seminar Presentation	**20**	**10**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	3	2	-	1	-	1	-	1	-	2
CO2	1	1	3	-	2	-	2	-	1	-	2
CO3	1	2	2	-	1	-	1	-	-	2	1
CO4	1	1	3	-	2	-	2	-	1	-	1
CO5	1	2	1	2	3	-	-	-	1	1	1

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
ENTERPRISE RESOURCE PLANNING **Category: PEC**					
Course Code	:	P24MCAC216	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	To provide a contemporary and forward-looking on the theory and practice of Enterprise Resource Planning Technology.
2.	To focus on a strong emphasis upon practice of theory in Applications and Practical oriented approach.
3.	To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.

Module – 1	**No. of Hours**
Introduction to Supply Chain Management: Supply chain – objectives – importance – decision phases – process view – competitive and supply chain strategies – achieving strategic fit – supply chain drivers – obstacles – framework – facilities – inventory – transportation – information – sourcing – pricing.	9
Module – 2	**No. of Hours**
ERP Implementation: Implementation of Life Cycle, Implementation Methodology, Hidden Costs, Organizing Implementation, Vendors, Consultants and Users, Contracts, Project Management and Monitoring.	9
Module – 3	**No. of Hours**
Business Modules: Business Modules in an ERP Package, Finance, Manufacturing, Human Resource, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution.	9
Module – 4	**No. of Hours**
ERP Market: ERP Market Place, SAP AG, People Soft, Baan Company, JD Edwards World Solutions Company, Oracle Corporation, QAD, System Software Associates.	9
Module – 5	**No. of Hours**
ERP–Present And Future: Turbo Charge the ERP System, EIA, ERP and E–Commerce, ERP and Internet, Future Directions in ERP.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Analyze the essentials of supply chain management in ERP.
CO2	Analyze the implementation of ERP in the context of business of the different L2 Organization
CO3	Analyze and apply ERP for different business modules for the given problem.
CO4	Analyze the given case study of ERP marketing.
CO5	Analyze the design of ERP with future E-commerce and internet.

Text Books	
1.	Sunil Chopra and Peter Meindl, Supply Chain Management – Strategy, Planning and Operation, Pearson/PHI, 3rd Edition, 2007
2.	Alexis Leon, “ERP Demystified”, Tata McGraw Hill, 1999.
3.	Joseph A. Brady, Ellen F. Monk, Bret J. Wangner, “Concepts in Enterprise Resource Planning”, Thomson Learning, 2001

Web links and Video lectures (e-Resources)
• https://onlinecourses.nptel.ac.in/noc24_ce107/preview • http://www.digimat.in/nptel/courses/video/106106126/L01.html

ASSESSMENT DETAILS (BOTH CIE AND SEE)

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CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	**Internal Assessment1**	**50**	**30 (Average of Best Two Assessments)**	**50**
	Internal Assessment2	**50**		
	Internal Assessment3	**50**		
Self learning	**Two Assignments**	**20**	**10**	
	Seminar Presentation	**20**	**10**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	-	3	-	1	-	1	-	2
CO2	3	3	3	-	2	-	2	-	1	-	2
CO3	3	2	2	-	3	-	1	-	-	2	1
CO4	3	3	3	-	2	-	2	-	1	-	3
CO5	3	2	1	2	3	-	-	-	1	1	1

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
DIGITAL MARKETING **Category: PEC**					
Course Code	:	P24MCAD216	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	Understand the concept of marketing and the functions of marketing.
2.	Measuring digital marketing strategies, undertaking business analytics, and using tools like Web and Google Analytics to probe website data.
3.	Interpret tasks used in handling Techniques for evaluating competitors' digital marketing strategies and case studies on digital marketing strategies.
4.	Learn to Design, launch, and management of market offerings.

Module – 1	**No. of Hours**
Introduction to Digital Marketing Evolution of Digital Marketing from the traditional to the modern era, Role of the Internet; Current trends, Info-graphics, implications for business & society; Emergence of digital marketing as a tool; Drivers of the new marketing environment; Digital marketing strategy; P.O.E.M. framework, Digital landscape, Digital marketing plan, Digital marketing models.	9
Module – 2	**No. of Hours**
Internet Marketing and Digital Marketing Mix – Internet Marketing, opportunities and challenges; Digital marketing framework; Digital Marketing mix, Impact of digital channels on IMC; Search Engine Advertising: - Pay for Search Advertisements, Ad Placement, Ad Ranks, Creating Ad Campaigns, Campaign Report Generation Display marketing: - Types of Display Ads - Buying Models - Programmable Digital Marketing - Analytical Tools - YouTube marketing.	9
Module – 3	**No. of Hours**
Social Media Marketing – Role of Influencer Marketing, Tools & Plan– Introduction to social media platforms, penetration & characteristics; Building a successful social media marketing strategy Facebook Marketing: - Business through Facebook Marketing, Creating Advertising Campaigns, Adverts, Facebook Marketing Tools LinkedIn Marketing: - Introduction and Importance of LinkedIn Marketing, Framing LinkedIn Strategy, Lead Generation through LinkedIn, Content Strategy, Analytics and Targeting Twitter Marketing: - Introduction to Twitter Marketing, how Twitter Marketing is different than other forms of digital marketing, framing content strategy, Twitter Advertising Campaigns Instagram and Snapchat: - Digital Marketing Strategies through Instagram and Snapchat Mobile Marketing: - Mobile Advertising, Forms of Mobile Marketing, Features, Mobile Campaign Development, Mobile Advertising Analytics Introduction to social media metrics.	9
Module – 4	**No. of Hours**
Introduction to SEO, SEM, Web Analytics, Mobile Marketing, Trends in Digital Advertising– - Introduction and need for SEO, How to use internet & search engines; search engine and its working pattern, On-page and off-page optimization, SEO Tactics - Introduction to SEM Web Analytics: - Google Analytics & Google AdWords; data collection for web analytics, multichannel attribution, Universal analytics, Tracking code Trends in digital advertising.	9
Module – 5	**No. of Hours**
Social Media Channels: Introduction, Key terms and concepts, Traditional media v/s Social media. Social media channels: Social networking. Content creation, Bookmarking & aggregating and Location & social media. Tracking social media campaigns. Social media marketing: Rules of engagement. Advantages and challenges. **Social Media Strategy:** Introduction, Key terms and concepts. Using social media to solve business challenges. Step-by-step guide to creating a social media strategy. Documents and processes. Dealing with opportunities and threats. Step-by-step guide for recovering from an online brand attack. Social media risks and challenges.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Demonstrate the key concepts related to e-marketing for the given case.
CO2	Demonstrate the use of different electronic media for designing marketing activities.
CO3	Analyze the role of search engines in improving digital marketing.
CO4	Analyze the role of social media marketing in the given problem
CO5	Analyze technical solutions to overcome social media threats

Text Books	
1.	Seema Gupta "Digital Marketing" Mc-Graw Hill 1st Edition – 2017

Reference Text Books	
1.	Ian Dodson "The Art of Digital Marketing" Wiley Latest Edition
2.	Puneet Singh Bhatia "Fundamentals of Digital Marketing" Pearson 1st Edition – 2017
3.	Nitin C. Kamat, Mr. Chinmay Nitin Kamat Digital Social Media Marketing Himalaya Publishing House Pvt. Ltd. Latest Edition

Web links and Video lectures (e-Resources)
https://www.youtube.com/watch?v=8qOnSV0kKbU

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	Internal Assessment1	50	30 (Average of Best Two Assessments)	50
	Internal Assessment2	50		
	Internal Assessment3	50		
Self learning	Two Assignments	20	10	
	Seminar Presentation	20	10	
SEE	Semester End Examination	100	50	50
Grand Total				100

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	-	2	2	2	-	-	-	-	-	-
CO2	2	2	2	2	2	-	-	-	-	-	-
CO3	1	1	-	2	2	-	-	-	-	-	-
CO4	1	2	2	2	2	-	-	-	-	-	-
CO5	2	-	2	1	1	-	-	-	-	-	-

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
USER INTERFACE DESIGN **Category: PEC**					
Course Code	:	P24MCAE216	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	To study the concept of menus, windows, interfaces.
2.	To study business functions
3.	To study the characteristics and components of windows and the various controls for the windows.
4.	To study various problems in windows design with color, text, and graphics and To study the testing methods.

Module – 1	**No. of Hours**
The User Interface-Introduction, Overview, The importance of user interface – Defining the user interfaces -The importance of Good design, Characteristics of graphical and web user interfaces, Principles of user interface design.	9
Module – 2	**No. of Hours**
The User Interface Design process- Obstacles, Usability, Human characteristics in Design, Human Interaction speeds, Business functions definition and requirement analysis, Basic business functions, and Design standards.	9
Module – 3	**No. of Hours**
System menus and navigation schemes- Structures of menus, Functions of menus, Contents of menus, Formatting of menus, Phrasing the menu, selecting menu choices, Navigating menus, Kinds of graphical menus.	9
Module – 4	**No. of Hours**
Windows - Characteristics, Components of window, Window presentation styles, Types of window, Window management, Organizing window functions, Window operations, Web systems, Characteristics of device-based controls.	9
Module – 5	**No. of Hours**
Screen-based controls - Operable control, Text control, Selection control, Custom control, Presentation control, Windows Tests-prototypes, kinds of tests.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Explain the fundamental concepts of User Interface (UI)
CO2	Outline the UI design process, addressing key challenges, usability considerations, human interaction speeds, and the role of business functions in defining requirements and standards.
CO3	Identify and explain menu structures, navigation schemes, and menu functionalities to design efficient and intuitive system navigation for improved user experience.
CO4	Analyze window characteristics and describe device-based controls for effective UI design in diverse systems.
CO5	Evaluate screen-based controls, and outline testing methods (prototypes and test types) for assessing the effectiveness of interface designs.

Text Books	
1.	Wilbert O. Galitz, “The Essential Guide to User Interface Design”, John Wiley & Sons, Second Edition 2002.

Reference Text Books	
1.	Ben Sheiderman, “Design the User Interface”, Pearson Education, 1998.
2.	Alan Cooper, ”The Essential of User Interface Design”, Wiley- Dream Tech Ltd.,2002

Web links and Video lectures (e-Resources)
https://archive.nptel.ac.in/courses/124/107/124107008/

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	**Internal Assessment1**	**50**	**30 (Average of Best Two Assessments)**	**50**
	Internal Assessment2	**50**		
	Internal Assessment3	**50**		
Self learning	**Two Assignments**	**20**	**10**	
	Seminar Presentation	**20**	**10**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	1	-	-	-	-	-	-	-	-	-
CO2	3	3	-	1	-	-	-	-	-	-	2
CO3	3	3	3	1	3	-	-	-	-	-	2
CO4	3	3	-	3	3	-	-	-	-	-	-
CO5	3	1	-	-	-	-	-	-	-	-	-

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
CRYPTOGRAPHY AND NETWORK SECURITY **Category: PEC**					
Course Code	:	P24MCAF216	CIE	:	50 Marks
Teaching Hours L : T : P	:	3:0:0	SEE	:	50 Marks
Total Hours	:	45	Total	:	100 Marks
Credits	:	3	SEE Duration	:	3Hrs

Course Objectives	
1.	To make the student learn different encryption techniques along with hash functions, MAC, digital signatures and their use in various protocols for network security and system security.

Module – 1	**No. of Hours**
Introduction : Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Network Security. Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Steganography.	9
Module – 2	**No. of Hours**
Block Ciphers and the Data Encryption Standard: Block Cipher Principles, The Data Encryption Standard (DES), A DES Example, The Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles. Block Cipher Operation: Multiple Encryption and Triple DES, Electronic Codebook Mode, Cipher Block Chaining Mode, Cipher Feedback Mode, Output Feedback Mode, Counter Mode. Stream Ciphers: Stream Ciphers, RC4.	9
Module – 3	**No. of Hours**
Number Theory-: Divisibility and the Division Algorithm, The Euclidean Algorithm, Modular Arithmetic, Prime Numbers, Fermat's and Euler's Theorems, Testing for Primality, The Chinese Remainder Theorem, Discrete Logarithms. Public-Key Cryptography, RSA AND other Public-Key Cryptosystems: Principles of Public-Key Cryptosystems, The RSA Algorithm, Diffie Hellman Key Exchange, ElGamal Cryptosystem.	9
Module – 4	**No. of Hours**
Cryptographic Hash Functions: Applications of Cryptographic Hash Function, Two Simple Hash Functions, Requirements and Security, Hash Functions Based on Cipher Block Chaining, Secure Hash Algorithm (SHA). Message Authentication Codes: Message Authentication Requirements, Message Authentication Functions, Message Authentication Codes, Security of MACs, MACs Based on Hash Functions (HMAC).	9
Module – 5	**No. of Hours**
Digital Signatures- Digital Signatures, ElGamal Digital Signature Scheme, Schnorr Digital Signature Scheme, Digital Signature Standard (DSS). Key Management and Distribution: Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key Distribution Using Asymmetric Encryption, Distribution of Public Keys, X.509 Certificates, Public Key Infrastructure.	9

Course Outcomes: At the end of the course, the students will be able to	
CO1	Analyze and design classical encryption techniques and block ciphers
CO2	Understand and analyze data encryption standard
CO3	Understand and analyze public-key cryptography, RSA and other public-key cryptosystems
CO4	Understand key management and distribution schemes and design User Authentication, such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc.
CO5	Analyze and design hash and MAC algorithms, and digital signatures.

Text Books	
1.	William Stallings: Cryptography And Network Security- Principles And Practice, 5th Edition, Pearson/PHI, 2011.

Reference Text Books	
1.	William Stallings, "Network Security Essentials (Applications and Standards)", 4th Edition, Pearson Education. ,2012
2.	Charlie Kaufman, Radia Perlman and Mike Speciner: "Network Security – Private Communication in a Public World", 2nd Edition, Pearson/PHI, 2002.
3.	Eric Maiwald: "Fundamentals of Network Security", 1st Edition, Dreamtech Press, 2003.

Web links and Video lectures (e-Resources)
https://archive.nptel.ac.in/courses/106/105/106105162/

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 marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Theory	Internal Assessment1	50	30 (Average of Best Two Assessments)	50
	Internal Assessment2	50		
	Internal Assessment3	50		
Self learning	Two Assignments	20	10	
	Seminar Presentation	20	10	
SEE	Semester End Examination	100	50	50
Grand Total				100

SEMESTER END EXAMINATION

1. The question paper shall be set for 100 marks and duration of SEE is 3 hours.
2. Two questions of 20 marks (with minimum of 3 sub questions) from each module with internal choice.
3. Students should answer five full questions, selecting one full question from each module.
4. Question papers to be set as per the Blooms Taxonomy levels.

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	3	2	-	3	-	1	-	1	-	-
CO2	1	2	3	-	2	-	2	-	1	-	-
CO3	2	2	2	2	3	-	1	-	-	2	-
CO4	1	3	3	-	2	-	2	2	1	-	2
CO5	1	2	1	2	2	-	-	-	1	1	-

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
JAVA PROGRAMMING LAB **Category: PCCL**					
Course Code	:	P24MCAL207	CIE	:	50 Marks
Teaching Hours L : T : P	:	0:0:2	SEE	:	50 Marks
Total Hours	:	30	Total	:	100 Marks
Credits	:	1	SEE Duration	:	3Hrs

Course Objectives	
1.	Using java programming to develop programs for solving real-world problems.
2.	Reinforce the understanding of basic object-oriented programming concepts

S. No	**Experiments**
1.	Write a java program to find the Fibonacci series using recursive and non-recursive functions
2.	Write a java program to multiply two given matrices.
3.	Write a java program for Method overloading and Constructor overloading.
4.	Write a java program that checks whether a given string is palindrome or not.
5.	Write a Java program to print the following triangle of numbers 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5
6.	Write a java program to represent Abstract class with example.
7.	Write a java program to implement Interface using extends keyword.
8.	Write a Java program to list the factorial of the numbers 1 to 10. To calculate the factorial value, use while loop. (Hint Fact of 5 = 5*4*3*2*1)
9.	Write a Java program to accept a number and find whether the number is Prime or not
10.	Write a java program to create user defined package.
11.	Write a java program to create inner classes.
12.	Write a java program for creating multiple catch blocks.
13.	Write a java program for producer and consumer problem using Threads
14.	Write a Java program that implements a multi-thread application that has three threads.
15.	Write an applet program that displays a simple message.
16.	Write a Java program compute factorial value using Applet.
17.	Write a program for passing parameters using Applet.
18.	Write a java program that works as a simple calculator. Use a Grid Layout to arrange Buttons for digits and for the + - * % operations. Add a text field to display the result.
Demonstration Experiments (For CIE) if any	
19.	Write a java program that connects to a database using JDBC
20.	Write a Java Program to create a window when we press M or m the window displays Good Morning A or a the window displays Good After Noon E or e the window displays Good Evening N or n the window displays Good Night

Course Outcomes: At the end of the course, the students will be able to	
CO1	Write basic java program using proper syntax and semantics.

CO2	Create an application using interfaces and packages.
CO3	Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.
CO4	Develop Applet programs and manipulate the IO streams.
CO5	Design and develop database applications.

ASSESSMENT STRUCTURE FOR LABORATORY:

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

Component	Type of Assessment	Max. Marks	Max. Marks Scaling Down to	Total Marks
Laboratory	**Lab Conduction & Record**	**Evaluating Each Expt. For 10marks*12 expts.**	**15**	**50**
	Laboratory Test 1: After 6 expts	**50**	**15**	
	Laboratory Test 1: After 12 expts	**50**	**20**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO8	PO11
CO1	3	3	2	-	3	-	1	-	1	-	2
CO2	3	3	3	-	2	-	2	-	1	-	2
CO3	3	2	2	-	3	-	1	-	-	2	1
CO4	3	3	3	-	2	-	2	-	1	-	3
CO5	3	2	1	2	3	-	-	-	1	1	1

Level 3 - High, Level 2 - Moderate, Level 1 - Low

SEMESTER-II					
DATABASE MANAGEMENT SYSTEMS LAB WITH MINI PROJECT **Category: PCCL**					
Course Code	:	P24MCAL208	CIE	:	50 Marks
Teaching Hours L : T : P	:	0:2:2	SEE	:	50 Marks
Total Hours	:	30	Total	:	100 Marks
Credits	:	1	SEE Duration	:	3Hrs

Course Objectives	
1.	Create SQL queries for the small projects.
2.	Create database objects that include tables, constraints, indexes, and sequences.

S. 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: • List the details of Students who are all studying in 2nd sem MCA. • List the students who are not borrowed any books. • Display the USN, Student name, Branch_name, Book_name, Author_name, Books_Borrowed_Date of 2nd sem MCA Students who borrowed books. • Display the number of books written by each Author. • Display the student details who borrowed more than two books. • Display the student details who borrowed books of more than one Author. • Display the Book names in descending order of their names. List the details of students who borrowed the books which are all published by the same publisher.
2.	Consider the following schema: STUDENT (USN, name, date_of_birth, branch, mark1, mark2, mark3, total, GPA) Execute the following queries: i. Update the column total by adding the columns mark1, mark2, mark3. ii. Find the GPA score of all the students. iii. Find the students who born on a particular year of birth from the date_of_birth column. iv. List the students who are studying in a particular branch of study. v. Find the maximum GPA score of the student branch-wise. vi. Find the students whose name starts with the alphabet “S”. vii. Find the students whose name ends with the alphabets “AR”. Delete the student details whose USN is given as 1001

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: • Display the youngest player (in terms of age) Name, Team name, age in which he belongs of the tournament. • List the details of the stadium where the maximum number of matches were played. • List the details of the player who is not a captain but got the man_of _match award at least in two matches. • Display the Team details who won the maximum matches. 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 candidate are uniquely identified by using candidate_id, having Name, phone_no, age, state. A candidate belongs to only one party. There are 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 constituency. Queries: • List the details of the candidates who are contesting from more than one constituency which are belongs to different states. • Display the state name having maximum number of constituencies. • Create a stored procedure to insert the tuple into the voter table by checking the voter age. • If voter"s age is at least 18 years old, then insert the tuple into the voter else display the "Not an eligible voter msg". • 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. Create a TRIGGER to UPDATE the count of " Number_of_voters" of the respective constituency in

	"CONSTITUENCY" table , AFTER inserting a tuple into the "VOTERS" table..
5.	Design an ER-diagram for the following scenario, Convert the same into a relational model, normalize Relations into a suitable Normal form and then solve the following queries. A country can have many Tourist places. Each Tourist place is identified by using tourist_place_id, having a name, belongs to a state, Number of kilometers away from the 02.03.2021 updated 52/ 104 capital city of that state,history. There are many Tourists visits tourist places every year. Each tourist is identified uniquely by using Tourist_id, having a Name, age, Country and multiple email ids. A tourist visits many Tourist places; it is also required to record the visted_date in the database. A tourist can visit a Tourist place many times at different dates. A Tourist place can be visited by many tourists either in the same date or at different dates. Queries: i. List the state name which is having maximum number of tourist places. ii. List details of Tourist place where maximum number of tourists visited. iii. List the details of tourists visited all tourist places of the state "KARNATAKA". iv. Display the details of the tourists visited at least one tourist place of the state, but visited all states tourist places. Display the details of the tourist place visited by the tourists of all country.

Course Outcomes: At the end of the course, the students will be able to	
CO1	Create database objects.
CO2	Design entity-relationship diagrams to solve given database applications
CO3	Implement a database schema for a given problem.
CO4	Formulate SQL queries in Oracle for the given problem
CO5	Apply normalization techniques to improve the database design for the given problem.
CO6	Build database and verify for its appropriate normalization for any given problem

ASSESSMENT STRUCTURE FOR LABORATORY:

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks and Minimum passing marks for the SEE is 40% of the maximum marks of SEE. The minimum passing marks in SEE is 50% i.e. sum of the CIE and SEE together.

CONTINUOUS INTERNAL EVALUATION (CIE):

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Laboratory	**Lab Conduction & Record**	**Evaluating Each Expt. For 10marks*12 expts.**	**15**	**50**
	Laboratory Test 1: After 6 expts	**50**	**15**	
	Laboratory Test 1: After 12 expts	**50**	**20**	
SEE	**Semester End Examination**	**100**	**50**	**50**
Grand Total				**100**

MINI PROJECT WORK EVALUATION: During project work, the evaluation process will be divided into number of phases to assess the continuous progress (Minimum three phases).

- The project guides and project coordinator follows rubrics, which is set by the Department for evaluation and then submitted to the head of department.
- Each internal guide will verify the statement of project and literature of works and implementation details. The department will encourage students to make publications in standard conferences/journals.

Rubrics for Mini Project Evaluation CIE& SEE:

Review #	**Agenda**	**Assessment**	**Review Assessment Weightage**	**Overall Weightage**
Review 1	Project Synopsis Evaluation	Rubrics1	25	25 (Avg of R1, R2, R3)
Review 2	Mid-Term Project Evaluation	Rubrics2	25	
Review 3	Final Internal Project Evaluation	Rubrics3	25	
Final Project Viva-Voce	End-Semester Project Evaluation	25		25
Total				50

CO-PO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO8	PO11
CO1	2	1	-	-	-	-	2	-	-	2	1
CO2	2	1	-	-	-	-	2	-	1	2	1
CO3	2	3	-	-	-	-	2	-	1	2	1
CO4	3	1	-	-	-	-	3	-	1	2	1
CO5	3	3	-	-	-	-	3	-	1	1	1
CO6	2	1	-	-	-	-	1	-	1	-	-

Level 3 - High, Level 2 - Moderate, Level 1 - Low