NOIDA INSTITUTE OF ENGGINEERING & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR
(AN AUTONOMOUS INSTITUTE)

Affiliated to

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

Evaluation Scheme & Syllabus

For

Master of Computer Applications (Integrated)
Third Year

(Effective from the Session: 2024-25)

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)
Master of Computer Applications
MCA-INT
Evaluation Scheme
SEMESTER V

S.No	Subject Codes	Subjects	Type of Subject	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	Total	PS	TE	PE		
1	AMICA0503	Software Testing and Applications	Mandatory	3	1	0	30	20	50		100		150	4
2	AMICA0502	Web Technology	Mandatory	3	1	0	30	20	50		100		150	4
3		Departmental Elective-I	Departmental Elective	3	0	0	30	20	50		100		150	3
4	AMICA0501	Design and Analysis of Algorithms	Mandatory	3	1	0	30	20	50		100		150	4
5	AMICA0504	Organizational Behavior	Mandatory	4	0	0	30	20	50		100		150	4
6	AMICA0552	Web Technology Lab	Mandatory	0	0	4				50		50	100	2
7	AMICA0551	Design and Analysis of Algorithms Lab	Mandatory	0	0	4				50		50	100	2
8	AMICA0553	Software Testing and Application Lab	Mandatory	0	0	4				50		50	100	2
9	AMICA0559	Internship Assessment-II	Mandatory	0	0	2				50		50	100	1
10	AMICANC0501/ AMICANC0502	Constitution of India, Law and Engineering / Essence of Indian Traditional Knowledge	Compulsory Audit	2	0	0	30	20	50		50		100	NA
		*Massive Open Online Courses	*MOOCs											
		TOTAL											**1150**	**26**

*** List of MOOCs Based Recommended Courses for Third year (Semester-V) MCA (Int) Students**

Sr. No.	Subject Code	Course Name	University / Industry Partner Name	No. of Hours	Credits
1	BMC0043	Testing Fundamentals	IIHT (Infosys Springboard)	8h 27m	
2	BMC0028	HTML5 - The Language	Infosys Wingspan (Infosys Springboard)	13h 17m	

PLEASE NOTE: -

- **Internship(2-3weeks) shall be conducted during summer break after IV semester and will be assessed during V semester**

- **Compulsory Audit Courses (Non Credit – AMICANC0501/AMICANC0502)**

➢ All Compulsory Audit Courses (a qualifying exam) has no credit.
➢ Total and obtained marks are not added in the Grand Total.

Abbreviation Used:

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., CE: Core Elective,OE:Open Elective, DE: Departmental Elective, PE: Practical End Semester Exam, CA: Compulsory Audit, MOOCs: Massive Open Online Courses.

List of Departmental Electives: -

S. No.	Subject Code	Subject Name	Type of Subject
1	AMICA0511	Artificial Intelligence	Departmental Elective-I
2	AMICA0512	Fundamentals of Digital Marketing and Optimization	Departmental Elective-I
3	AMICA0513	CRM Fundamentals	Departmental Elective-I

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)
Master of Computer Applications
MCA-INT
Evaluation Scheme
SEMESTER VI

S.No	Subject Codes	Subjects	Type of Subject	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	Total	PS	TE	PE		
1	AMICA0602	Computer Graphics and Multimedia	Mandatory	4	0	0	30	20	50		100		150	4
2		Departmental Elective-II	Departmental Elective	3	1	0	30	20	50		100		150	4
3	AMICA0603	Computer Networks	Mandatory	3	1	0	30	20	50		100		150	4
4	AMICA0601	Advance Java	Mandatory	3	1	0	30	20	50		100		150	4
5	AMICA0604	Distributed System	Mandatory	4	0	0	30	20	50		100		150	4
6	AMICA0653	Computer Network Lab	Mandatory	0	0	4				50		50	100	2
7	AMICA0652	Computer Graphics and Multimedia Lab	Mandatory	0	0	4				50		50	100	2
8	AMICA0651	Advance Java Lab	Mandatory	0	0	4				50		50	100	2
9	AMICANC0602/ AMICANC0601	Essence of Indian Traditional Knowledge/ Constitution of India, Law and Engineering	Compulsory Audit	2	0	0	30	20	50		50		100	NA
		*Massive Open Online Courses	*MOOCs											
		TOTAL											**1050**	**26**

*** List of MOOCs Based Recommended Courses for Third year (Semester-VI) MCA (Int) Students**

Sr. No.	Subject Code	Course Name	University / Industry Partner Name	No. of Hours	Credits
1	BMC0027	Network Fundamentals	Infosys Wingspan (Infosys Springboard)	37h 57m	
2	BMC0044	Java 11 Beyond Basics	Infosys Wingspan (Infosys Springboard)	33h 13m	

PLEASE NOTE: -

- **Compulsory Audit Courses (Non Credit – AMICANC0602/AMICANC0601)**
  - All Compulsory Audit Courses (a qualifying exam) has no credit.
  - Total and obtained marks are not added in the Grand Total.

Abbreviation Used:

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., CE: Core Elective,OE:Open Elective, DE: Departmental Elective, PE: Practical End Semester Exam, CA: Compulsory Audit, MOOCs: Massive Open Online Courses.

List of Departmental Electives: -

S. No.	Subject Code	Subject Name	Type of Subjects
1	AMICA0611	Machine Learning	Departmental Elective-II
2	AMICA0612	Fundamentals of Digital Marketing and Analytics	Departmental Elective-II
3	AMICA0613	CRM Administration	Departmental Elective-II

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)
School of Computer Applications

Subject Name: Software Testing and Applications	**L-T-P [3-1-0]**
Subject Code: AMICA0503	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic knowledge of Computer Science.	
Course Objective: Study fundamental concepts of software testing and its application in various scenarios withthe help different testing strategies, methods and tools.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Describe the concepts of software testing.	**K1**
CO2	Demonstrate understanding of how different development and testing practices, and different constraints on testing, may apply in optimizing testing to different Contexts.	**K3, K5**
CO3	Apply test management principles for resources, strategies, planning, project control, and risk management.	**K3**
CO4	Analyze the project factors that drive the test priorities and test approach.	**K4**
CO5	Design how testing activities and work products align with project objectives, measures, and targets.	**K5**

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Introduction	**Introduction**	**Introduction:** Software Testing, Importance of testing, Roles and Responsibilities, Testing Principles,	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 1	**CO1**

		Attributes of Good Test, Test Case, Test Scenario, Bug, Failure , Defect , Fault ,SDLC , STLC.				
2. Types of Testing	**Testing Strategies**	**Testing Strategies:** Unit Testing, Integration Testing, System Testing, Smoke, Regression Testing, Acceptance Testing. Clean Room Software Engineering. Functional/Non- Functional Testing. Testing Tools	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 2 to 6, 13	**CO2**
	Categorization of testing methods	**Categorization of testing methods:** Manual Testing, Automation Testing and Automated Testing Vs. Manual Testing.				
3. Non Functional Testing	**Performance Test**	**Performance Test:** -Load testing, Stress testing, Scalability testing, Volume Testing, Configuration Testing, Regression Testing, Compatibility Testing, Recovery Testing, Maintenance Testing, Documentation Testing, Usability Testing, Efficiency Testing , Reliability Testing , Accountability Testing, Security Testing , Portability Testing.	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 8 to 10	**CO3**
4. Software Testing Methodologies	**Types of Testing**	**Types of Testing:** Validation & Verification, White/Glass Box Testing, Black Box Testing, Grey Box Testing, Statement Coverage Testing, Branch Coverage Testing, Path Coverage Testing, Conditional Coverage Testing, Loop Coverage Testing, Boundary Value Analysis, Equivalence Class Partition, State Based Testing, Cause Effective Graph, Decision Table, Use Case Testing, Exploratory testing and Testing Metrics	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 7, 11	**CO4**

5. Software Testing Life Cycle & Test Cases	**Software Testing Life Cycle**	Requirements Analysis/Design, Traceability Matrix, Test Planning, Objective, Scope of Testing, Schedule, Approach, Roles & Responsibilities, Assumptions, Risks & Mitigations, Entry & Exit Criteria, Test Automation, Deliverables.	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 12	**CO5**
	Test Cases Design	Write Test cases, Review Test cases, Test Cases Template, Types ofTest Cases, Difference between Test Scenarios and Test Cases. Test Environment setup, Understand the SRS, Hardware and software requirements, Test Data.				
Total				**40L+20P**		

Textbooks	
Sr. No	**Book Details**
1.	Roger S.Pressman, Software engineering- A practitioner’s Approach, McGraw-HillInternational 7 Editions, 2010
2.	Software Testing: Principles and Practices by Srinivasan Desikan, 2017
3.	Effective Software Testing: A Developer's Guide" by Maurício Aniche Edition: 1stYear: 2022
Reference Books:	

Sr. No	Book Details
1.	Modern Software Engineering: Doing What Works to Build Better Software Faster by David Farley Edition: 1st Year: 2021
2.	The Complete Guide to Software Testing: A Complete Guide to Software Testing" by William C. Hetzel Edition: 3rd Year: 2019
3.	Effective Software Testing: A Developer's Guide by Maurício Aniche Edition: 1st Year: 2022
	Link: NPTEL/YouTube/Faculty Video Link:
UNIT 1	https://www.youtube.com/watch?v=sbW4RThXNL8
UNIT 2	https://www.youtube.com/watch?v=T0TynxN77oY&t=46s
UNIT 3	https://www.youtube.com/watch?v=Qc-a0tBpdQQ
UNIT 4	https://www.youtube.com/watch?v=BSjRmiYP7vg
UNIT 5	https://www.youtube.com/watch?v=NiDe8lj-wGs

Subject Name: Web Technology					**L-T-P [3-1-0]**	
Subject Code: AMICA0502					**Applicable in Department: MCA-Integrated**	
Pre-requisite of Subject: Students are expected to be able to open command prompt window or terminal window, edit a text file, download, and install software, and understand basic programming concepts.						
Course Objective: To Develop an ability to design and implement static and dynamic website.						
Course Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO1	Discuss the concepts of Web Designing.					**K1, K2**
CO2	Design a responsive website using HTML and CSS.					**K4**
CO3	Implement interactive webpages using HTML, CSS, and JavaScript.					**K3**
CO4	Apply web designing concepts by database connectivity with JDBC in the current market place					**K3**
CO5	Analyze and build dynamic web pages using client-side programming JavaScript and also Develop the web application using servlet and JSP.					**K4, K5**
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
	Introduction	Web Technology, Web and web Protocols Governing Web, HTTP Protocol: Request and Response, Web browser and Webservers, Features of Web 2.0	Lectures, PPTS, Notes	8L	Assignment	**CO1**

1. Introduction	**Web Design**	Concepts of effective web design, Web design issues including Browser, Bandwidth, display resolution, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation				
2. HTML & CSS	**HTML**	Basics of HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, Frames and Framesets. HTML forms.	Lectures, PPTS, Notes	8L+5P	Experiment/ Program 1-13	**CO2**
	Style sheets	**I**ntroduction to CSS, need for CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, Positioning using CSS.				
3. Java script & Xml	**JavaScript**	Client-side scripting with JavaScript, variables, functions, conditions, loops and repetition, Popup boxes.	Lectures, PPTS, Notes	8L+5P	Experiment/ Program 14-29	**CO3**

	Advance JavaScript	JavaScript and objects, JavaScript toward objects-the DOM and web browser environments, Manipulation using DOM, forms and validations.				
	DHTML	Combining HTML, CSS and JavaScript, Events and buttons.				
	XML	Introduction XML				
4. **JDBC & Java Beans**	**Java Database Connectivity (JDBC)**	Introduction to JDBC, JDBC architecture, JDBC Connection steps, Perform JDBC manipulation, Statement, Prepared Statements, Transaction Processing	Lectures, PPTS, Notes	8L+5P	Experiment/ Program 30-35	**CO4**
	Java Beans	Introduction to Java Beans.				
5. Servlets & JSP	**Servlets**	Servlet Overview and Architecture, Servlet Life Cycle, Handling HTTP methods, Redirecting Requests to Other Resources, Session Tracking, Cookies, Session Tracking withHttp Session	Lectures, PPTS, Notes	8L+5P	Experiment/ Program 36-40	**CO5**
	Java Server Pages (JSP)	Introduction, Java Server Pages Overview, A First Java Server Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries.				

Total	40L+20P		

Textbooks	
Sr. No	**Book Details**
1.	Bayross Ivan, ”HTML, DHTML. JavaScript, and PHP”, BPB Publications, 4th Edition, 2019
2.	Xavier, C, “Web Technology and Design”, New Age International, Second edition ,2022
3.	Internet and World Wide Web How to program, P. J. Deitel &H. M. Deitel, Pearson, 5thedition, 2012

Reference Books:	
Sr. No	**Book Details**
1.	Margaret Levine Young, “The Complete Reference Internet”, TMH, 2022
2.	Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics by Jennifer Robbins Edition: 5th, 2018
3.	Santosh Kumar K “JDBC, Servlets, and JSP Black Book” "Publisher- Dreamtech Press;" "Edition- Second Edition" , 2016

Link: NPTEL/YouTube/Faculty Video Link:	
UNIT 1	https://www.youtube.com/watch?v=JsbxB2l7QGY
UNIT 2	https://www.youtube.com/watch?v=h_RftxdJTzs
UNIT 3	https://www.youtube.com/watch?v=uUhOEj4z8Fo
UNIT 4	https://www.youtube.com/watch?v=eEqPrlu28Sc
UNIT 5	https://www.youtube.com/watch?v=OuBUUkQfBYM

Subject Name: Design And Analysis of Algorithms	**L-T-P [3-1-0]**
Subject Code: AMICA0501	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic knowledge of programming, data structures and mathematics.	
Course Objective: Analyze asymptotic performance of algorithms designed using different computational model. Study advanced data structures like Red black Tree, binomial and Fibonacci heap and learn the concept of complexity classes.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Analyze and understand the asymptotic performance of algorithms and write rigorous correctness proofs for algorithms.	**K2, K4**
CO 2	Apply and use efficient sorting and searching techniques according to the problem.	**K3**
CO 3	Apply divide and conquer and greedy algorithm approach for solving different problems such as Prim's & Kruskal's etc	**K3**
CO 4	Apply important algorithmic design paradigms and methods of analysissuch as dynamic programming, backtracking, branch and bound.	**K3, K5**
CO 5	Demonstrate tractable and intractable problems and graph algorithms	**K3**

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Introduction	**Fundamentals of Algorithms:**	Problem Definition, Algorithm Specification-Simple example of design and analysis of time complexity, Performance Analysis: Space Complexity and Time complexity, Asymptotic Notation.	Lectures, PPTS, Notes	8L+4P	Assignment	**CO1**
	Analysis of Algorithms:	Orders of Magnitude (Asymptotic notations), Growth rates, Average and				

		worst case analysis, Analyzing control statements, Recurrence Relations- substitution, change of variables.				
2. **Sorting and searching**	**Sorting and searching algorithms**:	Selection sort, Bubble sort, Insertion sort, Sorting in linear time: Count sort, Binary search & linear search. Nave String Matching & Rabin-Karp Algorithm. Binary Search Tree Algorithm.	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 1-5	**CO2**
3.Divide and Conquer and Greedy Methods	**Divide and Conquer and Greedy Methods**	Divide and Conquer concepts with Examples Such as Quick sort, Merge sort, Strassen's Matrix Multiplication, ConvexHull, Searching. Greedy Methods with Examples Such as Activity Selection, Task scheduling, Knapsack (Fractional), Minimum Spanning Trees – Prim's and Kruskal's, Algorithms, Single Source Shortest Paths - Dijkstra's and Bellman Ford Algorithms, Huffmancodes	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 6-8	**CO3**
4. **Dynamic Programming, Branch and Bound**	**Dynamic Programming**	Dynamic Programming concepts, Examples Such as All Pair Shortest Paths – Warshal's and Floyd's Algorithms, 0/1 Knapsack, Longest Common Sub Sequence, Matrix Chain Multiplication, Resource Allocation Problem.	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 9-11	**CO4**
	Branch and Bound	Branch and Bound with Examples Such as Travelling Salesman Problem, Graph Coloring.				
5.Graph Algorithm	**Graph Algorithms**:	An introduction using graphs and games, Traversing Trees– Pre conditioning, Depth First Search, Undirected Graph, Directed		8L+4P	Experiment/ Program 12	

and Backtracking		Graph, Breath First Search. Height Balanced, m-way and RB-Tree.	Lectures, PPTS, Notes			**CO5**
	. Backtracking:	The Knapsack Problem, the 4/8/n-queens problem, Sum of Subsets.				
Total				**40L+20P**		

Textbooks	
Sr. No	**Book Details**
1.	Thomas H. Coreman, Charles E. Leiserson and Ronald L. Rivest, “Introduction to Algorithms”, MIT Press, 4th Edition, 2022
2.	Anany Levitin, “Introduction to the Design and Analysis of Algorithms", Pearson Publication, 3rd Edition, 2012 Algorithm Design and Applications" by Michael T. Goodrich and Roberto Tamassia Wiley Publication, 1st Edition, 2015
3.	Thomas H. Coreman, Charles E. Leiserson and Ronald L. Rivest, “Introduction to Algorithms”, MIT Press, 4th Edition, 2022

Reference Books:	
Sr. No	**Book Details**
1.	Design and Analysis of Algorithms, S. Sridhar, 2014
2.	Jon Kleinberg and ÉvaTardos, Algorithm Design, Pearson, 2013.
3.	Michael T Goodrich and Roberto Tamassia, Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Wiley, 2014

Link: NPTEL/YouTube/Faculty Video Link:	
Unit-I	https://nptel.ac.in/courses/106106131
Unit-II	https://www.youtube.com/watch?v=bE_MYkWukwI&list=PLgjc0A1c-mogMbecoTJWWSRL450glE6aw
Unit-III	https://nptel.ac.in/courses/106101060
Unit-IV	https://nptel.ac.in/courses/106101060
Unit-V	https://www.youtube.com/watch?v=5hPfm_uqXmw&list=PLm77mruelczpPDzLgp4UefbQRT4-cyJsW

Subject Name: Organizational Behavior	**L-T-P [4-0-0]**
Subject Code: AMICA0504	**Applicable in Department: MCA- Integrated**
Pre-requisite of Subject: Basic understanding and foundational knowledge of general communication skills.	
Course Objective: This course explores the theories and concepts of organisational behaviour and their application in the workplace. It covers individual behaviour, group dynamics, and managerial processes to enhance effectiveness. The Organizational Behaviour course focuses on a better understanding of the key factors that determine human behaviour in organisations. The course focuses on critical factors for understanding people's behaviour in organisational contexts from a socio-psychological point of view that play an essential role in people management. That is the basis of any leadership course in the rest of the program.	

Course Outcomes (CO)

Course outcome: After completion of this course, students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Demonstrate a sound understanding of the prominent theories, concepts and models that are used to understand and analyze human behaviour in organizations	**Analyzing (K4)**
CO2	Analyze the elements of group dynamics and solve applied problems related to group behavior	**Applying (K3)**
CO3	Develop practical insights into perception and apply motivational theories for effectively managing the Organizational people and processes	**Applying (K3)**
CO4	Apply conceptual knowledge of theory and models relevant to leadership and Change in organizations.	**Applying (K3)**
CO5	Display a working understanding of organizations as institutions including issues of structure, power, politics and conflicts.	**Knowledge (K2)**

Syllabus

Module Name	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**

Introduction to OB, Personality & Attitude	Fundamentals of individual behaviour, Models of OB, Organizational Climate and Culture, Personality-Determinants of Personality, types of personality, Personal effectiveness. Attitudes: Meaning, Types, Components, Theory of attitude formation	Discussion, Interactive lecture	8	Compare and contrast the culture and structure of any two organisations in the same industry.	**CO1**
Foundation of Group Behaviour	Group: Meaning, types, group dynamics, group cohesiveness, Team Building, Tuckman Model of Team Development. Meaning of Interpersonal Behaviour& Interpersonal skills, Transactional Analysis, Johari Window	Discussion, Simulation, Roleplay, Group activities	8	Self-Analysis using Johari window Role plays on Transactional Analysis	**CO2**
Motivation, Perception	Meaning & definition, Traditional theory of Motivation: Maslow's, Herzberg's, McClelland, Contemporary theories of Motivation: Self Determination Theory, Self-Efficacy Theory, Vroom's Expectancy Theory, Equity Theory, Reinforcement Theory. Meaning, process, principles and errors of perception, managerial &behavioural applications of perception.	Interactive lecture, Case study	8	Case study discussion	**CO3**
Leadership, Organizational Change	Leadership, types of leaders and leadership styles, traits and qualities of effective leader, trait theory, LSM – Leadership Situational Model, Meaning of organizational change, approaches to managing organizational change, creating a culture for change, implementing the change, Kurt Lewin Model of change.	Discussion, Leadership games, role plays	8	Select a business leader of your choice. Identify its leadership style and analyse its impact on team performance.	**CO4**
Organizational Power and Politics, Conflict Management	Organizational Power: Definition, Types of powers, Sources and Characteristics, Effective use of power, Organizational Politics: Factors and Impact. Organizational conflict: Constructive and Destructive conflicts, Conflict Process, Strategies for resolving destructive conflict	Discussion, Case study	8	"The political power game is very real in today's organizations" Explain this statement in terms of the discussion in the unit and support your answer with appropriate examples from the industry.	**CO5**
Total			**40**		

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Textbooks	
Sr No	**Book Details**
1.	Robbins, S. P., Judge, T. A., & Vohra, N. (2019). *Organizational behaviour by pearson 18e*. Pearson Education India.
2.	Pareek Udai (2018). Understanding Organizational Behaviour. Oxford University Press.
Reference Books	
Sr No	**Book Details**
1	Luthans, F., Luthans, B. C., & Luthans, K. W. (2021). *Organisational behaviour: An evidence-based approach fourteenth edition*. IAP.
2	Buchanan, D., & Badham, R. (2020). *Power, politics, and organisational change*. Sage.
Link: NPTEL/YouTube/Faculty Video Link:	
1. **https://openstax.org/books/principles-management/pages/10-1-organizational-structures-and-design** 2. **http://www.mbaexamnotes.com/organization-change-and-development.html**	

Subject Name: Artificial Intelligence					**L-T-P [3-0-0]**	
Subject Code: AMICA0511					**Applicable in Department: MCA-Integrated**	
Pre-requisite of Subject: Basic Knowledge of Transform techniques						
Course Objective: Introduce knowledge of historical perspective of AI and its foundations and familiarity with principles of AI toward problem solving, inference, perception, knowledge representation, and learning.						
Course Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO 1	Describe the history of Artificial intelligence (AI) and its foundations					**K2**
CO 2	Apply principles of AI in solutions that require problem solving, inference and perception.					**K3**
CO 3	Explain the important AI techniques, including intelligent search methods and solutions					**K2**
CO 4	Apply the concepts of knowledge & reasoning of predicate logic and representing knowledge using rules & Probabilistic reasoning					**K3**
CO 5	Evaluate the AI techniques presented and apply them to real world problems					**K4**
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Introduction	**Introduction to AI**	Introduction to Artificial Intelligence, Historical developments of Artificial Intelligence, well defined learning problems, Designing a Learning System, Basics of problem-solving: problem representation paradigms, state space, Problem reduction, Constraint satisfaction, Applications of AI	Lectures, PPTS, Notes	8L	Assignment	**CO1**

2. Search Techniques	**Search Techniques**	Searching for solutions, Uninformed Search Strategies: DFS, BFS, Informed Search Strategies: Local search algorithms and optimistic problems, adversarial Search, Search for games, minimax, Alpha - Beta pruning, Heuristic Search techniques, Hill Climbing, Best-first search, Means Ends Analysis, Iterative deepening Heuristic Search and A*.	Lectures, PPTS, Notes	8L	Assignment	**CO2**
3. Logic And Knowledge Representation	**Logic And Knowledge Representation**	Introduction of Logic, Propositional Logic Concepts, Semantic Tableaux and Resolution in Propositional logic, FOPL, Semantic Tableaux and Resolution in FOPL, Logic Programming in Prolog. Production systems and rules for some AI problems: Water Jug Problem, Missionaries-Cannibals Problem, n-Queen problem, monkey banana problem, Travelling Salesman Problem. Knowledge representation, semantic nets, partitioned nets, parallel implementation of semantic nets. Frames, Common Sense reasoning and thematic role frames.	Lectures, PPTS, Notes	8L	Assignment	**CO3**
4. Expert System	**Expert System**	Architecture of knowledge-Based System, Rule-based systems, Forward and Backward Chaining, Frame Based systems. Architecture of Expert System, Agents and Environment, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.	Lectures, PPTS, Notes	8L	Assignment	**CO4**

5. Planning And Uncertainty	**Planning And Uncertainty**	Planning with state Space Search, Conditional Planning, Continuous planning, Multi-Agent Planning, Forms of learning, inductive learning, Reinforcement Learning, learning decision trees, Neural Net learning and Genetic learning. Probabilistic Methods, Bayesian Theory, Dempster Shafer Theory, Bayes Network. 19 Evolutionary computations: Swarm Intelligence, ant colony optimization Agents, Intelligent Agents, Structure of Intelligent Agents, Virtual Agents, Multi-agent systems. Case Study: Health Care, E Commerce, Smart Cities.	Lectures, PPTS, Notes	8L	Assignment	**CO5**
Total				**40L**		

Textbooks	
Sr. No	**Book Details**
1.	Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, Pearson Education. Fourth Edition 2021.
2.	Elaine Rich and Kevin Knight, “Artificial Intelligence”, McGraw-Hill 3rdEdition 2010.

Reference Books:	
Sr. No	**Book Details**
1.	Patrick Henry Winston, “Artificial Intelligence”, Pearson Education Inc., Third edition.
2.	Python Machine Learning: Learn Python in a Week and Master It. An Hands-On Introduction to Artificial Intelligence Coding, a Project-Based Guide with Practical Exercises (7 Days Crash Course, Book 2) 2020.
3.	Nils J.Nilsson, “Artificial Intelligence - A New Synthesis", Harcourt Asia Pvt. Ltd
4.	AI in the Wild: Sustainability in the Age of Artificial Intelligence 2020.
5.	Knowledge-Based Systems Techniques and Applications (4-Volume Set).

Link: NPTEL/YouTube/Faculty Video Link:	
Unit-I	https://nptel.ac.in/courses/106/106/106106198/
Unit-II	https://nptel.ac.in/courses/111/107/111107137/
Unit-III	https://nptel.ac.in/courses/106/106/106106202/
Unit-IV	https://nptel.ac.in/courses/106/106/106106213/
Unit-V	https://nptel.ac.in/courses/106/105/106105152/

Subject Name: Fundamentals of Digital Marketing and Optimization						**L-T-P [3-0-0]**
Subject Code: AMICA0512						**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic Marketing Concepts, Basic Knowledge of Computers						
Course Objective: To introduce students about digital and social media marketing techniques and decisions on digital platforms. Identify the benefits and advantages to a business of using social media to engage an audience, Build, manage, and sustain an active social media community.						

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Describe importance of digital marketing.	**K2**
CO2	Reorganize how marketers use Google SEO projects to influence purchasing and selling decisions on digital platforms using digital content and tools.	**K2**
CO3	Analyze the benefits of integrating traditional and digital marketing with Google SEO for sells and purchasing marketing strategies.	**K3**
CO4	Evaluate the benefits of search advertising for a business that uses social media to target an audience.	**K4**
CO5	Implement an active social media community by using social media advertising.	**K3**

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Introduction	**Digital Marketing Landscape:**	Digital Consumer Behavior, The Digital Customer Journey, The Digital Opportunity, Digital and Your Organization, Business Growth and Digital Marketing Principles: Key Digital Marketing Concepts, Traditional and Digital Marketing, 3i Principles, Integrating Traditional	Lectures, PPTS, Notes	8L	Assignment	**CO1**

		and Digital Marketing, Tools for Digital Marketing.				
2. Content Marketing	**Content Marketing for Social:**	Content Marketing, Content Types, Social Media Platforms, Content Creation Tools, Influencer Marketing, eBook and Whitepapers	Lectures, PPTS, Notes	8L	Assignment	**CO2**
	Business Strategy:	Social Media : Social Media Platforms, Key Concepts of Social Media, Types and Primary Uses of Social Media Platforms, Benefits of Social Media to Business, Role of Social Media, Social Media Platforms for Business: Social Media Marketing Concepts, Key Social Media Platforms, Setting up Social on Key Platforms. The value of building Social Media Community.				
3. Social Media Strategy	**Social Content Strategy:**	Content Seeding, Social Media Formats, Content Promotion, Content Optimization, Influencer Marketing, Word of Mouth Marketing, Measurement and Tracking, Content Promotion Strategy, Audience Segmentation	Lectures, PPTS, Notes	8L	Assignment	**CO3**
	Fundamentals:	Facebook Marketing : Introduction to Facebook, The Value to Marketers, Page Management, Facebook Live, Messenger Facebook Ads and Marketing: Facebook Ads, Ads Manager, Strategy Process, Buying Channels and Ad Auctions				

4. Instagram And Snapchat Applications	**Instagram and Snapchat:**	Social Apps: Introduction to Social Apps, Differentiating Social Apps	Lectures, PPTS, Notes	8L	Assignment	**CO4**
	Basic Features of Instagram:	Video, stories, live, Instagram Posts, Snapchat Meanings, Snapchat Story, Basic Features Instagram				
	Snapchat Marketing:	Instagram Account Overview, Audience Development, Advertising Overview, 3V Advertising, Ads Manager, SnapAds, Instagram Analysis, Snapchat Analysis, Campaign Setup, Snapchat Geofilters				
5. Twitter, LinkedIn And YouTube Applications	**Twitter Marketing:**	Twitter Concepts, Platform Features, Profile Promotion and management, Hashtags, Analysis and Reporting.	Lectures, PPTS, Notes	8L	Assignment	**CO5**
	LinkedIn and Social Selling:	Social Selling and Personal Branding, The Benefits of Personal Branding, LinkedIn Concepts, Features and Functions, LinkedIn Social Plugins, LinkedIn Analytics. YouTube and Social Video Marketing: Misconceptions and Benefits, Platform Features, Channel Setup, Channel Promotion, Channel Management, YouTube Native Formats.				
Total				**40L**		

Textbooks	
Sr. No	**Book Details**
1.	Ryan Deiss & Russ Henneberry, “Digital Marketing for Dummies”, Publisher: John Wiley & Sons, Inc ,2021

2.	JayBaer , “Youtility”, Publisher : Gildan Media, LLC,2013
Reference Books:	
Sr. No	**Book Details**
1.	Dave Chaffey and Fiona Ellis-Chadwick , “Digital Marketing: Strategy, Implementation and Practice" , Pearson Publication, 2021 (7th Edition)
2.	Ira Kaufman, Chris Horton, and Rajan Sambandam, “Digital Marketing: Integrating Strategy and Tactics with Values", 2nd Edition, 2022
3.	Simon Kingsnorth, “Digital Marketing Strategy: An Integrated Approach to Online Marketing” , 2020
Link: NPTEL/YouTube/Faculty Video Link:	
Unit 1	**https://www.coursera.org/learn/social-media-digital-marketing-fundamentals**
Unit 2	**https://www.coursera.org/learn/social-media-social-content-strategy**
Unit 3	**https://www.coursera.org/learn/facebook-instagram-snapchat-marketing**
Unit 4	**https://www.coursera.org/learn/facebook-instagram-snapchat-marketing**
Unit 5	**https://www.coursera.org/learn/twitter-linkedin-youtube-marketing**

Subject Name: CRM Fundamentals						**L-T-P [3-0-0]**
Subject Code: AMICA0513						**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic knowledge of computer, marketing concepts and good communication skills .						
Course Objective: This course is designed to help in understanding the fundamentals of CRM which will help in providing better services for Sales, Marketing and Customer Relations in an Enterprise.						
Course Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO 1	Discuss the basic concepts of customer relationship management.					**K2**
CO 2	Recognize strategy and framework of customer relationship management.					**K2**
CO 3	Acquire basics of cloud-based customer relationship management.					**K3**
CO 4	Illustrate customer relationship management in context with business usecases.					**K3**
CO 5	Implement basics of CRM.					**K3**
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Introduction	**CRM**	Definition, history, goals. Sources of CRM value. Components of CRM: people, process, technology.	Lectures, PPTS, Notes	8L	Assignment	**CO1**
	Evolution of CRM:	Marketing and its principles, customer relations to CRM. Dynamics of Customer Supplier Relationships, Nature and context of CRM, Strategy				

	Organization of CRM:	The relationship-oriented organization: Mission, Culture, Structure, People, Communication & Information Systems.				
2. CRM Strategy and Framework	**CRM Strategy and Framework**	Developing a CRM strategy. Customer oriented (C in CRM), Relationship driven, 360-degreeview of customer. CRM system features-functions, application, benefits and solutions. Importance of loyalty-active, passive, split, shifting and switchers, customer profiling, customer segmentation model, Customer Experience, relationship marketing and journey, Case study.	Lectures, PPTS, Notes	8L	Assignment	**CO2**
3. Solution Design and Architecture	**CRM system solution-specifications**	Data Analysis, Solution Requirements. Types ofCRM- On-Premise, cloud based. Pros and Cons of each. Integration CRM with other enterprise applications.	Lectures, PPTS, Notes	8L	Assignment	**CO3**
	The Technology of CRM:	Data warehouses and customer relationships, creating data mart model, components of operational data warehouse.				
4. CRM for Business	**CRM for Business:**	CRM in Sales, Service, Marketing, E-commerce. Social Customer Relationship Management. Analytical CRM: Predictive Analytics Vs Operational Analytics. Channel Partner Relationship management, Collaborative CRM (using data pooling), Business Benefits of	Lectures, PPTS, Notes	8L	Assignment	**CO4**

		Cloud Based System, SLAs, Practical Challenges.				
5. CRM implementation	**Building CRM roadmaps:**	Current processes, customers, strategic goals, technology issues, pilot and proof of concept projects. Preliminary Roadmap and its template, developing roadmap midstream. Design stage, custom development, integration, reporting, data migration, and implementation, testing, launching and application management.	Lectures, PPTS, Notes	8L	Assignment	**CO5**
	Introduction to CRM tools:	ZOHO, Pega, Microsoft Dynamics 365, Sales force.				
Total				**40L**		

Textbooks	
Sr. No	**Book Details**
1.	Francis Buttle and Stan Maklan, “Customer Relationship Management”, 4th edition 2019.
2.	Michael Pearce, “Customer Relationship Management- How to develop and execute a CRM strategy”, Business Expert Press, 2021.
3.	Francis Buttle , “Customer Relationship Management: Concepts and Technologies" 3rd Edition, 2016

Reference Books:	
Sr. No	**Book Details**
1.	V. Kumar and Werner Reinartz, “Customer Relationship Management: Concepts and Tools", Springer, 4th Edition 2018.
2.	V.Kumar and Werner Reinartz, “Customer Relationship Management: A Databased Approach”, Wiley Publication, 2018
3.	Stanley A. Brown , “Customer Relationship Management: A Strategic Imperative in the World of E- Business" , Wiley publication, 1st Edition, 2000

Link: NPTEL/YouTube/Faculty Video Link:

Unit 1	https://onlinecourses.nptel.ac.in/noc20_mg57/preview https://archive.nptel.ac.in/courses/110/105/110105145/
Unit 2	https://www.youtube.com/watch?v=67ruTkrQXIY
Unit 3	https://www.youtube.com/watch?v=DE077z2kxVk
Unit 4	https://www.youtube.com/watch?app=desktop&v=l20oaKkDssw
Unit 5	https://www.youtube.com/watch?app=desktop&v=l20oaKkDssw

Subject Name: Web Technology Lab	**L-T-P [0-0-4]**
Subject Code: AMICA0552	**Applicable in Department: MCA-Integrated**

Course Objective: Design static and dynamic web pages using HTML and CSS, implementing client-side script programming using JavaScript. Learn how to connect database using JDBC with Project development. Learn Servlet API development and JSP application design.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Describe the concept of web designing and publishing website	**K2**
CO 2	Apply and design web pages using HTML and CSS	**K3, K5**
CO 3	Implement JavaScript code to add interactivity and dynamic behavior to webpages.	**K3**
CO 4	Apply database connectivity using Java Database Connectivity (JDBC)	**K3**
CO 5	Create dynamic web pages using JSP	**K5**

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1	Write a program for different formatting tags used in HTML.	**CO2**
2	Write a program for different types of list.	**CO2**
3	Write a program for printing class time table showing use of rowspan and colspan.	**CO2**
4	Program to show the use of target attribute with different values.	**CO2**
5	Write a program to create a web page using image as hyperlink.	**CO2**
6	Write a program to set a background image.	**CO2**

7	Write a program to create a web page showing the use of font and text attribute of CSS.	**CO2**
8	Write a program to create a web page showing the use of color and background attribute of CSS.	**CO2**
9	Write html code to develop a webpage having two frames that divide the webpage into two equal rows.	**CO2**
10	Write a program to create a web page showing the use of inline, internal and External CSS.	**CO2**
11	Write a program to create a web page showing the use of implementation of BOX model in CSS.	**CO2**
12	Write a program to create a web page showing the use of CSS positioning.	**CO2**
13	Create your resume using HTML tags also experiment with colors, text , link , size and also other tags you studied.	**CO2**
14	Write a JavaScript Program to Print Hello World.	**CO3**
15	Write a JavaScript Program to Add Two Numbers	**CO3**
16	Write a JavaScript Program to Find the Square Root	**CO3**
17	Write a JavaScript Program to Calculate the Area of a Triangle	**CO3**
18	Develop simple calculator for addition, subtraction, multiplication and division operation using JavaScript	**CO3**
19	Write a JavaScript Program to Swap Two Variables	**CO3**
20	Write a JavaScript Program to Convert Celsius to Fahrenheit	**CO3**
21	Write a JavaScript Program to Convert Decimal to Binary	**CO3**
22	Write a JavaScript Program to Check if a number is Positive, Negative.	**CO3**
23	JavaScript Program to Find the Factorial of a Number	**CO3**
24	JavaScript Program to Check Prime Number	**CO3**
25	JavaScript Program to Display the Multiplication Table	**CO3**
26	JavaScript Program to Print the Fibonacci Sequence	**CO3**
27	JavaScript Program to Check Armstrong Number	**CO3**
28	JavaScript Program to Find the Sum of Natural Numbers	**CO3**
29	Write a JavaScript code to enter week day number and print day name.	**CO3**

30	Write a program for implementation of statement in JDBC	**CO4**
31	Write a program Transaction management using statement.	**CO4**
32	Write a program to Import JDBC packages	**CO4**
33	Write a program to Register JDBC Driver	**CO4**
34	Write a program to Open and Close a connection using JDBC	**CO4**
35	Write a program to Extract data from above created student table.	**CO4**
36	Write a basic Servlet program that prints "Hello, World!" on the web page.	**CO5**
37	Write a Program to create simple servlet that just generates plain text.	**CO5**
38	Write a Servlet program displays the current date and time.	**CO5**
39	Write a servlet program to demonstrate Http Servlet.	**CO5**
40	A Servlet program that demonstrates session management by storing user data in a session.	**CO5**

Required Software and Tools	
1.	**VS-Code**
2.	**Subline text editor**
3.	**Netbeans**

Subject name: Design and Analysis of Algorithm Lab	**L-T-P [0-0-4]**
Subject Code: AMICA0551	**Applicable in Department: MCA-Integrated**

Course Objective: Analyze asymptotic performance of algorithms designed using different computational model. Study advanced data structures like Red black Tree, binomial and Fibonacci heap and learn theconcept of complexity classes

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Describe & illustrate algorithm to solve problems by iterative approach.	**K2, K3**
CO 2	Implement & illustrate algorithm to solve problems by divide and conquer approach.	**K3**
CO 3	Determine & develop algorithm to solve problems by Greedy algorithm approach.	**K5**
CO 4	Illustrate algorithm to solve problems by Dynamic programming, branchand bound approach.	**K3**
CO 5	Apply & analyze algorithm to solve problems by backtracking approach.	**K3, K4**

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1	Write an Algorithm / Program for the following: a) Leap Year Check b) Prime Number Check c) Generate a Fibonacci Series d) Factorial of a Number e) Check Number is a palindrome or not f) Find GCD g) Number is an Armstrong Number or Not Two strings are Anagram Strings or not.	CO1

2	Program for Recursive and Non Recursive for Binary & Linear Search.	CO2
3	Program for Selection, Bubble and Count Sort.	CO2
4	Program for Merge Sort.	CO2
5	Program for Insertion Sort.	CO2
6	Program for Quick Sort.	CO2
7	Program for Heap Sort.	CO2
8	Program to implement Knapsack Problem using Greedy Solution.	CO3
9	Program for 0/1 knapsack.	CO4
10	Program for LCS (Longest Common Subsequence).	CO4
11	Program for BFS and DFS.	CO5
12	Program to implement Dijkstra's Algorithm.	CO5
13	Program to find Minimum Spanning Tree using Kruskal's Algorithm.	CO5
14	Program to implement N Queen Problem using Backtracking.	CO5
15	Program for traversing a tree.	CO5

Required Software and Tools

1. **Python**
2. **Java**

Subject Name: Software Testing and Application Lab	**L-T-P [0-0-4]**
Subject Code: AMICA0553	**Applicable in Department: MCA-Integrated**

Course objectives: To equip students with practical skills in testing methodology, tools and techniques, to develop expertise in test case design, execution, automation, defect tracking and performance testing for robust software development.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Design and execute effective test cases for various programming constructs and application functionalities.	**K5,K6**
CO 2	Identify, analyze, and document potential causes of failures in software applications, such as matrix multiplication.	**K1,K4**
CO 3	Prepare testing user interfaces and performance metrics for web applications, particularly focusing on registration and login pages.	**K5**
CO4	Apply security testing techniques to ensure the robustness of web applications against potential vulnerabilities.	**K3**
CO5	Develop the ability to write detailed system specifications, identify bugs, and create test cases for complex systems like ATM and banking applications.	**K1,K5,**

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1	Write the Test cases for programs in any language which demonstrate the working of the following constructs i) do. While ii) while iii) if…else iv) switch v) for.	**CO1**
2	Write down the possible reasons for failure of Matrix multiplication.	**CO1**
3	Write the Test cases based on UI of Registration Page in Online Banking System.	**CO2**
4	Write the Test cases based on Terms and Conditions field of Registration Page.	**CO2**
5	Write the Test cases based on Performance in Registration Page.	**CO2**
6	Write the Test cases for Functionality in Registration Page.	**CO3**
7	Write the Test cases based on Security in Registration Page.	**CO3**

8	Write the Test cases for Functionality in Login Page.	**CO3**
9	Write the Test cases based on UI in Login Page.	**CO4**
10	Write the Test cases based on Performance in Login Page.	**CO4**
11	Write the Test cases based on Security in Login Page.	**CO4**
12	Write system specifications for ATM and make report on various bugs.	**CO5**
13	Write the test cases for banking application in respect of Registration Page and Login Page.	**CO5**
Required Software and Tools		
1. Excel		
2. TestLink		

Subject Name: Constitution Of India, Law and Engineering	**L-T-P [2-0-0]**
Subject Code: AMICANC0501	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic Understanding of the Indian Constitution.	
Course Objective: To acquaint the students with legacies of constitutional development in India and help them to understand the most diversified legal document of India and philosophy behind it.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Identify and explore the basic features and modalities about Indian constitution.	**K1**
CO 2	Differentiate and relate the functioning of Indian parliamentary system at the center and state level.	**K2**
CO 3	Differentiate different aspects of Indian Legal System and its related bodies.	**K4**
CO 4	Discover and apply different laws and regulations related to engineering practices.	**K4**
CO 5	Correlate role of engineers with different organizations and governance models	**K4**

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Introduction And Basic Information About Indian Constitution	**Introduction**	Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947,Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution, Fundamental Rights, Fundamental	Lectures, PPTS, Notes	4L	Assignment	**CO1**

		Duties, Directive Principles of State Policy, Parliamentary System, Federal System, Centre-State Relations, Amendment of the Constitutional Powers and Procedure, The historical perspectives of the constitutional amendments in India				
	Emergency Provisions:	National Emergency, President Rule, Financial Emergency, and Local Self Government – Constitutional Scheme in India.				
2. Union Executive And State Executive	**Powers Of Indian Parliament**	Functions of Rajya Sabha, Functions of Lok Sabha, Powers and Functions of the President, Comparison of powers of Indian President with the United States, Powers and Functions of VicePresident, Powers and Functions of the Prime Minister	Lectures, PPTS, Notes	4L	Assignment	**CO2**
	Judiciary	The Independence of the Supreme Court, Appointment of Judges, Judicial Review, Public Interest Litigation, Judicial Activism, LokPal, Lok Ayukta, The Lokpal and Lok ayuktas Act 2013				
	State Executives	Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature, Functions of High Court and Subordinate Courts.				

3.Introduction And Basic Information About Legal System	**The Legal System, Sources Of Law And The Court Structure:**	Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court).	Lectures, PPTS, Notes	4L	Assignment	**CO3**
	Arbitration:	As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration. Contract law, Tort, Law at workplace.				
4.Intellectual Property Laws And Regulation To Information	**Intellectual Property Laws**	Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information, Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act.	Lectures, PPTS, Notes	4L	Assignment	**CO4**

5.Business Organizations And E-Governance	**Sole Traders, Partnerships, Companies: The Company's Act:**	Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E-Governance and role of engineers in E-Governance, Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development.	Lectures, PPTS, Notes	4L	Assignment	**CO5**
Total				**20L**		

Textbooks	
Sr. No	**Book Details**
1.	M Laxmikanth: Indian Polity for civil services and other State Examination,6th Edition, Mc Graw Hill
2.	Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI Learning Pvt. Ltd.
3.	Granville Austin: The Indian Constitution: Cornerstone of a Nation (Classic Reissue), Oxford University Press.
Reference Books:	
Sr. No	**Book Details**
1.	Madhav Khosla: The Indian Constitution, Oxford University Press.
2.	2. PM Bakshi: The Constitution of India, Latest Edition, Universal Law Publishing.
3.	3. V.K. Ahuja: Law Relating to Intellectual Property Rights (2007)
Link: NPTEL/YouTube/Faculty Video Link:	
Unit 1	https://archive.nptel.ac.in/courses/129/106/129106003/

Unit 2	https://archive.nptel.ac.in/courses/129/106/129106003/
Unit 3	https://archive.nptel.ac.in/courses/129/106/129106003/
Unit 4	https://archive.nptel.ac.in/courses/129/106/129106003/
Unit 5	https://archive.nptel.ac.in/courses/129/106/129106003/

Subject Name: Essence Of Indian Traditional Knowledge	**L-T-P [2-0-0]**
Subject Code: AMICANC0502	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic Understanding of the Indian Constitution.	
Course Objective: This course aims to provide basic knowledge about different theories of society, state and polity in India, Indian literature, culture, Indian religion, philosophy, science, management, cultural heritage and different arts in India.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Understand the basics of past Indian politics and state polity.	**K2**
CO 2	Understand the Vedas, Upanishads, languages & literature of Indian society.	**K2**
CO 3	Know the different religions and religious movements in India.	**K4**
CO 4	Identify and explore the basic knowledge about the ancient history of Indian agriculture, science & technology, and ayurveda.	**K4**
CO 5	Identify Indian dances, fairs & festivals, and cinema.	**K1**

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**

1. Society State And Polity In India	**State In Ancient India:**	Evolutionary Theory, Force Theory, Mystical Theory Contract Theory, Stages of State Formation in Ancient India, Kingship , Council of Ministers Administration Political Ideals in Ancient India Conditions' of the Welfare of Societies, The Seven Limbs of the State, Society in Ancient India, Purusārtha, Varnāshrama System, Āshrama or the Stages of Life, Marriage, Understanding Gender as a social category, The representation of Women in Historical traditions, Challenges faced by Women.	Lectures, PPTS, Notes	4L	Assignment	**CO1**
2. Indian Literature, Culture, Tradition, And Practices	**Evolution Of Script And Languages In India:**	Harappan Script and Brahmi Script. The Vedas, the Upanishads, the Ramayana and the Mahabharata, Puranas, Buddhist And Jain Literature in Pali, Prakrit And Sanskrit, Sikh Literature, Kautilya's Arthashastra, Famous Sanskrit Authors, Telugu Literature, Kannada Literature, Malayalam Literature ,Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature	Lectures, PPTS, Notes	4L	Assignment	**CO2**
3. Indian Religion, Philosophy, And Practices	**Indian Religion, Philosophy, And Practices**	Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy, Shankaracharya, Various Philosophical Doctrines , Other Heterodox Sects, Bhakti Movement, Sufi movement, Socio religious reform movement of 19th century, Modern religious practices.	Lectures, PPTS, Notes	4L	Assignment	**CO3**

4. Science, Management And Indian Knowledge System	**Science, Management And Indian Knowledge System**	Astronomy in India, Chemistry in India, Mathematics in India, Physics in India, Agriculture in India, Medicine in India , Metallurgy in India, Geography, Biology, Harappan Technologies, Water Management in India, Textile Technology in India ,Writing Technolog	Lectures, PPTS, Notes	4L	Assignment	**CO4**
5.Cultural Heritage And Performing Arts	**Cultural Heritage And Performing Arts**	Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Pottery, Painting, Indian Handicraft, UNESCO'S List of World Heritage sites in India, Seals, coins, Puppetry, Dance, Music, Theatre, drama, Martial Arts Traditions, Fairs and Festivals, UNESCO'S List of Intangible Cultural Heritage, Calenders, Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema	Lectures, PPTS, Notes	4L	Assignment	**CO5**
Total				**20L**		

Textbooks

Sr. No	Book Details
1.	Sivaramakrishna (Ed.), Cultural Heritage of India-Course Material, Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014.
2.	S. Baliyan, Indian Art and Culture, Oxford University Press, India
3.	Nitin Singhania, Indian Art and Culture: for civil services and other competitive Examinations,3rd Edition,Mc Graw Hill

Reference Books:

Sr. No	Book Details
1.	Romila Thapar, Readings In Early Indian History Oxford University Press, India

2.	Basham, A.L., The Wonder that was India (34th impression), New Delhi, Rupa & co.
Link: NPTEL/YouTube/Faculty Video Link:	
https://onlinecourses.swayam2.ac.in/imb23_mg53/preview	

Subject Name: Computer Graphics and Multimedia	**L-T-P [4-0-0]**
Subject Code: AMICA0602	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Knowledge of Computer, Mathematics and algorithm is preferable.	
Course Objective: Understanding Basic Concepts and fundamental concepts of computer graphics, including rendering, geometric transformations, and image processing. Introduce students to graphics software and libraries commonly usedfor developing graphics applications, and provide experience with programming graphics applications.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Analyze various Generating Algorithms, attributes associatedwith output primitives and Area Filling Algorithms.	**K4**
CO 2	Apply the concepts of parallel and perspective projections with proficient inline clipping.	**K3**
CO 3	Develop 3-D transformations on objects and various algorithms for visiblesurface detection.	**K5**
CO 4	Create, implement and control animations using computer-based methods.	**K3, K5**
CO 5	Explore basic and advanced compression techniques.	**K3**

Syllabus

Unit No	Module Name	Topic covered	Pedagogy	Lecture Required (L+P)	Practical/ Assignment/ Lab Nos	CO Mapping
1.Introduction	**Computer Graphics and output primitives:**	Concepts and applications, Interactive Graphics, Random and Raster scan devices, Refresh Cathode ray tubes, LCD monitors, Laser, Printers, Keyboards, Mouse,Scanners.	Lectures, PPTS, Notes	10L+4P	Experiment/ Program 1-6	**CO1**
	Graphics Software output	Line drawing algorithm: DDA along with Bresenhan's. Circle generating algorithm, Midpoint algorithms:				

	primitives:	ellipse and other curves. Attributes of output primitive, Antialising.				
	Area filling:	Filled area primitive: Scan-line Polygon fill Algorithm, boundary fill algorithm, flood fill algorithm.				
2. Two-Dimensional Graphics Transformations	**2-D-Transformation, Viewing, clipping:**	Two-dimensional Transformations: Translation, scaling, rotation, reflection, shear, matrix representation of all homogeneous coordinates, composite transformation.	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 7-9	**CO2**
	2D-projections	parallel and perspective projection. Two-dimensional viewing, Viewing pipeline Window-to-view port transformation. Clipping operations. Line Clipping: Cohen Sutherland, Nicholl-lee-Nichol land Liangbarsky, Polygon Clipping.				
3. Three-Dimensional Graphics Transformations	**3-D Transformation and Visible surface detection:**	Three-dimensional object representations: Polygon Surface, Tables, Plane Equation. Curved lines and Surfaces: Spline representation, Interpolating and approximation curves, continuity conditions Cubic Splines, Bezier curves B- Spline curves: characteristics and generation, 3-D Transformation.	Lectures, PPTS, Notes	10L+4P	Experiment/ Program 10-12	**CO3**
	Visible Surface detection Algorithm:	Object based and image based methods, depth comparison, A-Buffer, Back face removal, Scan-line method, Depth Sorting Method Area subdivisionmethod.				

4. Introduction to Multimedia and Animation	**Overview of multimedia, Classification, basic concept of sound/audio MIDI:**	devices, messages, software. Speech, Video and Animation: Basic concept, computer-based animation, methods of controlling animation, display of animation, and transmission of animation.	Lectures, PPTS, Notes	6L+4P	Experiment/ Program 13-14	**CO4**
5. Data Compression Techniques	**Data Compression**	storage space, coding requirements. Source, entropy and hybrid coding	Lectures, PPTS, Notes	6L+4P	Experiment/ Program 15-16	**CO5**
	somebasic compression technique	runlength code, Huffman code. JPEG: Image preparation, Lossy sequential DCT – based mode, expanded lossy DCT based mode, Lossless mode, Hierarchical mode. MPEG, Huffman Encoding, LZW compression.				
Total				**40L+20P**		

Textbooks

Sr. No	Book Details
1.	Donand Hearn & M. Pauline Baker, “Computer Graphics” , Pearson Publication, 2nd Edition 2014.
2.	Ralf Steimnety & Kerla Neshtudt., “Multimedia Computing Communication & Applications”, Pearson Publication 2017,
3.	P. K. Andleigh & K. Thakrar, “Multimedia Systems Design”, Pearson Publication, 1st Edition, 2015.

Reference Books:

Sr. No	Book Details
1.	W. M. Newman & Robert F Sproull, “Principles of Interactive Computer Graphics”, McGraw Hills, 2nd Edition 2001.
2.	David Rogers , “Procedural elements of Computer Graphics”, 2nd Edition, 2017.
3.	Anirban Mukhopadhyay & Arup Chattopadhyay, “Introduction to Computer Graphics and Multimedia”, 2nd Edition, 2007.

Link: NPTEL/YouTube/Faculty Video Link:

Unit 1	https://onlinecourses.nptel.ac.in/noc20_cs90/preview
Unit 2	https://nptel.ac.in/courses/106103224
Unit 3	https://archive.nptel.ac.in/courses/106/103/106103224/
Unit 4	https://nptel.ac.in/courses/106106090
Unit 5	https://gec.digimat.in/nptel/courses/video/106106090/L42.html

Subject Name: Computer Networks						**L-T-P [3-1-0]**
Subject Code: AMICA0603						**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic computer concepts and terminology						
Course Objective: To develop understanding of concepts, principles, and technologies related to networking. To enhance their knowledge and skills in designing, implementing and managing networkinfrastructure. To establish a strong foundation for a career in the field of networking.						
Course Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO 1	Identification of Network fundamentals.					**K1**
CO 2	Classify Various IP addressing techniques.					**K2**
CO 3	Implement, and verify IP routing technologies.					**K3**
CO 4	Identify and configure LAN switching technologies.					**K1**
CO 5	Explore about network management methods and tools for monitoring and troubleshooting.					**K2**
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Network Fundamentals	**Introduction to Networks**	Basic network concepts, Network architecture and topologies, OSI and TCP/IP models, **Physical Layer:** Cabling and network devices, Ethernet standards and technologies, **Data Link Layer:** MAC addressing and ARP,VLANs and trunking, **Network Layer:** IP addressing and subnetting, IPv4 vs.	Lectures, PPTS, Notes	8L+4P	Assignment/ Program 1-4, 23, 25	**CO1**

		IPv6,Routing basics and protocols (e.g., RIP, EIGRP, OSPF), **Transport Layer:** TCP and UDP operations, Port numbers and sockets, **Application Layer:** Common network services and protocols (e.g., HTTP, FTP, DNS)				
2.Network Access and IP Connectivity	**Switching Concepts**	Switch operations and configuration, Spanning Tree Protocol (STP), EtherChannel and link aggregation	Lectures, PPTS, Notes	8L+4P	Assignment/ Program 5-8, 13, 16-22, 26, 30, 44, 47	**CO2**
	Routing Concepts	Static and dynamic routing, Routing tables and protocols, Inter, VLAN routing				
	IP Services	DHCP and NAT, NTP and Syslog				
	Network Security Basics	Access control lists (ACLs), Secure access to devices				
3. Security Fundamentals and Automation	**Network Security Fundamentals:**	Security threats and vulnerabilities, Mitigation techniques and best practices,	Lectures, PPTS, Notes	8L+4P	Assignment/ Program 9-12, 14, 15, 29, 31-34, 36-39, 46, 48	**CO3**

	Securing Network Devices:	Secure device management, Implementing device hardening,				
	Firewall and IPS:	Firewall technologies and types, Intrusion Prevention Systems (IPS)				
	Network Automation and Programmability:	Introduction to network automation, Configuration management tools (e.g., Ansible, Puppet), Basics of network programmability and SDN				
4. Advanced Routing and Switching	**Advanced Switching**:	Advanced STP features, Multilayer switching, QoS concepts,	Lectures, PPTS, Notes	8L+4P	Assignment/ Program 27	**CO4**
	Advanced Routing:	Advanced OSPF configurations, BGP fundamentals and configuration, Route redistribution and filtering,				
	WAN Technologies:	MPLS and VPNs, WAN topologies and protocols (e.g., GRE, DMVPN)				
5. Network Design and Troubleshooting	**Network Design Principles**:	Hierarchical network design, Enterprise network architecture, High availability and redundancy,	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 27, 28, 35, 40-43, 45, 49, 50	**CO5**
	Network Troubleshooting:	Troubleshooting methodologies and tools, Common network issues and resolutions, Case studies and real-world scenarios,				
	Wireless Networks:	Wireless technologies and standards, Wireless LAN configuration and management, Wireless security protocols,				
	Emerging Technologies	IoT and cloud networking, Network virtualization				

	:					
Total				**40L+20P**		

Textbooks	
Sr. No	**Book Details**
1.	Behrouz A. Forouzan, ”Computer Networks”, Standard Edition, McGraw Hill, 2023
2.	Andrew S. Tanenbaum, "Computer Networks", 6th Edition, Pearson Education India, 2022
3.	Peterson and Davie, "Computer Networks, A Systems Approach", 5th ed., Elsevier, 2011.
Reference Books:	
Sr. No	**Book Details**
1.	Ying-Dar Liu, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", McGraw-Hill, 2011.
2.	W. Richard Stevens, Bill Fenner and Andrew Rudoff, "Unix Network Programming", Volumes 1 and 2, Third Edition, Addison-Wesley Professional, 2003.
3.	Michael Donahoo, Ken Calvert, Pocket Guide to TCP/IP Socket Programming in C, Morgan Kaufmann Series in Networking, 2000.
4.	CCNA Cisco certified Network Associate Study Guide by Todd Lammle 5th edition (BPB)
5.	James F. Kurose, “ Computer Networking A top Down Approach” 8th Edition ,Pearson Education 2022
Link: NPTEL/YouTube/Faculty Video Link:	
Unit 1	https://www.youtube.com/watch?v=AozdnphtXIU
Unit 2	https://www.youtube.com/watch?v=HAVcXPI7oUY
Unit 3	https://archive.nptel.ac.in/courses/106/105/106105081/
Unit 4	https://youtu.be/21LlTSa58a0?si=hSIjx3yXGZEM2naB
Unit 5	https://youtu.be/PG46YejJseA?si=e_S79EyX9e9Jz3IW

Subject Name: Advance Java	**L-T-P [3-1-0]**
Subject Code: AMICA0601	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basics of Programming Concepts and Core JAVA, Database-SQL, JavaScript, HTML, CSS.	
Course Objective: Objective of this course is to provide the ability to design console based, GUIbased, web based applications, Integrated development environment to create, debug and run multi-tier and enterprise-level applications.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Illustrate, Analyze, and Build dynamic web pages for server-sideprogramming.	**K3, K4**
CO 2	Implement the connection between Java andDatabase using JDBC.	**K3**
CO 3	Analyze and design the Spring Core Modules and DI to configure and wirebeans (application objects) together.	**K4, K5**
CO 4	Design Model View Controller architecture and ready components that can beused to develop flexible and loosely coupled web applications.	**K5**
CO 5	Analyze and Design React components using JavaScript functions.	**K4, K5**

Syllabus

Unit No	Module Name	Topic covered	Pedagogy	Lecture Required (L+P)	Practical/ Assignment/ Lab Nos	CO Mapping
1. Introduction: Servlets and JSP	**Applets in Java:**	Applet Basics, Life Cycle of an Applet in Java, Flow of Java Applet Life Cycle, The Applet Class, Invoking an Applet, Getting Applet Parameters, Application Conversion to Applets, Event Handling. Displaying Images.	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 1-22	**CO1**

	JSP and Servlets:	Setting up for JSP and Servlets, Hello Servlets, Servlets lifecycle, Hello JSP, JSP scripting elements, JSP Declarations element, JSP Comments, Deployment descriptor and annotations Reading URL parameter(s) in Servlets, Include file(s) in JSP page, How to create Maven project in Eclipse, Import class in JSP file, Forward and Redirect in JSP,				
	The Concept of MVC:	A simple JSP exercise, Forms overview, Forms under JSP, Forms underServlets.				
2.Java Beans, JSP, Database, Hibernate.	**Java beans overview**:	Java beans scopes - Session and application, Java beans scopes - page and request Java beans with forms, Session in JSP – introduction, Introduction to cookies, Read and Write Operation of Cookie in JSP and Servlets, User logout using cookie, User logout using session, Organizing the application, Adding redirects and forwards, About web templates, Integrate template with project	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 26	**CO2**
	MySQL installation	Setting up the controller, Database connection setup, Displaying data from database, Adding database operations in Model, Add user form, Add user operation, Update user operation, Delete user operation.				
	Hibernate Overview:	Setting up eclipse project for hibernate, Setting hibernate configuration file, About Hibernate sessions, Setting hibernate entity class, Hibernate CURD operation –				

		Create, Hibernate CURD operation – Read, Hibernate CURD operation – Update, Hibernate CURD operation – Delete, Hibernate HQL operation – Listing, Hibernate HQL operation - Where clause, Hibernate HQL operation – update, HQL - Delete and wrap up, Debugging in Eclipse.				
3. **Spring 5.0**	**Spring framework**:	(Setting things up) Setting the IDE, Dependency injection getting started, Dependency injection continues, Inversion of control, Autowire introduction, Autowire scenarios, Qualifier annotation, Spring beans, Constructor injection, SpringMVC minimal project,	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 23-25	**CO3**
	Restful:	Introduction To Web Services, Resource based URIs, Rest response, Status codes, Idempotence of HTTP Methods, Hypermedia as the Engine of Application State (HATEOAS) The Richardson Maturity Model.				
	Spring Boot and what are we building:	Setting up for Spring boot, Spring Starter project, Spring Web MVC starter project, The template and external files, Adding Fragments, header, footers to web pages Finalizing the template for the application, Updating application properties, Adding Models in Spring Boot Adding repository and service classes in Spring Boot, Adding seed data in the database, Displaying data on webpage, Spring Boot, Adding				

		Account models in Spring Boot, Updating the seed data, Adding register account form, Adding login user form, Adding Spring security into the application, Spring security login, adding rules and Bcrypt password, Spring security login, override loadUserByUsername, Update the Webtemplate with Thymeleaf tags.				
4.**Spring Boot**	**Spring Boot**	Role and Authorities, Adding Roles to user account, Add Authorities to UserAccount in Spring boot, Add users with Roles and Authorities, Add users with Roles and Authorities continues, Application has bugs Add security rules for Roles and Authorities, Update homepage, for post links, GetPost from Spring Boot Application, View a post with editoptions. Add post in Spring Boot application Add WYSIWYG text Editor in the Add post page,Handle post add in **Spring Boot Blog application**, Add edit post form in Spring Boot Blog application, Handle edit post in Spring Boot Blog application, Delete post in Spring Boot Blogapplication, Add warning model for Delete operation	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 27-30	**CO4**
	Adding validations	Upgrading the registration form in Springboot, Adding Profile page on the Blog application, Update Profile (Account) on the Spring BootBlog, Update Profile Photo on the Spring Boot Blog, Remember				

		me, Add forgot password view, Handle reset password and token generation, Sending email for password reset, Sending email for password reset continues, Email Service , Spring Boot, Password change in Spring boot, Reset password Spring Boot. Adding Pagination and Sorting option on homepage, Pagination and Sorting in Spring boot.				
5. **React**	**React**	Setting up React JS, Getting started with React, Downloading the template, Understanding the template, Making changes in the template, Dark mode on Google Chrome, Making HTTP GET call with axios, Local server, CORS and Proxy, The login page with react JavaScript, Login, token handling and local storage, Token validation and redirections, Dynamic menus and updated registration page, Logout and about page Logout and about page continues, Section wrap-up, Add albums, Album tiles on homepage, Upload photos onto the Albums, Upload photos form, Upload photos processing animation, Props, useEffect and Async, AlbumsShow page, Albums Show page, Network calls, Add album and photo actions, Edit album and photo action, Edit album and photo action continues, Delete actions, Download photo action, View Photo.	Lectures, PPTS, Notes	8L+4P	Experiment/ Program 31-33	**CO5**

Total	40L+20P		

Textbooks	
Sr. No	**Book Details**
1.	Sarika Agarwal and Vivek Gupta“Java for Web Development”,2022
2.	Budi Kurniawan, “Servlet and JSP”,2016
3.	Marty Hall & Larry Brown “Core Servlets and JavaServer Pages”,second edition

Reference Books:	
Sr. No	**Book Details**
1.	Uttam K. Roy “Advanced Java Programming”,Oxford University Press
2.	Kathy Sierra, “Head First Servlets and JSP”,O’Really Media
3.	“Core and Advanced Java”,Black Book,Dreamtech Press(eBook)

Link: NPTEL/YouTube/Faculty Video Link:	
Unit 1	https://www.youtube.com/watch?v=xve6QEgIR-0&list=PL0zysOflRCel5BSXoslpfDawe8FyyOSZb
Unit 2	https://www.youtube.com/watch?v=WkKT5M-ABnY&list=PLlhM4lkb2sEiiEAP0uSFXiFY8KdXPnN0f
Unit 3	https://www.youtube.com/watch?v=-Fe0zk-F4OA
Unit 4	https://www.youtube.com/watch?v=9SGDpanrc8U
Unit 5	https://react.dev/community/videos

Subject Name: Distributed System	**L-T-P [4-0-0]**
Subject Code: AMICA0604	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic knowledge of Data Structures and Algorithms, Basic networking concepts, and Basic OS concepts.	
Course Objective: To have a broad and up-to-date coverage of the principles and practice in Distributed Systems. To understand the heterogeneous systems such as computers, mobile phones, other devices, andInternet) and their functionalities.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Compare and contrast different architectural models such as client-server,peer-to-peer, and three-tier architectures.	**K4**
CO 2	Implement and manage remote object interactions using RMI or similar technologies.	**K3, K4**
CO 3	Develop distributed applications using middleware solutions.	**K5**
CO 4	Apply event-driven programming for asynchronous communication.	**K3**
CO 5	Implement clock synchronization algorithms.	**K3**

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**

1. **Basic Concepts**	**Basic Concepts**	Definition of a distributed systems, Examples, Resource sharing and the Web, Challenges, System models, Architectural and fundamental models, Networking Inter process communication, External data representation and marshalling, Client-server and Group communication.	Lectures, PPTS, Notes	8L	Assignment	**CO1**
2.Distributed Objects and Process	**Distributed Objects and Process**	Distributed objects and remote invocation, Communication between distributed objects, Remote procedure call, Events and notifications - The operating system layer, Protection, Processes and Threads, Communication and invocation, OS Architecture. Security techniques, Cryptographic algorithms, Access control, Digital signatures, Cryptography pragmatics, Needham-Schroeder, Kerberos, Securing electronics transaction, IEEE 802.11 WiFi.	Lectures, PPTS, Notes	8L	Assignment	**CO2**
3. **Operating System Issues**	**Operating System Issues**	Distributed file systems - Name services, Domain name system, Directory and discovery services, Peer to peer systems, Napster file sharing system, Peer to peer middleware routing overlays – Clocks, Events and process states Clock Synchronization - Logical clocks Global states - Distributed debugging - Distributed mutual exclusion - Elections - Multicast communication.	Lectures, PPTS, Notes	8L	Assignment	**CO3**

4. **Distributed Transaction Processing**	**Distributed Transaction Processing**	Transactions - Nested transactions - Locks - Optimistic concurrency control - Timestamp ordering - Flat and nested distributed transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery - Overview of replication, Distributed shared memory and Web services.	Lectures, PPTS, Notes	8L	Assignment	**CO4**
5. **Distributed Algorithms**	**Distributed Algorithms**	Synchronous network model - Algorithms: leader election, maximal independent set - Asynchronous system model: I/O automata, operations on automata, fairness - Asynchronousshared memory model - Mutual exclusion: model, the problem, stronger conditions, lockout-free mutual exclusion algorithms, lower bound on the number of registers - Asynchronous network model - Asynchronous network algorithms: leader election in a ring and an arbitrary network.	Lectures, PPTS, Notes	8L	Assignment	**CO5**
Total				**40L**		

Textbooks	
Sr. No	**Book Details**
1.	George Coulouris, Jean Dollimore, and Tim Kindberg, " Distributed Systems Concepts and Design", 5th eition., Pearson Education, 2017.
2.	Andrew S. Tanenbaum, Maarten Van Steen, "Distributed Systems Principles and Paradigms", 2nd edition, Pearson Education, 2015.
Reference Books:	

Sr. No	Book Details
1.	Vijay K. Garg , "Elements of Distributed Computing", Wiley Publication, 1st Edition, 2008.
2.	Ajay D. Kshemkalyani and, Mukesh Singhal , "Distributed Computing: Principles, Algorithms, and Systems" , Cambridge University Prees, 2010.
3.	Christian Cachin, Rachid Guerraoui, and Luís Rodrigues, "Introduction to Reliable and Secure Distributed Programming", Springer, 2nd Edition, 2014.
Link: NPTEL/YouTube/Faculty Video Link:	
Unit 1	https://nptel.ac.in/courses/106106168
Unit 2	https://nptel.ac.in/courses/106106093
Unit 3	https://onlinecourses.nptel.ac.in/noc21_cs87/preview
Unit 4	https://onlinecourses.nptel.ac.in/noc22_cs80/preview

Subject Name: Machine Learning						**L-T-P [3-0-0]**
Subject Code: AMICA0611						**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Programming Proficiency, Mathematics Fundamentals, Data Structures and Algorithms.						
Course Objective: Understand the basic principal of Machine Learning and importance of Supervised Learning, Unsupervised Learning & Familiarize with concepts of clustering.						
Course Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO 1	Describe the fundamental concepts and terminologies of machine learning.					**K1, K2**
CO 2	Evaluate and compare supervised learning models using appropriateevaluation metrics.					**K4**
CO 3	Implement dimensionality reduction techniques to visualize high-dimensionaldata and extract important features.					**K3**
CO 4	Apply feature engineering techniques to preprocess raw data and improvemodel accuracy.					**K3**
CO 5	Analyze and solving the results of machine learning models in the context ofethical considerations and societal impact.					**K4**
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Introductio n to	**Overview of Machine Learning**	Definition of machine learning, Historical development and milestones, Applications of machine learning in various fields	Lectures, PPTS, Notes	8L	Assignment	**CO1**

Machine Learning	**Types of Machine Learning**	Supervised learning, Unsupervised learning, Semi-supervised learning, Reinforcement learning, Other paradigms (e.g., self-supervised learning, transfer learning), Basic Concepts and Terminology Features, labels, and examples Training data, validation data, Loss functions and optimization algorithms				
2.Supervised Learning	**Regression**	Linear regression, Polynomial regression, Regularization techniques (L1, L2 regularization), Evaluation metrics (e.g., mean squared error, R-squared)	Lectures, PPTS, Notes	8L	Assignment	**CO2**
	Classification	Binary classification, Multi-class classification , Logistic regression, Decision trees, Support Vector Machines (SVM), Evaluation metrics (e.g., accuracy, precision, recall, F1- score)				
3. Unsupervised Learning	**Clustering**	K-means clustering, Hierarchical clustering, Density-based clustering (e.g., DBSCAN), Evaluation metrics (e.g., silhouette score)	Lectures, PPTS, Notes	8L	Assignment	**CO3**
	Dimensionality Reduction	Principal Component Analysis (PCA), t-Distributed Stochastic Neighbor Embedding (t-SNE), Autoencoders, Applications and interpretation of dimensionality reduction techniques.				

4. Advanced Techniques in Machine Learning	**Ensemble Learning**	Bagging (e.g., Random Forest), Boosting (e.g., AdaBoost, Gradient Boosting), Stacking Feature Engineering: Techniques for creating new features from raw data, Feature scaling and normalization, Handling missing data.	Lectures, PPTS, Notes	8L	Assignment	**CO4**
	Model Evaluation and Selection	Cross-validation, Bias-variance tradeoff, Model selection techniques (e.g., grid search, random search), Model interpretability and visualization				
5. Applications and Case Studies	**Real-world Applications of Machine Learning**	Healthcare, Finance, Marketing, E-commerce,Social media analysis	Lectures, PPTS, Notes	8L	Assignment	**CO5**
	Case Studies and Projects	Practical implementation of machine learning algorithms on real datasets, Project planning, execution, and presentation Ethical considerations in machine learning projects				
Total				**40L**		

Textbooks	
Sr. No	**Book Details**
1.	Christopher M. Bishop, "Pattern Recognition and Machine Learning", Springer ,1st Edition 2006
2.	Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", The MIT Press, : 1st Edition 2012.
3.	Aurélien Géron, "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow", O'Reilly Media, 2nd Edition, 2019.

Reference Books:	
Sr. No	**Book Details**
1.	Trevor Hastie, Robert Tibshirani, and Jerome Friedman, "The Elements of Statistical Learning: Data Mining, Inference, and Prediction", Springer, 2nd Edition, 2017.

2.	David Barber, "Machine Learning for Beginners", Cambridge University Press, 2014
3.	Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, "Machine Learning", Pearson Publication, 2018.
Link: NPTEL/YouTube/Faculty Video Link:	
Unit 1	https://onlinecourses.nptel.ac.in/noc23_cs18/preview
Unit 2	https://onlinecourses.nptel.ac.in/noc23_ee87/preview
Unit 3	https://www.shiksha.com/online-courses/machine-learning-courses-certification-training-by-nptel-st553
Unit 4	https://onlinecourses.nptel.ac.in/noc22_cs24/preview
Unit 5	https://archive.nptel.ac.in/courses/106/106/106106198/

Subject Name: Fundamentals of Digital Marketing and Analytics					**L-T-P [3-0-0]**	
Subject Code: AMICA0612					**Applicable in Department: MCA-Integrated**	
Pre-requisite of Subject: Creative thinking and which is being used by the creative talent in your business areas.						
Course Objective: The course aims to equip learners with foundational skills in digital marketing and analytics, covering strategies, tools, metrics, and analytics techniques essential for effective digital marketing campaign planning, execution, and optimization.						
Course Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO 1	Develop proficiency in interpreting marketing strategies in the digital age and provide fundamental knowledge for working in an online team					**K1,K2**
CO 2	Discuss various concepts of data analytics pipeline					**K1,K2**
CO 3	Evaluate the productivity of digital marketing channels for business success					**K3**
CO 4	Prepare candidates for global exposure of digital marketing practices to make them employable in a high growth industry					**K1,K2**
CO 5	Learn data mining basic concepts and understand association rules mining.					**K1,K3**
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Fundamentals of Digital marketing	**Introduction**	Fundamentals of Digital marketing & Its Significance, Traditional marketing Vs Digital Marketing, Evolution of Digital Marketing, Digital Marketing Landscape, Key Drivers, Digital Consumer & Communities, Gen Y & Netizen's expectation & influence wrt Digital Marketing.	Lectures, PPTS, Notes	8L	Assignment	**CO1**

2. Introduction to Data Analytics	**Introduction to Data Analytics**	Sources and nature of data, classification of data (structured, semi-structured, unstructured), characteristics of data, introduction to Big Data platform, need of data analytics, evolution of analytic scalability, analytic process and tools, analysis vs reporting, modern data analytic tools, applications of data analytics.	Lectures, PPTS, Notes	8L	Assignment	**CO2**
	Data Analytics Lifecycle	Need, key roles for successful analytic projects, various phases of data analytics lifecycle – discovery, data preparation, model planning, model building, communicating results, operationalization.				
3. Prepare Data for Exploration and Stakeholder	**Prepare Data for Exploration and Stakeholder**	Prepare Data for Exploration and Stakeholder-data analysts, balance needs and expectations, managing stakeholder expectations, communication with your team. Datatypes and structures-generate data, Collection of data, analysis for data, Bias, credibility, privacy, ethics, and access-data analysts work, data is unbiased and credible, different types of bias in data, importance of data ethics and data privacy.	Lectures, PPTS, Notes	8L	Assignment	**CO3**
4. Organizing and protecting	**Organizing and protecting your data Databases**	Where data lives- databases, access them and extract, filter, and sort the data, metadata and its different types and how analysts use them.	Lectures, PPTS, Notes	8L	Assignment	**CO4**

your data						
	Organizing and protecting your data	organizing data and keeping it secure, analysts use file naming conventions. Engaging in the data community-how to manage your online presence, benefits of networking with other data analytics professionals				
5. Introduction to Data Mining	**Introduction**	Data Mining, Definition, KDD, Challenges, Data Mining Tasks, Data Preprocessing, Data Cleaning, Missing data, Dimensionality Reduction, Feature Subset Selection, Discretization and Binarization, Data Transformation; Measures of Similarity and Dissimilarity- Basics.	Lectures, PPTS, Notes	8L	Assignment	**CO5**
Total				**40L**		

Textbooks	
Sr. No	**Book Details**
1.	Vandana, Ahuja, “Digital Marketing”, Oxford University Press India, November, 2015
2.	Eric Greenberg, and Kates, Alexander, “Strategic Digital Marketing: Top Digital Experts Share the Formula for Tangible Returns on Your Marketing Investment”, McGraw-Hill Professional October, 2013.
3.	David Whiteley, “E-Commerce: Strategy, Technologies and Applications”, McGraw Hill Education, 2017.
Reference Books:	
Sr. No	**Book Details**
1.	Puneet Bhatia, “Fundamentals of digital Marketing” Pearson Publications – 29 June 2023
2.	Seema Gupta, “Marketing Analytics”- Wiley Publication, 2021
Link: NPTEL/YouTube/Faculty Video Link:	

Unit 1	https://www.youtube.com/watch?v=68B3N0x3cPI&list=PLbRMhDVUMnge625uLkVoqfSuK- KJTBgp&index=1
Unit 2	https://www.youtube.com/watch?v=3iSKFCKLUsI&list=PLbRMhDVUMnge625uLkVoqfSuK- KJTBgp&index=2
Unit 3	https://www.youtube.com/watch?v=67lO4HtJitg&list=PLbRMhDVUMnge625uLkVoqfSuK-KJTBgp&index=8
Unit 4	https://www.youtube.com/watch?v=fYSvrZD4G38&list=PLbRMhDVUMnge625uLkVoqfSuK- KJTBgp&index=14
Unit 5	https://www.youtube.com/watch?v=GauClv1HsZA&list=PLbRMhDVUMnge625uLkVoqfSuK- KJTBgp&index=19

Subject Name CRM Administration					**L-T-P [3-0-0]**	
Subject Code: AMICA0613					**Applicable in Department: MCA-Integrated**	
Pre-requisite of Subject: Basic understanding of CRM, Basic knowledge of computer, marketing concepts and good communication skills.						
Course Objective: Understand the working concept of Trailhead and importance of Salesforce. To make familiar with data modelling and security concepts.						
Course Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO 1	Describe the working of Trailhead					**K3**
CO 2	Describe the importance of Salesforce and its features					**K2**
CO 3	Implement the validations					**K3**
CO 4	Discuss the concept and importance of user management					**K2**
CO 5	Identify and implement Security concepts in Industry					**K2, K3**
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Trailhead and Trailblazer Community	**TrailMix-1 :**	Trailhead and Trailblazer Community, Impacts of the fourth Industrial Revolution, Trailhead Playground Management	Lectures, PPTS, Notes	8L	Assignment	**CO1**

2. Salesforce Platform Basic	**Salesforce Platform Basic**	Salesforce Platform Basic, Salesforce User Basic, Lightening Experience User Basic, Lightening Experience Basics	Lectures, PPTS, Notes	8L	Assignment	**CO2**
3. Data Modelling	**Trail Mix -2 :**	Data Modelling , Formulas and Validations, Picklist Administration, AppExchange, Basic Data Management	Lectures, PPTS, Notes	8L	Assignment	**CO3**
4. Lightening Experience Customization	**TrailMix-3 :**	Lightening Experience Customization, Salesforce Mobile App Basics, UserManagement	Lectures, PPTS, Notes	8L	Assignment	**CO4**
5. Data Security	**Data Security**	Data Security, Salesforce Mobile App Customization, Security specialist	Lectures, PPTS, Notes	8L	Assignment	**CO5**
Total				**40L**		

Textbooks

Sr. No	Book Details
1.	Alok Kumar Rai : Customer Relationship Management : Concepts and Cases 2nd Edition, PHI Learning, 2018
2.	"Bhasin", " Customer Relationship Management", Wiley Dreamtech ,2019
3.	Shaarif Sahaalane, " Salesforce for beginners ", book by Amazon (Online edition)

Reference Books:

Sr. No	Book Details
1.	Salesfore Essentials for Administrators , By Shrivasthava Mohith, Edition Ist ,2018
2.	Christopher Mathew Spencer , “Salesforce : A quick Study laminated Reference Guide” eBook by Amazon (Online)
3.	Mastering Salesforce CRM Administration By Gupta Rakesh Edition 2nd 2018
Link: NPTEL/YouTube/Faculty Video Link:	
Unit 1	www. Trailhead.salesforce.com https://www.youtube.com/watch?v=9dlgpAKtL34&list=PLJYRK0JYJM2Fn9f1YBXtHoC6MGFKZpNh_&index=8
Unit 2	www.mindmajix.com/salesforce-tutorial
Unit 3	https://www.youtube.com/playlist?list=PLJYRK0JYJM2Fn9f1YBXtHoC6MGFKZpNh_
Unit 4	https://youtu.be/saRDk6sYkVg?si=7ZQcXHyjMeZl6h-2
Unit 5	https://www.youtube.com/watch?v=ncDZ4S2xhHk

Subject Name: Computer Networks lab		**L-T-P [0-0-4]**
Subject Code: AMICA0653		**Applicable in Department: MCA-Integrated**
Course objectives: To provide hands-on experience with network design, configuration, and troubleshooting, covering protocols, hardware, and software tools to build and maintain reliable and efficient network systems.		
Course Outcomes (CO)		
Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Identify and use various networking components Understand different transmissionmedia and design cables for establishing a network	**K1**
CO2	Implement any topology using network devices	**K3**
CO3	Analyze performance of various communication protocols.	**K3**
CO4	Discuss TCP/IP configuration for Windows and Linux	**K2**
CO5	Demonstrate the major software and hardware technologies used on computer networks	**K3**

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1.	Connect and configure basic network devices (switch, router, PC).	**CO1**
2.	Create straight-through and crossover cables, test connectivity.	**CO1**
3.	Configure a switch with a hostname, passwords, and basic settings.	**CO1**
4.	Use commands to explore and clear the MAC address table on a switch.	**CO1**
5.	Create and assign VLANs on a switch, verify VLAN configurations.	**CO2**
6.	Configure a router with a hostname, passwords, and basic settings.	**CO2**
7.	Assign IP addresses to devices, subnet a network, and configure interfaces.	**CO2**

8.	Configure static routes between two or more routers.	**CO2**
9.	Set up a router or server as a DHCP server, configure DHCP pools.	**CO3**
10.	Use ping and traceroute to test connectivity and understand network paths.	**CO3**
11.	Configure a router on a stick or a Layer 3 switch for inter-VLAN routing.	**CO3**
12.	Configure STP on switches, test failover scenarios.	**CO3**
13.	Configure EtherChannel between switches, verify configuration.	**CO2**
14.	Configure EIGRP on routers, verify and troubleshoot EIGRP.	**CO3**
15.	Configure OSPF on routers, understand and verify OSPF areas.	**CO3**
16.	Configure standard and extended ACLs, apply them to interfaces.	**CO2**
17.	Configure static and dynamic NAT, and PAT on a router.	**CO2**
18.	Configure Syslog for logging and NTP for time synchronization.	**CO2**
19.	Configure a basic wireless LAN, set up SSIDs and security settings.	**CO2**
20.	Diagnose and resolve common VLAN and routing problems	**CO2**
21.	Configure SSH for secure remote access to network devices.	**CO2**
22.	Configure basic firewall rules on a router or firewall device.	**CO2**
23.	Configure IPS features on a network device, monitor alerts.	**CO1**
24.	Apply best practices for securing network devices (e.g., disable unused services, securepasswords).	**CO1**
25.	Configure port security on switches to restrict access based on MAC addresses.	**CO1**
26.	Implement VLAN access control policies and verify their effects.	**CO2**
27.	Write simple Python scripts to automate network configurations.	**CO5**
28.	Use Ansible to automate device configuration tasks.	**CO5**
29.	Set up SNMP for monitoring network devices.	**CO3**
30.	Set up and verify IPSec VPN connections between routers.	**CO2**

31.	Configure RSTP or MSTP, and test failover scenarios.	**CO3**
32.	Configure OSPF for multiple areas, verify route propagation.	**CO3**
33.	Configure basic BGP between routers, verify and troubleshoot BGP peering.	**CO3**
34.	Configure route redistribution between different routing protocols.	**CO3**
35.	Implement basic QoS policies on a router or switch.	**CO5**
36.	Configure basic MPLS settings, verify MPLS forwarding.	**CO3**
37.	Set up GRE tunnels between routers, test and verify tunnel connectivity.	**CO3**
38.	Configure and verify DMVPN in a hub-and-spoke topology.	**CO3**
39.	Configure VRRP or HSRP for gateway redundancy.	**CO3**
40.	Set up and test IP SLA for monitoring and troubleshooting	**CO5**
41.	Create a network design diagram using tools like Cisco Packet Tracer or GNS3.	**CO5**
42.	Configure redundant links and devices, test failover scenarios.	**CO5**
43.	Plan and design a wireless network for an office environment.	**CO5**
44.	Use structured methodologies (e.g., OSI model approach) to troubleshoot network issues.	**CO2**
45.	Use Wireshark to capture and analyze network traffic.	**CO5**
46.	Set up SNMP monitoring on network devices, use SNMP tools to gather information.	**CO3**
47.	Resolve VLAN-related issues based on a provided network scenario.	**CO2**
48.	Troubleshoot and resolve issues with routing protocols (e.g., OSPF, EIGRP).	**CO3**
49.	Design and implement a network with redundant paths and devices.	**CO5**
50.	Diagnose and resolve common wireless network problems.	**CO5**
Required Software and Tools		
1. **Packet Tracer**		

Subject Name: Computer Graphics & Multimedia lab		**L-T-P [0-0-4]**
Subject Code: AMICA0652		**Applicable in Department: MCA-Integrated**
Course Objective: To implement drawing algorithm, polygon fitting, clipping and 2D transformation curves and an introduction to 3D transformation. It provides the basics of OpenGL application programming interface which allows students to develop programming skills in CG.		
Course Outcomes (CO)		
Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Apply and compare the algorithms for drawing 2D images also explainaliasing, anti aliasing and half toning techniques	**K3, K4**
CO2	Analyze and apply clipping algorithms and transformation on 2D images.	**K3, K4**
CO3	Solve the problems on viewing transformations and explain the projection andhidden surface removal algorithms.	**K2, K3**
CO4	Use of geometric transformations on graphics objects and their application in composite form.	**K3**
CO5	Extract scene with different clipping methods and its transformation to graphics display device.	**K4**

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1.	To Study various in build graphics functions in Python library.	**CO1**
2.	Write a program to draw a line using DDA algorithm.	**CO1**
3.	Write a program to draw a line using Bresenham's algorithm.	**CO1**
4.	Write a program to draw a circle using midpoint algorithm.	**CO1**
5.	Write a program to draw a circle using Bresenham's algorithm.	**CO1**
6.	Write a program to draw a rectangle using line drawing algorithm.	**CO1**

7.	Write a program to perform 2D Transformation on a line.	**CO2**
8.	Write a program to perform shear transformation on a rectangle.	**CO2**
9.	Write a program to rotate a circle (alternatively inside and outside) around thecircumference of another circle.	**CO2**
10.	Write a program to draw a car using in build graphics function and translate it frombottom left corner to right bottom corner of screen.	**CO2**
11.	Write a program to draw balloons using in build graphics function and translate it frombottom left corner to right top corner of screen.	**CO2**
12.	Write a program to draw a cube using in build library function and perform 3Dtransformations i) Translations in x, y, z directions ii) Rotation by angle 450 about z axis, rotation by 600 about y-axis in succession. Scaling in x-direction by a factor of 2, scaling in y- direction by a factor of 3.	**CO3**
13.	Write a program to implement line clipping (Cohen Sutherland algorithm).	**CO3**
14.	Write a program for making Bezier curve.	**CO4**
15.	Write a program to study various in build functions for 2D drawing in MAYA software.	**CO4**
16.	Write a program to show animation of a ball moving in a helical path.	**CO5**
Required Software and Tools		
1. **Turbo C** 2. **Code Block** 3. **VS Code**		

Subject Name: Advance Java Lab	**L-T-P [0-0-4]**
Subject Code: AMICA0651	**Applicable in Department: MCA-Integrated**

Course objectives: To create a fully functional window-based applications. To develop GUIapplications, and designing and implementing Component based application like Jelly Beans, Color bean, and designing of server-sidepages, client server interactions with TCP.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Develop the window-based applications.	**K5**
CO 2	Create a client and server communication using netpackage.	**K5**
CO 3	Develop reusable software components using java beans	**K4**
CO 4	Demonstrate server-side programming.	**K3**
CO 5	Create the dynamic web pages using JSP.	**K5**

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1	Write a Java Program to create an applet that show a simple message along withbackground and foreground colors?	**CO1**
2	Write a Java Program to create an applet that scrolls a message from left to right?	**CO1**
3	Write a Java Program to create an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named"Compute" is clicked.	**CO1**
4	Write a Java Program to create an applet that receives a string and returns either itUppercase or Lowercase, Reverse of given string, and length of a given String.	**CO1**
5	Write a java program to draw Lines, ovals, filled ovals and arcs, filled arcs?	**CO1**
6	Write a java program to draw rectangle, filled rectangle and rounded rectangle and filledrounded rectangle with any two colors?	**CO1**
7	Write a java program to draw a smiley face?	**CO1**

8	Write a Java program to demonstrate the mouse event handlers.	**CO1**
9	Write a Java program to demonstrate the key event handlers.	**CO1**
10	Write a Java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 werenot an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.	**CO1**
11	Write a Java program that works as a simple calculator. Use a grid lay	**CO1**
12	Write a Java Program to create 4 push Buttons bearing the names of 4 colors. When abutton is licked, that particular color is set as background color in a frame?	**CO1**
13	Write a Java Program that simulates a traffic light. The program lets the user select one ofthree lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.	**CO1**
14	Write a Java Program a simple user form which reads the name of a user and mail id in Text fields, select gender with radio buttons, and selects some Known languages using checkboxes, and also enters an address in a text area. After filling details whenever a userpress the “submit” button, then displays all the information about the user input.	**CO1**
15	Write a Java Program to create multiple frames, which create a Frame2 with a ‘back‘button, such that when a user click ‘back’ button, Frame 2 is closed and we see theFrame1 only?	**CO1**
16	Write a Java Program to create an applet using Swings which contains two push buttons.If a user presses a particular button then display a message ‘selected’ button is pressed.	**CO1**
17	Write a Java Program to create a frame using swing in which create a push button with alabel and image. When the button is clicked an image is displayed in the Frame?	**CO1**
18	Write a Java Program to create a student table, which includes name, roll no, branch andage or DOB?	**CO1**
19	Write a Java Program to create a tabbed pane with two tabs. In the first tab sheet, displaysome push buttons with names of Branches. In second tab sheet, display checkboxes withnames of subjects.	**CO1**
20	Write a java program to create a menu with several menu items by implementing JMenu.	**CO1**
21	Write a java program to create a combo box with some name of some places. The user canselect any one name from the list and the selected country name is displayed in the frame?(Use JComboBox)	**CO1**
22	Write a java program to select multiple places and displayed in Frame using JList?	**CO1**
23	Write a java program to create a simple visual bean with a area filled with a color. Theshape of the area depends on the property shape. If it is set to true then the shape of thearea is Square and it is Circle, if it is false. The color of the area	**CO3**

	should be changed dynamically for every mouse click. The color should also be changed if we change thecolor in the "property window "	
24	Write a java program to create a bean that performs conversion of American dollar toIndian rupee.	**CO3**
25	Write a java program to create a bean that counts the number of button clicks?	**CO3**
26	Write a Java program that implements a simple client/server application. The client sendsdata to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The datasent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)	**CO2**
27	Write a Java program to retrieve the information from the given URL? (Note: Read theURL from Command Line Arguments)	**CO4**
28	Write a java program to create a sample TCP chat application where client and server canchat with each other?	**CO4**
29	Installation of Apache Tomcat webserver	**CO4**
30	Write a java Program to create a simple servlet and run it using tomcat server.	**CO5**
31	Write a java Program to create a JSP page to display a simple message along with currentDate?	**CO5**
32	Write a java Program to create a JSP page to display the random number?	**CO5**
33	Write a java Program to create a User request page in JSP?	**CO5**
Required Software and Tools		
1. VS Code		

Subject Name: Essence Of Indian Traditional Knowledge	**L-T-P [2-0-0]**
Subject Code: AMICANC0602	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic Understanding of the Indian Constitution.	
Course Objective: This course aims to provide basic knowledge about different theories of society, state and polity in India, Indian literature, culture, Indian religion, philosophy, science, management, cultural heritage and different arts in India.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Understand the basics of past Indian politics and state polity.	**K2**
CO 2	Understand the Vedas, Upanishads, languages & literature of Indian society.	**K2**
CO 3	Know the different religions and religious movements in India.	**K4**
CO 4	Identify and explore the basic knowledge about the ancient history of Indian agriculture, science & technology, and ayurveda.	**K4**
CO 5	Identify Indian dances, fairs & festivals, and cinema.	**K1**

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**

1. Society State And Polity In India	**State In Ancient India:**	Evolutionary Theory, Force Theory, Mystical Theory Contract Theory, Stages of State Formation in Ancient India, Kingship , Council of Ministers Administration Political Ideals in Ancient India Conditions' of the Welfare of Societies, The Seven Limbs of the State, Society in Ancient India, Purusārtha, Varnāshrama System, Āshrama or the Stages of Life, Marriage, Understanding Gender as a social category, The representation of Women in Historical traditions, Challenges faced by Women.	Lectures, PPTS, Notes	4L	Assignment	**CO1**
2. Indian Literature, Culture, Tradition, And Practices	**Evolution Of Script And Languages In India:**	Harappan Script and Brahmi Script. The Vedas, the Upanishads, the Ramayana and the Mahabharata, Puranas, Buddhist And Jain Literature in Pali, Prakrit And Sanskrit, Sikh Literature, Kautilya's Arthashastra, Famous Sanskrit Authors, Telugu Literature, Kannada Literature, Malayalam Literature ,Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature	Lectures, PPTS, Notes	4L	Assignment	**CO2**
3. Indian Religion, Philosophy, And Practices	**Indian Religion, Philosophy, And Practices**	Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy, Shankaracharya, Various Philosophical Doctrines , Other Heterodox Sects, Bhakti Movement, Sufi movement, Socio religious reform movement of 19th century, Modern religious practices.	Lectures, PPTS, Notes	4L	Assignment	**CO3**

4. Science, Management And Indian Knowledge System	**Science, Management And Indian Knowledge System**	Astronomy in India, Chemistry in India, Mathematics in India, Physics in India, Agriculture in India, Medicine in India , Metallurgy in India, Geography, Biology, Harappan Technologies, Water Management in India, Textile Technology in India ,Writing Technolog	Lectures, PPTS, Notes	4L	Assignment	**CO4**
5.Cultural Heritage And Performing Arts	**Cultural Heritage And Performing Arts**	Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Pottery, Painting, Indian Handicraft, UNESCO'S List of World Heritage sites in India, Seals, coins, Puppetry, Dance, Music, Theatre, drama, Martial Arts Traditions, Fairs and Festivals, UNESCO'S List of Intangible Cultural Heritage, Calenders, Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema	Lectures, PPTS, Notes	4L	Assignment	**CO5**
Total				**20L**		

Textbooks

Sr. No	Book Details
1.	Sivaramakrishna (Ed.), Cultural Heritage of India-Course Material, Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014.
2.	S. Baliyan, Indian Art and Culture, Oxford University Press, India
3.	Nitin Singhania, Indian Art and Culture: for civil services and other competitive Examinations,3rd Edition,Mc Graw Hill

Reference Books:

Sr. No	Book Details
1.	Romila Thapar, Readings In Early Indian History Oxford University Press, India

2.	Basham, A.L., The Wonder that was India (34th impression), New Delhi, Rupa & co.
Link: NPTEL/YouTube/Faculty Video Link:	
https://onlinecourses.swayam2.ac.in/imb23_mg53/preview	

Subject Name: Constitution Of India, Law and Engineering	**L-T-P [2-0-0]**
Subject Code: AMICANC0601	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic Understanding of the Indian Constitution.	
Course Objective: To acquaint the students with legacies of constitutional development in India and help them to understand the most diversified legal document of India and philosophy behind it.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Identify and explore the basic features and modalities about Indian constitution.	**K1**
CO 2	Differentiate and relate the functioning of Indian parliamentary system at the center and state level.	**K2**
CO 3	Differentiate different aspects of Indian Legal System and its related bodies.	**K4**
CO 4	Discover and apply different laws and regulations related to engineering practices.	**K4**
CO 5	Correlate role of engineers with different organizations and governance models	**K4**

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1. Introduction And Basic Information About Indian Constitution	**Introduction**	Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947,Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution, Fundamental Rights, Fundamental	Lectures, PPTS, Notes	4L	Assignment	**CO1**

		Duties, Directive Principles of State Policy, Parliamentary System, Federal System, Centre-State Relations, Amendment of the Constitutional Powers and Procedure, The historical perspectives of the constitutional amendments in India				
	Emergency Provisions:	National Emergency, President Rule, Financial Emergency, and Local Self Government – Constitutional Scheme in India.				
2. Union Executive And State Executive	**Powers Of Indian Parliament**	Functions of Rajya Sabha, Functions of Lok Sabha, Powers and Functions of the President, Comparison of powers of Indian President with the United States, Powers and Functions of VicePresident, Powers and Functions of the Prime Minister	Lectures, PPTS, Notes	4L	Assignment	**CO2**
	Judiciary	The Independence of the Supreme Court, Appointment of Judges, Judicial Review, Public Interest Litigation, Judicial Activism, LokPal, Lok Ayukta, The Lokpal and Lok ayuktas Act 2013				
	State Executives	Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature, Functions of High Court and Subordinate Courts.				

3.Introduction And Basic Information About Legal System	**The Legal System, Sources Of Law And The Court Structure:**	Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court).	Lectures, PPTS, Notes	4L	Assignment	**CO3**
	Arbitration:	As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration. Contract law, Tort, Law at workplace.				
4.Intellectual Property Laws And Regulation To Information	**Intellectual Property Laws**	Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information, Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act.	Lectures, PPTS, Notes	4L	Assignment	**CO4**

5.Business Organizations And E-Governance	**Sole Traders, Partnerships, Companies: The Company's Act:**	Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E-Governance and role of engineers in E-Governance, Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development.	Lectures, PPTS, Notes	4L	Assignment	**CO5**
Total				**20L**		

Textbooks	
Sr. No	**Book Details**
1.	M Laxmikanth: Indian Polity for civil services and other State Examination,6th Edition, Mc Graw Hill
2.	Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI Learning Pvt. Ltd.
3.	Granville Austin: The Indian Constitution: Cornerstone of a Nation (Classic Reissue), Oxford University Press.
Reference Books:	
Sr. No	**Book Details**
1.	Madhav Khosla: The Indian Constitution, Oxford University Press.
2.	2. PM Bakshi: The Constitution of India, Latest Edition, Universal Law Publishing.
3.	3. V.K. Ahuja: Law Relating to Intellectual Property Rights (2007)
Link: NPTEL/YouTube/Faculty Video Link:	
Unit 1	https://archive.nptel.ac.in/courses/129/106/129106003/

Unit 2	https://archive.nptel.ac.in/courses/129/106/129106003/
Unit 3	https://archive.nptel.ac.in/courses/129/106/129106003/
Unit 4	https://archive.nptel.ac.in/courses/129/106/129106003/
Unit 5	https://archive.nptel.ac.in/courses/129/106/129106003/