NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)

Affiliated to

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

Evaluation Scheme & Syllabus

For

MASTER OF COMPUTER APPLICATIONS (MCA)

Second Year

(Effective from the Session: 2021-2022)

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)

MCA
EVALUATION SCHEME
SEMESTER-III

S.No.	Subject Codes	Subject Name	Periods			Evaluation Schemes				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	AMCA0301	Software Engineering	3	1	0	30	20	50		100		150	4
2	AMCA0302	Web Technology	3	1	0	30	20	50		100		150	4
3	AMCA0303	Design Thinking	3	1	0	30	20	50		100		150	4
4		Elective-II	3	0	0	30	20	50		100		150	3
5		Elective-III	3	0	0	30	20	50		100		150	3
6	AMCA0352	Web Technology Lab	0	0	2	30	20		50		50	100	2
7	AMCA0351	Software Engineering Lab	0	0	2	30	20		50		50	100	2
8	AMCA0354	Seminar	0	0	4				50			50	4
		GRAND TOTAL						**250**	**150**	**500**	**100**	**1000**	**26**

Abbreviation Used:-
L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., PE: Practical End Semester Exam.

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

MCA

List of Elective (Semester-III): -

S.No.	Subject Code	Subject Name
ELECTIVE 2		
1	AMCA0311	Advance RPA
2	AMCA0312	CRM Administration
3	AMCA0313	CRM Development
4	AMCA0314	Routing and Scaling of Network
ELECTIVE 3		
1	AMCA0315	Big Data
2	AMCA0316	Mobile Computing
3	AMCA0317	Client Server Computing
4	AMCA0318	Cloud Computing
5	AMCA0319	Artificial Intelligence

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)

MCA
Evaluation Scheme
SEMESTER IV

S.No.	Subject Codes	Subjects Name	Periods			Evaluation Schemes				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1		Elective – IV	3	0	0	30	20	50		100		150	3
2	AMCA0451	Colloquium	0	0	3				100			100	3
3	AMCA0452	Industrial Project/ Dissertation	0	0	20				200		350	550	20
		GRAND TOTAL						**50**	**300**	**100**	**350**	**800**	**26**

Abbreviation Used:-
L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., PE: Practical End Semester Exam.

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)
MCA

List of Elective (Semester-IV): -

S.No.	Subject Code	Subject Name
ELECTIVE 4		
1	AMCA0411	RPA Development
2	AMCA0412	CRM Advanced Administration
3	AMCA0413	CRM Advanced Development
4	AMCA0414	Connecting Network

MCA SECOND YEAR			
Course Code	**AMCA0301**	**L T P**	**Credits**
Course Title	**Software Engineering**	**3 1 0**	**4**

Course objective:

To enable students to develop methods and procedures for software development that can scale up for large systems and that can be used consistently to produce high-quality software at low cost and with a small cycle of time. Students will be able to understand the concepts of requirement engineering, designing and its principles, testing techniques and maintenance methods for effective software development.

Pre-requisites: Basic knowledge about software and its types.
Basic knowledge of any programming language.

Course Contents / Syllabus

UNIT-I	Introduction	8 Hours

Introduction: Evolving role of Software, Software Characteristics, Software Crisis, Silver Bullet, Software Myths, Software Process, Software Engineering Phases, Team Software Process (TSP), Emergence of Software Engineering, Software process, Project and Product.

Software Process Models:SDLC,Waterfall Model, Prototype Model, Spiral, Model, Iterative Model, Incremental Model, V Process Model, Agile Methodology.

UNIT-II	Software Requirement	8 Hours

Software Requirement Specifications (SRS): Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Decision Tables, SRS Document, IEEE Standards for SRS.

UNIT-III	Software Design	8 Hours

Software Design: Design principles, the design process; Design concepts: Abstraction, Refinement, Modularity (Cohesion and coupling), Software Architecture (Function Oriented Design, Object Oriented Design), Control Hierarchy (Top-Down and Bottom-Up Design), Structural partitioning, Data structure, Software procedure, Information hiding.

Software Measurement and Metrics: Various Size Oriented Measures, Function Point, Design Heuristics for effective modularity, Cyclomatic Complexity Measures: Control Flow Graphs.

UNIT-IV	Software Testing	8 Hours

Software Testing: Testing Objectives, Unit Testing, Integration Testing, User Acceptance Testing, Regression Testing, testing for Functionality and Testing for Performance, Top Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, Test Beds and Test Oracle, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products.

Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards.

Software Quality Assurance (SQA): Quality concepts, Software quality assurance, SQA activities,

Formal approaches to SQA; Statistical software quality assurance; CMM, The ISO standard.

UNIT-V	Project Maintenance and Management Concepts	8 Hours

Software Maintenance: Preventive, Corrective and Perfective Maintenance, Project Management concepts, Planning the Software Project, Cost of Maintenance, Estimation—Empirical Estimation COCOMO- A Heuristic Estimation Techniques, Staffing Level Estimation, Team structures, Risk analysis and management, Configuration Management, Software reengineering, Reverse Engineering, restructuring, Forward engineering, Clean Room software engineering, CASE Tools.

Course outcome: After completion of this course students will be able to

CO 1	Explain various software characteristics and analyze different software Development Models	K1, K2
CO 2	Demonstrate the contents of a SRS and apply basic software quality assurance practices to ensure that design, development meet or exceed applicable standards	K1, K2
CO 3	Compare and contrast various methods for software design.	K2, K3
CO 4	Formulate testing strategy for software systems, employ techniques such as unit testing, Test driven development and functional testing	K3
CO 5	Manage software development process independently as well as in teams and make use of Various software management tools for development, maintenance and analysis.	K5

Text books

1.KK Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.

2. RS Pressman, Software Engineering: A Practitioners Approach, McGraw Hill

3. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.

Reference Books

1. Pankaj Jalote, Software Engineering, Wiley .

2. Ghezzi, M. Jarayeri, D. Manodrioli, Fundamentals of Software Engineering, PHI Publication.

3. Kassem Saleh, “Software Engineering”, Cengage Learning.

4. Ian Sommerville, Software Engineering, Addison Wesley.

NPTEL/ Youtube/ Faculty Video Link:

Unit 1	https://youtu.be/x-jqSXYE4S4
Unit 2	https://youtu.be/mGkkZoFc-4I
Unit 3	https://youtu.be/sGxgZxwuHzc
Unit 4	https://youtu.be/BNk7vni-1Bo
Unit 5	https://youtu.be/8swQr0kckZI

MCA SECOND YEAR			
Course Code	**AMCA0302**	**L T P**	**Credits**
Course Title	**Web Technology**	**3 1 0**	4
Course objectives:	The course enable the students to :		
1	Understanding the concepts of web technology, internet and Web Designing.		
2	Design static and dynamic web pages using HTML, CSS.		
3	Understanding and implementing client side script programming using JavaScript.		
4	Understand how server-side programming works on the web using PHP		
5	Apply tools to retrieve the information from the database using PHP.		

Pre-requisites: Students are expected to be able to open command prompt window or terminal window,editatextfile,downloadandinstallsoftware,andunderstandbasicprogrammingconcepts.

Course Contents / Syllabus		
UNIT-I	**INTRODUCTION & WEB DESIGN**	**8 hours**

Introduction: Web Technology, Web and web Protocols Governing Web, HTTP Protocol: Request and Response, Web browser and Web servers, Features of Web 2.0

Web Design: Concepts of effective web design, Web design issues including Browser, Bandwidth, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation.

UNIT-II	**HTML & CSS**	**8 hours**

HTML: Basics of HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, Character entities, frames and frame sets. HTML forms.

Style sheets: Introduction 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. Overview of some front end web development tools.

UNIT-III	**JAVASCRIPT & XML**	**8 hours**

JavaScript: Client side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes.

AdvanceJavaScript: JavaScriptandobjects,JavaScriptownedobjects-theDOMandwebbrowser environments, Manipulation using DOM, forms andvalidations.

DHTML: Combining HTML, CSS and JavaScript, Events and buttons.

UNIT-IV	**PHP**	**8 hours**

PHP::Downloading,installing,configuringPHP,basicsyntaxofPHPprogram,Variablesanddata types, operators, expressions and statements , decision and looping, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing,Files.

Advance PHP: Cookies and Sessions.

UNIT-V	PHP AND DATABASE ACCESS in MySQL	8 hours

PHP and MySQL : Basic database concepts, , Overview of PHP myadmin for handling MySQL, Basic commands with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables,.

Course outcomes: After completing this course student will be able to :

CO 1	Understanding the concepts of Web Designing.	K1, K2
CO 2	Design a responsive web site using HTML and CSS.	K1, K4
CO 3	Implement interactive web pages using HTML, CSS, and JavaScript.	K3
CO 4	Understanding and implementing PHP programming.	K2
CO 5	Build Dynamic web site using server side PHP Programming and Database connectivity.	K2, K4

Text books:

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India, 2nd Edition January 2013
2. Xavier, C, " Web Technology and Design", New Age International, First edition (Reprint- August 2018)
3. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel, Pearson, 5th edition (2012)

References :

1. Ivan Bayross," HTML, DHTML, Java Script, Perl & CGI", BPB Publication, Fourth Edition Revised (2010)
2. Developing Web Applications in PHP and AJAX, Harwani, McGraw Hill, First Edition (January-2010)
3. Web Technologies, Black Book, Dreamtech Press, 1st edition (1 January 2009)

Online Content links :

https://nptel.ac.in/courses/106105084/

http://www.nptelvideos.in/2012/11/internet-technologies.html

http://www.nitttrchd.ac.in/sitenew1/nctel/comp_sc.php

https://spoken-tutorial.org/tutorial-search/?search_foss=HTML&search_language=English

https://spoken-tutorial.org/tutorial-search/?search_foss=PHP+and+MySQL&search_language=English

https://www.youtube.com/watch?v=JsbxB2l7QGY

https://www.youtube.com/playlist?list=PL-JvKqQx2Atf5w_httliQrmqPpL7oLc-W

https://www.youtube.com/playlist?list=PLERZXVMwiajr9lYUA1RVq4_D0VxLuTUHh

https://www.youtube.com/watch?v=uDwSnnhl1Ng&list=PLsyeobzWxl7qtP8Lo9TReqUMkiOp446cV

https://www.youtube.com/playlist?list=PL4cUxeGkcC9gksOX3Kd9KPo-O68ncT05o

MCA SECOND YEAR			
Course Code	**AMCA0303**	**L T P**	**Credits**
Course Title	**Design Thinking**	**3 1 0**	**4**

Course Objectives:

1	To introduce students with the design process as a tool for breakthrough innovation.
2	To help students develop into professionals with good interpersonal and presentation skills
3	To help students becoming efficient team players with potent leadership skills
4	To participate and lead teams in order to collaborate and create innovative ideas and solutions
5	To apply design thinking skills for understanding the assumptions and claims that frame the idea

Pre-requisites: None

Course Contents / Syllabus

UNIT-I	**Introduction**	**8 HOURS**

Introduction to design thinking, traditional problem solving versus design thinking, history of design thinking, wicked problems. Innovation and creativity, the role of innovation and creativity in organizations, creativity in teams and their environments, creativity to innovation, design mindset. Introduction to elements and principles of design. Arcturus IV case study, individual activity on identifying an opportunity in different scenarios.

UNIT-II	**Ethical Values and Empathy**	**8 HOURS**

Understanding humans as a combination of I (self) and body, basic physical needs up to actualization, prosperity, the gap between desires and actualization. Understanding culture in family, society, institution, startup, socialization process. Ethical behavior: effects on self, society, understanding core values and feelings, negative sentiments and how to overcome them, definite human conduct: universal human goal, developing human consciousness in values, policy, and character. Understand stakeholders, techniques to empathize, identify key user problems. Empathy tools- Interviews, empathy maps, emotional mapping, immersion and observations, customer journey maps, and brainstorming. Individual activity- 'Moccasin walk', scenario-based role-play activities using empathy mapping.

UNIT-III	**Problem Statement and Ideation**	**10 HOURS**

Defining the problem statement, synthesis frameworks, creating personas, Point of View (POV) statements. Research- identifying drivers, information gathering, target groups, samples, and feedbacks. Idea Generation-basic design directions, Themes of Thinking, inspirations and references, brainstorming, value, inclusion, sketching and presenting ideas, idea evaluation, double diamond approach, analyze – four W's, 5 why's, "How Might We", Conflict of Interest and Six Thinking Hats. Case study /Group activities - making right personas and defining the key problem, ideation activity games - six thinking hats, million-dollar idea

UNIT-IV	**Critical Thinking**	**6 HOURS**

Fundamental concepts of critical thinking, the difference between critical and ordinary thinking, characteristics of critical thinkers, critical thinking skills- linking ideas, structuring arguments, recognizing incongruences, five pillars of critical thinking, argumentation versus rhetoric, cognitive bias, tribalism, and politics. Case study on applying critical thinking on different scenarios.

UNIT-V	**Logic and Argumentation**	**8 HOURS**

The argument, claim, and statement, identifying premises and conclusion, truth and logic conditions, valid/invalid arguments, strong/weak arguments, deductive argument, argument diagrams, logical reasoning, scientific reasoning, logical fallacies, propositional logic, probability, and judgment, obstacles to critical thinking. Group activity/role plays on evaluating arguments

Course outcome: After completion of this course, students will be able to

CO 1	Develop a strong understanding of the design process and how it can be applied in a variety of business settings	K1
CO 2	Understand and analyze self, culture and exhibit ethical behavior	K1,K2
CO 3	Use empathy tools for target segment from different cultures by understanding their unique needs	K2
CO 4	Generate innovative ideas and define specific problem statement to lead nurturing	K1,K2
CO 5	Demonstrate an enhanced ability to apply design thinking skills for evaluation of claims and arguments	K2,K3

Textbooks

1. 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization by Vijay Kumar
2. This is Service Design Thinking: Basics, Tools, Cases by Marc Stickdorn and Jakob Schneider
3. Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation by Tim Brown
4. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
5. BP Banerjee, 2005, Foundations of Ethics and Management, Excel Books.

Reference Books

1. How to kill creativity by Amabile, T.
2. The era of open innovation by Chesbrough, H.
3. A Foundation Course in Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, 2009
4. Foundations of Ethics and Management, BP Banerjee, 2005, Excel Books.
5. Mindware: Tools for Smart Thinking, Richard E. Nisbett, 2016, Doubleday publisher, Canada
6. Fundamentals of Ethics for Scientists & Engineers by E G Seebauer& Robert L. Berry, 2000, Oxford University Press
7. Universal Principles of Design by William Lidwell, Kritina Holden, Jill Butler
8. The Art of Empathy: A Complete Guide to life's most essential skill - Karla McLaren
9. Basics Design 08: Design Thinking 0th Edition by Gavin Ambrose, Paul Harris.
10. Design Thinking: Business Innovation by MaurícioVianna, YsmarVianna, Isabel K. Adler, Brenda Lucena, Beatriz Russo.
11. Design of Business: Why Design Thinking is the Next Competitive Advantage by Roger L. Martin.

NPTEL/ YouTube/ Web Link

Unit I

https://nptel.ac.in/courses/110/106/110106124/

https://nptel.ac.in/courses/109/104/109104109/

https://designthinking.ideo.com/

https://www.invisionapp.com/inside-design/what-is-design-thinking/ https://blog.hypeinnovation.com/an-introduction-to-design-thinking-for-innovation-managers https://www.creativityatwork.com/design-thinking-strategy-for-innovation/ https://www.youtube.com/watch?v=GFffb2H-gK0
Unit II https://aktu.ac.in/hvpe/ http://aktu.uhv.org.in/ https://nptel.ac.in/courses/110/106/110106124/ https://swayam.gov.in/nd1_noc19_mg60/preview
Unit III https://nptel.ac.in/courses/110/106/110106124/ https://swayam.gov.in/nd1_noc19_mg60/preview https://www.udemy.com/course/design-thinking-for-beginners/ https://www.designthinking-methods.com/en/ https://www.youtube.com/watch?v=GNvLpfXCge8 https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them
Unit IV https://en.wikipedia.org/wiki/Critical_thinking https://www.forbes.com/sites/sap/2016/08/25/innovation-with-design-thinking-demands-critical-thinking/#340511486908 https://www.criticalthinking.org/pages/defining-critical-thinking/766
Unit V https://www.udemy.com/course/critical-thinker-academy/ https://swayam.gov.in/nd2_aic19_ma06/preview

MCA SECOND YEAR			
Course Code	**AMCA0311**	**L T P**	**Credits**
Course Title	**Advanced RPA**	**3 0 0**	**3**

Course Objectives: Thestudent will learn about:

1	Learn about the RPA	K_1, K_2
2	Learn about the emerging Develop and Deploy basic robots using UiPath Community Edition	K_1, K_4
3	Study the method to do process mapping and optimization	K_3
4	Learn to identify processes for automation	K_2
5	Learn to calculate RoI on automation	K_2, K_4

Pre-requisites: Basics of data structure and C

Course Contents / Syllabus

UNIT-I	**Data Manipulation**	**8 Hours**

Data Manipulation: Data Manipulation Introduction, Scalar variables, collections and Tables, Text Manipulation, Data Manipulation, Gathering and Assembling Data

Recording and Advanced UI Interaction: Recording Introduction, Basic and Desktop Recording, Web Recording, Input/output Methods, Screen Scraping, Data Scraping, Scraping advanced techniques.

UNIT-II	**Advanced Citrix Automation**	**8 Hours**

Selectors: Selectors, Defining and Assessing Selectors, Customization, Debugging, Dynamic Selectors, Partial Selectors, RPA Challenge

Image, Text & Advanced Citrix Automation : Introduction to Image & Text Automation, Image based automation, Keyboard based automation, Information Retrieval, Advanced Citrix Automation challenges, Best Practices, Using tab for Images Starting Apps

UNIT-III	**Extract Data Tables**	**8 Hours**

Excel Data Tables & PDF:

Data Tables in RPA, Excel and Data Table basics Data Manipulation in excel, Extracting Data from PDF, Extracting a single piece of data, Anchors, Using anchors in PDF

Email Automation: Email Automation, Incoming Email automation, Sending Email automation

UNIT-IV	**Exception Handling**	**8 Hours**

Debugging and Exception Handling: Debugging Tools, Strategies for solving issues, Catching errors

Orchestrator: Tenants, Authentication, Users, Roles, Robots, Environments, Queues & Transactions, Schedules

UNIT-V	**Robotic Enterprise Framework**	**8 Hours**

Robotic Enterprise Framework: ReFramework template, Reframe work template works,
Use Reframe work to automate your own processes. .NET Classes and Objects

Course Outcomes: After completion of this course students will be able to

CO 1	Apply some basic concepts and methods from design engineering to explore creative solutions of real world problems.	**K_1, K_2**
CO 2	To understand what Robotic Process Automation, and massive career opportunity in this field.	**K_1, K_4**

CO 3	Apply the knowledge of RPA tools, functions in various industries and Perform, control various tasks using RPA bots.	**K_3**
CO 4	Gain expertise in Desktop, Web & Citrix Automation and use Reframe work to build a structured business automation process.	**K_2**
CO 5	To organize a real-world workflow automation project and develop skills in debugging a workflow.	**K_2, K_4**

Text Books:

1. Vaibhav Jain, "Crisper Learning: For UiPath", Latest Edition, Independently Published, first edition,2018.
2. Alok Mani Tripathi, "Learning Robotics Process Automation", Latest Edition, Packt Publishing ltd, Birmingham, first edition , 2018.
3. Gerardus Blokdyk "Robotic Process Automation RPA A Complete Guide – 2020" Edition Kindle Edition.

Reference Books:

1. Kelly Wibbenmeyer, "The Simple Implementation Guide to Robotic Process Automation (RPA)", Latest Edition, iUniverse Press first edition 2018.
2. "Robotic Process Automation:Guide to Building Software Robots" by Richard Murdoch 2018 edition.
3. Robotic Process Automation Projects: Build real – world RPA solutions using UiPath and Automation Anywhere, first Edition, By NandanMullakara and Kumar Asokan, Kindle Edition.

NPTEL/ You tube/ Faculty Video Link:

Unit 1	https://www.youtube.com/watch?v=6QoCG6YIPVo&list=PL41Y-9S9wmyJarNN2KnB4XudpT1yE1kVd
Unit 2	https://www.youtube.com/watch?v=YOHFgrOvPTM&list=PL41Y-9S9wmyLvF6Ou0oPhg6MrFWSw7sn4
Unit 3	https://www.youtube.com/watch?v=QMBuyLMjOhM&list=PL41Y-9S9wmyIYX6kciM8DboVYymsv2y6K
Unit 4	https://www.youtube.com/watch?v=KE9raKNTkfI&list=PL41Y-9S9wmyLeXL1DY9j-XepNb_vg9N8t
Unit 5	https://www.youtube.com/watch?v=2rjr8QhD9oc&list=PL41Y-9S9wmyJi2zmWY77yPZrdVI7ab3Ja

MCA SECOND YEAR			
Course Code	**AMCA0312**	**L T P**	**Credits**
Course Title	**CRM Administration**	**3 0 0**	**3**

Course Objective:

1	Understand the working concept of Trailhead
2	Understand the importance of Salesforce
3	Familiarize with concepts of Data Modelling
4	Will Have insight of User Management
5	Get knowledge of Security Concepts

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

Course Contents / Syllabus		
UNIT-I	**Trailhead and Trailblazer Community**	**8 hours**

TrailMix-1 : Trailhead and Trailblazer Community, Impacts of the fourth Industrial Revolution, Trailhead Playground Management,

UNIT-2	**Salesforce Platform Basic**	**8 hours**

Salesforce Platform Basic, Salesforce User Basic, Lightening Experience User Basic, Lightening Experience Basics

UNIT-3	**Data Modelling**	**8 hours**

Trail Mix -2 :Data Modelling , Formulas and Validations, Picklist Administration, AppExchange Basic Data Management

UNIT-4	**Lightening Experience Customization**	**8 hours**

TrailMix-3 : Lightening Experience Customization, Salesforce Mobile App Basics, User Management

UNIT 5	**Data Security**	**8 hours**

Data Security, Salesforce Mobile App Customization, Security specialist

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

CO1	Understand the working of Trailhead	K1,K2
CO2	Describe the importance of Salesforce and its features	K1,K2
CO3	Implement the validations	K3
CO4	Understand the concept and importance of user management	K1,K2
CO5	Identify and implement Security concepts in Industry	K1,K3

Text Books:

1. Alok Kumar Rai : Customer Relationship Management : Concepts and Cases(Second Edition), PHI Learning, 2018

2. Bhasin- Customer Relationship Management (Wiley Dreamtech) ,2019
3. Salesforce for beginners by ShaarifSahaalane book by Amazon (Online edition)
Reference :
1. Salesfore Essentials for Administrators , By ShrivasthavaMohith, Edition Ist ,2018
2. Salesforce : A quick Study laminated Reference Guide by Christopher Mathew Spencer eBook by Amazon (Online)
3. Mastering Salesforce CRM Administration By Gupta Rakesh Edition IInd 2018
Online Link :
www. Trailhead.salesforce.com
www.mindmajix.com/salesforce-tutorial
www,youtube.com/watch?v=7K42geizQCI

MCA SECOND YEAR					
Course Code	**AMCA0313**	**L**	**T**	**P**	**Credits**
Course Title	**CRM Development**	**3**	**0**	**0**	**3**

Course Objective:

1	Understand the working concept of Trailhead
2	Understand the importance of Salesforce
3	Familiarize with concepts of Data Modelling
4	Will Have insight of User Management
5	Get knowledge of Lightning App

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

Course Contents / Syllabus		
UNIT 1	**TRAILHEAD AND TRAILBLAZER COMMUNITY**	**8 Hours**
Trailhead and Trailblazer Community, Salesforce Platform Basic, Platform Development Basic		
UNIT 2	**PICKLIST ADMINISTARTION**	**8 Hours**
Picklist Administration: Get Started with Picklist, Manage your picklist values, Share values with global set, Duplicate Management :Improve Data Quality, Resolve and Prevent Duplicate Data		
UNIT 3	**DATA MODELLING**	**8 Hours**
Data Modelling and its basic concepts, Understanding Custom Objects, Create Object Relationship, Work with Schema Builder, Build a Data Model for a Travel Approval App,Improve Data Quality for a Recruiting App,Customize a Salesforce Object		
UNIT 4	**FORMULAS AND VALIDATIONS**	**8 Hours**
Formulas and Validations: Use formula Fields, Implement Roll-up Summary Fields, Create Validation Rules, Customize the User Interface for a Recruiting App,Automate Business Processes for a Recruiting App.		
UNIT 5	**SALESFORCE FLOW**	**8 Hours**
Salesforce Flow, Choose the right automation tool, Automate Simple Business Processes with Process Builder, Guide Users through your business processes with flow builder, customize how records get approved with approvals ,Lightning App Builder: Get started with Lightning app builder, build a custom home page for lightning Experience, build a Custom Record page for lightning Experience and the salesforce mobile App, Build an app home lightning page, Work with Custom Lightning componentsBuild a Discount Approval Process,Quick Start: Lightning App Builder,Quick Start: Process Builder		

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

CO1	Understand the working of Trailhead	K1,K2
CO2	Describe the importance of Salesforce and its features	K1,K2
CO3	Implement the validations	K3
CO4	Understand the concept and importance of user management	K1,K2
CO5	Implement Lightning app	K1,K3

Text Books:
1. Alok Kumar Rai : Customer Relationship Management : Concepts and Cases(Second Edition), PHI Learning, 2018
2. Bhasin- Customer Relationship Management (Wiley Dreamtech) ,2019
3. Salesforce for beginners by ShaarifSahaalane book by Amazon (Online edition)
Reference :
1. Salesforce : A quick Study laminated Reference Guide by Christopher Mathew Spencer eBook by Amazon(Online)
2. Salesforce Platform Developer By Vandevelde Jain Edition Ist 2016
3. Learning Salesforce Development By Paul Battisson Online(EBook)
Online Link :
www. Trailhead.salesforce.com
www.mindmajix.com/salesforce-tutorial
www,youtube.com/watch?v=7K42geizQCI

MCA SECOND YEAR					
Course Code	**AMCA0314**	**L**	**T**	**P**	**Credits**
Course Title	**Routing and Scaling of Networks**	**3**	**0**	**0**	**3**

Course objective: Students will understand the

1	Fundamentals of Routing Concepts.	K1, K2
2	Concepts of Switched Networks and its configuration	K1, K4
3	Concepts of DHCP, NAT for IPv4 and its implementation.	K3
4	Concepts of LAN design and its implementation	K2
5	Concepts of Ether Channel	K2, K4

Pre-requisites: Familiar with fundamentls of computer networks

Course Contents / Syllabus

UNIT-I	**Routing Concepts**	**8 hours**

Routing Concepts: primary functions and features of a router, Connect devices for a small, routed network, Configure basic settings on a router to route between two directly-connected networks, using CLI,Verify connectivity between two networks, routing table entries for directly connected networks, Static Routing-Configure with IPv4 and IPV6, Dynamic Routing- Configure with IPv4 and IPV6, EIGRP-Implement EIGRP for IPv4

UNIT-II	**Switched Networks**	**8 hours**

Switched Networks-LAN Design,The Switched Environment, and Switch Configuration:Configure initial settings on a Cisco switch,Configure switch ports to meet network requirements,Configure the management virtual interface on a switch,Configure the port security feature to restrict network access.

VLANs: VLANs segment broadcast domains, Implement VLANs, Configure routing between VLANs, VLAN Trunk Protocol, Extended VLANs ,Dynamic Trunking Protocol

UNIT-III	**DHCP**	**8 hours**

DHCP-Implement DHCPv4 to operate across multiple LANs,Implement DHCPv6 to operate across multiple LANs, NAT for IPv4-NAT Operation, ConfigureNAT, TroubleshootNAT, Device Discovery, Management, and Maintenance.

UNIT-IV	**LAN Design**	**8 hours**

LAN Designs-Campus Wired LAN Designs, Campus Network Device Selection,Scaling Troubleshoot Layer 3 Switching,Spanning Tree Concepts, Varieties of Spanning Tree Protocols, Spanning Tree Configuration

UNIT-V	**Ether Channel**	**8 hours**

Ether Channel and HSRP-Link Aggregation Concepts, Link Aggregation Configuration,First Hop Redundancy Protocols,

Course outcome: **At the end of course, the student will be able**

CO 1	To understand the fundamentals of Routing Concepts.	K1, K2
CO 2	To configure the switched networks	K1, K4
CO 3	To understand the concepts of DHCP, NAT for IPv4 and its implementation.	K3
CO 4	To understand lan design and its implementation.	K2
CO 5	To understand Concepts of Ether Channel	K2, K4

Reference link

1. https://www.netacad.com/
2. https://www.youtube.com/watch?v=Ysw7G9NiAN8&list=PLJqb_j53o7BhRrYwLDy41AwR4pm-5nWk4L

Text Book:

1. Computer Networks | Fifth Edition(January 2013)| by Andrew S. Tanenbaum
2. Data Communications and Networking | 5th Edition(July 2017) by Forouzan
3. Computer Networking : A top down approach | Sixth Edition(30 June 2017)by Kurose James & Ross Keith

Reference Book:

1. Computer Networks and Internets|6th Edition(January 2014)|by Douglas E. Comer
2. Network Routing| 2nd Edition(September 2017)|by Deep Medhi, KarthikRamasamy
3. TCP/IP Illustrated, Volume 1: The Protocols (Addison-Wesley Professional Computing Series) 2nd Edition(November 2011)|by Fall Kevin R., Stevens W. Richard

MCA SECOND YEAR			
Course Code	**AMCA0315**	**L T P**	**Credits**
Course Title	**Big Data**	**3 0 0**	**3**

Course Objectives:

1	To introduce students toBig Data and Why Big Data used.
2	To help students toHadoop and open source technologies.
3	To help students to Demonstrate a familiarity with NO SQL data management.
4	To apply important concepts of Big Data and Hadoop with unstructured data
5	To Synthesize the use of Hbase data models and implementation.

Pre-requisites: Basic Programming Knowledge of Java and Linux Operating System, Basic Knowledge of SQL Database

Course Contents / Syllabus

UNIT-I	**Understanding Big Data**	**8 HOURS**

Understanding big data What is big data, why big data, convergence of key trends, unstructured data, industry examples of big data, web analytics, big data and marketing, fraud and big data, risk and big data ,credit risk management, big data and algorithmic trading, big data and HealthCare, big data in medicine, advertising and big data, big data technologies, Introduction to Hadoop, open source technologies, cloud and big data mobile business intelligence, Crowd sourcing Analytics ,inter and trans firewall analytics.

UNIT-II	**NoSQL Data Management**	**8 HOURS**

NoSQL data management Introduction to NoSQL, aggregate data models,aggregates,key-value and document data models, relationships, graph databases, schema less databases, materialized views, distribution models, sharing, masters slave replication, peer-peer replication, shearing and replication, consistency, relaxing consistency, version stamps, map reduce, partitioning and combining , composing map-reduce calculations.

UNIT-III	**Basic of Hadoop**	**8 HOURS**

Basics of Hadoop Data format, analyzing data with Hadoop, scaling out, Hadoop streaming, Hadoop pipes, design of Hadoop distributed file system (HDFS), HDFS concepts, Java interface, data flow, Hadoop I/O, data integrity, oppression,serialization, Avro file-based data structures.

UNIT-IV	**Map Reduce Applications**	**8 HOURS**

Map reduce applications Map Reduce workflows , unit tests with MR Unit , test data and local tests – anatomy of Map Reduce job run, classic Map-reduce, YARN , failures in classic Map-reduce and YARN, job scheduling, shuffle and sort, task execution, Map Reduce types, input formats, output formats.

UNIT-V	**Hadoop Related Tools**	**8 HOURS**

Hadoop related tools Hbase,data model and implementations, Hbaseclients,Hbase examples – praxis. Cassandra, cassandra data model,Cassandraexamples, Cassandra clients, Hadoop integration. Pig,Grunt, pig data model, Pig Latin, developing and testing PigLatin scripts. Hive, data types and file formats,HiveQL data definition, HiveQL data manipulation – HiveQL queries.

Course outcome: After completion of this course, students will be able to

CO 1	Understand important concepts of Big Data and Hadoop with unstructured data, semi-structured and structured data.	K1
CO 2	Analyze data with Hadoop and design of Hadoop distributed file system (HDFS).	K1
CO 3	Apply the industry examples of Big data in real life and analyze to implement the industry examples of big data.	K1,K2
CO 4	Understand the concept of NO SQL and aggregate data models.	K2
CO 5	Understand the use of Hbase data models and Hbase examples – praxis. Cassandra, cassandra data model HiveQL queries.	K3

Textbooks

1. Michael Minelli, Michelle Chambers, and AmbigaDhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013.
2. Polyglot Persistence", Addison-Wesley Professional, 2012.
3. P. J. Sadalage and M. Fowler, "NoSQL Distilled: A Brief Guide, 2014
4. Tom White, "Hadoop: The Definitive Guide", Third Edition, O'Reilley, 2012.
5. Eric Sammer, "Hadoop Operations", O'Reilley, 2012

Reference Books

1. E. Capriolo, D. Wampler, and J. Rutherglen, "Programming Hive", O'Reilley, 2012
2. Lars George, "HBase: The Definitive Guide", O'Reilley, 2011
3. Eben Hewitt, "Cassandra: The Definitive Guide", O'Reilley, 2010

NPTEL/ YouTube/ Web Link

Unit I

- https://www.sanfoundry.com/bigdata-questions-answers/
- https://www.tutorialspoint.com/hadoop/hadoop_big_data_overview.htm
- https://www.tutorialspoint.com/big_data_analytics/index.htm
- https://www.tutorialspoint.com/big_data_tutorials.htm

Unit II

- https://hadoop.apache.org/docs/r1.2.1/mapred_tutorial.html
- https://www.tutorialspoint.com/hadoop/hadoop_mapreduce.htm
- https://www.sanfoundry.com/mapreduce-questions-answers/

Unit III

- https://www.javatpoint.com/hadoop-tutorial
- https://www.tutorialspoint.com/hadoop/index.htm
- https://www.sanfoundry.com/hadoop-filesystem-hdfs-questions-answers/

Unit IV

- https://www.developer.com/java/understanding-mapreduce-types-and-formats.html

• https://www.tutorialspoint.com/map_reduce/map_reduce_tutorial.pdf • https://www.javatpoint.com/yarn
Unit V • https://www.tutorialspoint.com/apache_pig/pig_latin_basics.htm • https://www.tutorialspoint.com/cassandra/cassandra_introduction.htm • https://bigdata-madesimple.com/20-essential-hadoop-tools-for-crunching-big-data/

MCA SECOND YEAR			
Course Code	**AMCA0316**	**LT P**	**Credits**
Course Title	**Mobile Computing**	**3 0 0**	**3**

Course Objectives:

1	To impart fundamental concepts in the area of mobile computing.
2	To provide a solution for handling the fault tolerance during using the mobile
3	To understand the basic properties of transaction processing in mobile computing.
4	To introduce wireless communication and networking principles, that support connectivity to cellular networks and wireless internet.

Pre-requisites: Computer network

Course Contents / Syllabus

UNIT-I	**Introduction**	**8 HOURS**

Introduction, issues in mobile computing, Mobile Computing Functions, Mobile computing Architecture, overview of wireless telephony: cellular concept, GSM: air interface, channel structure, location management: HLR-VLR, hierarchical, handoffs,Multiple Access, channel allocation in cellular systems, CDMA, GPRS. Introduction to smartphones, Introduction to smartphone system architecture.

UNIT-II	**Wireless Networking**	**8 HOURS**

Wireless Networking, Wireless LAN Architecture, Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP,Tunneling, Encapsulation,WAP: Architecture, protocol stack, application environment, applications.

UNIT-III	**Data Management Issues**	**10 HOURS**

Data management issues,Broadcast Data Management Architecture, data replication for mobile computers, Wireless Security Issues, adaptive clustering for mobile wireless networks, File system, Disconnected operations.

UNIT-IV	**Mobile Agents**	**6 HOURS**

Mobile code, Mobile Agents computing, Mobile Agent System Architecture, security and fault tolerance, transaction processing in mobile computing environment, Issues in Mobile Transactions.

UNIT-V	**Routing protocols**	**8 HOURS**

Ad Hoc networks, Routing protocols, Global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), Cluster Based Routing Protocol (CBRP), QoS in Ad Hoc Networks.

Course outcome: After completion of this course, students will be able to

CO 1	Understand the basic concepts and principles in mobile computing.	K1
CO 2	Understand the concept of Wireless LANs, PAN, Mobile Networks, and Sensor Networks.	K1,K2
CO 3	Understand the structure and components for Mobile IP and Mobility Management.	K2
CO 4	Apply the important issues and concerns on security and privacy in the mobile environment.	K2,K3

CO 5	Understand positioning techniques and location-based services and applications.	K2

Textbooks

1. M. V. D. Heijden, M. Taylor, Understanding WAP, Artech House.
2. J. Schiller, "Mobile Communications", Addison Wesley, Second Edition, 2011.
3. Raj Kamal , Mobile Computing , Oxford University Press, Second Edition , 2012

Reference Books

1. Charles Perkins, "Mobile IP", Addison Wesley, 2008 Edition
2. Charles Perkins, "Ad hoc Networks", Addison Wesley. 2008 Edition,
3. Dharam Prakash Agarwal and Qing- An – Zeng, "Introduction to wireless and Mobile Systems" 3rd Edition, Cengage Learning 2013.

NPTEL/ YouTube/ Web Link

Unit I

https://www.youtube.com/watch?v=5kBknJWi71Q&list=PLrjkTql3jnm-kLRBgIt8kvuwbTScoI2IJ
https://www.youtube.com/watch?v=t6XFH396rQc&list=PLrjkTql3jnm-kLRBgIt8kvuwbTScoI2IJ&index=2
https://www.youtube.com/watch?v=PDM5zWE8dsw&list=PLrjkTql3jnm-kLRBgIt8kvuwbTScoI2IJ&index=11
https://www.youtube.com/watch?v=OaeGni4QBdA&list=PLrjkTql3jnm-kLRBgIt8kvuwbTScoI2IJ&index=10

Unit II

https://www.youtube.com/watch?v=0xj7-waXXIs
https://www.youtube.com/watch?v=WcMoZ2VUyfU
https://www.youtube.com/watch?v=iDHLkVAOYPE
https://www.youtube.com/watch?v=FaFbaVqDznA

Unit III

https://www.youtube.com/watch?v=BWvncI0K7WE
https://www.youtube.com/watch?v=S7jJP93Cne8
https://www.youtube.com/watch?v=XYs_osmAGI4
https://www.youtube.com/watch?v=3NWnxTnnrSY

Unit IV

https://www.youtube.com/watch?v=zi9Qw-MrFHM
https://www.youtube.com/watch?v=QemBfkLC79Y
https://www.youtube.com/watch?v=xP2BTvUudcQ
https://www.youtube.com/watch?v=-lGQ98DWNqs

Unit V

https://www.youtube.com/watch?v=e_hZJYaJqqU
https://www.youtube.com/watch?v=Zkm98MGvo_w

MCA SECOND YEAR			
Course Code	**AMCA0317**	**L T P**	**Credits**
Course Title	**Client Server Computing**	**3 0 0**	**3**

Course Objectives:

1	To introduce students with the general principles of Client Server Computing.
2	To help students to develop an understanding of computer networking basics.
3	To help students to develop an understanding of different components of client server computing, various protocols, modern technologies and their applications.
4	To participate in order to describe how computer networks are organized with the concept of client server network
5	To apply client server computing skills to train the user to use client server computing applications.

Pre-requisites: Basic knowledge of networking, Basic Programming Skills

Course Contents / Syllabus

UNIT-I	**Introduction to Client Server Computing**	**8 HOURS**

What is client-server computing, Introduction to client and Server, advantages of client server computing, Client/Server Computing: DBMS concept, Client/Server architecture: one tier, two tier, three tier and N tier architecture, Single system image, mainframe-centric client server computing, downsizing and client server computing, preserving mainframe applications investment through porting.

UNIT-II	**Components of Client Server Application**	**8 HOURS**

Components of Client/Server application: The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA), client server development tools.

UNIT-III	**Client Server Network**	**8 HOURS**

Client/Server Network: connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI, CDDI) network management.

The server: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system.

UNIT-IV	**Client Server System Development**	**8 HOURS**

Client-server system development: Software, Client–Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation, x-terminals, And server hardware.

Client Server Systems Development: Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues.

UNIT-V	**Client Server System Training**	**8 HOURS**

Client/Server System Development: Training, Training advantages of GUI Application, System Administrator training, Database Administrator training, and End-user training. The future of client server Computing Enabling Technologies, The transformational system. Network protection devices, Power Protection Devices, UPS, Surge protectors.

Course outcome: After completion of this course, students will be able to

CO 1	Understand, and identify software and hardware development environment as client and server respectively.	K1
CO 2	Understand and discuss the use of data different components of client/server applications.	K1
CO 3	Find, learn and use client-server based software development tools and different network topologies.	K2
CO 4	Define the underlying concepts in client server development using common access databases.	K2,K3
CO 5	Find, learn and use client-server based software development tools.	K2,K3

Textbooks

1. Patrick Smith &SteaveGuengerich, "Client / Server Computing", PHI Learning Private Limited, Delhi India., 2nd Edition 2011
2. Subash Chandra Yadav & Sanjay Kumar Singh "An Introduction to client server computing ", 1st Edition 2009
3. Korth, Silberchatz, Sudarshan, "Database Concepts", Tata Mcgraw-hill Education Pvt. Ltd., 7th Edition 2019

Reference Books

1. Elmasri, Navathe, S.B, "Fundamentals of Data Base System", Addison Wesley, 7th Edition 2016
2. Majumdar& Bhattacharya, "Database management System", Tata Mcgraw-hill Education Pvt. Ltd., 1st Edition 2017
3. Dawna Travis Dewire, "Client/Server Computing", Tata Mcgraw-hill Education Pvt. Ltd., 2nd Edition 2003

NPTEL/ YouTube/ Web Link

Unit I

https://www.youtube.com/watch?v=Z6f9ckEElsU&list=PL8751DA481F0F0D17
https://www.youtube.com/watch?v=65upETPuENk
https://www.youtube.com/watch?v=dxslf8jHlAo
https://www.youtube.com/watch?v=5bx6jyfblzs
https://www.youtube.com/watch?v=eA9mnY1Z2so&t=11s
https://www.youtube.com/watch?v=eA9mnY1Z2so

Unit II

https://www.youtube.com/results?search_query=service+of+client+in+client+server
https://searchapparchitecture.techtarget.com/definition/Remote-Procedure-Call-RPC
https://www.youtube.com/watch?v=5GGEl7q9lFA
https://www.youtube.com/watch?v=wGHKZhCWEbw
https://www.youtube.com/watch?v=PtEkcBRO6dk

https://www.youtube.com/watch?v=PpbJq5OA66Y https://www.youtube.com/watch?v=0pcaxdvk2QA&list=PLMcRIuCKvYlaPim0OzS0vscBfzpj-HbiX
Unit III https://www.youtube.com/watch?v=h6O9xWiwXr0&t=43s https://www.youtube.com/watch?v=JlyYNVAGURc https://www.youtube.com/watch?v=gXMlXOfmt48&t=12s https://www.youtube.com/watch?v=CpRA0bGpO3M https://www.youtube.com/watch?v=cFSW1Q_sZZk&t=87s
Unit IV https://www.youtube.com/watch?v=e5EbiMm1oLs https://www.youtube.com/watch?v=3vBND1H4aRI https://www.youtube.com/watch?v=1DvTwuByjo0 https://www.youtube.com/watch?v=1DvTwuByjo0 https://www.youtube.com/watch?v=1DvTwuByjo0
Unit V https://www.youtube.com/watch?v=ncCSmDAmcQY https://www.youtube.com/watch?v=D7SQesHch7o https://www.youtube.com/watch?v=D7SQesHch7o https://www.youtube.com/watch?v=D7SQesHch7o https://www.youtube.com/watch?v=sJPidssZH4Y

MCA SECOND YEAR					
Course Code	**AMCA0318**	**L**	**T**	**P**	**Credits**
Course Title	**Cloud Computing**	**3**	**0**	**0**	**3**

Course Objective:	**At the end of course, the student will be able to understand**	
1	Basics and deployment models of cloud computing	K1, K2
2	Service models of cloud computing	K1, K4
3	Major service providers of cloud computing	K3
4	Online communication methods by using cloud computing	K4
5	Concept of Virtualization and Virtual Machines	K2, K4

Pre-requisites: Students know about any computer programming language and probability theory up to a satisfactory level.

Course Contents / Syllabus		
UNIT-I	**INTRODUCTION**	**8 hours**

Cloud- Definition, benefits, usage scenarios, History of Cloud Computing, Cloud Architecture, Types of Clouds, Business models around Clouds, Issues in Clouds.

UNIT-II	**CLOUD SERVICES**	**8 hours**

Types of Cloud services: Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Database as a Service, Monitoring as a Service, Communication as services.

UNIT-III	**CLOUD SERVICE PROVIDERS**	**8 hours**

Major Players in Cloud Computing: Eucalyptus, Nimbus, Open Nebula, Cloud Sim
Service providers: Google, Amazon, Microsoft Azure, IBM, Sales force.

UNIT-IV	**COLLABORATING USING CLOUD SERVICES**	**8 hours**

Email Communication over the Cloud - CRM Management - Project Management-Event Management - Task Management – Calendar - Schedules - Word Processing – Presentation – Spreadsheet - Databases – Desktop - Social Networks and Groupware.

UNIT-V	**VIRTUALIZATION FOR CLOUD**	**8 hours**

Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization –System VM, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - supervisors – Xen, KVM, VMware, Virtual Box, Hyper-V.

Course outcome:	**At the end of course, the student will be able**	
CO 1	To explain the basic concepts and major players of cloud computing.	K1, K2
CO 2	To explain the types of cloud services.	K1, K4
CO 3	To discuss about different cloud service provider software and	K3

	organizations.	
CO 4	To illustrate about collaboration using cloud services.	K4
CO 5	To explain about Virtualization techniques and tools available.	K2, K4

Text books

1. David E.Y. Sarna Implementing and Developing Cloud Application, CRC press 2011.

2. Anthony T Velte, Toby J Velte, Robert Elsenpeter, Cloud Computing: A Practical Approach, Tata McGraw-Hill 2010.

3. Haley Beard, Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.

Reference Books: -

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Que Publishing, August 2008.

2. James E Smith, Ravi Nair, Virtual Machines, Morgan Kaufmann Publishers, 2006.

3. John Rittinghouse & James Ransome, Cloud Computing, Implementation, Management and Strategy, CRC Press, 2010.

Video Links:

- https://www.digimat.in/nptel/courses/video/106105167/L01.html
- http://www.infocobuild.com/education/audio-video-courses/computer-science/CloudComputing-VT-Kharagpur/lecture-40.html
- https://www.youtube.com/watch?v=RmuVkB3siYY
- http://www.infocobuild.com/education/audio-video-courses/computer-science/CloudComputing-IIT-Kharagpur/lecture-40.html

MCA SECOND YEAR			
Course Code	**AMCA0319**	**L T P**	**Credits**
Course Title	**Artificial Intelligence**	**3 0 0**	**3**

Course objective: **At the end of course, the student will be able to understand**

1	Describe the key components of the artificial intelligence (AI) field and its relation and role in Computer Science, automated planning and agent systems.	K1, K2
2	Identify and describe artificial intelligence techniques, including search, heuristics and knowledge representation.	K1, K4
3	Identify and apply AI techniques to a wide range of problems, including complex problem solving via search, probabilistic models and probabilistic reasoning.	K3
4	Discussion of different machine learning techniques including decision tree.	K2
5	Discuss different AI techniques and models for pattern recognition and classification	K2, K4

Pre-requisites: Students know about any computer programming language and probability theory.

Course Contents / Syllabus

UNIT-I	**Introduction to Artificial Intelligence**	**8 hours**

INTRODUCTION:-Fundamentals of AI. Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Related fields, Intelligent Agents, Structure of Intelligent Agents, Classification of Intelligent Agents.

UNIT-II	**Introduction To Search**	**8 hours**

INTRODUCTION TO SEARCH:-Searching for solutions, Uninformed search strategies, Informed search strategies, Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha - Beta pruning.

UNIT-III	**Knowledge Representation & Reasoning**	**8 hours**

KNOWLEDGE REPRESENTATION &REASONING:-Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.

UNIT-IV	**Machine Learning**	**8 hours**

MACHINE LEARNING:-Supervised and unsupervised learning, Reinforcement learning, Decision trees, Classification Techniques: Nearest Neighbor (NN) Rule, Bayes Classifier, Support Vector Machine (SVM), and K – means clustering.

UNIT-V	**Pattern Recognition**	**8 hours**

PATTERN RECOGNITION:- Introduction, Design principles of pattern recognition system, Statistical Pattern recognition, Parameter estimation methods - Principle Component Analysis (PCA) and Linear Discriminant Analysis (LDA), Computer vision, Natural Language Possessing.

Course outcome: **At the end of course, the student will be able**

CO 1	To explain the history and basics of Artificial Intelligence, Intelligent Agents.	K1, K2
CO 2	To illustrate the various searching techniques including Informed search, Uninformed search, Game playing strategies and Alpha-Beta pruning.	K1, K4
CO 3	To demonstrate different knowledge representation scheme including Hidden Markov model and Bayesian networks.	K3
CO 4	To explainthe Machine learning concepts including statistical learning models.	K2
CO 5	To explain the pattern recognition and classification algorithms, computer vision and natural language processing.	K2, K4

Text books

1. Dan W. Patterson, "Artificial Intelligence and Expert Systems", Prentice Hall of India, 1st Edition, 2015
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", McGraw-Hill, 3rd Edition, 2017
3. Ela Kumar, "Artificial Intelligence", Wiley publications, 1st Edition 2020

Reference Books

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Pearson Education, 3rd Edition, 2015
2. E Charniak and D McDermott, "Introduction to Artificial Intelligence", Pearson Education, 3rd Edition, 2016
3. Dr. Neelaksi Jain, "artificial Intelligence", Wiley Publications, 1st Edition 2019

Video Links:

- https://www.youtube.com/watch?v=4JNApj1wjsw
- https://www.youtube.com/watch?v=SWxpkZ_SzaA
- https://www.youtube.com/watch?v=MBVXsQKxYQk
- https://in.video.search.yahoo.com/yhs/search?fr=yhs-itm-001&hsimp=yhs-01&hspart=itm&p=nptel+video+lecture+on+introduction+to+artificial+intelligence#id=1&vid=cf3755807ebe306b71ea26b0aee82b6f&action=click
- https://in.video.search.yahoo.com/yhs/search?fr=yhs-itm-001&hsimp=yhs-001&hspart=itm&p=video+lecture+on+introduction+to+artificial+intelligence#id=1&vid=6c252f3e69977c7859d3e67f7aeca15d&action=click

MCA SECOND YEAR			
Course Code	**AMCA0352**	**L T P**	**Credits**
Course Title	**Web Technology Lab**	**0 0 2**	**2**

Course objectives: The course enable the students to :

1	Design static and dynamic web pages using HTML, CSS and Java Script.	K6
2	Apply server-side programming on the web using PHP	K3
3	Design retrieves the information from the database using PHP.	K6

Pre-requisites: 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.

The programs in Web Technology lab will cover the following concepts :

1. Basic HTML Tags, Table Tags, List Tags, Image Tags, Hyperlink, Forms.
2. Implement forms using HTML Frames, CSS.
3. Basic Java script syntax, operators, conditional statements, loop control statements.
4. Java scripts pre-defined and user defined functions, arrays.
5. Java Script objects, DOM.
6. Basic PHP syntax, operators, conditional statements, loop control statements.
7. PHP pre-defined and user defined functions, arrays.
8. Form handling using PHP.
9. File inclusion using PHP.
10. PHP cookies and sessions.
11. MySQL database handling using PHP, creation, updation, deletion of database.
12. MySQL table creation, updation, and deletion using PHP.
13. Data insertion, updation, deletion from My SQL database table using PHP.

Course outcomes: After completing this course student will be able to :

CO 1	Design a responsive web site using HTML, CSS, Java Script	K6
CO 2	Understanding and implementing PHP programming.	K2, K6
CO 3	Build Dynamic web site using server side PHP Programming and Database connectivity.	K6

Text books:

1. Web Technologies, Black Book, Dreamtech Press
2. Internet and World Wide Web How to program, P.J. Deitel& H.M. Deitel, Pearson
3. Xavier, C, " Web Technology and Design", New Age International
Reference
1. Ivan Bayross," HTML, DHTML, Java Script, Perl & CGI", BPB Publication
2. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
1. Developing Web Applications in PHP and AJAX, Harwani, McGraw Hill
Video Links :
https://nptel.ac.in/courses/106105084/
http://www.nptelvideos.in/2012/11/internet-technologies.html
http://www.nitttrchd.ac.in/sitenew1/nctel/comp_sc.php
https://spoken-tutorial.org/tutorial-search/?search_foss=HTML&search_language=English
https://www.youtube.com/watch?v=JsbxB2l7QGY
https://www.youtube.com/playlist?list=PL-JvKqQx2Atf5w_httliQrmqPpL7oLc-W

MCA SECOND YEAR			
Course Code	**AMCA0351**	**L T P**	**Credit**
Course Title	**Software Engineering Lab**	**0 0 2**	**2**

Suggested list of Experiment

Sr. No.	Name of Experiment	CO
1	Prepare a SRS document in line with the IEEE recommended standards on any one of the following mini project: • Covid Vaccination System • Online Exam Management • Academic performance Evaluation System • Online Grocery Store • College Admission System	CO1
2	Design the mini project.	CO3
3	Create a technicaldocument on mini project.	CO2
4	Draw the architectural diagram of mini project.	CO4
5	Perform forward engineering in java. (Model to code conversion)	CO5
6	Perform reverse engineering in java. (Code to Model conversion)	CO5
7	Demo of JIRA software (Test case management & Agile software development).	CO1

Note: The instructor may add/delete/modify/tune mini project, wherever he/she feels in a justified manner.

Lab Course Outcome:

CO 1	Identify ambiguities, inconsistencies and incompleteness from a requirements specification and state functional and non-functional requirement	K2,K4
CO 2	Identify different actors and use cases from a given problem statement and draw use case diagram to associate use cases with different types of relationship	K3, K5
CO 3	Draw a class diagram after identifying classes and association among them	K4, K5
CO 4	Graphically represent various UML diagrams, and associations among them and identify the logical sequence of activities undergoing in a system, and represent them pictorially	K4, K5
CO5	Able to use modern engineering tools for specification, design, implementation and testing	K3, K4

MCA SECOND YEAR			
Course Code	**AMCA0411**	**L T P**	**Credits**
Course Title	**RPA(Robotic Process Automation) Development**	**3 0 0**	**3**
Course Objectives: Thestudent will learn about:			
1	Learn about the RPA		K_1, K_2
2	Learn about the emerging Develop and Deploy basic robots using UiPath Community Edition		K_1, K_4
3	Study the method to do process mapping and optimization		K_3
4	Learn to identify processes for automation		K_2
5	Learn to calculate RoI on automation		K_2, K_4
Pre-requisites: Basics of RPA Concept			
Course Contents / Syllabus			
UNIT-I	**Introduction to UiPath**		**8 Hours**
UiPathStudio : Downloading & installing UiPath Studio , Installing browser extensions , Installing extension on Chrome browser, Installing extension for Firefox browser , Installing extension for Edge browser **Number series :** Natural number series , Odd number series , Even number series , Prime number series, Number order sorting			
UNIT-II	**Variable Handling**		**8 Hours**
Variable swapping: Using three bucket method , Using two variables only , **Print "Hello" :**Print "Hello" by using Sequence activity, Print "Hello" by using Flowchart activity **Addition of two numbers, Displaying a Sun Sign**			
UNIT-III	**Working with Spreedsheet**		**8 Hours**
Guessing game, Compare two columns of a spreadsheet , Disk cleanup , Extracting data from a website, Filling a web form from an excel sheet			
UNIT-IV	**Data Extraction**		**8 Hours**
Extracting data from an invoice image, Filling a web form from a true PDF file, Creating list of unique words			
UNIT-V	**E- Mail Handling**		**8 Hours**
Extracting and storing the subject of emails, Saving attachment with subject 'Resume' from unread emails, Checking data mismatch using "Try catch" mechanism			
Course Outcomes: After completion of this course students will be able to			
CO 1	Apply some basic concepts and methods from design engineering to explore creative solutions of real world problems.		**K_1, K_2**
CO 2	To understand what Robotic Process Automation, and massive career opportunity in this field.		**K_1, K_4**
CO 3	Apply the knowledge of RPA tools, functions in various industries and Perform, control various tasks using RPA bots.		**K_3**

CO 4	Gain expertise in Desktop, Web & Citrix Automation and use REFramework to build a structured business automation process.	**K_2**
CO 5	To organize a real-world workflow automation project and develop skills in debugging a workflow.	**K_2, K_4**

Text Books:

1. Vaibhav Jain, "Crisper Learning: For UiPath", Latest Edition, Independently Published, first edition, 2018.
2. Alok Mani Tripathi, "Learning Robotics Process Automation", Latest Edition, Packt Publishing ltd, Birmingham, first edition , 2018.
3. Gerardus Blokdyk "Robotic Process Automation Rpa A Complete Guide – 2020" Edition Kindle Edition.

Reference Books:

1. Kelly Wibbenmeyer, "The Simple Implementation Guide to Robotic Process Automation (RPA)", Latest Edition, iUniverse Press first edition 2018.

2. "Robotic Process Automation: Guide to Building Software Robots" by Richard Murdoch 2018 edition.

3. Robotic Process Automation Projects: Build real – world RPA solutions using UiPath and Automation Anywhere, first Edition, By NandanMullakara and Kumar Asokan, Kindle Edition.

NPTEL/ You tube/ Faculty Video Link:

Unit 1	https://www.youtube.com/watch?v=6QoCG6YIPVo&list=PL41Y-9S9wmyJarNN2KnB4XudpT1yE1kVd
Unit 2	https://www.youtube.com/watch?v=YOHFgrOvPTM&list=PL41Y-9S9wmyLvF6Ou0oPhg6MrFWSw7sn4
Unit 3	https://www.youtube.com/watch?v=QMBuyLMjOhM&list=PL41Y-9S9wmyIYX6kciM8DboVYymsv2y6K
Unit 4	https://www.youtube.com/watch?v=KE9raKNTkfI&list=PL41Y-9S9wmyLeXL1DY9j-XepNb_vg9N8t
Unit 5	https://www.youtube.com/watch?v=2rjr8QhD9oc&list=PL41Y-9S9wmyJi2zmWY77yPZrdVI7ab3Ja

MCA SECOND YEAR				
Course Code	**AMCA0412**	**L**	**T** **P**	**Credits**
Course Title	**CRM Advance Administration**	**3**	**0** **0**	**3**

Course objective:

1	Understand the working concept of Accounts
2	Understand the importance of Report formulation
3	Familiarize with concepts of Data Quality
4	Understand the concepts of CRM
5	Get knowledge of Cloud

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

UNIT-1	**Accounts & Contacts For Lightning Experience**	**8 Hours**

TrailMix-4 Accounts & Contacts for lightning Experience, Leads & Opportunities for lightning Experience, Entitlement Management , Set Up Case Escalation and Entitlements

UNIT-2	**Reports and Dash Boards For Lightning Experience**	**8 Hours**

Reports and Dashboards for Lightning Experience, Quick Start Reports & Dash Board Create Reports and Dashboards for Sales and Marketing Managers,

UNIT -3	**Data Quality**	**8 Hours**

Customize and Org to support a new business unit, Data Quality, Lightning Experience Reports and Dash Boards Specialist

UNIT- 4	**Chatter for Lightning Experience**	**8 Hours**

Chatter for Lightening Experience, Tableau CRM Basics

UNIT- 5	**Cloud Basic**	**8 Hours**

Experience Cloud Basic, Marketing Cloud Basics, Salesforce Einstein Basics, Business Administration Specialist

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

CO1	Understand the working of Accounts	K1,K2
CO2	Describe the importance of Salesforce and its features	K1,K2
CO3	Design the reports	K3
CO4	Understand the concept and importance of Data Quality	K1,K2
CO5	Understand the concepts of Cloud	K1,K3

Text Books:

1) Alok Kumar Rai : Customer Relationship Management : Concepts and Cases(Second Edition), PHI Learning 2018 2) Bhasin- Customer Relationship Management (Wiley Dreamtech),2019 3) Salesforce for beginners by ShaarifSahaalane book by Amazon (Online Edition)
Reference :
1) Salesfore Essentials for Administrators , By ShrivasthavaMohith, Edition Ist 2018 2) Salesforce : A aquick Study laminated Reference Guide by Christopher Mathew Spencer ebook by Amazon (Online) 3) Mastering Salesforce CRM Administration By Gupta Rakesh, Edition IInd 2018
Video Link :
www. Trailhead.salesforce.com
www.mindmajix.com/salesforce-tutorial
www,youtube.com/watch?v=7K42geizQCI

MCA SECOND YEAR			
Course Code	**AMCA0413**	**L T P**	**Credits**
Course Title	**CRM Advance Development**	**3 0 0**	**3**

Course objective:

1	Understand the working concept of Variables
2	Understand the importance of Data Management
3	Familiarize with concepts of Encryption
4	Understand the concepts of APEX
5	Identify and implement Security concepts of APEX

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

UNIT-1	Flow Builder	8 Hours

Flow Builder : Learn about flow resources and variables, Create a variable, Add screens to your flow, Add logic to your flow, Add actions to your flow, Help article : automate your business process

UNIT-2	Data Management and Data Security	8 Hours

Data Management: Export and Import Data, Event Monitoring: Get started with Event Monitoring, Query Event Log Files, Download and Visualize Event Log files ,Overview of Data Security, Control Access to the org, Control Access to objects, Control Access to fields, Control Access to records, Create a role hierarchy , Define Sharing Rules

Data Protection in Salesforce (Part 1), Data Protection in Salesforce (Part 2, User Access Management and Assets Management)

UNIT- 3	Shield Platform Encryption	8 Hours

Shield Platform Encryption : Get started with Shield platform Encryption, Setup and manage shield platform encryption, Deploy shield platform encryption the smart way, API Basics : Make API for you and Me, Learn the benefits of API , Put the web in web API, Lightning Platform API Basics : Get to know salesforce Lightning platform API, Use rest API

UNIT 4	APEX Triggers and Testing	8 Hours

APEX Triggers :Get started with APEX Triggers, Bulk Apex Triggers, APEX Testing : Get started with Apex Unit tests, Test Apex Triggers, Create Test Data for Apex Test , Asynchronous APEX, Keep Data Secure in a Recruiting App, Apex Specialist

UNIT- 5	Apex Integration Services	8 Hours

Apex Integration Services: Apex Integration Overview, Apex Rest Callouts, Apex Soap callouts, Apex Web Services, Process Automation Specialist

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

CO1	Implement the working concept of Variables	K1,K2
CO2	Apply the concepts of Data Management	K1,K2

CO3	Familiarize with concepts of Encryption	K3
CO4	Understand the concepts of APEX	K1,K2
CO5	Implement concepts of APEX Integration	K1,K3

Text Books:

1) Alok Kumar Rai : Customer Relationship Management : Concepts and Cases(Second Edition), PHI Learning, 2018
2) Bhasin- Customer Relationship Management (Wiley Dreamtech),2019
3) Salesforce for beginners by ShaarifSahaalane book by Amazon(Online Edition)

Reference Books:

1) Salesforce : A quick Study laminated Reference Guide by Christopher Mathew Spencer eBook by Amazon(Online)
2) Salesforce Platform Developer ByVandevelde Jain Edition Ist 201
3) Learning Salesforce Development By Paul BattissonE-book (Online)

Online Link :

www. Trailhead.salesforce.com

www.mindmajix.com/salesforce-tutorial

www,youtube.com/watch?v=7K42geizQCI

MCA SECOND YEAR

Course Code	AMCA0414	L	T	P	Credits
Course Title	Connecting Networks	3	0	0	3

Course objective: Student will understand the

1	Concepts of OSPF	K1, K2
2	Concepts of WAN and its configuration	K1, K4
3	Concepts of Troubleshoot in WAN	K3
4	Concepts of lan security and its its implementation	K2
5	Concepts of Access Control Lists	K2, K4

Pre-requisites: Familar with routing and scaling of networks.

Course Contents / Syllabus

UNIT-I	**Open ShortestPathFirst (OSPF)**	**8 hours**

Single-Area OSPF-Implement single-area OSPFv2 and OSPFv3,Multiarea OSPF-Implement Multiarea OSPF,OSPF Tuning and Troubleshooting

UNIT-II	**WAN Concepts**	**8 hours**

WAN Concepts,Point-to-Point Connections-Serial Point-to-Point,PPP Operation,PPP Implementation

UNIT-III	**Troubleshoot WAN**	**8 hours**

Troubleshoot WAN Connectivity, Branch Connections-Remote Access ,Cconnections,PPPoE,VPNs,GRE, Ebgp

UNIT-IV	**LAN Security**	**8 hours**

Network Security and Monitoring-LAN Security,SNMP,Quality of Service,Network Evolution-Internet of Things,Cloud and Virtualization,Network Programming,Network Troubleshooting

UNIT-V	**Access Control Lists**	**8 hours**

Access Control Lists-ACL Operation, Standard IPv4 ACLs,and Troubleshoot ACLs.

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

CO 1	To understand the Concepts of OSPF	K1, K2
CO 2	Cconfigure the WAN	K1, K4
CO 3	To Troubleshoot in WAN	K3
CO 4	Concepts of LAN security and its implementation.	K2
CO 5	To implement the ACL	K2, K4

Video link

1. https://www.netacad.com/
2. https://www.youtube.com/watch?v=O--rkQNKqls&list=PLbRMhDVUMngf-peFloB7kyiA40EptH1up
3. https://www.youtube.com/watch?v=Ysw7G9NiAN8&list=PLJqb_j53o7BhRrYwLDy41AwR4pm-5nWk4L

Text book:

1. Computer Networks | Fifth Edition(January 2013)| by Andrew S. Tanenbaum
2. Data Communications and Networking | 5th Edition(July 2017) by Forouzan
3. Computer Networking : A top down approach | Sixth Edition(30 June 2017)by Kurose James & Ross Keith

Reference Book

1. Computer Networks and Internets|6th Edition(January 2014)|by Douglas E. Comer
2. Network Routing| 2nd Edition(September 2017)|by Deep Medhi, KarthikRamasamy
3. Computer Networking for LANS to WANS: Hardware, Software and Security | June 2009| by James Antonakos, Kenneth Mansfield Jr.