









RAJARAJESWARI COLLEGE OF ENGINEERING

An Autonomous Institution

Under VTU, Approved by AICTE, UGC & GoK No. 14, Ramohalli Cross, Kumbalagodu, Mysore Road, Bengaluru

SCHEME & SYLLABUS

PG PROGRAM MCA 2nd Semester





Effective from the Academic Year

2024-25







RAJARAJESWARI COLLEGE OF ENGINEERING

An Autonomous Institution



Under VTU - Belagavi, Approved by AICTE, UGC & GoK

No. 14, Ramohalli Cross, Kumbalagodu, Mysore Road, Bengaluru - 560074



Institute Vision

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

Institute Mission

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.

To foster a transformative learning environment that integrates technology, research, and practical experience, empowering students to become skilled professionals and socially conscious leaders.

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.

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



Rajarajeswari College of Engineering

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











Master of Computer Applications Scheme 2024-25

II Semester



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 2024-25)

II Semester

				19	Te	aching H	ours/ Weel	(Exam	ination			
S. No	Course Category and Course Code						TD/PSB Lecture Seminar		Tutorial / SDA	Credits	Duration in Hours	CIE Marks	E Marks	Total Marks
					L	P	T/S	=	ā	5	SEE	To		
1	PCC	P24MCA201	Artificial Intelligence and Machine Learning	MCA	3	0	0	3	3	50	50	100		
2	IPCC	P24MCA202	Data Analytics using Python	MCA	3	2	0	4	3	50	50	100		
3	IPCC	P24MCA203	Web Technologies	MCA	3	2	0	4	3	50	50	100		
4	PCC	P24MCA204	Object Oriented Programming through Java	MCA	3	0	0	3	3	50	50	100		
5	PCC	P24MCA205	Data base Management Systems	MCA	3	0	0	3	3	50	50	100		
6	PEC	P24MCAX216	Professional Elective Course-I	MCA	3	0	0	3	3	50	50	100		
7	PCCL	P24MCAL207	Java Programming Lab	MCA	0	2	0	1	3	50	50	100		
8	PCCL	P24MCAL208	Database Management Systems Lab with Mini Project	MCA	0	2	2	2	3	50	50	100		
		1 10001		TOTAL	18	08	2	23	24	400	400	800		

Note: PCC: Professional core. IPCC-Integrated Professional Core Courses, PCC: Professional Core Courses, PCCL-Professional Core Course lab, L-Lecture, P-Practical, T/SDA-Tutorial/Skill Development Activities, PEC: Professional Elective Course.



MOOGAMBIGAI CHARITABLE AND EDUCATIONAL TRUST Rajarajeswari College of Engineering



 ${\bf (An Autonomous Institution under Visves varaya Technological University, Belagavi)}\\$

Master of Computer Applications

Scheme of Teaching and Examinations-2024 Outcome Based Education(OBE) and Choice Based Credit System(CBCS)

(EffectivefromtheAcademicYear2024-25)

	Pro	fessional Elective Cours	ses -I
Course Code	Course Title	Course Code	
P24MCAA216	Data Warehousing & Data Mining	D24MCA D216	Course Title
	Enterprise Resource Planning	P24MCAD216	Big Data Analytics
DO 43 40 4	User Interface Design	P24MCAF216	Digital Marketing
	1	124MCAF216	Cryptography and Network Security

PCC: Professional Core Course, PEC: Professional Elective Course, IPCC: Integrated Professional Core Course, Project Based Learning Course (PBLC): Project Based Learning course is a professional core Course only Students have to complete a project out of learning from the course and SEE will be viva voce on project work. PCCL: Professional Core Course Laboratory: Practical courses whose CIE will be evaluated by the class teacher and SEE will be evaluated by

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

1. Interact with industry (small, medium, and large).

- $2. \ Involve in research/testing/projects to understand their problems and help creative and innovative methods to solve the problem.$
- 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 Rajarajeswari College of Engineering

Bengaluru - 560 074.

RAJARAJESWARI COLLEGE OF ENGINEERING Ramohalli Cross, Bengaluru-7



Rajarajeswari College of Engineering

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











Master of Computer Applications Syllabus 2024-25

II Semester



Master of Computer Applications								
Semester II								
Artificial Intelligence and Machine Learning								
		Category:	PCC					
		(Theor	y)					
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	:	3 Hrs			

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

Course	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 B	ooks						
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).						
Refere	Reference Text Books						



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1	Elaine Rich, Kevin Knight, Artificial Intelligence, 3rdedition, Tata McGraw Hill,2013
	George F Lugar, Artificial Intelligence Structure and strategies for complex, Pearson Education, 5th Edition, 2011

Web links and Video lectures (e-Resources)

- 1. https://onlinecourses.nptel.ac.in/noc24_ce107/preview
- 2. 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 the Semester End Examination (SEE) is 50%. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50). The minimum passing mark for SEE is 40% of maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. Student has to secure a minimum 50% (50 marks out of 100) in the total of the CIE and SEE together.

Continuous Internal Evaluation (CIE):

- 1. Three tests each of 50 marks, after the completion of the syllabus 40%, 70% and 100% respectively.
- 2. Average of best two internal assessment tests each of 50 marks, scale down to 30 marks.
- 3. Any two assessment methods as per regulations i.e. Assignment/Quiz/Seminar/Group Discussion/Case Studies/Practical orientation on Design Thinking/ problem Solving Exercises/Presentation of Research work/hack-a-thon/Code-a-thon conducted by reputed organizations/ any other for **20 marks**.
- 4. Total marks scored (30+20 = 50 marks).
- 5. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50)

Semester End Examination (SEE):

- 1. The question paper shall be set for 100 marks.
- 2. The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module.
- 3. Students have to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to 50 marks.
- 4. There will be two questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
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





Master of Computer Applications								
Semester II								
Data Analytics using Python								
		Category: I	PCC					
		(Theory + Pra	ectical)					
Course Code	:	P24MCA202	CIE	:	50 Marks			
Teaching Hours L: T: P : 3:0:2 SEE : 50 Marks								
Total Hours : 45 L + 15 P Total : 100 Marks								
Credits	:	4	SEE Duration	:	3 Hrs			

Cours	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	No. of Hrs
Python Basic Concepts and Programming	
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	
ifelse Decision Control Flow Statement, The ifelifelse Decision Control Statement, Nested	
if Statement, The while Loop, The for Loop, The continue and break Statements, Built-In	9
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.	
Module – 2	No. of Hrs
Python Collection Objects, Classes	
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	9
Methods. Sets, Tuples and Dictionaries. Files: reading and writing files. Class Definition –	
Constructors – Inheritance – Overloading.	
Module – 3	No. of Hrs
Data Pre-processing and Data Wrangling	
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	9
Manipulation, Regular Expressions.	
Module – 4	No. of Hrs
Web Scraping And Numerical Analysis	
Data Acquisition by Scraping web applications –Submitting a form - Fetching web pages –	
Downloading web pages through form submission – CSS Selectors. NumPy Essentials:	9
TheNumPy.	
Module – 5	No. of Hrs
Data Visualization with NumPy Arrays, Matplotlib, and Seaborn	
Data Visualization: Matplotlib package – Plotting Graphs – Controlling Graph – Adding Text –	
More Graph Types - Getting and setting values - Patches. Advanced data visualization with	9
Seaborn. Time series analysis with Pandas.	



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Course	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							

Text B	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, I Edition.

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

Assessment Details both CIE and SEE:

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Continuous Internal Evaluation (CIE): Theory

- 1. Three tests each of 50 marks, after the completion of the syllabus 40%, 70% and 100% respectively.
- 2. Average of best two internal assessment tests each of 50 marks, scale down to 30 marks.
- 3. Any two assessment methods as per regulations i.e. Assignment/Quiz/Seminar/Group Discussion/Case Studies/Practical orientation on Design Thinking/ problem Solving Exercises/Presentation of Research work/hacka-thon/Code-a-thon conducted by reputed organizations/ any other for **20 marks**.
- 4. Total marks scored (30+20 = 50 marks) scale down to 25.

CIE for the Practical component of IC:

- 1. On completion of every experiment / program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day.
- 2. Each experiment is evaluated for 10 marks and scaled down to 5 marks
- 3. Laboratory test at the end of the semester / after completion of all the experiments shall be conducted test for 50 marks and scale down to 20 marks.
- 4. Total marks scored for lab component 25 marks.

Total CIE Marks = 25 (Theory) +25 (Practical) = 50 Marks

Semester End Examination (SEE):

- 1. The question paper shall be set for 100 marks.
- 2. The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module.
- 3. Students have to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to 50 marks.
- 4. There will be two questions from each module. Each of the two questions under a module (with a



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maximum of 3 sub-questions), should have a mix of topics under that module.

Sl.NO	Experiments
1	Write a Python program to perform linear search
2	Write a Python program to insert an element into a sorted list
3	Write a python program using object oriented programming to demonstrate encapsulation,
	overloading and inheritance
4	Implement a python program to demonstrate
	1) Importing Datasets 2) Cleaning the Data 3) Data frame manipulation using Numpy
5	Implement a python program to demonstrate the following using NumPy
	Array manipulation, Searching, Sorting and splitting.
	broadcasting and Plotting NumPy arrays
6	Implement a python program to demonstrate
	Data visualization with various Types of Graphs using Numpy
7	Write a Python program to demonstrate Data Visualization using Seaborn
8	Write a Python program that creates a mxn integer array and Prints its attributes using
	matplotlib
9	Write a Python program to demonstrate the generation of linear regression models.
10	Write a Python program to demonstrate Time series analysis with Pandas.

Practical:

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
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
CO4	3	2	3	-	2	1	1	-	1	1	-	1





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Master of Computer Applications									
Semester II									
		Web Technolog	ies						
		Category: IPC	C						
		(Theory + Practi	cal)						
Course Code	:	P24MCA203	CIE	:	50 Marks				
Teaching Hours L : T : P	Teaching Hours L: T: P : 3:0:2 SEE : 50 Marks								
Total Hours : 45 L + 15 P Total : 100 Marks									
Credits		4	SEE Duration	:	3 Hrs				

Cours	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 Hrs
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.	9
Introduction to CSS, Levels of CSS, Selectors, Font, color and Text Properties, BOX Model, Span	
and Div tags.	
Module – 2	No. of Hrs
Introduction to JavaScript, controls statements, Arrays and functions, Pattern Matching, Element	9
Access, Event Handling	
Module – 3	No. of Hrs
Introduction to Bootstrap, First example, containers, Bootstrap elements: colors, tables, images,	
buttons, button groups, progress bars, Forms, utilities, Classes, alerts, custom forms, Grid	9
System.	
Module – 4	No. of Hrs
Introduction to JQuery, Syntax, selectors, events, JQuery HTML, JQuery Effects, JQuery CSS.	9
Module – 5	No. of Hrs
Introduction to Angular, Introduction, Architecture.	
Components: Interaction, styles, dynamic components, Angular elements, Attribute directives and	
Pipes.	9
Templates: Displaying Data, Template Syntax, User input, Life Cycle Hooks.	
Forms: Introduction.	

Course Out	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)





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http://greenteapress.com/wp/thinkpython/

Practical:

Sl.NO	Experiments											
1	Create an HTML page that provides information about your department. Your HTML 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).											
2	Develop and demonstrate the usage of inline, external and internal style sheet using CSS. Use											
	HTML page that contains at least three paragraphs of text, listed elements and a table with four											
	rows and four columns											
3	Develop and demonstrate a HTML 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											
4	Develop, test and validate an HTML document that has checkboxes for apple (59 cents each),											
	orange (49 cents each), and banana (39 cents each) along with submit button. Each check box											
	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 the											
	message "your total cost is \$xxx", where xxx is the total cost of the chose fruit, including 5											
	percent 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.											
5	Develop and demonstrate a HTML file which includes JavaScript that uses functions for the											
	following problems: a. Parameter: A string Output: The position in the string of the left-most											
	vowel. b. Parameter: A number Output: The number with its digits in the reverse order											
6	Develop and demonstrate, using JavaScript script, a HTML 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											

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- 2. Each experiment is evaluated for 10 marks and scaled down to 5 marks
- 3. Laboratory test at the end of the semester / after completion of all the experiments shall be conducted test for 50 marks and scale down to 20 marks.
- 4. Total marks scored for lab component 25 marks.

Total CIE Marks = 25 (Theory) +25 (Practical) = 50 Marks

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- 3. Students have to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to 50 marks.
- 4. There will be two questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
CO1	3	2	1	3	-	-	-	-	-	-	-	-
CO2	1	3	2	-	-	3	-	-	-	-	-	-
CO3	3	2	3	-	-	-	-	-	-	-	-	-
CO4	1	2	2	-	3	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-	-



Master of Computer Applications					
		Semeste	r II		
	Ob	ject Oriented Progran	nming through Java		
		Category:	PCC		
		(Theor	y)		
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	:	3 Hrs

Cours	se Objectives
1	The objective of this course is 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.

	N. C.II
Module – 1	No. of Hrs
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	9
Syntax.	
Introducing classes: Class fundamentals – Declaring objects-Assigning object reference variables	
Introducing methods – Constructors – The 'this' Keyword-Garbage collection- The finalize ()	
method–A Stackclass.	
Module – 2	No. of Hrs
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.	9
Inheritance – Inheritance types, super keyword, preventing inheritance: final classes and	
methods.	
Polymorphism – method overloading and method overriding, abstract classes and methods.	
Module – 3	No. of Hrs
Packages- Defining, creating and accessing a package, importing packages.	110.01 1115
Interfaces - Interfaces Vs Abstract classes, defining an interface, implement interfaces,	
accessing implementations through interface references, extending interface, inner class.	9
accessing implementations unough interface references, extending interface, inner class.	,
Exception handling Renefits of exception handling the classification of exceptions — exception	
Exception handling-Benefits of exception handling, the classification of exceptions – exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws	
hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws	
hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses.	No of Hea
hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses. Module – 4	No. of Hrs
hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses. Module – 4 Multithreading – Differences between multiple processes and multiple threads, thread life	No. of Hrs
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a database, querying a database and processing the results, updating data with JDBC, Data	9
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.	

Course	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 Bo	ooks
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

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- 4. Total marks scored (30+20 = 50 marks).
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- 1. The question paper shall be set for 100 marks.
- 2. The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module.
- 3. Students have to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to 50 marks.
- 4. There will be two questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.



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PO/	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
ĆO												
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	1	-	3
CO5	3	2	1	2	3	-	-	-	1	1	-	1



	•	Master of Compute	r Applications		_
		Semeste	r II		
		Database Manager	ment Systems		
		Category:	PCC		
		(Theor	y)		
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	:	3 Hrs

Cours	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 Hrs
Introduction to Databases: Introduction, Characteristics of database approach, Advantages of using	2,00
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	9
Data Modeling using Entities and Relationships: Entity types, Entity sets, attributes, roles, and	,
structural constraints, Weak entity types, ER diagrams, Examples	
Module - 2	No. of Hrs
Relational Model: Relational Model Concepts, Relational Model Constraints and relational	1(0/ 01 1115
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	9
into a Logical Design: Relational Database Design using ER-to-Relational mapping.	
Module - 3	No. of Hrs
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:	9
Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces,	
SQLJ, Stored procedures, Case study: The internet Bookshop.	
Module - 4	No. of Hrs
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	9
Relational Database Schema Design, Nulls, Dangling tuples, and alternate Relational Designs,	
Further discussion of Multivalued dependencies and 4NF, Other dependencies and Normal Forms.	
Module - 5	No. of Hrs
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	9
control based on Timestamp ordering, Multiversion Concurrency control techniques, Validation	
Concurrency control techniques, Granularity of Data items and Multiple Granularity Locking.	



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Course	e 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 I	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.
Refer	ence Text Books
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)
1. https://onlinecourses.nptel.ac.in/noc22_cs91/preview

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PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
CO1	3	-	3	-	-	-	-	-	-	-	-	-
CO2	-	2	-	ı	3	1	-	-	-	-	ı	-
CO3	3	-	3	-	-	-	-	-	-	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-	-	-
CO5	-	3	3	-	-	-	-	-	-	-	-	-



Master of Computer Applications								
	Semester II							
	Data Warehousing & Data Mining							
		Professional Electiv	ve					
		(Theory)						
Course Code	:	P24MCAA216	CIE	:	50 Marks			
Teaching Hours L:T:P	Teaching Hours L : T : P : 3:0:0 SEE : 50 Marks							
Total Hours : 45 Total : 100 Marks								
Credits		3	SEE Duration	:	3 Hrs			

Cours	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 Hrs
Data warehouse: Introduction to Data warehouse, Difference between operational database	
systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and	9
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.	
Module – 2	No. of Hrs
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	9
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.	
Module – 3	No. of Hrs
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-	9
Maximal Frequent Item Set, Closed Frequent Item Set.	
Module – 4	No. of Hrs
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-	9
Nearest neighbor classification-Algorithm and Characteristics. Prediction: Accuracy and Error	
measures, Evaluating the accuracy of classifier or a predictor, Ensemble methods.	
Module – 5	No. of Hrs
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	9
Agglomerative Hierarchical Clustering Algorithm, Key Issues in Hierarchical Clustering,	
Strengths and Weakness, Outlier Detection.	

Course	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						



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CO5 Apply suitable data mining techniques for various real time applications

Text Bo	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.							

ſ	Reference Books						
Ī	1	Data Mining Techniques, Arun KPujari, 3rd Edition, Universities Press.					
Ī	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

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PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
60												
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
	•	•	•	•	•	•	•	•	•	•	•	•



Master of Computer Applications								
	Semester II							
	Big Data Analytics							
		Professional Electiv	e					
		(Theory)						
Course Code	:	P24MCAB216	CIE	:	50 Marks			
Teaching Hours L: T: P	Teaching Hours L:T:P: 3:0:0 SEE: 50 Marks							
Total Hours : 45 Total : 100 Marks								
Credits	Credits 3 SEE Duration : 3 Hrs							

Cours	se 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 Hrs
Big Data and Analytics: Example Applications, Basic Nomenclature, Analysis Process Model,	
Analytical Model Requirements, Types of Data Sources, Sampling, Types of Data Elements,	9
Data Exploration, Exploratory Statistical Analysis, Missing Values, Outlier Detection and	
Treatment, Standardizing Data Labels, Categorization	
Module – 2	No. of Hrs
Introduction to Technology Landscape NoSQL, Comparison of SQL and NoSQL, Hadoop -	
RDBMS Versus Hadoop - Distributed Computing Challenges - Hadoop Overview - Hadoop	9
Distributed File System - Processing Data with Hadoop - Managing Resources and Applications	
with Hadoop YARN - Interacting with Hadoop Ecosystem	
Module – 3	No. of Hrs
Introduction to MongoDB AND Map Reduce Programming MongoDB: Why Mongo DB -	
Terms used in RDBMS and Mongo DB - Data Types - MongoDB Query Language MapReduce:	9
Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression.	
Module – 4	No. of Hrs
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	9
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.	
Module – 5	No. of Hrs
Introduction to Data Analytics with R Machine Learning: Introduction, Supervised Learning,	
Unsupervised Learning, Machine Learning Algorithms: Regression Model, Clustering,	9
Collaborative Filtering, Associate Rule Making, Decision Tree, Big Data Analytics with BigR.	

Course	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.									



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

Refere	ence Books
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/	

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PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
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
	l .			l		l		l			l	



Master of Computer Applications										
Semester II										
Enterprise Resource Planning										
		Professional Electiv	ve							
		(Theory)								
Course Code	:	P24MCAC216	CIE	:	50 Marks					
Teaching Hours L: T: P	Teaching Hours L : T : P : 3:0:0 SEE : 50 Marks									
Total Hours	Total Hours : 45 Total : 100 Marks									
Credits		3	SEE Duration	:	3 Hrs					

Cours	se Objectives
1	To provide a contemporary and forward-looking on the theory and practice of Enterprise Resource Planning
2	Technology.
3	To focus on a strong emphasis upon practice of theory in Applications and Practical oriented approach.
4	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 Hrs
Introduction to Supply Chain Management: Supply chain – objectives – importance – decision	
phases – process view – competitive and supply chain strategies – achieving strategic fit –	9
supply chain drivers – obstacles – framework – facilities – inventory – transportation –	
information – sourcing – pricing.	
Module – 2	No. of Hrs
ERP Implementation: Implementation of Life Cycle, Implementation Methodology, Hidden	
Costs, Organizing Implementation, Vendors, Consultants and Users, Contracts, Project	9
Management and Monitoring.	
Module – 3	No. of Hrs
Business Modules: Business Modules in an ERP Package, Finance, Manufacturing, Human	
Resource, Plant	9
Maintenance, Materials Management, Quality Management, Sales and Distribution.	
Module – 4	No. of Hrs
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 Hrs
ERP-Present And Future: Turbo Charge the ERP System, EIA, ERP and E-Commerce, ERP	
and Internet, Future Directions in ERP.	9

Course	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 B	ooks
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",



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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:

The weightage of continuous Internal Evaluation (CIE) is 50% and for the Semester End Examination (SEE) is 50%. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50). The minimum passing mark for SEE is 40% of maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. Student has to secure a minimum 50% (50 marks out of 100) in the total of the CIE and SEE together.

Continuous Internal Evaluation (CIE):

- 1. Three tests each of 50 marks, after the completion of the syllabus 40%, 70% and 100% respectively.
- 2. Average of best two internal assessment tests each of 50 marks, scale down to 30 marks.
- 3. Any two assessment methods as per regulations i.e. Assignment/Quiz/Seminar/Group Discussion/Case Studies/Practical orientation on Design Thinking/ problem Solving Exercises/Presentation of Research work/hack-a-thon/Code-a-thon conducted by reputed organizations/ any other for **20 marks**.
- 4. Total marks scored (30+20 = 50 marks).
- 5. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50)

Semester End Examination (SEE):

- 1. The question paper shall be set for 100 marks.
- 2. The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module.
- 3. Students have to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to 50 marks.
- 4. There will be two questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<u>e</u> 60												
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



Master of Computer Applications								
		Semester II						
	Digital Marketing							
	Professional Elective							
(Theory)								
Course Code	Course Code : P24MCAD216 CIE : 50 Marks							
Teaching Hours L:T:P	Teaching Hours L:T:P : 3:0:0 SEE : 50 Marks							
Total Hours	:	45	Total	:	100 Marks			
Credits		3	SEE Duration	:	3 Hrs			

Cours	se 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 Hrs
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,	9
Digital marketing models.	
Module – 2	No. of Hrs
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 Hrs
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 Hrs
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 Hrs
Social Media Channels: Introduction, Key terms and concepts, Traditional media vs 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.	9



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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.

Course	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 Bo	ooks
1	Seema Gupta "Digital Marketing" Mc-Graw Hill 1st Edition – 2017

Refere	nce 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 the Semester End Examination (SEE) is 50%. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50). The minimum passing mark for SEE is 40% of maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. Student has to secure a minimum 50% (50 marks out of 100) in the total of the CIE and SEE together.

Continuous Internal Evaluation (CIE):

- 1. Three tests each of 50 marks, after the completion of the syllabus 40%, 70% and 100% respectively.
- 2. Average of best two internal assessment tests each of 50 marks, scale down to 30 marks.
- 3. Any two assessment methods as per regulations i.e. Assignment/Quiz/Seminar/Group Discussion/Case Studies/Practical orientation on Design Thinking/ problem Solving Exercises/Presentation of Research work/hack-a-thon/Code-a-thon conducted by reputed organizations/ any other for **20 marks**.
- 4. Total marks scored (30+20 = 50 marks).
- 5. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50)

Semester End Examination (SEE):

- 1. The question paper shall be set for 100 marks.
- 2. The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module.
- 3. Students have to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to



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50 marks.

4. There will be two questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
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	-	-	-	-	-	-	-



Master of Computer Applications								
	Semester II							
	User Interface Design							
	Professional Elective							
	(Theory)							
Course Code	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	:	3 Hrs			

Cours	se 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 Hrs
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,	9
Principles of user interface design.	
Module – 2	No. of Hrs
The User Interface Design process- Obstacles, Usability, Human characteristics in Design,	
Human Interaction speeds, Business functions definition and requirement analysis, Basic	9
business functions, and Design standards.	
Module – 3	No. of Hrs
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,	9
Kinds of graphical menus.	
Module – 4	No. of Hrs
Windows - Characteristics, Components of window, Window presentation styles, Types of	
window, Window management, Organizing window functions, Window operations, Web	9
systems, Characteristics of device-based controls.	
Module – 5	No. of Hrs
Screen-based controls - Operable control, Text control, Selection control, Custom control,	
Presentation control, Windows Tests-prototypes, kinds of tests.	9

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

Referen	nce 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

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



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Assessment Details both CIE and SEE:

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Continuous Internal Evaluation (CIE):

- 1. Three tests each of 50 marks, after the completion of the syllabus 40%, 70% and 100% respectively.
- 2. Average of best two internal assessment tests each of 50 marks, scale down to 30 marks.
- 3. Any two assessment methods as per regulations i.e. Assignment/Quiz/Seminar/Group Discussion/Case Studies/Practical orientation on Design Thinking/ problem Solving Exercises/Presentation of Research work/hack-a-thon/Code-a-thon conducted by reputed organizations/ any other for **20 marks**.
- 4. Total marks scored (30+20 = 50 marks).
- 5. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50)

Semester End Examination (SEE):

- 1. The question paper shall be set for 100 marks.
- 2. The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module.
- 3. Students have to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to 50 marks.
- 4. There will be two questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

Course	ourse 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.						

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
CO1	3	1	-	-	-	-	-	-	-	-	-	-
CO2	3	3	-	1	-	-	-	-	-	-	-	2
CO3	3	3	3	1	3	-	-	-	-	-	-	2
CO4	3	3	-	3	3	-	-	-	-	-	-	-
CO5	3	1	-	-	-	-	-	-	-	-	-	-



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Master of Computer Applications								
Semester II								
Cryptography and Network Security								
		Professional E	Elective					
		(Theory	<i>y</i>)					
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	:	3 Hrs			

Course Objectives 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 Hrs
Introduction: Computer Security Concepts, The OSI Security Architecture, Security Attacks,	
Security Services,	
Security Mechanisms, A Model for Network Security.	9
Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques,	
Transposition Techniques, Steganography.	
Module – 2	No. of Hrs
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.	9
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.	
Module – 3	No. of Hrs
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	9
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.	
Module – 4	No. of Hrs
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).	9
Message Authentication Codes: Message Authentication Requirements, Message Authentication	
Functions, Message Authentication Codes, Security of MACs, MACs Based on Hash Functions	
(HMAC).	
Module – 5	No. of Hrs
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,	9
Symmetric Key Distribution Using Asymmetric Encryption, Distribution of Public Keys, X.509	
Certificates, Public Key Infrastructure.	



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

Refere	References 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 the Semester End Examination (SEE) is 50%. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50). The minimum passing mark for SEE is 40% of maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. Student has to secure a minimum 50% (50 marks out of 100) in the total of the CIE and SEE together.

Continuous Internal Evaluation (CIE):

- 1. Three tests each of 50 marks, after the completion of the syllabus 40%, 70% and 100% respectively.
- 2. Average of best two internal assessment tests each of 50 marks, scale down to 30 marks.
- 3. Any two assessment methods as per regulations i.e. Assignment/Quiz/Seminar/Group Discussion/Case Studies/Practical orientation on Design Thinking/ problem Solving Exercises/Presentation of Research work/hack-a-thon/Code-a-thon conducted by reputed organizations/ any other for **20 marks**.
- 4. Total marks scored (30+20 = 50 marks).
- 5. The minimum passing mark for the CIE is 50% of maximum marks (25 marks out of 50)

Semester End Examination (SEE):

- 1. The question paper shall be set for 100 marks.
- 2. The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module.
- 3. Students have to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to 50 marks.
- 4. There will be two questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.



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PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<i>e</i> 6												
CO1	2	3	2	-	3	-	1	-	1	-	-	2
CO2	1	2	3	-	2	-	2	-	1	-	-	2
CO3	2	2	2	2	3	-	1	-	_	2	-	1
CO4	1	3	3	-	2	-	2	2	1	-	2	3
CO5	1	2	1	2	2	-	-	-	1	1	-	1



		Master of Compute	er Applications	•	_				
		Semeste	r II						
Java Programming Lab									
		Category:	PCCL						
		(Practic	eal)						
Course Code	:	P24MCAL207	CIE	:	50 Marks				
Teaching Hours L: T: P	:	0:0:2	SEE	:	50 Marks				
Total Hours : 15 Total : 100 Marks									
Credits		1	SEE Duration	:	3 Hrs				

(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					
1	Write a java program that connects to a database using JDBC					



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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

RUBRI	C FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY)							
Sl. No	Components	Marks						
	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.							
1	CIE marks for the practical course is 50 Marks.							
	 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. 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 20 marks Weightage to be given for neatness and submission of record/write-up on time. Department shall conduct 02 tests for 100 marks, the first test shall be conducted after the 8th week of the semester and the second test shall be conducted after the 14 week of the semester. 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 sum of 02 tests is scaled down to 30 marks. The Sum of scaled-down marks scored in the report write-up/journal and marks of two tests is the total CIE marks scored by the student (30+20 = 50 marks). 	50						
	MAXIMUM MARKS	50						

RUBRIC FOR THE SEMESTER END EXAMINATION (SEE)							
Sl. No	Contents	Marks					
	Semester End Evaluation (SEE):						
	 SEE marks for the practical course is 50 Marks. 						
	 SEE shall be conducted jointly by the two examiners of the same institute; examiners are appointed by the University. 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						



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the internal /external examiners jointly.	50
 Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners. General rubrics suggested for SEE is 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 of SEE is 03 hours	
MAXIMUM MARKS	50

Course Out	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.							

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
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





Master of Computer Applications						
Semester II						
Da	tabas	se Management Syster	ns Lab with Mini Projec	et		
		Category:	PCCL			
		Practio	cal			
Course Code	:	P24MCAL208	CIE	:	50 Marks	
Teaching Hours L: T: P	:	0:2:2	SEE	:	50 Marks	
Total Hours : 15 P + 15 P Total : 100 Marks						
Credits		2	SEE Duration		3 Hrs	

Co	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							
1	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. Biggland the standard data its wheels have a see than the standard data.							
	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".							
	viii.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							





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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.
- 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..
- 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.



Sl. No	C FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY) Components	Marks
	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.	
1	CIE marks for the practical course is 50 Marks.	
	 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. Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks. Weightage to be given for neatness and submission of record/write-up on time. Total marks scored by the students are scaled downed to 5 marks Department shall conduct 02 tests for 50 marks, the first test shall be conducted after the 8th week of the semester and the second test shall be conducted after the 14 week of the semester. 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 vivavoce. 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 (20+5=25 Marks) 	25
2	Mini Project :	
	Review 1: 10 Marks Review 2: 10 Marks	25
	Review 2: 10 Marks Review 3: 10 Marks	23
	Project Report : 20 Marks	
	Total Marks: 50. It will scale down to 25 marks.	
	MAXIMUM MARKS	50

RUBRI	RUBRIC FOR THE SEMESTER END EXAMINATION (SEE)						
Sl. No	Contents						
1	Semester End Evaluation (SEE):						
	 SEE marks for the practical course is 50 Marks. 						
	 SEE shall be conducted jointly by the two examiners of the same institute; examiners are appointed by the COE. 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						



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	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 is mentioned here, writeup-20%, Conduction						
	procedure and result in 60%, Viva-voce 20% of maximum marks.	25					
	• SEE for practical shall be evaluated for 100 marks and scored marks shall be						
	scaled down to 25 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 of SEE is 03 hours						
2	Final Project Viva-Voce:						
	End-Semester Project Evaluation: 25 marks	25					
	MAXIMUM MARKS	50					

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						

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
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