M.C.A Computer Applications

LOCF SYLLABUS – 2023-2024

CHOICE BASED CREDIT SYSTEM

The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning. Our College have has moved to CBCS and implemented the grading system.

OUTCOME-BASED EDUCATION (OBE)

LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (LOCF)

The fundamental premise underlying the learning outcomes-based approach to curriculum planning and development is that higher education qualifications are awarded on the basis of demonstrated achievement of outcomes (expressed in terms of knowledge, understanding, skills, attitudes and values) and academic standards expected of graduates of a programme of study. Learning outcomes specify what graduates completing a particular programme of study are expected to know, understand and be able to do at the end of their programme of study. The expected learning outcomes are used as reference points that would help formulate graduate attributes, qualification descriptors, programme learning outcomes and course learning outcomes which in turn will help in curriculum planning and development, and in the design, delivery and review of academic programmes. They provide general guidance for articulating the essential learnings associated with programmes of study and courses with in a programme, maintain national standards and international comparability of learning outcomes and academic standards to ensure global competitiveness, and to facilitate student/graduate mobility and provide higher education institutions an important point of reference for designing teaching-learning strategies, assessing student learning levels, and periodic review of programmes and academic standards.

Some important aspects of the Outcome Based Education

Course: is defined as a theory, practical or theory cum practical subject studied in a semester.

Course Outcomes (COs): are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Generally three or more course outcomes may be specified for each course based on its weightage.

Programme: is defined as the specialization or discipline of a Degree.

Programme Outcomes (POs): Programme outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate

Attributes.

Programme Specific Outcomes (PSOs): PSOs are what the students should be able to do at the time of graduation with reference to a specific discipline.

Some important terminologies repeatedly used in LOCF.

Core Courses (CC) A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. These are the courses which provide basic understanding of their main discipline. In order to maintain a requisite standard certain core courses must be included in an academic program. This helps in providing a universal recognition to the said academic program.

Discipline Specific Elective Courses (DSE) Elective course may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective (DSE). These courses offer the flexibility of selection of options from a pool of courses. These are considered specialized or advanced to that particular programme and provide extensive exposure in the area chosen; these are also more applied in nature.

Generic Elective Courses An elective course chosen generally from an **unrelated discipline/subject,** with an intention to seek exposure is called a Generic Elective. Generic Elective courses are designed for the students of **other disciplines**. Thus, as per the CBCS policy, the students pursuing particular disciplines would have to opt Generic Elective courses offered by other disciplines, as per the basket of courses offered by the college. The scope of the Generic Elective (GE) Courses is positively related to the diversity of disciplines in which programmes are being offered by the college.

Non Major Elective (NME): A student shall choose at least two Non-major Elective Courses (NME) from outside his/her department.

Skill Enhancement Courses (SECs) These courses focus on developing skills or proficiencies in the student, and aim at providing hands-on training. Skill enhancement courses can be opted by the students of any other discipline, but are highly suitable for students pursuing their academic programme. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge**.**

Field Study/Industrial Visit/Case Study: It has to be completed during the fifth semester of the degree programme. Credit for this course will be entered in the fifth semester's marks statement.

Internship: Students must complete internship during summer holidays after the fourth semester. They have to submit a report of internship training with the necessary documents and have to appear for a viva-voce examination during fifth semester. Credit for internship will be entered in the fifth semester's mark statement.

Extra Credit Courses: In order to facilitate the students, gaining knowledge/skills by attending online courses MOOC, credits are awarded as extra credits, the extra credit are at three semesters after verifying the course completion certificates. According to the guidelines of UGC, the students are encouraged to avail this option of enriching their knowledge by enrolling themselves in the Massive Open Online Courses (MOOC) provided by various portals such as SWAYAM, NPTEL etc.

Post graduate Programme:

Programme Pattern: The Post Graduate degree programme consists of FIVE vital components. They are as

follows:

Part –A : Core Course (Theory) Project

Part-B (i) : Elective courses

Part-B (ii) : Non Major Elective, Soft Skills, Professional Competency course

Part-B (iii) : Internship

Part –C : Extension activity

EXAMINATION

Continuous Internal Assessment (CIA):

PG - Distribution of CIA Marks

Passing Minimum: 50 %

Assignments – 3 = 30%

Tests- 2 = 50%

Seminar = 10 %

Attendance = 10 %

Question Paper Pattern

Part A:

Part A 1 (10X1=10 marks)

One word question/ Fill in/ True or False/ Multiple Choice Questions

Two Questions from Each unit

Part A 2 (5X2=10 marks)

Match the following /Short Answers

One question from Each unit

Total Marks - 20

Part B: (5X5=25 marks)
Paragraph Answers
Either/ or type, One Questions from each unit

Part C: (10X3=30)
Essay Type Answers
Answer 3 out of 5 Questions
One Question from each unit

Part A: K1 Level
Part B: K2, K3 and K4 Level
Part C: K5 and K6 Level

Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

S. No.	Level	Parameter	Description
1	K1	Knowledge/Remembering	It is the ability to remember the previously learned
2	K2	Comprehension/ Understanding	The learner explains ideas or concepts
3	K3	Application/Applying	The learner uses information in a new way
4	K4	Analysis/Analysing	The learner distinguishes among different parts
5	K5	Evaluation/Evaluating	The learner justifies a stand or decision
6	K6	Synthesis /Creating	The learner creates a new product or point of view

WEIGHTAGE of K – LEVELS IN QUESTION PAPER

(Cognitive Level) K- LEVELS →	Lower Order Thinking			Higher Order Thinking			Total
	K1	K2	K3	K4	K5	K6	
END SEMESTER EXAMINATIONS (ESE)	20	25			30		**75**
Continuous Internal Assessment (CIA)	20	25			30		**75**

QUESTION PATTERN FOR SEMESTER EXAMINATION/ Continuous Internal Assessment

PART		MARKS
PART –A I. (No choice ,One Mark) **TWO** questions from each unit	(10x1 =10)	**20**
II. (No choice ,Two Mark) **ONE** question from each unit	(5x2 =10)	
PART -B (Either/ or type ,5-Marks) **ONE** questions from each unit	(5x5 =25)	**25**
PART -C (3 out of 5) (10 Marks) **ONE** question from each unit	(3x10 =30)	**30**
	Total	**75**

BLUE PRINT OF QUESTION PAPER FOR SEMESTER EXAMINATION							
DURATION: 3. 00 Hours.							**Max Mark : 100**
K- LEVELS	**K1**	**K2**	**K3**	**K4**	**K5**	**K 6**	**Total Marks**
PART							
PART –A (One Mark, No choice) (10x1 =10)	10						**10**
(2-Marks, No choice) (10x2=20)	10						**10**
PART –B (5- Marks) (Either/or type) (5x5=25)		5	10	10			**25**
PART -C (10 Marks) (3 out of 5) (3x10=30) Courses having only **K5,K6** levels, K5 level- 3 Questions, K6 level- 2 Questions **(One K6 level question is compulsory)**					20	10	**30**
Total	**20**	**05**	**10**	**10**	20	10	**75**

EVALUATION

GRADING SYSTEM

Once the marks of the CIA and the end-semester examination for each of the courses are available, they will be added and converted as final mark. The marks thus obtained will then be graded as per the scheme provided in Table-1.

Grade Point Average (GPA) will be calculated from the first semester onwards for all semester. From the second semester onwards, the total performance within a semester and the continuous performance starting from the first semester are indicated by semester Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) , respectively. These twoare calculated by the following formulae:

$GPA = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{I=1}^{n} C_i}$	$WAM\,(Weighted\ Average\ Marks) = \frac{\sum_{i=1}^{n} C_i M_i}{\sum_{I=1}^{n} C_i}$
Where, C_i is the Credit earned for the Course i G_i is the Grade Point obtained by the student for the Course i M_i is the marks obtained for the course i and n is the number of Courses **Passed** in that semester.	

CGPA: Average GPA of all the Courses starting from the first semester to the current semester.

CLASSIFICATION OF FINAL RESULTS:

i) For each of the first three parts, there shall be separate classification on the basis of CGPA, as indicated in Table-2.

ii) For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/Commerce/Management as Outstanding/Excellent/Very Good/Good/Above Average/Average, the marks and the corresponding CGPA earned by the candidate in Part-III alone will be the criterion, provided the candidate has secured the prescribed passing minimum in the all the Five parts of the Programme.

iii) Grade in Part –IV and Part-V shall be shown separately and it shall not be taken into account for classification.

iv) A Pass in PART- V will be mandatory although the marks will not count for the calculation of the CGPA.

v) Absence from an examination shall not be taken an attempt.

Table-1: Grading of the Courses - UG

Marks Range	Grade Point	Corresponding Grade
90 and above	**10**	**O**
80 and above and below 90	**9**	A+
70 and above and below 80	**8**	**A**
60 and above and below 70	**7**	**B+**
50 and above and below 60	**6**	**B**
40 and above and below 50	**5**	**C**
Below 40	**0**	**RA**

Table- 2: Grading of the Courses - PG

Marks Range	Grade Point	Corresponding Grade
90 and above	**10**	**O**
80 and above and below 90	**9**	A+
70 and above and below 80	**8**	**A**
60 and above and below 70	**7**	**B+**
50 and above and below 60	**6**	**B**
Below 50	**0**	**RA**

Table-3: Final Result

CGPA	Corresponding Grade	Classification of Final Result
9.00 and above	**O**	**Outstanding**
8.00 to 8.99	A+	Excellent
7.00 to 7.99	**A**	**Very Good**
6.00 to 6.99	**B+**	**Good**
5.00 to 5.99	**B**	**Above Average**
4.00 to 4.99	**C**	**Average**
Below 4.00	**RA**	**Re-appearance**

Vision

To Empower the women students by providing excellent software engineering skills to meet the global needs of IT industry

.

Mission

- Providing quality education in computer science and its applications by updated knowledge through technology transfer
- Enhancing professional skills to satisfy the needs of the Software industries and Technical skills of the individual towards competitive world.

PROGRAMME OUTCOMES FOR M.C.A.,DEGREE PROGRAMMES

PO.No	Programme Outcomes (*Upon completion of the M.C.A.,Degree Programme, the Post Graduate will be able to)*
PO-1	**Disciplinary Knowledge**: demonstrate in-depth knowledge and understanding of theories, policies, and practices in one or more disciplines that form a part of a Post Graduate program of study in Master of Computer Applications.
PO-2	**Critical Thinking and Problem Solving**: apply analytic thought to a body of knowledge, analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence, identify relevant assumptions or implications, formulate coherent arguments, critically evaluate practices, policies and theories by following scientific approach to knowledge development: solve problems and extrapolate the same to real life situation
PO-3	**Information/digital literacy and Communication Skills:** use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources, and use appropriate software for analysis of data: communicate thoughts and ideas analytically and effectively in writing and orally using appropriate media, and present complex information in a clear and concise manner to different groups..
PO-4	**Research-related skills:** conduct independent inquiry in a chosen scientific discipline, demonstrate sense of inquiry and capability for asking relevant/appropriate questions, problematising, synthesizing and articulating; recognize cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; plan, execute and report the results of an experiment or investigation.
PO-5	**Scientific reasoning and Reflective Thinking:** analyse, interpret and draw conclusions from quantitative/qualitative data and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective; critically and sensibly evaluate life experiences, with self awareness and reflexivity of both self and society.
PO-6	**Multidisciplinary Approach, Innovation and Entrepreneurship:** propose novel ideas of interdisciplinary approach in providing better solutions and new ideas for the sustainable developments; identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.
PO-7	**Moral and ethical awareness/reasoning:** embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work, demonstrate the ability to identify ethical issues related to one's work, avoid unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights, appreciate environmental and sustainability issues, and adopt objective, unbiased and truthful actions in all aspects of work.
PO-8	**Self directed Learning:** work independently, identify appropriate resources required for age a project till completion.
PO-9	**Lifelong Learning:** engage in continuous learning for professional growth and development, acquire knowledge and skills, adapt to changing environment and to changing trades and demands of work place through knowledge/skill development/reskilling.
PO-10	**Multicultural Competence, Social Interaction and Effective Citizenship:** understand the values and beliefs of multiple cultures, global perspectives, engage and interact respectfully with diverse groups and elicit views of others, mediate disagreements and help reach conclusions in group settings, and demonstrate empathetic social concern and equity centered national development

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO No.	Program Specific Outcomes (M.C.A.,DEGREE)
PSO1	Design, Develop, Analyse, and implement systems and to deliver the application software.
PSO2	Pursue the research in computer science and computer applications.
PSO3	Develop techniques for independent and lifelong learning in computer applications.
PSO4	Analyze and Plan systematic planning, development, testing and executing of complex computing applications in Social Media and Analytics, Web Application Development and Data Interpretations.
PSO5	Utilize current technologies, skills and models for computing practice
PSO6	Formulate diverse software engineering practices and project management, and work as a team leader/team member and communicate efficiently with team in developing software of multidisciplinary nature.
PSO7	Appraise emerging technologies and provide innovative solutions to real time problems within the constraints such as financial, environmental, social and ethical.

M.C.A SYLLABUS

Syllabus

2023-2024

Programme Code:2PSMCA

SENGAMALA THAYAAREDUCATIONAL TRUST
WOMEN'S COLLEGE (AUTONOMOUS)
(Affiliated to Bharathidasan University, Tiruchirappalli)
(Accredited by NAAC) | (An ISO 9001:2015 Certified Institution)
Sundarakkottai, Mannargudi–614016,
Thiruvarur(Dt.), Tamil Nadu, India.

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

(Affiliated to Bharathidasan University)

(Accredited by NAAC|AnISO9001:2015CertifiedInstitution)

SUNDARAKKOTTAI, MANNARGUDI–614016, TAMILNADU, INDIA.

MASTER OF COMPUTER APPLICATIONS COURSE STRUCTURE UNDER CBCS

(For the candidates admitted in the academic year 2023-2024)

LEARNINIG OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

ELIGIBILITY: Those who have completed any degree with Mathematics as one of the core subjects in degree or in+ 2 levels.

Sem.	Part	Nature of the Course	Course Code	Title of the Course	Ins. Hrs/ Week	L	T	P	O	Credit	Exam Hrs	Marks		Total
												Int.	Ext.	
I	Part A	Core Course(CC)–I	P23CA101	Discrete Mathematics	5	4	1	-	-	4	3	25	75	100
		Core Course(CC)–II	P23CA102	Linux and Shell Programming	5	4	1	-	-	4	3	25	75	100
		Core Practical(CP)–I	P23CA103P	Linux and Shell Programming Lab	5	2	-	3	-	3	3	25	75	100
		Core Practical(CP)–II	P23CA104P	Python Programming Lab	5	2	-	3	-	3	3	25	75	100
	Part B(i)	Elective Course(EC)–I	P23CAE11A/ P23CAE11BP/ P23CAE11C/ P23CAE11DP	Data Engineering and Management/ Data Engineering and Management Lab/ Architecture and Frameworks/ Architecture and Frameworks lab	4	3	1	-	-	3	3	25	75	100
		Elective Course (EC)–II	P23CAE12A/ P23CAE12BP/ P23CAE12C/ P23CAE12DP	Software Development Technologies/ Software Development Technologies Lab/ Soft Computing/ Soft Computing Lab	4	3	1	-	-	3	3	25	75	100
	Part B(ii)	Non Major Elective (NME) -I			2	2	-	-	-	2	3	25	75	100
		Total			**30**	**20**	**4**	**6**	-	**22**	**-**	**-**	**-**	**700**
II	Part A	Core Course(CC)–III	P23CA205	Data Structures and Algorithms	5	4	1	-		4	3	25	75	100
		Core Course (CC)–IV	P23CA206	Accounting and Financial Management	5	4	1	-		4	3	25	75	100
		Core Practical(CP)–III	P23CA207P	Data Structures and Algorithms Lab	5	2	-	3	-	3	3	25	75	100
		Core Practical(CP)–IV	P23CA208P	Big data Analytics Lab	5	2	-	3		3	3	25	75	100
	Part B(i)	Elective Course(EC)–III	P23CAE23A/ P23CAE23BP/ P23CAE23C/ P23CAE23DP	Internet of Things/ Internet of Things Lab/ Computer Vision/ Computer Vision Lab	4	3	1	-	-	3	2	25	75	100
		Elective Course(EC)–IV	P23CAE24A P23CAE24BP P23CAE24C P23CAE24DP	Cyber Security/ Cyber Security Lab/ Block chain Technologies/ Block chain Technologies Lab	4	1	3	-	-	3	3	25	75	100
	Part B(ii)	Non Major Elective (NME) -II			2	2	-	-	-	2	3	25	75	100
	Part B(iii)	Internship / Industry Activity			-	-	-	-	-	-	-	-	-	-
		Total			**30**	**18**	**6**	**6**	-	**22**	**-**	**-**	**-**	**700**

		Core Course(CC)–V	P23CA309	Java Programming	6	5	1	-	-	5	3	25	75	100
		Core Industry Module	P23CA310	Machine Learning	6	5	1	-	-	3	3	25	75	100
		Core Practical(CP)–V	P23CA311P	Java Programming Lab	6	3	-	3	-	3	3	25	75	100
		Core Practical(CP)–VI	P23CA312P	Web Technologies Lab	6	3	-	3	-	3	3	25	75	100
III	Part B(i)	Elective Course (EC)– V	P23CAE35A/ P23CAE35B/ P23CAE35C/ P23CAE35DP	Web Technologies/ Compiler Design/ Mobile Computing/ Mobile Computing Application Development Lab	4	3	1	-	-	**3**	3	25	75	100
		Skill Enhancement course	P23SECA31A/ P23SECA31B/ P23SECA31C	Managerial Skills / Organizational Behavior/ Soft Skill Development Lab	2	2	-	-	-	**2**	3	25	75	100
	Part B(iii)	Internship / Industry Activity			-	-	-	-	-	**2**	-	-	-	-
		Total			**30**	**21**	**3**	**06**	**-**	**21**	**-**	**-**	**-**	**600**
IV	Part A	Core course(CC)-VI	P23CA413	Research Methodology	6	5	1	-	-	5	3	25	75	100
		Core Course (CC)-VII	P23CA414	Cloud Computing Technologies	5	4	1	-	-	5	3	25	75	100
		Core Practical(CP)-VII	P23CA415P	Cloud Computing Technologies Lab	5	2	-	3	-	3	3	25	75	100
		Core Project	P23CAPW	Project	8	2	-	6	-	7	3	25	75	100
	Part B(i)	Elective Course(EC)– VI (Industry Entrepreneurship)	P23CAE46A/ P23CAE46BP/ P23CAE46C/ P23CAE46DP	Social Networking/ Social Networking Lab / High Performance Computing/ High Performance Computing Lab	4	3	1	-	-	3	3	25	75	100
	Part B(ii)	Professional Competency Course	P23PCCA41A/ P23PCCA41B	Enterprise Resource Planning/ Management Information System	2	2	-	-		2	3	25	75	100
	Part C			Extension Activity	-	-	-	-		1	-	-	-	-
				TOTAL	**30**	**18**	**3**	**9**	**-**	**26**	**-**	**-**	**-**	**600**
				GRANDTOTAL	**120**	**80**	**14**	**26**	**-**	**91**	**-**	**-**	**-**	**2600**
	***Extra credit**			**MOOC/ SWAYAM/NPTEL**	-	-	-	-	-	2	-	-	-	-
				Value Added Course (At least one per year)	-	-	-	-	-	3*2	-	-	-	-

Student submit report of Industrial Internship Program after completion during summer.

S.No	Course Component	No. of Courses	Total Credits
1	Core Courses	7	31
2	Core Practical	7	21
3	Core Project	1	7
4.	Core Industry Module	1	3
4	Elective Courses	6	18
5	Skill Enhancement Course	1	2
6	Professional Competency Course	1	2
7	Non major Elective	2	4
8	Internship	1	2
9	Extension Activity	1	1
	Total	**28**	**91**

S.no	Particulars	CIA	ESE
1.	Theory	25	75
2.	Practical	25	75

Separate Passing Minimum is prescribed for Internal and External marks

FOR THEORY

1. The passing minimum for CIA shall be 40% out of 25marks[i.e.10marks]
2. The passing minimum for ESE shall be 40 % out of 75 marks[i.e.30marks]
3. The passing minimum not less than 50% in the aggregate

FOR PRACTICAL

1. The passing minimum for CIA shall be 40% out of 40 marks[i.e.16marks]
2. The passing minimum for ESE shall be 40 % out of 60 marks[i.e.24marks]
3. The passing minimum not less than50% in the aggregate.

NON MAJOR ELECTIVE (NME) OFFERED BY THE DEPARTMENT

S.NO	SEMESTER	COURSE CODE	ELECTIVECOURSE(EC) (Any one from the list)
1	**I**	**P23NMECA11**	Fundamentals of Human Rights
2.	**II**	**P23NMECA22**	Cloud Computing

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(For the Candidates admitted in the academic year 2023–2024)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: III-CC-V Java Programming

Ins. Hrs./Week:6 **Course Credit:5** **Course Code:P23CA309**

UNIT - I : Introduction **(18 Hours)**

Object Oriented Programming- Data Types, Variables, and Arrays: Primitive Types-Literals Variables - Type Conversion and Casting- Arrays-Operators: Control Statements-Classes and Methods – Inheritance- Exception Handling.

UNIT -II : String Handling **(18 Hours)**

The String Constructors - String Length - Special String Operations - Character Extraction - String Comparison- Searching Strings - Modifying a String - Input/ Output: The I/O Classes and Interfaces – File - Byte Streams - Character Streams.

UNIT -III : Applet Class **(18 Hours)**

Basic Architecture -Applet Skeleton - Display methods - Status Window – Passing Parameters. Introducing GUI Programming with Swing– Introducing Swing - Swing Is Built on the AWT- Two Key Swing Features - The MVC Connection - Components and Containers - The Swing Packages - A Simple Swing Application - Exploring Swing.

UNIT- IV : Java Beans **(18 Hours)**

Introduction - Advantages of Beans – Introspection - The JavaBeans API - A Bean Example. Servlets: Life Cycle Simple Servlet- Servlet API-Packages-Cookies session tracking.

UNIT - V: Network Programming **(18 Hours)**

Network Programming: Working with URLs- Working with Sockets - Remote Method Invocation. Introduction to Database Management Systems - Tables, Rows, and Columns - Introduction to the SQL SELECT Statement - Inserting Rows - Updating and Deleting Existing Rows - Creating and Deleting Tables - Creating a New Database with JDBC - Scrollable Result Sets.

Total Lecture Hours : 90

COURSE OUTCOMES:

On the successful completion of the course, students will be able

1. Understand the Object Oriented Program including classes and methods; inheritance and exceptionhandling
2. Complete comprehension of String functions and I/O Streams
3. Creation of graphical representation using Applet
4. Application of Servlets for designing Web based applications
5. Usage of JDBC connectivity and implementation of the concept to get desired results from database

TEXT BOOK(S):

1. Herbert Schildt, "Java the Complete Reference", 9th edition, McGraw Hill Publishing Company Ltd,New Delhi, 2017.
2. Tony Goddis, "Starting out with Java from Control Structures Through Objects" 6th Edition, PearsonEducation Limited, 2016

REFERENCE BOOK(S):

1. Herbert Schildt, Dale Skrien, "Java Fundamentals – A Comprehensive Introduction", TMGH PublishingCompany Ltd, New Delhi, 2013
2. John Dean, Raymond Dean, "Introduction to Programming with JAVA – A Problem Solving Approach", TMGH Publishing Company Ltd, New Delhi,2012.

E-RESOURCES:

1. https://docs.oracle.com/javase/tutorial/
2. https://www.codecademy.com/learn/learn-java
3. https://www.coursera.org/specializations/java-programming
4. https://stackify.com/java-tutorials/

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(For the Candidates admitted in the academic year2023–2024)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: III-Core Industry Module - Machine Learning

Ins. Hrs./Week: 6 **Course Credit: 3** **CourseCode:P23CA310**

UNIT I: Introducing Machine Learning **(18 Hours)**

The Origins of Machine Learning, Uses and Abuses of Machine Learning _ Basics of Machine Learning Algorithm Model Works - Steps to apply Machine Learning - Choosing a Machine Learning Algorithm - UsingMachine Learning concepts.

Managing and Understanding Data: Data Structures, Vectors And Factors: Lists, Data frames, Matrixes and arrays - Managing Data - Exploring and Understanding Data: Exploring the Structure of Data, Exploring Numeric variables - Exploring Categorical Variables- Exploring Relationships between Variables.

UNIT II: Classification Algorithm **(18 Hours)**

Lazy Learning – Classification Using Nearest Neighbors :The kNN Algorithm- Diagnosing Breast Cancer with the kNN Algorithm- Probabilistic Learning – Classification Using Naive Bayes: Basic concepts of Bayesian Methods- The Naïve Bayes Algorithm- Example – filtering Mobile Phone Spam with the Naive Bayes Algorithm.

Divide and Conquer – Classification Using Decision Trees and Rules: Understanding Decision Trees- Example– Identifying Risky Bank Loans using C5.0 Decision Trees- Understanding Classification Rules- Example – Identifying Poisonous Mushrooms with Rule Learners.

UNIT III: Regression Methods **(18 Hours)**

Forecasting Numeric Data – Regression Methods**:** Understanding Regression- Example–Predicting Medical Expenses using Linear Regression- Understanding Regression Trees and Model Trees- Example – Estimating the Quality of Wines with Regression Trees and Model Trees.

Black Box Methods Neural Networks and Support Vector Machines: Understanding Neural Networks, from Biological to Artificial Neurons, Activation Functions, Network Topology, Training Neural Networks with Back propagation - Modeling the Strength of Concrete with ANNs- Understanding Support Vector Machines- Performing OCR with SVMs- Finding Patterns – Market Basket Analysis Using Association Rules: Understanding Association Rules- Example – Identifying Frequently Purchased Groceries with Association Rules.

UNIT IV: Clustering **(18 Hours)**

Finding Groups of Data – **Clustering with K-Means:** Understanding Clustering- The k-means Algorithm for clustering- Finding teen market segments using k-means Clustering- Evaluating Model Performance: Measuring Performance for Classification- Beyond Accuracy – other Measures of Performance, Visualizing Performance Tradeoffs.

Improving Model Performance: Tuning Stock Models for Better Performance-Using Caret for Automated Parameter Tuning- Creating a simple Tuned Model- Customizing the Tuning Process- Improving Model Performance with meta-learning- Understanding Ensembles- Bagging- Boosting- Random forests.

UNIT V: Deep Learning **(18 Hours)**

Introduction to Deep Learning**:** Introduction to Deep Learning, Single Layer Perception Model (SLP), Multilayer Perception Model (MLP), Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs),Restricted Boltzmann Machines (RBMs).

Convolutional Neural Networks (CNNs): Structure and Properties of CNNs - Components of CNN Architectures- Convolutional Layer, Pooling Layer, Rectified Linear Units (ReLU) Layer, Fully Connected (FC) Layer, Loss Layer - Tuning Parameters ,Notable CNN Architectures, Regularization- Recurrent Neural Networks (RNNs): Fully Recurrent Networks, Training RNNs with Back-Propagation Through Time (BPPT)- Elman Neural Networks, Neural History Compressor, Long Short-Term Memory (LSTM), Traditional and Training LSTMs - Structural Damping Within RNNs, Tuning Parameter Update Algorithm.

Total Lecture Hours: 90

COURSE OUTCOMES

On the successful completion of the course, students will be able to

1. To understand, impart and analyze the concepts and of Machine Learning Techniques and types of data
2. To comprehend, apply and evaluate the classification techniques for real-world applications
3. To understand, use and perform evaluation of Regression methods
4. To recognize, implement and analyse the unsupervised techniques for real-world applications
5. To understand, identify, implement and review the deep learning techniques for real-time applications.

TEXT BOOK(S):

1. Brett Lantz, “Machine Learning with R”, Addison-Wesley Packt Publishing, 2013.
2. Taweh Beysolow, “Introduction to Deep Learning Using R: A Step-by-Step Guide to Learning andImplementing Deep Learning Models Using R”, San Francisco, California, USA, 2017.

REFRENENCE BOOK(S)

1. Daniel T. Larose, Chantal D. Larose, “Data mining and Predictive analytics”, Second Ed., WileyPublication, 2015.
2. Bertt Lantz, “Machine Learning with R: Expert techniques for predictive modeling”, 3rd Edition, April15,2019,
3. Jason Bell, “Machine Learning: Hands-On for Developers and Technical Professionals”, Wiley Publication,2015.

E-RESOURCES

1. https://www.geeksforgeeks.org/machine-learning/
2. https://www.coursera.org/learn/advanced-machine-learning-algorithms
3. https://monkeylearn.com/machine-learning/
4. https://www.coursera.org/learn/machine-learning
5. https://developers.google.com/machine-learning/crash-course

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)
SUNDARAKKOTTAI,MANNARGUDI-614016.
(For the Candidates admitted in the academic year2023–2024)
DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: III-CP-V- Java Programming Lab

Ins. Hrs./Week:6 **Course Credit:**3 **Course Code:P23CA311P**

LIST OF EXPERIMENTS:

1. Implementation of and Exception handling concepts with different type of Exception.
2. Build a Swing application to implement metric conversion.
3. Use Grid Layout to design a calculator and simulate the functions of a simple calculator.
4. Create a Color palette with a matrix of buttons using Applet.
5. To invoke a servlet from HTML forms.
6. To invoke servlet from Applets.
7. To invoke servlet from JSP.
8. Implement message communication using Network Programming.
9. Write a program to connect databases using JDBC.
10. Implementation of Java Beans.

Total Lecture Hours:90

COURSE OUTCOMES

On the successful completion of the course, students will be able to

1. Implement classes, objects, members of a class and the relationships among them needed for afinding the solution to specific problem.
2. Apply Applets and Swing programs
3. Develop Servlets and JSP for creating Web based applications using JDBC
4. Complete comprehension of String functions and I/O Streams
5. Application of Servlets for designing Web based applications

TEXT BOOK(S):

3. Herbert Schildt, "Java the Complete Reference", 10th edition, McGraw Hill Publishing Company Ltd,New Delhi, 2017.
4. Tony Goddis,Starting out with Java from Control Structures Through Objects" 6th Edition, PearsonEducation Limited, 2016

REFERENCE BOOK(S) :

1. Herbert Schildt, Dale Skrien, "Java Fundamentals – A Comprehensive Introduction", TMGH PublishingCompany Ltd, New Delhi, 2013
2. John Dean, Raymond Dean, "Introduction to Programming with JAVA – A Problem Solving Approach", TMGH Publishing Company Ltd, New Delhi,2012.

E-RESOURCES:

1. https://docs.oracle.com/javase/tutorial/
2. https://www.codecademy.com/learn/learn-java
3. https://www.coursera.org/specializations/java-programming
4. https://stackify.com/java-tutorials/

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DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester : III-CP-VI- Web Technologies Lab

Ins. Hrs./Week:6 **Course Credit:** 3 **CourseCode:P23CA312P**

LIST OF EXPERIMENTS:

1. Develop a web page to display your education details in a tabular format.
2. Develop a web page to display your CV on a web page.
3. Design a Homepage having three links: About Us, Our Services andContact Us. Create separate web pages for the three links.
4. Design a web page to demonstrate the usage of inline CSS, internal CSSand external CSS.
5. Design an XML document and create a style sheet in CSS & display thedocument in the browser.
6. Develop a web page to Create image maps.
7. Design a web page to perform input validation using Angular Javascript.
8. Develop a web page in PHP to fetch details from the database.
9. Design a web page to hide paragraph using J Query
10. Create a web page and add Java script to handle mouse events and formevents.

Total Lab Hours: 90

COURSE OUTCOMES:

On the successful completion of the course, students will be able

1. Design dynamic web pages using JavaScript, Jquery and Angular Java script.
2. Develop Web pages using HTML, CSS and XML.
3. Create web application using PHP and MySQL.
4. Develop interactive web pages using Jquery.
5. To design dynamic web pages using Angular java script

TEXT BOOK(S):

1. Robert W. Sebesta: Programming the World Wide Web, Eighth Edition, Pearson education, 2015.
2. Dayley Brad, Dayley Brendan ,"AngularJS, JavaScript, and jQuery All in One", Sams Teach Yourself1st Edition, Kindle Edition, 2015.

REFERENCE BOOK(S):

1. M. Srinivasan: Web Programming Building Internet Applications,3rdEdition, Wiley India, 2009.
2. Jeffrey C. Jackson: Web Technologies-A Computer Science Perspective, Pearson Education, 7thImpression,2012.
3. Chris Bates: Web Technology Theory and Practice, Pearson Education, 2012.
4. Raj Kamal: Internet and Web Technologies, McGraw Hill Education.

E-RESOURCE(S):

1. https://www.geeksforgeeks.org/web-technology/
2. https://www.naukri.com/code360/library/complete-introduction-to-web-technology
3. https://woz-u.com/blog/what-web-technologies-should-i-learn/
4. https://learn.microsoft.com/en-us/dotnet/architecture/modern-web-apps-azure/common-client-side-web-technologies

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DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester : III-EC- V-Web Technologies

Ins. Hrs./Week:4 **Course Credit:**3 **CourseCode:P23CAE35A**

UNIT –I : Web Fundamentals and Html **(12 Hours)**

A Brief Introduction to the Internet - The World Wide Web - Web Browsers - Web Servers -URLs, MIME, HTTP, Security- Introduction to HTML- Origins and Evolution of HTML and HTML - Basic Syntax - Standard HTML Document Structure - Basic Text Markup - Images- Hypertext Links - Lists, Tables, Forms, The Audio Element, The Video Element - Organization Elements, The Time Element

UNIT – II: Introduction to XHTML And CSS **(12 Hours)**

Frames, syntactic differences between HTML and XHTML-Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, The box model, Background images, The and tags, Conflict resolution.

UNIT - III :The Basics Of Java script **(12 Hours)**

Overview of JavaScript, Object orientation and JavaScript, general Syntactic characteristics, Primitives, operations, and expressions, Screen output and keyboard input, Control statements, Object creation and modification, Arrays, Functions, Constructors, Pattern matching using regular expressions, Errors in scripts.

JAVASCRIPT AND XHTML DOCUMENTS: The JavaScript Execution Environment, The Document Object Model, Elements Access in Java Script, Events and Event Handling, Handling Events from Body Elements, Handling Events from Text Box and password Elements, The DOM2 Model

UNIT- IV :Dynamic Documents With Java script And Xml **(12 Hours)**

Introduction, Positioning Elements, Moving Elements, Element Visibility, Changing Color and Fonts, Dynamic Content, Stacking Elements, Locating the Mouse Cursor, Reacting to a Mouse Click, Slow Movement of Elements, Dragging and Dropping Elements. Introduction to XML, Syntax of XML, XML Document Structure, Document type definitions, Namespaces, XML schemas, displayingraw XML documents, Displaying XML documents with CSS, XSLT Style Sheets, Web services.

UNIT - V: Php, Angular JS And JQuery **(12 Hours)**

Introduction to PHP: Overview of PHP -General Syntactic Characteristics - Primitives, Operations, andExpressions - Output - Control Statements - Arrays - Functions - Pattern Matching - Form Handling - Cookies - Session Tracking - Introduction to JQuery, Syntax, selectors, events, JQuery HTML, JQuery Effects,JQuery CSS. Introduction to Angular JS, Directives, Expressions, Controllers, Filters, Services, Events, Forms, Validations, Examples.

Total Lecturer Hours :60

COURSE OUTCOMES:

On the successful completion of the course, students will be able

1. Design dynamic web pages using Javascript, Jquery and Angular Java script
2. Develop Web pages using HTML, CSS and XML
3. Create web application using PHP and MySQL.
4. To design dynamic web pages using Angular javascript.
5. Develop interactive web pages using Jquery

TEXT BOOK(S):

1. Robert W. Sebesta: Programming the World Wide Web, Eighth Edition, Pearson education, 2015.
2. Dayley Brad, Dayley Brendan ,"AngularJS, JavaScript, and jQuery All in One", Sams Teach Yourself1st Edition, Kindle Edition, 2015.

REFERENCE BOOK(S):

1. M. Srinivasan: Web Programming Building Internet Applications, 3rdEdition, Wiley India, 2009.
2. Jeffrey C. Jackson: Web Technologies-A Computer Science Perspective, Pearson Education, 7thImpression,2012.
3. Chris Bates: Web Technology Theory and Practice, Pearson Education, 2012.
4. Raj Kamal: Internet and Web Technologies, McGraw Hill Education.

E-RESOURCE(S):

1. https://www.geeksforgeeks.org/web-technology/
2. https://www.naukri.com/code360/library/complete-introduction-to-web-technology
3. https://woz-u.com/blog/what-web-technologies-should-i-learn/
4. https://learn.microsoft.com/en-us/dotnet/architecture/modern-web-apps-azure/common-client-side-web-technologies

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DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS(MCA)

Semester :III-EC-V-Compiler Design

Ins. Hrs./Week: 4 **Course Credit:** 3 **Course Code:P23CAE35B**

UNIT-I:Introduction **(12 Hours)**

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler –GroupingofPhases–Compilerconstructiontools–LexicalAnalysis– RoleofLexicalAnalyzer–Input Buffering– Specification of Tokens

UNIT-II: Grammars **(12 Hours)**

Role of the parser, Writing Grammars – Context – Free Grammars – Top Down parsing– Recursive Descent parsing – Predictive parsing – bottom –up parsing – shift Reduce Parsing – OperatorPrecedentParsing–LRParsers–SLRParser–CanonicalLRParser–LALR Parser

UNIT-III: Intermediate Languages **(12 Hours)**

IntermediateLanguages–DeclarationsStatements–AssignmentStatements–BooleanExpressions– Case Statements– Back patching–procedure calls

UNIT-IV: Code Generator **(12 Hours)**

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next use Information – A simple Code generator – DA Grepresentation of Basic Blocks– Peephole optimization

UNIT-V:Optimization **(12 Hours)**

Introduction – Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization–Storage Allocation strategies –Accesst on on-localnames–ParameterPassing

Total Lecture Hours- 60

COURSE OUTCOMES :

The students will be able to

1. Understand the various phases ofa compiler
2. Understand the concepts of grammar
3. Develop skills in designing a compiler
4. Understand the concept of intermediate languages
5. Develop code by code generator
6. Understand storage allocation
7. Apply the optimization techniques infield projects and analysis

TEXTBOOK(S):

AlfredAho,RaviSethi,JeffyDUllman.2006."Compilers–Principles,TechniquesandTools.Second Edition, Pearson Education, London, UK.

REFERENCEBOOK(S):

KakdeOG.2015.CompilerDesign.Fourthedition, Laxmi Publications,Chennai.

1. KennethC. Louden. 2003.CompilerConstruction: Principles and Practices.ThirdEdition,ThompsonLearning, Boston, USA.
2. HenkAlblasandAlbertNymeyer.2001.PracticeandPrinciplesofCompilerBuildingwithC, Third Edition,PHILearning,NewDelhi.
3. Rajkumar Y,Sudha Rani S, Karthi M.2019. Compiler Design.Dreamtech Press,NewDelhi.
4. TorbenAEgidiusMogensen.2011.IntroductiontoCompilerDesign.Springer,Germany.

E-RESOURCE(S):

1. https://www.tutorialspoint.com/compiler_design
2. https://www.geeksforgeeks.org
3. https://www.youtube.com/playlist?list=PLWPirh4EWFpGa0qAEcNGJo2HSRC5_KMT6
4. http://hjemmesider.diku.dk/~torbenm/Basics/basics_lulu2.pdf
5. http://hjemmesider.diku.dk/~torbenm/Basics/basics_lulu2.pdf

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DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS(MCA)

Semester: III-EC -V- Mobile Computing

Ins. Hrs./Week: 4 **Course Credit:** 3 **CourseCode:P23CAE35C**

UNIT-I: Introduction **(12 Hours)**

Introduction – Applications – History of wireless communication – A Simplified reference model - Wirelesstransmission – Frequencies for radio transmission – Regulations – Signals –Antennas - Signal propagation: Path loss of radio signals - Additional signal propagation effects - Multi-path propagation – Multiplexing – Modulation

UNIT-II :Spread Spectrum **(12 Hours)**

Spread spectrum – Direct sequence spread spectrum – Frequency hopping spread spectrum – Cellular systems. Medium access control: Hidden and exposed terminals – Near and far terminals – SDMA, FDMA, TDMA, Fixed TDM, Classical Aloha, slotted Aloha, Carrier sense multiple access – Reservation TDMA – Multiple access with collision avoidance – Polling – CDMA – Spread Aloha multiple access.

UNIT-III : Services **(12 Hours)**

GSM - Mobile services – System architecture – Radio interface – Protocols – Localization and calling – Handover – Security – New Data services. UMTS and IMT-2000 - Satellite Systems: Applications – Basics – Routing – Localization – Handover.

UNIT-IV :Wireless LAN **(12 Hours)**

Wireless LAN: Infra red vs. radio transmission – Infrastructure and ad-hoc network – IEEE 802.11 – System architecture – Protocol architecture – Physics layer – Medium access control layer – MAC management – Blue tooth. Mobile network layer: Mobile IP: Goals, assumptions and requirements – entities and terminology – packet delivery – Agent discovery – Registration – Tunneling and encapsulation Recent technologies

UNIT-V:Routing Protocols **(12 Hours)**

WAP: Architecture – wireless datagram Protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Mobile ad-hoc networks – MANET Characteristics – Classification of MANETs, Routing of MANETs, Proactive Routing Protocol - DSDV, Reactive Routing Protocols – DSR, AODV.

Total Lecture Hours- 60

COURSE OUTCOMES:

On the successful completion of the course, students will be able to:

1. Understanding the basic concepts of Wireless Communication
2. Understanding the basic concepts of Spread Spectrum
3. Analyzing the concepts of Global System for Mobile Communication
4. Understanding the basic concepts of Wireless LAN
5. Analyzing the concepts of Routing Protocols in MANET

TEXT BOOK(S):

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education, 2013.
2. Kum KumGarg, "Mobile Computing Theory and Practice", Pearson Education, 2014.

REFERENCE BOOKS(S):

1. Rifaat A. Dayen, "Mobile Data & Wireless LAN Technologies", Prentice Hall,1997.
2. Steve Mann and Scoot Schibli, "The Wireless Application Protocol", John Wiley & Inc., 2000.

E-RESOURCE(S):

1. https://www.techtarget.com/searchmobilecomputing/definition/nomadic-computing
2. https://www.tutorialspoint.com/mobile_computing/mobile_computing_overview.htm
3. https://www.inderscience.com/jhome.php?jcode=ijwmc
4. https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=7755
5. https://www.interaction-design.org/literature/topics/mobile-computing

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DEPARTMENTOFCOMPUTERAPPLICATIONS
MASTER OF COMPUTER APPLICATIONS(MCA)

Semester :III-EC -V- Mobile Computing Application Development Lab

Ins. Hrs./Week: 4 Course Credit: **3** CourseCode:P23CAE35DP

LIST OF PROGRAMS

1. Implement the WML tags and Image using WML/J2ME.
2. Design of simple Calculator having +, -, * and / using WML/J2ME.
3. Design of Calendar for any given month and year using WML/J2ME.
4. Design a Timer to System Time using WML/J2ME.
5. Design of a simple game using WML/J2ME.
6. Animate an image using WML/J2ME.
7. Design a personal phone book containing the name, phone no., address, e-mail, etc
8. Browsing the Internet using a Mobile phone simulator.
9. Develop a Mobile application to view the live streaming using video view.
10. Develop a mobile application that makes use of any database.

Total Lab Hours-60

COURSE OUTCOMES

On the successful completion of the course, students will be able to

1. Apply the knowledge of mobile application development with WML/J2ME.
2. Design real life situational problems and think creatively about solutions of them.
3. Appraise the best features Programs for creating dynamic and interactive web pages using forms.
4. Create a Mobile application to view the live streaming using video view.
5. Create a mobile application that makes use of any database.

TEXT BOOK(S):

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education, 2013.
2. Kum KumGarg, "Mobile Computing Theory and Practice", Pearson Education, 2014.

REFERENCE BOOK(S):

1. Rifaat A. Dayen, "Mobile Data & Wireless LAN Technologies", Prentice Hall,1997.
2. Steve Mann and Scoot Schibli, "The Wireless Application Protocol", John Wiley & Inc., 2000.

E-RESOURCES:

1. https://www.techtarget.com/searchmobilecomputing/definition/nomadic-computing
2. https://www.tutorialspoint.com/mobile_computing/mobile_computing_overview.htm
3. https://www.inderscience.com/jhome.php?jcode=ijwmc
4. https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=7755
5. https://www.interaction-design.org/literature/topics/mobile-computing

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DEPARTMENTOFCOMPUTERAPPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Semester : III-SEC- Managerial Skills

Ins. Hrs./Week:2 **Course Credit:2** **Course Code: P23SECA31A**

UNIT-I: Thinking Strategies **(6 Hours)**

Strategic thinking – meaning – questions-things included in Strategic thinking Process consideration in Strategic thinking– Strategic thinking competencies importance of Strategic thinking–characteristics of Strategic Thinkers– Points to be kept in mind in Strategic thinking. Lateral Thinking–meaning–why Lateral Thinking–when to use Lateral Thinking– Benefits of Lateral Thinking – Techniques used in Lateral Thinking – Who needs Lateral Thinking – How to use Lateral Thinking? – Conventional Vs Lateral Leaders – Questions asked by Lateral Leaders–becoming a Lateral leader

UNIT- II :Interpersonal Strategies **(6 Hours)**

Conflict Resolution–meaning–points to be understood before studying conflict resolution – sources of conflict – common reactions to conflict – role of perception in conflict–steps for Conflict Resolution– Conflict handling matrix Functional and Dys functional outcome of conflict. Negotiation skills–process– styles–outcome– principles involved– negotiation model–being an egotiator–qualities of an egotiator.

UNIT- III: Implementation Strategies **(6 Hours)**

Facing changes – meaning – characteristics –why changes –pace of changes – impact of resistance – Reasons for resistance – types of people in facing changes – introducing change. Facing challenges – meaning – importance –path to facing challenges – benefits of facing challenges.

UNIT- IV: Action Based Strategies **(6 Hours)**

Risk taking-meaning–factors determining Risk Taking – Risk management–users of Risk Management– Steps in Risk Management. Effective decision making–meaning–approaches–methods–steps–Decision making at the work place.

UNIT-V: Behavioral Strategies **(6 Hours)**

Motivation and Staying motivated–meaning–finding reason for being motivated – staying motivated at work place – staying motivated in negative work environment – staying motivated during crisis. Balancing work and life – meaning – work satisfaction – gender differences – responsibility of the employers and employees– way so balancing work and life –handling professional and personal demands–organizing your desk.

Total Lecture Hours-30

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

1. Apply the knowledge of thinking strategies
2. Master interpersonal strategies, including conflict resolution and negotiation skills
3. Acquire implementation strategies to navigate organizational changes, overcome resistance, andeffectively introduce and manage change initiatives.
4. Cultivate action-based strategies such as risk management and effective decision-making techniques toidentify, assess, and mitigate risks, and make timely and well-informed decisions.
5. Enhance behavioral strategies, including motivation, resilience, and work-life balance, to stay motivated, productive, and maintain a healthy balance between personal and professional life amidst challenges.

TEXTBOOK(S):

1. Alex K. (2012) Soft Skills – Know Yourself& Know the World, S.Chand& Company LTD, RamNagar, New Delhi- 110 055. (Dr. K. Alex)

REFERENCE BOOK(S):

1. Meena. K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills : A Road Map toSuccess), P.R. Publishers& Distributors, No, B-20&21,V.M.M.Complex,ChatiramBusStand,Tiruchirappalli-620002
2. Emotional Quotient–Daniel Goleman
3. Power of the Plusfactor–NormanVincentPeale.
4. The Seven Habits of Highly Effective people–Stephen covey

E-RESOURCES:

1. https://corporatefinanceinstitute.com/resources/management/management -skills/
2. https://www.pfh.de/en/blog/three-types-managerial-skills
3. https://www.betterup.com/blog/functions-of-management
4. https://in.indeed.com/career-advice/career-development/management-skills

SENGAMAL THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE (AUTONOMOUS)

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(For the Candidates admitted in the academic year2023–2024)

DEPARTMENTOFCOMPUTERAPPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester :III-SEC-Organizational Behavior

Ins. Hrs./Week:2 **Course Credit: 2** **CourseCode:P23SECA31B**

UNIT-I:Fundamentals of Organization Behaviour (6 Hours)

Understanding Organization Behaviour –Fundamental Concepts – Contingency Approach – Limitation of Organization Behaviour–An Organization Behaviour System–Model of Organization Behaviour– Managing Communications: communications Fundamentals–Upwardand Downward Communication– Other Form of Communication–Informal Communication.

UNIT-II: Social Systems and Organizational Culture (6 Hours)

Social Systems and Organizational Culture: Understanding a Social System – Social Culture– Role – Status – Organizational Culture – Motivation: Model – Motivational Drives – Human Needs – Behaviour Modification – Goal Setting. Appraising: Organizational Behaviour and performance Appraisal – Economic Incentive Systems

UNIT-III: Leadership (6 Hours)

Leadership – The Nature of Leadership – Behaviour Approaches to Leadership Style – Contingency approachesto Leadership Style – Individual and Interpersonal Behaviour: Nature of Employee Attitudes – Effects of Employee Attitudes – Studying Job Satisfaction. Interpersonal Behaviour: Conflict in Organizations – Power and Politics

UNIT-IV: Rights (6 Hours)

Organizations and Individuals: Rights to Privacy – Discipline – QWL –Individual Responsibilities. Informal and Formal Groups: Group Dynamics –Nature of Informal Group – Formal Group – Team and Team Building: Organizational Context for Teams –Teamwork – Team Building.

UNIT-V: Stress and Counselling (6 Hours)

Change and its Effects: Change at Work- Resistance to Change – Implementing Change Successfully – Understanding Organization Development. Stress and counseling: Employee Stress– Employee Counseling – Type of counseling.

Total Lecture Hours-30

COURSEOUTCOMES

The Students will be able to

1. Enumerate Organizational Behavior
2. Understand organization alculture
3. Apply leadership quality
4. Understand the Team work and Group
5. Underst and changes and effects of organization
6. Apply the rights in organization and society
7. Implement the counselling and stress reduction methods

TEXTBOOK(S)

1. JohnWNewstrom.2007.OrganizationalBehavior:HumanBehavioratWork.TwelfthEdition,Ta taMc-Graw Hill Education Private Limited, New Delhi.

REFERENCEBOOK(S)

1. FredLuthans.2015.OrganizationalBehavior:AnEvidencebasedApproach.ThirteenthEdition,I n formation Age PublishingInc.North Carolina,USA.
2. Joseph E. Champoux. 2020. Organizational Behavior: Integrating Individuals,GroupsandOrganizations.Sixth Edition,Routledgepublications,London,UK.
3. Ricky W. Griffin, Jean M. Phillips, Stanley M. Gully. 2017.Organizational Behavior:ManagingPeople and Organizations. Twelfth Edition, Cengage Learning, Boston,USA.
4. Schermerhorn,Osborn,UhlBien,Hunt.2012.OrganizationalBehavior.TwelfthEdition,WileyP u blisher,New Jersey, USA.
5. StephenP.Robbins.2010.OrganizationalBehavior.ThirteenthEdition,PHI Pvt.Ltd,NewDelhi.

E-RESOURCE(S)

1. http://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20 VI%20SEM/BCA-629%20OB.pdf
2. https://www.geektonight.com/organisational-behaviour-notes-pdf
3. https://2012books.lardbucket.org/pdfs/an-introduction-to-organizational-behavior-v1.1.pdf
4. https://old.mu.ac.in/wp-content/uploads/2014/04/Management-PAPER-II-Organizational-Behavior-final-book.pdf
5. https://www.macmillanihe.com/resources/samplechapters/9781137429445_s ample.pdf

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Semester :III-SEC-Soft Skill Development Lab

Ins. Hrs./Week:2 **Course Credit: 2** **CourseCode:P23SECA31C**

LIST OF EXERCISE

1. Characteristics of Technical Writing
2. Development of Employability Skills
3. Vocabulary Development
4. Sentence Completion
5. Error Spotting
6. Interpretation of Verbal Analogy
7. Interpretation of Reading (Comprehension -Conception)
8. Interpretation of Reading (Comprehension -Reasoning)
9. Practice for writing E-mails/Technical Blogs/Forums
10. PPT Preparation / Demonstration of Technical Presentation
11. Preparation of Resume
12. Preparation for Job Interviews / Mock Interview Section
13. Group Discussion Skills
14. Developing Listening Skill(Comprehension)
15. Practice for Short Speeches / Situational Conversation
16. English through Mass Media
17. Essential Grammar
18. Communicating and collaborating with peer members
19. Team Empowerment
20. Persuasive Communication

Total Lab Hours-30

TEXT BOOK(S):

1. Uma Narula, "Development Communication: Theory and Practice", Revised Edition, Har-Aanad Publication, 2019.
2. Annette Capel and Wendy Sharp, "Cambridge English: Objective First", Fourth Edition, Cambridge University Press, 2013.
3. Emma Sue-Prince, "The Advantage: The 7 Soft Skills You Need to Stay One Step Ahead", FirstEdition, FT Press, 2013.
4. Guy Brook-Hart, "Cambridge English: Business Benchmark",Second Edition, Cambridge UniversityPress, 2014.
5. Norman Lewis, "How to Read Better & Faster", Binny Publishing House, New Delhi, 1978.

REFERENCE BOOK(S):

1. Michael McCarthy and Felicity O'Dell, "English Vocabulary in Use:100 Units of VocabularyReference and Practice", Cambridge UniversityPress,1996.
2. Murphy, Raymond, "Intermediate English Grammar", Second Edition, Cambridge UniversityPress, 1999.

E-RESOURCES:

1. https://soaneemrana.org/onewebmedia/SOFT%20SKILL%20DEVELOPMENT%20LAB%20SE M%206.pdf
2. https://www.zebra.com/ap/en/products/mobile-computers.html
3. https://www.interaction-design.org/literature/topics/mobile-computing
4. https://tkmit.ac.in/soft-skill-training/

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
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(For the Candidates admitted in the academic year 2023–2024)
DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS(MCA)

Semester : IV-CC-VI- Research Methodology

Ins. Hrs./Week:6 **Course Credit:5** **CourseCode:P23CA413**

UNIT-I : Introduction To Research **(18 Hours)**

Research - Objectives-Motivation-Types of Research- Research Approaches – Process – Research Problem: Selecting the Problem-Defining the problem-Techniques. Research Design: Need-Features-Concepts-Research Design –Principles.

UNIT-II : Measurement And Scaling Techniques **(18 Hours)**

Measurement- Measurement Scales-Sources of Error-Tests of Sound Measurement -Techniques Of Measurement-Scale Classification Bases- Rating Scales-Scale Constructing Techniques- Arbitary Scales-Differential Scales-Summated Scales-Cumulative Scales-Factor Scales-Multidimensional Scaling

UNIT-III: Data Collection Analysis And Interpretation **(18 Hours)**

Collection of Primary Data : Observation Method ,Interview Method, Through Questionnaires, Through Schedules-Difference between Questionnaires and schedules-Other Methods-Collection of Secondary Data- Method for Data Collection – Guidelines for Questionnaire design – Interview technique. Processing and Analysis of Data: Processing Operations: Editing, Coding, Classification, Tabulation

UNIT IV: Hypothesis And Statistical Techniques **(18 Hours)**

Hypothesis-Concepts-Procedure-Flow Diagram-Power of Hypothesis Test- Test of hypothesis- Parametric Tests:"t" Test-"F" Test- "Z" Test, Chi- Square Test-Analysis of Variance. Non Parametric: Sign Test, U Test, HTest, Rank Sum Test.

UNIT - V: Research Report Writing **(18 Hours)**

Meaning of Report Writing Importance Interpretation – Techniques of Interpretation –Precaution in Interpretation - Significance of Report Writing- Different Steps In Writing Report – Layout of Research Report– Types – Oral Presentation – Mechanics of Writing a Research Report – Precautions for Writing ResearchReports – Role of Computers in Research.

Total Lecture Hours:90

COURSEOUTCOMES:

On the successful completion of the course, students will be able to

1. Understandtheconceptsandapplicationareaofresearchandresearchethics.
2. Build a skills to converting the qualitative data into quantitative data
3. Execute the use of Research design techniques.
4. Enumerate the concepts and procedures of sampling, data collection, analysis.
5. Apply the Statistical techniques for analysis of research data.

TEXTBOOK(S)

1. C.R..Kothari, ,Research Methodology :Methods And Techniques, Second Edition, New Age InternationalPublishers ,Chennai.

REFERENCEBOOK(S)

1. DonaldH.McburneyandTheresa,2018,Researchmethods,Cengagelearning,UK.
2. MathukuttyMMonippally,BadrinarayanShankarPawar,2008,AcademicWriting:AGuidefo r ManagementStudentsandResearchers,SagePublicationsPvt.Ltd,NewYork.
3. RanjitKumar,2010,ResearchMethodology:AStep-By-StepGuideforBeginners,SagePublications, NewYork.
4. RashmiAgrawal,2013,ResearchMethodsConcepts,Process and Practice, Shipra Prakashan Publication, New Delhi.
5. SantoshGupta,2018,ResearchMethodology And Statistical Techniques, Deep &Deep Publications, New Delhi.

E-RESOURCE(S):

1. http://arts.brainkart.com/subject/research-methodology-4/
2. http://www2.ift.ulaval.ca/~chaib/IFT-6001/articles/RMethodology_Marzuki_1.pdf
3. http://bbamantra.com/research-methodology/
4. http://arts.brainkart.com/article/introduction-of-data-collection---sources-of-data-570/
5. https://www.brainkart.com/menu/mba/

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DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS(MCA)

Semester :IV-CC-VII- Cloud Computing Technologies

Ins. Hrs./Week:5 **CourseCredit:5** **CourseCode:P23CA414**

UNIT- I:Introduction **(15 Hours)**

Cloud Computing Foundation: Introduction to Cloud Computing: Cloud computing Basics, History of cloud Computing, Importants of Cloud Computing in the Current Era, Characteristics of Cloud Computing–Move to Cloud Computing: Pros and Cons of Cloud Computing, Nature of the Cloud Technologies in Cloud Computing–Types of Cloud: Public and Private Cloud, Cloud Infrastructure, Cloud Application Architecture– Working of Cloud Computing: Trends in Computing, Cloud Service Models.

UNIT -II: Cloud Computing Architecture **(15 Hours)**

Cloud Computing Architecture: Cloud Computing Technology: Cloud Life cycle Model, Role of Cloud Modeling and Architecture–Cloud Architecture –Cloud System Architecture Cloud Modeling and Design-Virtualization: Foundation– Grid, Cloud and Virtualization– Virtualization and Cloud Computing

UNIT III :Data Storage and Cloud Computing **(15 Hours)**

Data Storage and Cloud Computing: Data Storage: Data Management for Cloud Storage, Provisioning Cloud Storage – Cloud Storage – Cloud Storage from LANs to WANs–CloudComputing Services: Cloud Services– Cloud Computing at Work

UNIT -IV : Cloud Technologies **(15 Hours)**

Cloud Computing and Security: Risks in Cloud Computing: Introduction ,Risk Management, Types of Risk in Cloud Computing – Data Security in Cloud :Introduction, Current State,– Cloud Security Services –Cloud Computing Tools: Tools and Technologies for Cloud – Cloud Mashaps –Apache Hadoop–Cloud Tools

UNIT-V :Cloud Applications **(15 Hours)**

Cloud Applications– Moving Applications to the Cloud: Cloud opportunities, Business Opportunities Using Cloud, Applications in Cloud, Managing Desktop and Dives Services, Scientific Applications in The Cloud– Microsoft Cloud Services–Google Cloud Applications–Amazon Cloud Services–Cloud Applications.

Total Lecture Hours:75

COURSEOUTCOMES:

On te successful completion of the course, students will be able to

1. Building Cloud Computing environments
2. Understand Cloud Application Design Methodologies
3. Installing Python and Designing a Restful Web API
4. Gain Knowledge in data security
5. Analyze Case Study :Live Video Stream App

TEXTBOOK(S)

Srinivasan.A, Suresh.J'Cloud Computing–A Practical Approach for Learning

REFERENCEBOOK(S)

1. Rittinghouse and Ransome ,Cloud Computing: Implementation, Management, andSecurity, CRCPress,2016.
2. MichaelMiller"CloudComputingWebbasedapplicationthatchangethewayyouworkandcollaborateonline".Pearsonedition,2008.
3. KrisJamsa,CloudComputing:SaaS,PaaS,IaaS,Virtualization,BusinessModels,Mobile ,SecurityandMore,Jones&BartlettLearning,2012.
4. RajkumarBuyya,JamesBroberg,andAndrzejGoscinski.2011.CloudComputing-PrinciplesandParadigms.JohnWiley&Sons,Inc.,Hoboken,NewJersey,USA .
5. JohnRittinghouse,JamesRansome.2009.CloudComputing:Implementation,Management,andSecu r ity.CRCPress,BocaRaton,USA

E-RESOURCE(S):

1. https://www.guvi.in/blog/websites-to-learn-cloud-computing/
2. https://onlinecourses.nptel.ac.in/noc21_cs14/preview
3. https://www.coursera.org/articles/how-to-learn-cloud-computing
4. https://www.edx.org/search?q=cloud+computing

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DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Semester : IV-CP-VII- Cloud Computing Technologies Lab

Ins. Hrs./Week:5 **CourseCredit:3** **CourseCode:P23CA415P**

LIST OF PROGRAMS:

1. Install Virtual box/VMware Workstation with different flavours of linux orwindows OS on top of windows7 or 8.
2. Install a C compiler in the virtual machine created using virtualbox andexecute Simple Programs.
3. Install Google App Engine. Create *hello world* app and other simple webapplications using python/java.
4. Use GAE launcher to launch the web applications.
5. Simulate a cloud scenario using Cloud Simandruna scheduling algorithmthat is not present in Cloud Sim.
6. Find a procedure to transfer the files from one virtual machine to anothervirtual machine.
7. Find a procedure to launch virtual machine using try stack(Online Open stack Demo Version)
8. Install Hadoop using lenodeclusterandrun simple applications like word count

Total Lab Hours-75

TEXTBOOK(S)

1. Srinivasan.A, Suresh.J' Cloud Computing–A Practical Approachfor Learning

REFERENCEBOOK(S)

1. Ritting house and Ransom ,Cloud Computing: Implementation,Management, and Security, CRCPress,2016.
2. MichaelMiller"CloudComputingWebbasedapplicationthatchangethewayyouworkandcollaborateonline".Pearsonedition,2008.

3. KrisJamsa,CloudComputing:SaaS,PaaS,IaaS,Virtualization,BusinessModels,Mobile ,SecurityandMore,Jones&BartlettLearning,2012.
4. RajkumarBuyya,JamesBroberg,andAndrzejGoscinski.2011.CloudComputing-PrinciplesandParadigms.JohnWiley&Sons,Inc.,Hoboken,NewJersey,USA .
5. JohnRittinghouse,JamesRansome.2009.CloudComputing:Implementation,Management,andSecu r ity.CRCPress,BocaRaton,USA

E-RESOURCES

1. https://www.guvi.in/blog/websites-to-learn-cloud-computing/
2. https://onlinecourses.nptel.ac.in/noc21_cs14/preview
3. https://www.coursera.org/articles/how-to-learn-cloud-computing
4. https://www.edx.org/search?q=cloud+computing

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DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester : IV-EC-VI- Social Networking

Ins. Hrs./Week:4 **CourseCredit:3** **CourseCode:P23CAE46A**

UNIT I: Introduction **(12 Hours)**

Social Media Strategy-Important First Decisions -Websites, Blogs - RSS Feeds Mapping -Preparation - Multimedia Items Gathering Content for Blog Posts RSS Feeds & Blogs-RSS Feeds-The Feed Reader-The Feed-Options for Creating an RSS Feed-Planning Feed-Blogs-Options for Starting. Blog and RSS Feed-Feed orBlog Content-Search Engine Optimization (SEO)-Feed Burner-RSS Feed and Blog Directories-An Optimization Plan for Blog or RSS Feed

UNIT II: Building a Word Press Powered Website **(12 Hours)**

Word Press as A CMS - Diversity of Word Press Sites-The Anatomy of a Word Press Site -a Brief Look at the Word Press Dashboard Planning - Site Themes Plug-ins setting up Sidebars Building Pages- Posting Blog Entries. Podcasting, Vidcasting, & Webcasting- Publishing Options for Podcast- Creating and Uploading Podcast Episodes-Publishing Podcast Optimizing Podcast- Webcasting

UNIT III:Social Networking & Micro-Blogging **(12 Hours)**

Facebook-The Facebook Profile -Myspace LinkedIn-Twitter-Niche Social Networking Sites-Creating Own Social Network-Promoting Social Networking Presence- Social Bookmarking & Crowd-Sourcing - Social Bookmarking-A Social Bookmarking Strategy- Crowd-Sourced News Sites- Preparation And Tracking Progress Media Communities-Image Sharing Sites-Image Sharing Strategy-Video Sharing Sites-Video Sharing Strategy-Searching And Search Engine Placement-Connecting With Others.

UNIT IV:Widgets & Badges **(12 Hours)**

Highlighting Social Web Presence-Sharing And Syndicating Content Making Site More Interactive-Promoting Products And Making Money-Using Widgets In Word Press-Widget Communities And Directories- Working Widgets Into Strategy Social Media Newsrooms-Building Social Media Newsroom - Populating The Newsroom-Social Media News Releases-Social Media Newsroom Examples. More Social Tools-Social Calendars-Social Pages Wikis-Social Search Portals-Virtual Worlds.

Unit V:Website optimization **(12 Hours)**

A Website Optimization Plan-Streamlining Web Presence-An Integration Plan- Looking to the Future-Life streaming: The Future of Blogging-Distributed Social Networking-Social Ranking, Relevancy, and—Defriending-Web 3.0 or The Semantic Web-Mobile Technology- Measuring Your Success-A Qualitative Framework-A Quantitative Framework-Tools to Help You Measure-Come To Your Own Conclusions

Total Lecture Hours:60

COURSE OUTCOMES

On the successful completion of the course, students will be able to

1. To understand, impart and summarize the concepts of Social media, Social networking and Webcasts
2. To comprehend, design and develop a Word Press Powered Website
3. To understand, implement and perform evaluation of Social Networking and Micro-Blogging
4. To collaborate, implement and analyse the Widgets and Badges in social networking environment
5. To understand, illustrate and perform evaluation of web optimization for social networks

TEXT BOOK(S):

1. Deltina hay —A Survival Guide To social Media and Web 2.0 Optimization‖, Dalton Publishing, 2009

REFERENCE BOOK(S):

1. Miriam Salpeter —Social Networking for Career Success‖ Learning Express, 2011.
2. Miles, Peggy, —Internet world guide to webcasting‖ Wiley, 2008Professionals", Wiley Publication,2015.

E-RESOURCES

1. https://www.techtarget.com/whatis/definition/social-networking#:~:text=Social%20networks%20are%20websites%20and,uses%20of%20the%20inter net%20today.
2. https://en.wikipedia.org/wiki/Social_networking_service
3. https://www.psychologytoday.com/us/basics/social-networking
4. https://www.britannica.com/technology/social-network

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DEPARTMENTOFCOMPUTERAPPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Semester : IV-EC-VI- Social Networking Lab

Ins.Hrs./Week:4 **CourseCredit:3** **CourseCode:P23CAE46BP**

LIST OF PROGRAMS

1. Creating and Exploring Twitter's API
2. To analyzing and visualizing tweets and tweet entities with frequency analysis
3. Creating and Exploring Facebook's Social Graph API
4. To analyzing the Facebook's Social Graph connections
5. Creating and Exploring LinkedIn API
6. To downloading LinkedIn connections as a CSV file
7. Creating and Exploring Google+ API
8. To create and querying Human Language Data with TF-IDF
9. Creating and Exploring GitHub's API
10. To analyzing GitHub interest graph

Total Lab Hours :60

TEXT BOOK:

1. Deltina hay —A Survival Guide To social Media and Web 2.0 Optimization‖, Dalton Publishing, 2009

REFERENCE BOOKS:

1. Miriam Salpeter —Social Networking for Career Success‖ Learning Express, 2011.
2. Miles, Peggy, —Internet world guide to webcasting‖ Wiley, 2008
Professionals", Wiley Publication,2015.

E-RESOURCES

1. https://www.techtarget.com/whatis/definition/social-networking#:~:text=Social%20networks%20are%20websites%20and,uses%20of%20the%20inter net%20today.
2. https://en.wikipedia.org/wiki/Social_networking_service
3. https://www.psychologytoday.com/us/basics/social-networking
4. https://www.britannica.com/technology/social-network

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DEPARTMENTOFCOMPUTERAPPLICATIONS

MASTER OF COMPUTER APPLICATIONS(MCA)

Semester :IV-EC-VI- High Performance Computing

Ins. Hrs./Week: 4 **CourseCredit:3** **CourseCode:P23CAE46C**

UNIT-I : Modern processors **(12 Hours)**

Stored-program computer architecture-General purpose cache based microprocessor architecture-Memory hierarchies-Multi core processors-Multithreaded processors-Vector processors. Basic optimization techniques for serial code: Scalar profiling-Common sense optimizations-Simple measures, large impact-The role of compilers- C++ optimizations.

UNIT-II :Data access optimization **(12 Hours)**

Balance analysis and light speed estimates-Storage order-Algorithm classification and access optimizations-TheJacobi algorithm-Algorithm classification and access optimizations-Sparse matrix-vector multiply. Parallel computers: Taxonomy of parallel computing paradigms-Shared-memory computers-Distributed memory computers-Hierarchical systems-Networks.

UNIT-III :Basics of parallelization **(12 Hours)**

Introduction to Parallelism -Parallel scalability. Shared memory parallel programming with OpenMP: Short introduction to OpenMP-OpenMP-parallel Jacobi algorithm.

UNIT-IV :Efficient Open MP programming **(12 Hours)**

Profiling Open MP programs-Performance pitfalls-Parallel sparse matrix-vector multiply. Locality optimizations on cc NUMA architectures: Locality of access on cc NUMA-cc NUMA optimization of sparse MVM-Placement pitfalls-cc NUMA issues with C++.

UNIT-V :Distributed-memory parallel programming with MPI **(12 Hours)**

Message passing-A short introduction to MPI-MPI parallelization of a Jacobi solver. Efficient MPI programming: MPI performance tools-Communication parameters-Synchronization, serialization, contention- Reducing communication overhead-Understanding intranode point-to-point communication.

Total Lecture Hours:60

COURSE OUTCOMES:

On the successful completion of the course, students will be able to,

1. Understand of the HPC and ccNUMA concepts
2. Design and develop a parallel programming with modern C, C++ and new version ofFORTRAN
3. Apply with parallel computing
4. Develop an efficient OpenMP programming
5. Evaluate an efficient MPI programming

TEXT BOOK:

1. Georg Hager, Gerhard Wellein "Introduction to High Performance Computing for Scientists and Engineers", CRC Press, 2011. **Chapters:** 1 to 10.

REFERENCE BOOKS:

1. Michael W. Berry, Kyle A. Gallivan, Efstratios Gallopoulos, Ananth Grama, Bernard Philippe, Yousef Saad, Faisal Saied, "High-performance scientific computing: algorithms and applications", Springer, 2012.
2. Victor Eijkhout, "Introduction to High Performance Scientific Computing", MIT Press, 2011.

E-RESOURCES

1. https://www.meity.gov.in/content/high-performance-computinghpc#:~:text=High%20Performance%20Computing%20most%20generally,science%2C%20engineering%2C%20or%20business.
2. https://www.geeksforgeeks.org/high-performance-computing/
3. https://cloud.google.com/discover/what-is-high-performance-computing
4. https://www.intel.com/content/www/us/en/high-performance-computing/what-is-hpc.html

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DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS(MCA)

Semester :IV-EC-VI- High Performance Computing Lab

Ins. Hrs./Week:2 **Course Credit:2** **CourseCode:P23CAE46DP**

LIST OF EXPERIMENTS:

(Implemented either PB, Slurm,OpenMP, OpenMPI, and CUDA)

1. Demo: - Access and best practices on HPC
2. Matrix multiplication with Job scheduling (PB or Slurm)
3. Vectors add with malloc shared
4. Vector add program with MPI
5. Hello world task for Multithreading with openMP
6. openMP shared memory on Host and Device
7. openMP Matrix Multiplication with parallelism and Barrier
8. openMP with Reduction on operands and aggregate functionality
9. Vector and Matrix multiplication on CUDA
10. Feed forward computing on CUDA

Total Lab Hours : 30

TEXT BOOK:

1. Georg Hager, Gerhard Wellein "Introduction to High Performance Computing for Scientists and Engineers", CRC Press, 2011. **Chapters:** 1 to 10.

REFERENCE BOOKS:

1. Michael W. Berry, Kyle A. Gallivan, Efstratios Gallopoulos, Ananth Grama, Bernard Philippe, Yousef Saad, Faisal Saied, "High-performance scientific computing: algorithms and applications", Springer, 2012.
2. Victor Eijkhout, "Introduction to High Performance Scientific Computing", MIT Press, 2011.

E-RESOURCE(S):

1. https://www.meity.gov.in/content/high-performance-computinghp
2. https://www.geeksforgeeks.org/high-performance-computing/
3. https://cloud.google.com/discover/what-is-high-performance-computing
4. https://www.intel.com/content/www/us/en/high-performance-computing/what-is-hpc.html

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DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS(MCA)

Semester :IV–PCC Enterprise Resource Planning

Ins. Hrs./Week:2 **CourseCredit:2** **CourseCode:P23PCCA41A**

UNIT-I :Introduction **(6 Hours)**

A Foundation for Understanding Enterprise Resource Planning systems–Re- engineering and Enterprise Resource Planning Systems – Planning ,Design ,and Implementation of Enterprise Resource Planning Systems – ERP Systems: Sales and Marketing–ERP Systems: Accounting and finance ERP Systems: Production and Materials Management ERP Systems: Human Resources

UNIT-II: Supply Chain Management **(6 Hours)**

Managing an ERP Project – Supply chain Management and the marketplace – Rules of the game – Winning as ateam.

Unit -III: Solutions **(6 Hours)**

Supply chains as Systems-Modeling the Supply Chain–Supply Chain Software-Operations–Meeting Demand– Maintaining Supply–Measuring Performance

Unit –IV: Planning **(6 Hours)**

Forecasting Demand–Scheduling Supply–Improving performance–Mastering Demand–Designing the Chain– Maximizing Performance

Unit- V: Customer Relationship Management **(6 Hours)**

Essentials of Customer relationship management–Designing CRM application– Various modules of CRM application-Advantages of CRM

Total Lecture Hours:30

COURSE OUTCOMES:

On the successful completion of the course, students will be able to,

1. Understand the foundations and implementation of Enterprise Resource Planning systems.
2. Understand the foundations and implementation of Enterprise Resource Planning systems.
3. Gain proficiency in managing ERP projects and Supply Chain Management.
4. Learn to model and optimize supply chains for efficient operations.
5. Master forecasting, scheduling, and performance improvement techniques.

TEXTBOOK(S):

1. Sumner Mary, Enterprise Resource Planning, First edition, Pearson education,2006
2. Taylor David A., Supply Chains (A managers guide), Pearson education, 2004
3. Tiwana, Essential guide to knowledge management : The e-business and CRM applications,

REFERENCE BOOK(S):

1. Leon, ENTERPRISE RESOURCE PLANNING, TataMcGrawHill,2013
2. ALTEKARRahulV.,Enterprisewideresourceplanning(Theoryandpractice), Prentice Hall of India, 2005(ISBN 81-203-2633-4)
3. Garg Vinod K &Venkitakrishnan N.K, Enterprise resource planning, Secondedition,PrenticeHallofIndia,2006(ISBN81-203-2254-1).
4. Handfield R. B& Nichols. Ernest L., Introduction to supply chain management, Prentice Hall of India,2006 (ISBN 81-203-2753-5)

E-RESOURCE(S):

1. https://www.investopedia.com/terms/e/erp.asp
2. https://www.oracle.com/in/erp/what-is-erp/
3. https://en.wikipedia.org/wiki/Enterprise_resource_planning
4. https://www.techtarget.com/searcherp/definition/ERP-enterprise-resource-planning
5. https://www.sap.com/india/products/erp.html

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Semester :IV–PCC –I - Management Information System

Ins.Hrs./Week:2 **Course Credit:** 2 **CourseCode:P23PCCA41B**

UNIT-I: Introduction to MIS **(6 Hours)**

Definition of MIS – MIS versus Data Processing – MIS & Decision support System – Fundamental of Information Systems – Types of Information System – Concept of an MIS – Structure of MIS.

UNIT- II: MIS Planning Structure **(6 Hours)**

Concept of organization planning – The Planning Process –Characteristics of Control process – The nature of control in an organization.

UNIT-III: Information System **(6 Hours)**

Internet and Electronic Commerce –Information System for Business Operations – Information System for Managerial Decision Support – Information System for Strategic Advantage.

UNIT- IV: Information Controls and Security **(6 Hours)**

Information Resource Management– Challenges to global Information Systems–Information System Controls – Information Ethics –Concept of Information Security.

UNIT- V: **Enterprise Resource Planning** **(6 Hours)**

Enterprise Resource Planning–ERP Benefits–ERP Modules–Supply Chain Management– Supply Chain Decisions –Seven Principles of Supply Chain – Component of CRM –Features of Procurement Management System.

Total Lecture Hours:30

COURSE OUTCOMES

Students will be able to

1. Relate the basic concepts and technologies used in the field of management information systems
2. Compare the processes of developing and implementing information systems
3. Outline the role of the ethical, social ,and security issue so information systems
4. Translate the role of information systems in organizations, the strategic management processes, with the implications for the management
5. ApplytheunderstandingofhowvariousinformationsystemslikeDBMSworktogether to accomplish the information objectives of an organization

TEXT BOOK(S)

1. Avdhesh Gupta,AnuragMalik.2006.ManagementInformationSystems.Second Edition, An Imprintof Laxmi Publications Pvt,Ltd., Chennai.
2. CSV Murthy.2017.ManagementInformationSystems.Himalayapublication, Mumbai.
3. M Jaiswal and M Mittal. 2004. Management Information Systems. Oxford UniversityPress India.

REFERENCEBOOK(S)

1. GuptaA.K.2014.ManagementInformationSystems.S.ChandPublications,Chennai.
2. JamesO'Brien.2019.ManagementInformationSystems.EleventhEdition,McGraw Hill Publications, New Delhi.
3. Kenneth C.Laudon, Jane P.Laudon. 2017. Management Information Systems. Fifteenth Edition, Pearson Education, London.
4. PoojaSingh,SumanMann,SeemaShokeen.2018.InformationSystemsManagement, IK International Publishing House, New Delhi.
5. SashikalaParimi.2012.ManagementInformationSystems.FirstEdition,Dreamtech Press, New Delhi.

E-RESOURCES

1. https://www.slideshare.net/HarishChand5/management-information-system-full-notes
2. https://www.sigc.edu/department/mba/studymet/ManagmentInformationSystem.pdf
3. https://www.shopify.com/encyclopedia/management-information-systems-mis
4. https://www.cleverism.com/management-information-systems-mis
5. https://searchitoperations.techtarget.com/definition/MIS-management-information-systems