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



Affiliated to

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



Evaluation Scheme & Syllabus

For

Master of Computer Applications (Integrated)

Fourth Year

(Effective from the Session: 2025-26)

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

MCA-Integrated Evaluation Scheme Semester-VII

Sl.	Subject	Subject Name	Type of	J	Period	s		Evaluat	ion Scheme	Scheme End Semester			Total	Credit
No.	Codes	•	Subject	L	T	P	CT	TA	TOTAL	PS	TE	PE		
1	AMICA0701	Business Intelligence and Data Visualization	Mandatory	3	1	0	30	20	50		100		150	4
2	AMICA0702	Cryptography and Network Security	Mandatory	3	1	0	30	20	50		100		150	4
3	AMICA0703	Internet of Things	Mandatory	3	1	0	30	20	50		100		150	4
4		Departmental Elective-III	Dept. Elective	3	0	0	30	20	50		100		150	3
5		Departmental Elective-IV	Dept. Elective	3	0	0	30	20	50		100		150	3
6	AMICA0751	Business Intelligence and Data Visualization Lab	Mandatory	0	0	4				50		50	100	2
7	AMICA0752	Cryptography and Network Security Lab	Mandatory	0	0	4				50		50	100	2
8	AMICA0753	Internet of Things Lab	Mandatory	0	0	4				50		50	100	2
9	AMICA0754	Personality development & Skill Enhancement	Mandatory	0	0	4				50		50	100	2
10	AMICA0759	Internship Assessment-III	Mandatory	0	0	2				50		50	100	1
11		*Massive Open Online Courses (For MCA-Int Degree)	*MOOCs											
		GRAND TOTAL							250	250	500	250	1250	27

* List of MOOCs Based Recommended Courses for Fourth year (Semester-VII) MCA-Integrated Students

Sr. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	AMC0267	Internet of Things 201	Infosys Wingspan (Infosys Springboard)	15h 59m	
2	AMC0311	Network Management Systems Fundamentals	Infosys Wingspan (Infosys Springboard)	23h 50m	

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.

LISTOF DEPARTMENTAL ELECTIVES

Sr. No.	Subject Codes	Subject Name	Types of Subjects	Bucket Name	Branch	Semester
1	AMICA0711	Deep Learning	Departmental Elective-III	Emerging Technologies	MCA-Int	VII
2	AMICA0712	Advance concepts of Analytics	Departmental Elective-III	Digital Marketing	MCA-Int	VII
3	AMICA0713	CRM Advance Administration	Departmental Elective-III	CRM Using Salesforce	MCA-Int	VII
4	AMICA0715	Big Data Analytics	Departmental Elective-IV	Emerging Technologies	MCA-Int	VII
5	AMICA0714	Advance Concepts of Optimization	Departmental Elective-IV	Digital Marketing	MCA-Int	VII
6	AMICA0716	CRM Development	Departmental Elective-IV	CRM Using Salesforce	MCA-Int	VII

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

MCA-Integrated <u>Evaluation Scheme</u> SEMESTER-VIII

Sr.	Subject	Subject	Types of	P	eriod	ls	Ev	aluati	ion Schem	nes	End Semester		Total	Credit
No	Codes		Subjects	L	T	P	CT	TA	TOTAL	PS	TE	PE		
1	AMICA0801	Augmented & Virtual Reality -3D	Mandatory	3	1	0	30	20	50		100		150	4
2	AMICA0802	Block Chain Technology	Mandatory	3	1	0	30	20	50		100		150	4
3	AMICA0803	Mobile Application Development	Mandatory	3	1	0	30	20	50		100		150	4
4	AMICA0804	Cognitive Ability	Mandatory	3	0	0	30	20	50		100		150	3
5	AMICA0805	Software Project Management	Mandatory	3	0	0	30	20	50		100		150	3
6		Departmental Elective-V	Departmental Elective	3	0	0	30	20	50		100		150	3
7	AMICA0851	Project Based on Augmented & Virtual Reality -3D Lab	Mandatory	0	0	4				50		50	100	2
8	AMICA0852	Block Chain Technology Lab	Mandatory	0	0	4				50		50	100	2
9	AMICA0853	Mobile Application Development Lab	Mandatory	0	0	4				50		50	100	2
10		*Massive Open Online Courses (For MCA-Int Degree)	*MOOCs											
		Total							300	150	600	150	1200	27

* List of MOOCs Based Recommended Courses for Fourth year (Semester-VIII) MCA-Integrated Students

S. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	AMC0334	Blockchain Basics	Coursera	15h 30m	
2	AMC0343	Software Project Management Training	Infosys Wingspan (Infosys Springboard)	6h 54m	

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.

LISTOF DEPARTMENTAL ELECTIVES

Subject Codes	Subject Name	Types of Subjects	Bucket Name	Branch	Semester
AMICA0811	Programming for Data Analytics	Departmental Elective-V	Emerging Technologies	MCA-Int	VIII
AMICA0812	Search Engine Optimization	Departmental Elective-V	Digital Marketing	MCA-Int	VIII
AMICA0813	Administering cloud and App Using Sales force	Departmental Elective-V	CRM Using Salesforce	MCA-Int	VIII

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

Master of Computer Applications (Integrated)

AICTE Guidelines in Model Curriculum:

A student will be eligible to get Under Graduate degree with Honours only, if he/she completes the additional MOOCs courses such as Coursera certifications, or any other online courses recommended by the Institute (Equivalent to 20 credits). During Complete B.Tech. Program Guidelines for credit calculations are as follows.

1.	For 6 to 12 Hours	=0.5 Credit
2.	For 13 to 18	=1 Credit
3.	For 19 to 24	=1.5 Credit
4.	For 25 to 30	=2 Credit
5.	For 31 to 35	=2.5 Credit
6.	For 36 to 41	=3 Credit
7.	For 42 to 47	=3.5 Credit
8.	For 48 and above	=4 Credit

For registration to MOOCs Courses, the students shall follow Coursera registration details as per the assigned login and password by the Institute these courses may be cleared during the B. Tech degree program (as per the list provided). After successful completion of these MOOCs courses, the students shall provide their successful completion status/certificates to the Controller of Examination (COE) of the Institute through their coordinators/Mentors only.

The students shall be awarded Honours Degree as per following criterion.

- i. If he / she secures 7.50 as above CGPA.
- ii. Passed each subject of that degree program in the single attempt without any grace.
- iii. Successful completion of MOOCs based 20 credits.

	Master of Computer Applications (Integrated)		
	Fourth Year		
Course	AMICA0701	LTP	Credits
Code			
Course Title	Business Intelligence & Data Visualization	310	4

Course Objectives: This course covers fundamental concepts of Business Intelligence tools, techniques, components and its future. As well as a bit more formal understanding of data visualization concepts and techniques. The underlying theme in the course is feature of Tableau and its capabilities.

Pre-requisites: Basic knowledge of data analytics and Python.

Course Contents / Syllabus

UNIT-I Introduction to Business Intelligence

8 hours

Business Intelligence (BI), Scope of BI solutions and their fitting into existing infrastructure, BI Components and architecture, BI Components, Future of Business Intelligence, Functional areas of BI tools, End user assumptions, setting up data for BI, Data warehouse, OLAP and advanced analytics, Supporting the requirements of senior executives including performance management, Glossary of terms and their definitions specific to the field of BI and BI systems.

UNIT-II Elements of Business Intelligence Solutions

8 hours

. Business Query and Reporting, Reporting, Dashboards and Scorecards Development, Development, Scorecards, Metadata models, Automated Tasks and Events, Mobile Business Intelligence, Software development kit (SDK). Stages of Business Intelligence Projects, Project Tasks, Risk Management and Mitigation, Cost justifying BI solutions and measuring success, BI Design and Development, Building Reports, Building a Report, Drill-up, Drill-down Capabilities.

UNIT-III Tableau

8 hours

Introductions and overview: What Tableau can and cannot do well, Debug and troubleshoot installation and configuration of the software.

Creating Your First visualization: Getting started with Tableau Software, Using Data file formats, connecting your Data to Tableau, creating basic charts (line, bar charts, Tree maps), Using the Show me panel

Tableau Calculations: Overview of SUM, AVR, and Aggregate features Creating custom calculations and fields, Applying new data calculations to your visualization.

Formatting Visualizations: Formatting Tools and Menus, formatting specific parts of the view, Editing and Formatting Axes.

UNIT-IV Data Visualization

8 hours

Manipulating Data in Tableau: Cleaning-up the data with the Data Interpreter, structuring your data, Sorting, and filtering Tableau data, Pivoting Tableau data.

Advanced Visualization Tools: Using Filters, Using the Detail Panel Using the Size panels, customizing filters, Using and Customizing tooltips, Formatting your data with colours.

Creating Dashboards & Stories: Using Storytelling, creating your first dashboard and Story, Design for different displays, Adding interactivity to your Dashboard

Distributing & Publishing Your Visualization: Tableau file types, publishing to Tableau Online, sharing your visualization, Printing, and exporting.

UNIT-V Introduction to Power BI

8 hours

Describe the Power BI ecosystem, Define Power BI and its relationship with Excel, Discuss the Power BI suite of products, Describe how the Power BI products integrate, Explain the typical analytics process flow, Differentiate between the various data sources, Connect Power BI to a data source, Clean and transform data to ensure data quality, Load the data to the Power BI Data Model, Describe the Power BI ecosystem, Define Power BI and its relationship with Excel, Discuss the Power BI suite of products, Describe how the Power BI products integrate, Explain the typical analytics process flow.

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

CO 1	Apply quantitative modelling and data analysis techniques to the solution of real-world business problems.	К3
CO 2	Discuss the importance of data visualization, design and use of many visual components in business.	K2
CO 3	Describe as products integrate defining various analytical process flow.	K2
CO 4	Evaluate the basics of troubleshooting and creating charts using various formatting tools.	K5
CO 5	Discuss basics of structuring data and creating dashboard stories adding interactivity dashboard stories.	K5
Toxt books		

Text books:

- 1. "Decision Support and Business Intelligence Systems", by Efraim Turban, Ramesh Sharda, Dursun Delen ,9th Edition, 2011
- 2. "Learning Tableau: Business Intelligence and data visualization that brings your business into focus", by Joshua N. Milligan 2nd ed. Edition, 2016
- 3. "Tableau Your Data!", by Daniel G. Murray November 2013

Reference Books:

1. "Business Intelligence Roadmap: The Complete Project Lifecycle of Decision Making", by Larissa T. Moss, S. Atre Addison Wesley, 2022.

NPTEL/ YouTube/ Faculty Video Link:

UNIT 1	https://www.youtube.com/watch?v=dRG5JP6zxck
UNIT 2	https://www.youtube.com/watch?v=jkCCnwvO_fg
UNIT 3	https://www.youtube.com/watch?v=KPc6950u0TE
UNIT 4	https://www.tableau.com/academic/students
UNIT 5	https://www.youtube.com/watch?v=cHSR_1U0ki8

	Master of Computer Applications (Integrated) Fourth Year		
Course		LTP	Credits
Code			
Course Title	Cryptography and Network Security	310	4
cryptographic	ectives: The aim of this course is to provide students with a statechniques and network security principles, and preparing students challenges and industry applications.	•	
_ · _ · _ ·	s: Basic knowledge of computer networks, discrete mathematics, a	and progr	ramming
	Course Contents / Syllabus		,
UNIT-I	Introduction		8 hours
diffusion, Feis	lock ciphers: Characteristics of Block Ciphers, Shannon's theoretel structure, Stream Ciphers: Concept and Applications.	iy oi coi	iiusioii aiiu
-	Symmetric and Asymmetric Cryptography s: Data Encryption Standard (DES), Triple DES, Block Cipher M Foundations for Cryptography: Linear Feedback Shift Register (I		-
Block Ciphers Mathematical Ciphers, Abst Modular Arith and Application	s: Data Encryption Standard (DES), Triple DES, Block Cipher M Foundations for Cryptography: Linear Feedback Shift Register (Litract Algebra: Groups, Rings, and Fields. Number Theory: Printhenetic. Advanced Encryption Standard (AES), Public Key Cryptons, Diffie-Hellman Key Exchange, RSA Algorithm and its Securit	LFSR) bame Num tography	Operation. ased Stream bers, GCD, Principles derations
Block Ciphers Mathematical Ciphers, Abst Modular Arith and Application	s: Data Encryption Standard (DES), Triple DES, Block Cipher M Foundations for Cryptography: Linear Feedback Shift Register (I tract Algebra: Groups, Rings, and Fields. Number Theory: Printentic. Advanced Encryption Standard (AES), Public Key Cryptons, Diffie-Hellman Key Exchange, RSA Algorithm and its Securit Public Key Cryptosystems and Cryptographic Hash	LFSR) bame Num tography ity Consid	Operation. ased Stream bers, GCD, Principles derations 8 hours
Block Ciphers Mathematical Ciphers, Abst Modular Arith and Application UNIT-III Public Key Cr (ECC), Ellipt Cryptographic	s: Data Encryption Standard (DES), Triple DES, Block Cipher M Foundations for Cryptography: Linear Feedback Shift Register (Litract Algebra: Groups, Rings, and Fields. Number Theory: Printhenetic. Advanced Encryption Standard (AES), Public Key Cryptons, Diffie-Hellman Key Exchange, RSA Algorithm and its Securit	LFSR) bame Num tography ty Considerate Curve Crabin Crystal Cr	Coperation. Sed Stream bers, GCD, Principles derations 8 hours Typtography yptosystem.
Block Ciphers Mathematical Ciphers, Abst Modular Arith and Application UNIT-III Public Key Cr (ECC), Ellipt Cryptographic	s: Data Encryption Standard (DES), Triple DES, Block Cipher M Foundations for Cryptography: Linear Feedback Shift Register (Litract Algebra: Groups, Rings, and Fields. Number Theory: Printender. Advanced Encryption Standard (AES), Public Key Cryptons, Diffie-Hellman Key Exchange, RSA Algorithm and its Security Public Key Cryptosystems and Cryptographic Hash ryptosystems: Primality Testing, ElGamal Cryptosystem, Elliptic Cic Curve over the Reals, Elliptic Curve Modulo a Prime, Rec Hash Functions: Properties of Cryptographic Hash Functions, Sec	LFSR) bame Num tography ty Considerate Curve Crabin Crystal Cr	Operation. ased Stream bers, GCD, Principles derations 8 hours yptography yptosystem.
Block Ciphers Mathematical Ciphers, Abst Modular Arith and Application UNIT-III Public Key Cr (ECC), Ellipt Cryptographic (SHA-1, SHA) UNIT-IV Authentication Management Introduction Cryptanalysis,	s: Data Encryption Standard (DES), Triple DES, Block Cipher M Foundations for Cryptography: Linear Feedback Shift Register (Latract Algebra: Groups, Rings, and Fields. Number Theory: Printentic. Advanced Encryption Standard (AES), Public Key Cryptons, Diffie-Hellman Key Exchange, RSA Algorithm and its Security Public Key Cryptosystems and Cryptographic Hash ryptosystems: Primality Testing, ElGamal Cryptosystem, Elliptic Cic Curve over the Reals, Elliptic Curve Modulo a Prime, Rec Hash Functions: Properties of Cryptographic Hash Functions, Security 1-2, SHA-3), Digital Signature Standard (DSS)	LFSR) bame Num tography ty Consider Curve Crabin Cr	S Operation. Sed Stream bers, GCD, Principles derations 8 hours Typtography yptosystem. Algorithm 8 hours atures, Key n Security. Ind Linear s: Shamir's
Block Ciphers Mathematical Ciphers, Abst Modular Arith and Application UNIT-III Public Key Cr (ECC), Ellipt Cryptographic (SHA-1, SHA) UNIT-IV Authentication Management Introduction Cryptanalysis,	s: Data Encryption Standard (DES), Triple DES, Block Cipher M. Foundations for Cryptography: Linear Feedback Shift Register (Litract Algebra: Groups, Rings, and Fields. Number Theory: Printenetic. Advanced Encryption Standard (AES), Public Key Cryptons, Diffie-Hellman Key Exchange, RSA Algorithm and its Security Public Key Cryptosystems and Cryptographic Hash ryptosystems: Primality Testing, ElGamal Cryptosystem, Elliptic Cic Curve over the Reals, Elliptic Curve Modulo a Prime, Rechash Functions: Properties of Cryptographic Hash Functions, Security Authentication, Cryptanalysis, and Modern Ciphers and Key Management: Message Authentication Techniques, Dig and Key Exchange Mechanisms, Hash Functions and Their to Cryptanalysis: Time-Memory Trade-off Attack, Differential and Linear Cryptanalysis, Advanced Encryption Techniques, Differential Encryption En	LFSR) bame Num tography ty Consider Curve Crabin Cr	S Operation. Sed Stream bers, GCD, Principles derations 8 hours Typtography yptosystem. Algorithm 8 hours atures, Key n Security. Ind Linear s: Shamir's

CO1	Describe cryptographic techniques and algorithms.	K2
CO2	Analyze cryptographic security mechanisms and vulnerabilities.	К3
CO3	Implement and evaluate encryption algorithms.	К3
CO4	Develop secure communication protocols.	K5
CO5	Discuss advancements in quantum cryptography and blockchain security.	K2
Text books:		
1. "C	Cryptography and Network Security: Principles and Practice", by William	n Stallings,
Se	eventh Edition, By Pearson, 2017	
2. "C	Cryptography and Network Security", by Behrouz A. Forouzan and	d Debdeep
M	ukhopadhyay ,July 2010	
Reference B	ooks:	
1. "H	Iandbook of Applied Cryptography", by Alfred J. Menezes, Oorschot, Vansto	one 2018
NPTEL/ Yo	utube/ Faculty Video Link:	
UNIT 1	https://surl.li/qntktj =Collection	
UNIT 2	https://surl.li/qntktj =Collection	
UNIT 3	https://onlinecourses.nptel.ac.in/noc22_cs90/preview	
UNIT 4	https://onlinecourses.nptel.ac.in/noc22_cs90/preview	
UNIT 5	https://onlinecourses.nptel.ac.in/noc22_cs90/preview	

	Master of Computer Applications (Integration Fourth Year	rated)	
Course	AMICA0703	LTP	Credits
Code			
Course Title	Internet of Things	310	4
Components, at understandi and studying a	ectives: This course emphasizes the study of the intro architecture, network communications and applications proing various hardware for IoT, programming concepts using about applications of IoT. s: Basic knowledge of electronics, computer networks, and	otocols. The cours g Arduino and Ra	se also aims
	Course Contents / Syllabus		
UNIT-I	An Architectural Overview:		8 hours
standards cons wide area netv M2M and IoT	rchitecture, Main design principles and needed capabilities siderations. M2M and IoT Technology Fundamentals- Dev working, Data management, Business processes in IoT, Ev Analytics, Knowledge Management.	ices and gateway	s, Local and vice(XaaS),
UNIT-II	Hardware Components:		8 hours
Technology.	erent types of Sensors, Transducer, Actuators, Radio Freq Overview of IOT supported Hardware Computational		
	Raspberry Pi, Node MCU, and ARM cortex and its Archite Programming Arduino and Raspberry Pi:	-	
UNIT-III Arduino platform addition in A Introduction to	Programming Arduino and Raspberry Pi: form boards anatomy, Arduino IDE coding, using emulated Arduino IDE, programming the Arduino for IoT. Program o Raspberry Pi Board. Interfacing and programming the vision of the programming of the programming the vision of the programming of the programmi	or, using libraries	8 hours , arithmetic lode MCU,
UNIT-III Arduino platfo addition in A	Programming Arduino and Raspberry Pi: form boards anatomy, Arduino IDE coding, using emulated Arduino IDE, programming the Arduino for IoT. Program o Raspberry Pi Board. Interfacing and programming the vision of the programming of the programming the vision of the programming of the programmi	or, using libraries	8 hours , arithmetic lode MCU,
UNIT-III Arduino platform addition in A Introduction to different platform UNIT-IV PHY/MAC La	Programming Arduino and Raspberry Pi: form boards anatomy, Arduino IDE coding, using emulated arduino IDE, programming the Arduino for IoT. Programs o Raspberry Pi Board. Interfacing and programming the victorins	or, using libraries ramming with Narious sensors, IC	8 hours , arithmetic lode MCU, Ds, etc. with 8 hours
UNIT-III Arduino platform addition in A Introduction to different platform UNIT-IV PHY/MAC La	Programming Arduino and Raspberry Pi: form boards anatomy, Arduino IDE coding, using emulated Arduino IDE, programming the Arduino for IoT. Program o Raspberry Pi Board. Interfacing and programming the visorms Transport & Session Layer Protocols: ayer ,Bluetooth Low Energy, Zigbee Smart Energy, Netwo	or, using libraries ramming with Narious sensors, IC	8 hours , arithmetic lode MCU, Ds, etc. with 8 hours
UNIT-III Arduino platfor addition in A Introduction to different platfor UNIT-IV PHY/MAC La 6TiSCH,ND, UNIT-V Smart meteric communication and Ideation of the communication and Ideation and	Programming Arduino and Raspberry Pi: form boards anatomy, Arduino IDE coding, using emulated arduino IDE, programming the Arduino for IoT. Programs of Raspberry Pi Board. Interfacing and programming the visorms Transport & Session Layer Protocols: ayer ,Bluetooth Low Energy, Zigbee Smart Energy, Netword DHCP, ICMP, RPL, CORPL, CARP, COAP, XMPP, AMO IoT Applications: Ing, e-health, Smart city automation, Automotive appling data with H/W units, mobiles, and tablets, Designing smart of Mini Project	or, using libraries ramming with Narious sensors, ICO	8 hours , arithmetic lode MCU, los, etc. with 8 hours 6LoWPAN, 8 hours automation,
UNIT-III Arduino platfor addition in A Introduction to different platfor UNIT-IV PHY/MAC La 6TiSCH,ND, UNIT-V Smart meteric communication and Ideation of the communication and Ideation and	Programming Arduino and Raspberry Pi: form boards anatomy, Arduino IDE coding, using emulated arduino IDE, programming the Arduino for IoT. Programming the Arduino for IoT. Programming the viscorms Transport & Session Layer Protocols: ayer ,Bluetooth Low Energy, Zigbee Smart Energy, Netword DHCP, ICMP, RPL, CORPL, CARP, CoAP, XMPP, AMO IoT Applications: Ing, e-health, Smart city automation, Automotive appling data with H/W units, mobiles, and tablets, Designing smart for Mini Project ome: After completion of this course students will be about the state of the state	or, using libraries ramming with Narious sensors, ICO	8 hours , arithmetic lode MCU, Os, etc. with 8 hours 6LoWPAN, 8 hours automation,
UNIT-III Arduino platfor addition in A Introduction to different platfor UNIT-IV PHY/MAC La 6TiSCH,ND, UNIT-V Smart meteric communication and Ideation of the communication and Ideation and	Programming Arduino and Raspberry Pi: form boards anatomy, Arduino IDE coding, using emulated arduino IDE, programming the Arduino for IoT. Programs of Raspberry Pi Board. Interfacing and programming the visorms Transport & Session Layer Protocols: ayer ,Bluetooth Low Energy, Zigbee Smart Energy, Netword DHCP, ICMP, RPL, CORPL, CARP, COAP, XMPP, AMO IoT Applications: Ing, e-health, Smart city automation, Automotive appling data with H/W units, mobiles, and tablets, Designing smart of Mini Project	or, using libraries ramming with Narious sensors, ICO	8 hours , arithmetic lode MCU, Os, etc. with 8 hours 6LoWPAN, 8 hours automation,

CO3	Execute and verify programs with the help of Arduino, Node MCU, and Raspberry Pi.	K ₃
CO4	Illustrate various applications of IoT protocols.	K 2,
CO5	Analyze applications like Smart metering systems, Smart streetlights, home automation, and smart city applications	K ₄
Text books:		
"The Interne	t of Things", by Michael Miller, 1st Edition March 2015	
"INTERNET	"INTERNET OF THINGS", McGraw-Hill, 2nd Edition, May 2022	
Reference B	ooks:	
"Programmin	"Programming arduino next steps" by Mc Graw-Hill Education, 2nd Edition, 2018	
"Internet of VPT, 2015.	"Internet of Things (A Hands-on-Approach)" by Vijay Madisetti and Arshdeep Bahga, 1stEdition VPT, 2015.	
NPTEL/ Yo	utube/ Faculty Video Link:	
UNIT 1	https://www.youtube.com/watch?v=7iWriXyI2cE&t=2s	
UNIT 2	https://www.youtube.com/watch?v=FRxRT0DjE7A	
UNIT 3	https://www.youtube.com/watch?v=qtkKa0Dsv30	
UNIT 4	https://www.youtube.com/watch?v=bIbfkOPhJL4	

	Master of Computer Applications (Integrated) Fourth Year		
Course	AMICA0711	LTP	Credits
Code			Cicaio
Course Title	Deep Learning	300	3
•	ectives: To be able to learn unsupervised techniques and in accuracy and outcomes of various datasets with more reliable	-	
Pre-requisites	s: Python, Basic Modeling Concepts.		
	Course Contents / Syllabus		0.1
UNIT-I	Introduction		8 hours
Artificial Neu activation fund recurrent netw Perceptron's,	vement and Performance: Curse of Dimensionality, Bias and dunderfitting, Regression - MAE, MSE, RMSE, R Squared, Adjustation - Precision, Recall, F1, Other topics, K-Fold Cross valieter Tuning Introduction – Grid search, random search, Introduction aral Network: Neuron, Nerve structure and synapse, Artificial Nettions, Neural network architecture: Single layer and Multilayer feetorks. Various learning techniques; Perception and Convergence of Multilayer perceptron, Gradient descent and the Delta rule, Neuropagation Algorithm.	n to Deep euron and ed forwar rule, Heb	Learning. d its model, d networks, b Learning.
	Backpropagation Algorithm.		0 h arrag
UNIT-II	Convolutional Neural Network		8 hours
net, Explore t convolutional tuning CNN,	ion, Convolutions (CNN), Introduction to CNN, Train a simple of the design space for convolutional nets, Pooling layer motivation layered application, Understanding and visualizing a CNN, Transf Image classification, Text classification, Image classification a ing NN architectures.	n in CNN fer learni	N, Design ang and fine-
UNIT-III	Detection & Recognition		8 hours
	dge Detection, Stride Convolutions, Networks in Networks an	d 1x1Cc	nvolutions,
	work Motivation, Object Detection, YOLO Algorithm Recurrent Neural Networks		0 houng
UNIT-IV		.• -	8 hours
(BTT), Differ sequences, Va	dels, Recurrent Neural Network Model, Notation, Back-propagent types of RNNs, Language model and sequence generation ishing gradients with RNNs, Gated Recurrent Unit (GRU), Long strectional RNN, Deep RNNs.	on, Samp	oling novel
UNIT-V	Auto Encoders In Deep Learning		8 hours
	s and unsupervised learning, Stacked auto-encoders and semi- n - Dropout and Batch normalization.	supervise	ed learning,
Course outco	me: After completion of this course students will be able to		
CO1	Analyze ANN model and understand the ways of accuracy measurement.		K4
CO2	Develop a convolutional neural network for multi-class classificatimages	ation in	K5

CO3	Apply Deep Learning algorithm to detect and recognize an object.	К3
CO4	Apply RNNs to Time Series Forecasting, NLP, Text and Image Classification;	K4
CO5	Apply Lower-dimensional representation over higher-dimensional data for dimensionality reduction and capture the important features of an object	К3
Text books:		
	nental Of Neural Network And Deep Learning, by Dr. Sushma Jaiswal 1st edition (25 September 2022)	and Dr. A.
	Networks and Learning Machines 3e, Simon Haykin, 3rd Edition, 2016	
	earning with Python, by François Chollet, First Edition, December 2017	
Reference Bo		
	to Deep Learning, by Aston Zhang, Zachary C. Lipton, Mu Li, and Alexando	er J. Smola,
	mber 2023	
	al Intelligence: A Modern Approach, by Russell, S. and Norvig, 3rd edition,	, December
2009	4-1/F	
	tube/ Faculty Video Link:	
UNIT 1	(371) Lec-1 Introduction to Artificial Neural Networks - YouTube	
	(3) Deep Learning(CS7015): Lec 8.1 Bias and Variance - YouTube (3) Mod 10 Lea 20 Assessing Learnt classifiers: Cross Validation. YouTube	Fuha
	(3) Mod-10 Lec-39 Assessing Learnt classifiers; Cross Validation; - You (3) Lec-1 Introduction to Artificial Neural Networks - YouTube	<u>r ube</u>
	(3) Lec-2 Artificial Neuron Model and Linear Regression - YouTube(3) E	Evaluation
	and Cross-Validation - YouTube	<u>zvaruation</u>
UNIT 2	(3) Lecture 1 Introduction to Convolutional Neural Networks for Visual	
	Recognition -	
	YouTube (2) Leature 2 Image Classification VoyTube	
	(3) Lecture 2 Image Classification - YouTube (3) Lecture 3 Loss Functions and Optimization - YouTube	
	(3) Hyperparameter optimization - YouTube(3) Deep Learning(CS7015):	Lac 11 3
	Convolutional Neural Networks - YouTube	<u>Ltt 11.5</u>
UNIT 3	(3) C4W3L09 YOLO Algorithm - YouTube	
	(3) Edge Detection - YouTube(3) Neural Networks - Networks in Network	ks and
	1x1 Convolutions - YouTube	
UNIT 4	(3) Backpropagation in CNNs - YouTube	
	(3) Deep RNNs and Bi- RNNs - YouTube	
	(3) Deep Learning(CS7015): Lec 13.4 The problem of Exploding and Van	<u>nishing</u>
	Gradients -	
	YouTube(3) Deep Learning(CS7015): Lec 14.2 Long Short Term Memor	y(LSTM)
	and Gated Recurrent Units(GRUs) - YouTube	
UNIT 5	(3) Deep Learning(CS7015): Lec 7.1 Introduction to Autoncoders - YouT	`uhe
	(3) Deep Learning(CS7015): Lec 9.5 Batch Normalization - YouTube	400
	100 Touristics (Control of the Control of the Contr	

(3) Deep Learning(CS7015): Lec 7.3 Regularization in autoencoders (Motivation) - YouTube

	Master of Computer Applications (Integrated)		
	Fourth Year		
Course	AMICA0712	LTP	Credits
Code			
Course Title	Advance concepts of Analytics	300	3

Course Objectives: To help students understand digital marketing practices, inclination of digital consumers and role of content marketing. To provide understanding of the concept of E-commerce and developing marketing strategies in the virtual world to impart learning on various digital channels and how to acquire and engage consumers online. To provide insights on building organizational competency by way of digital marketing practices and cost considerations. To develop understanding of the latest digital practices for marketing and promotion.

Pre-requisites: Creative thinking which is being used in your business areas.

Course Contents / Syllabus

UNIT-I Process Data from Dirty to Clean

8 hours

Introduction to focus on integrity, why data integrity is important, balancing objectives with data integrity, dealing with insufficient data, the importance of sample size, using statistical power, Determine the best sample size Clean it up! Why data cleaning is important Recognize and remedy dirty data, Data-cleaning tools and techniques, cleaning data from multiple sources, Data cleaning features in spreadsheets, Optimize the data-cleaning process.

UNIT-II Advance Data Cleaning

8 hours

Data Cleaning and Pre-Processing, Exploring raw data, Missing values, Noisy Data, Data Integration-The Entity Identification Problem, Redundancy and Correlation Analysis, Tuple Duplication, Detection and Resolution of Data Value Conflicts.

UNIT-III Share Data through the Art of Visualization

8 hours

Communicating your data insights, Introduction to communicating your data insights, understand data visualization: Why data visualization matters, Connecting images with data, A recipe for a powerful visualization, Dynamic visualizations, Design data visualizations: Elements of art, Data visualization impact, Design thinking and visualizations

UNIT-IV Introduction to PowerBI

8 hours

Working with data – Importing from flat files, excel files, other Sources, Data Sources in Power BI Desktop, Loading Data in Power BI Desktop, Views in Power BI Desktop, Query Editor in Power BI, Transform, Clean, Shape, and Model Data Manage Data Relationship, editing a Relationship, Cross Filter Direction, Saving Work file Measures. Data Analysis Expressions – Introduction to Power Query – Introduction to Power View – Power View visualizations – Power View filtering options –Introduction to Power Map – Preparing geospatial data – Publish from Power BI desktop – Publish Dashboard to Web.

UNIT-V Introduction to Big Data

8 hours

Evolution – Data as Economy - What is Big Data – Sources of Big Data. – Big Data Myths - Characteristics of Big Data 6Vs – Big Data Use cases - Big data- Challenges of Conventional

Systems -- Data Processing Models - Limitation of Conventional Data Processing Approaches -Data Discovery-Traditional Approach, Big Data Technology: Big Data Exploration - Data Augmentation – Operational Analysis – 360 View of Customers – Security and Intelligence – Data Analytics - Classification - Descriptive - Diagnostic - Predictive - Prescriptive - Augmented -**Pervasive Analytics**

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

CO1	Discuss how to check for data integrity. Discover data cleaning	K2
	techniques using spreadsheets.	
CO2	Develop basic SQL queries for use on databases. Apply basic SQL	K3
COZ	functions for cleaning and transforming data.	
CO3	Examine the importance of data visualization. Learn how to form a	K1
	compelling narrative through data stories.	
	Explain an understanding of how to use Tableau to create dashboards	K2
CO4	and dashboard filters, discover how to use Tableau to create effective	
CO4	visualizations. Explore the principles and practices involved with	
	effective presentations.	
CO5	Discuss Big Data Characteristics What, why, When, Limitation of	K2
	traditional approaches and models.	K2
Text books:		

- 1. "Digital Marketing", Oxford University Press India, by Vandana, Ahuja November 2015
- 2. "Strategic Digital Marketing: Top Digital Experts", by Eric Greenberg, and Kates, Alexander ,1st Edition 2013

Reference Books:

1. "E, Commerce: Strategy, Technologies and Applications", by David Whitely ,McGraw Hill Education.1st July 2017

NPTEL/ Youtube/ Faculty Video Link:

	outlier I welley 1 laco million
UNIT 1	https://www.youtube.com/watch?v=9gfER4p1jXM&list=PLLqEsfz6HOalezPFBfib MfoewWICkigHk&index=3
TINITE	
UNIT 2	https://www.youtube.com/watch?v=8LgR42WCR10&list=PLLqEsfz6HOalezPFBfib
	MfoewWICkigHk&index=5
UNIT 3	https://www.youtube.com/watch?v=SUXOFrhWsAQ&list=PLLqEsfz6HOalezPFBfi
	bMfoewWICkigHk&index=6
UNIT 4	https://www.youtube.com/watch?v=AZlpYHup1Cw&list=PLLqEsfz6HOalezPFBfib
	MfoewWICkigHk&index=11
UNIT 5	https://www.youtube.com/watch?v=XaHFNhHfXwQ&list=PLLqEsfz6HOalezPFBfi
	bMfoewWICkigHk&index=12

	Master of Computer Applications (Integrated)		
	Fourth Year		
Course	AMICA0713	LTP	Credits
Code			
Course Title	CRM Advance Administration	300	3
-	etives: Understand the importance of Security in Database Learn thons. Familiarize with concepts of maintaining data in cloud. Genagement.	_	•
	Fundamental Knowledge of CRM and Problem-Solving Skills.		
Tre requisite	Course Contents / Syllabus		
UNIT-I	Security and Access		8 hours
	nsaction Security, Session-Bases Permission Sets and Security m objects: quick look.	, Compar	ny-wide org
UNIT-II	Objects and Applications		8 hours
Lightning Excustomization	perience Rollout, Lightning Experience features Lightning K	nowledge	setup and
UNIT-III	Auditing and Monitoring		8 hours
	ring, Event Monitoring Analytics App, Leads & opportunities for es & Contracts, Territory management basics.	lightning	experience,
UNIT-IV	Cloud Applications		8 hours
Advanced Ter	ritory Management, Path & workspaces, Web chat basics, Omni	channel f	or lightning
experience ide	entity for customers, External services big object Basics		
UNIT-V	Data and Analytics Management		8 hours
	ifecycle and Development Models, change set Development		Change set
	nodel, Advance Formula, Apex Triggers, Process Automation Sp	pecialist	
Course outco	me: After completion of this course students will be able to		
CO 1	Describe the importance of Security in Database.		K1
CO 2	Apply the concepts of Objects and Applications.		К3
CO 3	Describe the concepts of Auditing.		K1
CO 4	Explain the concepts of maintaining data in cloud.		K2
CO 5	Discuss the knowledge of Data Analytics & Management.		K2
Text books:	<i>y</i>		_
1. "Salesfo	orce: A quick Study laminated Reference Guide", by Christopl	ner Mathe	ew Spencer,
	by Amazon (Online)		_
Reference Bo	orce Platform Developer", by Vandevelde Jain ,Edition Ist 2018		
		<u> </u>	
i. Learni	ng Salesforce Development", by Paul Battisson, E-book (Online)	

NPTEL/ Yo	NPTEL/ YouTube/ Faculty Video Link:	
UNIT 1	https://www.youtube.com/watch?v=Kn192OdHGKg	
UNIT 2	https://www.youtube.com/watch?v=al60A0C2nAg	
UNIT 3	https://www.youtube.com/watch?v=g1R_QJSoq-Q	
UNIT 4	https://www.youtube.com/watch?v=1oPiBgMcwZw	
UNIT 5	https://www.youtube.com/watch?v=bllHYNGiJC4	

	Master of Computer Applications (Integrated)	
Course	Fourth Year AMICA0715	LTP	Credits
	AWICAU/15	LIP	Credits
Code			
Course Title	Big Data Analytics	300	3
	ctives: Understand Big Data concepts, tools, processing, and ing, storage, scalability, ethical issues, and real-world application	-	isualization,
Pre-requisite	Basic Knowledge of Linux & programming language.		
	Course Contents / Syllabus		T
UNIT-I	Fundamental of Big Data		8 hours
characteristics compliance, a conventional	ortance & applications of Big Data, drivers for Big Data, Big 5, 5 Vs of Big Data, Big Data technology components, Features uditing and protection, Big Data privacy and ethics, Big Data A systems, intelligent data analysis, nature of data, analytic process modern data analytic tools.	of Big Dat nalytics, Cl	ta— security, hallenges of
UNIT-II	Hadoop		8 hours
Hadoop pipes	le System, data format, analyze data with Hadoop, scaling o Hadoop Echo System.	, 1	
UNIT-III	Map-Reduce		8 hours
Reduce featur tests, anatomy	Basics of Map-Reduce , Map-Reduce framework , working es, developing a Map Reduce application, unit tests with MR u of a Map Reduce job run, failures, job scheduling, shuffle ar Reduce, input & output formats, Real-world Map Reduce. Hadoop Distributed File System(HDFS)	ınit, test da	ta and local
benefits and of HDFS store, r Hadoop file s Hadoop I/O: Of Hadoop Environment	ributed File System (HDFS): HDFS concepts, HDFS conceptable allenges of HDFS, file sizes, block sizes and block abstraction and write files, data replication, Java interfaces to HDFS, consistent interfaces, data flow, data ingest with Flume and Scottompression, serialization, Avro and file-based data structures. Ironment: Setting up a Hadoop cluster, Hadoop configuration and installation, security in Hadoop, administering Hadoop, Hadoop benchmarks, Hadoop in the cloud.	on in HDFS command line cop, Hadoo	S, how does ne interface, op archives, pecification,
UNIT-V	Hadoop and its Components		8 hours
Hadaan Faa	System and YARN: Hadoop ecosystem components, schedu	lers fair a	l nd capacity

MRv1 in YARN.

Pig: Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators,

Hive - Apache Hive architecture and installation, Hive shell, Hive services, Hive.

metastore, comparison with traditional databases, HiveQL, tables, querying data and user defined functions, sorting and aggregating, Map Reduce scripts, joins & subqueries.

HBase – Hbase concepts, clients, example, Hbase vs RDBMS, advanced usage, schema design, advance indexing, Zookeeper – how it helps in monitoring a cluster. IBM Big Data strategy.

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

CO1	Illustrate knowledge of Big Data Analytics and its applications in business.	K2
CO2	Apply the functions and components of Hadoop.	К3
CO3	Apply process of developing Map Reduce based distributed processing applications.	К3
CO4	Describe the process of developing Map Reduce based distributed processing applications. Access and Process Data on Distributed File System	К2
CO5	Analyze the process of developing applications using HBASE, Hive, Pig etc.	K4
Text books:		

1. "Hadoop: The Definitive Guide", by Tom White ,3rd edition, May 2012

- 2. "Learning Spark: Lightning-Fast Big Data Analysis", by Holden Karau, Andy Konwinski, Patrick Wendell, and Matei Zaharia ,February 2015
- 3. "Data Science for Business", by Foster Provost and Tom Fawcett, 1st edition, July 2013

Reference Books:

- 1. "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", by Michael Minelli, Michelle Chambers, and Ambiga Dhiraj Wiley, January 2013
- 2. "Big Data Analytics with Spark", by Mohammed Guller, 1st ed. edition,25 December 2015
- 3. "Spark: The Definitive Guide", by Bill Chambers, Matei Zaharia, January 2017
- 4. "Data Mining: Concepts and Techniques", by Jiawei Han, Micheline Kamber ,3rd edition, June 2011

NPTEL/ YouTube/ Faculty Video Link:

UNIT 1	https://www.youtube.com/watch?v=rvJgArru8dI
UNIT 2	https://www.youtube.com/watch?v=mNP44rZYiAU
UNIT 3	https://www.youtube.com/watch?v=GJYEsEEfjvk
UNIT 4	https://www.youtube.com/watch?v=S0i4NX1vlCU
UNIT 5	https://www.youtube.com/watch?v=_Mh1yBJ8188

Master of Computer Applications (Integrated)			
Fourth Year			
Course	AMICA0714	LTP	Credits
Code			
Course Title	Advance Concepts of Optimization	300	3
Course Ohio	etizare. To introduce students how seems engine entimization a	nd again1	madia harra

Course Objectives: To introduce students how search engine optimization and social media have used the way businesses sell to consumers. To help students to recognize how marketers use the Google SEO to influence purchase and sell decisions on digital platforms using SEO content and tools. To help students to appreciate the benefits of integrating Google SEO Fundamentals with the advantages of sell and purchase marketing strategies. To Identify the benefits of Optimize a website for Google search to a business of using social media to engage an audience. To Build, manage, and sustain an active Advance Content and social tactics to optimize SEO.

Pre-requisite: Basic Marketing Concepts and Knowledge of Computer.

Course Contents / Syllabus

UNIT-I	Introduction to Search Engine Optimization	8 hours
Introduction 7	To SEO, Technical SEO, Keyword Research Process, Content Planning an	d Creation,
On-Page SEO	, Off-page SEO, Avoid Negative SEO, Local SEO	

UNIT-II Introduction to Google SEO

8 hours

Introduction to Google SEO: Introduction to Google SEO, SEO as a Career, How Search Engines Work, Evolution of SEO, Current SEO Best Practices: Current SEO Best Practices, Introduction to Search Engine Algorithms, SEO of Today, Tomorrow and Beyond: Featured Snippets and Rich Snippets, BERT, Evolution of Keyword Optimization, Your Audience and Building Personas: Your Audience and Building Personas, Persona Development

UNIT-III Google SEO Fundamentals

8 hours

Getting Started and Introduction to On-page SEO: Introduction to On-page SEO, Key Areas of SEO Analyzing a Website Using a Web Crawler, Introduction to Off-page SEO: Introduction to Off-page SEO, Off-site SEO Elements, Introduction to Technical SEO: Introduction to Technical SEO, Laying the Structural Foundation With Technical SEO, Keyword Theory & Research: Keyword Theory & Research, Introduction, Choosing the Right Keywords

UNIT-IV Optimizing a website for Google Search

8 hours

Applying Keyword Research Introduction, How to Perform a Competitive Keyword Analysis, Analyzing Your Competition, Advanced SEO Strategies: Advanced On-Page SEO, Benefits of a Competitive Content Analysis, Dissecting the Competitive Content Analysis, Mobile/App SEO and Metrics & KPIs: Mobile/App SEO, External App Optimization, App Store Optimization, Creating an SEO Campaign: Creating an SEO Campaign, Scoping an SEO Project, Importance of Achieving Quick Wins, Developing SMART Project Goals.

UNIT-V	Advance Content and social tactics to optimize SEO
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8 hours

Influence Man	eting: Social Media Marketing, Social Media Links & SEO, Influence rketing, Building the Relationship, Advanced: Targeted Advertising Crea	
	: Creating World Class Content, Market Data on Content Marketing.	
Course outco	ome: After completion of this course students will be able to	
CO1	Discuss the important concepts of search engine optimization.	K2
CO2	Describe to Recognize how marketers use Google SEO to influence purchase and sell decisions on digital platforms using SEO content and tools	K1
CO3	Identify the benefits of Google SEO Fundamentals with the advantages of sell and purchase marketing strategies.	K 1
CO4	Discuss the benefits of Optimize a website for Google search to a business of using social media to engage an audience.	K2
CO5	Implement the use of an Advance Content and social tactics to optimize SEO.	К3
Text books:		
	teting for Dummies", Publisher: John Wiley & Sons, Inc, March 2017	
"Youtility: WI 2013	hy Smart Marketing Is About Help Not Hype ",Jay Baer, Publisher: Gildan N	Media, LLC
Reference Bo	ooks:	
	t Marketing", by Joe Pulizzi ,Publication: McGraw Hill Education,2013	
NPTEL/ You	Tube/ Faculty Video Link:	
UNIT 1	https://www.youtube.com/watch?v=L_11kpq82bM&list=PLNfnAKZ4Zsa 0dJeQ-RnsaqpoT&index=2	ur3Jwb59D
UNIT 2	https://www.youtube.com/watch?v=eJ53AuVRMXc&list=PLNfnAKZ4ZsD0dJeQ-RnsaqpoT&index=8	sar3Jwb59
UNIT 3	https://www.youtube.com/watch?v=wbWOmTUeyJc&list=PLNfnAKZ4ZD0dJeQ-RnsaqpoT&index=9	sar3Jwb59
UNIT 4	https://www.youtube.com/watch?v=zlVDys3GtMw&list=PLNfnAKZ4ZsaD0dJeQ-RnsaqpoT&index=18	ar3Jwb59
UNIT 5	https://www.youtube.com/watch?v=jkIvYoHCs80&list=PLNfnAKZ4ZsardJeQ-RnsaqpoT&index=32	3Jwb59D0

	Master of Computer Applications (Integrated)	
Course	Fourth Year AMICA0716 L T	P Credits
Code		
Course Title	CRM Development 3 0	3
•	ctives: Understanding CRM concepts and strategies, mastering CRM tecsiness processes to improve customer interactions and achieve business	_
Pre-requisite areas.	: Creative thinking and which is being used by the creative talent in you	r business
	Course Contents / Syllabus	
UNIT-I	Salesforce Fundamentals	8 hours
Master Sales	ks of Salesforce, Data model & Security model, Business process autor Cloud and Service Cloud, Salesforce platform, Salesforce terminology, and cloud, Salesforce metadata and APIs, Salesforce architecture.	force platform,
UN11-11	Salesforce Data Modeling	8 hours
	ta model, IDIC model QIC model, CRM value chain model, Payne & Frojects, Relationship types, Formula fields and roll-up summary fields, a	
and CRM obj	jects, Relationship types, Formula fields and roll-up summary fields,	
and CRM objecting data UNIT-III Formulas and	jects, Relationship types, Formula fields and roll-up summary fields, a Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut	8 hours
unit-iii Formulas and Flow, Apex E Order of Execution	Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut Basics, Apex Triggers, Database & .NET Basics, Search Solution Basic cution, Platform Events Basics, Process Automation Specialist, Apex S	8 hours ion, Salesforce s, Triggers and
unit-iii Formulas and Flow, Apex E Order of Execution	Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut Basics, Apex Triggers, Database & .NET Basics, Search Solution Basic	8 hours ion, Salesforce s, Triggers and
and CRM objections and CRM objections data and CRM objections data and Flow, Apex B Order of Executive of Exe	Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut Basics, Apex Triggers, Database & .NET Basics, Search Solution Basic cution, Platform Events Basics, Process Automation Specialist, Apex Services, Apex Metadata API. User Interface elopment, Apex code development Visualforce development, Sales erformance, Technique for optimizing performance Lightning Web Company of the April 1988 of the Apri	8 hours ion, Salesforce s, Triggers and pecialist, Apex 8 hours es dashboard,
and CRM objections and CRM objections data and CRM objections data and Flow, Apex B Order of Executive of Exe	Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut Basics, Apex Triggers, Database & .NET Basics, Search Solution Basic cution, Platform Events Basics, Process Automation Specialist, Apex Services, Apex Metadata API. User Interface elopment, Apex code development Visualforce development, Salestone Salestone Services, Apex Metadata API.	8 hours ion, Salesforce s, Triggers and pecialist, Apex 8 hours es dashboard,
and CRM objection data UNIT-III Formulas and Flow, Apex Border of Executive integration Set UNIT-IV General development of Executive integration of Executive integratio	Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut Basics, Apex Triggers, Database & .NET Basics, Search Solution Basic cution, Platform Events Basics, Process Automation Specialist, Apex Services, Apex Metadata API. User Interface elopment, Apex code development Visualforce development, Salerformance, Technique for optimizing performance Lightning Web Comp Builders Development.	8 hours ion, Salesforce s, Triggers and pecialist, Apex 8 hours es dashboard, ponents Basics 8 hours ion, Test Data
and CRM objection data UNIT-III Formulas and Flow, Apex Border of Executive integration Set UNIT-IV General development of Executive integration of Executive integratio	Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut Basics, Apex Triggers, Database & .NET Basics, Search Solution Basic Cution, Platform Events Basics, Process Automation Specialist, Apex Services, Apex Metadata API. User Interface elopment, Apex code development Visualforce development, Salerformance, Technique for optimizing performance Lightning Web Comp Builders Development. Testing, Debugging, and Deployment g, Apex code Test Method, Custom controller and Controller Extensionsole Basics, Asynchronous Apex, Debugging Tool and Technique fecycle and development model, Change Set Development model.	8 hours ion, Salesforce s, Triggers and pecialist, Apex 8 hours es dashboard, ponents Basics 8 hours ion, Test Data
unit-iii Formulas and Flow, Apex E Order of Executing data Unit-iii Formulas and Flow, Apex E Order of Executing Apex Testing Apex Testing Developer Control Application lice Course outco	Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut Basics, Apex Triggers, Database & .NET Basics, Search Solution Basic cution, Platform Events Basics, Process Automation Specialist, Apex Services, Apex Metadata API. User Interface elopment, Apex code development Visualforce development, Salerformance, Technique for optimizing performance Lightning Web Comp Builders Development. Testing, Debugging, and Deployment g, Apex code Test Method, Custom controller and Controller Extensionsole Basics, Asynchronous Apex, Debugging Tool and Technique fecycle and development model, Change Set Development model. Implement the working concept of variables.	8 hours ion, Salesforce s, Triggers and pecialist, Apex 8 hours es dashboard, ponents Basics 8 hours ion, Test Data s, Debug logs, K2
unit-iii Formulas and Flow, Apex E Order of Executing data Unit-iii Formulas and Flow, Apex E Order of Executing and Execution Set Unit-iv General development of Unit-v Apex Testing Developer Contact Application line Course outcome.	Logic and Process Automation Validations, Formula Operators and Functions, Screen Flow Distribut Basics, Apex Triggers, Database & .NET Basics, Search Solution Basic Cution, Platform Events Basics, Process Automation Specialist, Apex Services, Apex Metadata API. User Interface elopment, Apex code development Visualforce development, Salerformance, Technique for optimizing performance Lightning Web Comp Builders Development. Testing, Debugging, and Deployment g, Apex code Test Method, Custom controller and Controller Extensionsole Basics, Asynchronous Apex, Debugging Tool and Technique fecycle and development model, Change Set Development model. Ome: After completion of this course students will be able to	8 hours ion, Salesforce s, Triggers and pecialist, Apex 8 hours es dashboard, ponents Basics 8 hours ion, Test Data s, Debug logs,

CO5	Implement concepts of APEX Integration.	K2	
Text books:			
1. "Custor	ner Relationship Management: Concepts and Cases (Second Edition)", by A	Alok Kumar	
Rai, PH	Rai, PHI Learning, 2018		
2. "Custor	ner Relationship Management (Wiley Dreamtech)", by Bhasin ,2019		
Reference Bo	oks:		
1. "Salesfo	orce: A quick Study" Christopher Mathew Spencer, eBook by Amazon(Or	nline)	
2. "Salesfo	orce Platform Developer, by Vandevelde Jain Edition Ist 2018		
NPTEL/ You	tube/ Faculty Video Link:		
UNIT 1	www. Trailhead.salesforce.com		
UNIT 2	www.mindmajix.com/salesforce-tutorial		
UNIT 3	www.youtube.com/watch?v=7K42geizQCI		
UNIT 4	https://onlinecourses.nptel.ac.in/noc22_mg93/preview		
UNIT 5	https://onlinecourses.nptel.ac.in/noc22_cs61/preview		

Master of Computer Applications (Integrated) Fourth Year			
Course Code	BMICA0751	LTP	Credit
Course Title	Business Intelligence & Data Visualization – Lab	0 0 4	2
List of Exper	iments		
Sr. No.	Name of Experiment		CO
1	Introduction to various Data Visualization tools		CO1
2	Basic Visualization in Python		CO1
3	Data visualization plots- Line, Area & Histogram		CO2
4	Data visualization plots- Bar & Pie charts		CO2
5	Data visualization plots- Box & Scatter plots		CO3
6	Introduction to Tableau and Installation		CO3
7	Connecting to Data and preparing data for visualization in	Tableau	CO4
8	Data Aggregation and Statistical functions in Tableau		CO4
9	Basic Dashboards in Tableau		CO4
10	Data Visualizations in Tableau		CO5
11	Components and the flow of work in Power BI		CO5
12	Power BI Desktop Interface, Filters in Power BI, Formatt dashboards	ing	CO5
Lab Course (Dutcome: After the completions of this course students will	be able to	
CO1	Describe the main concepts of data visualization for intelligence and decision making.	or business	K2
CO2	Analyze reports, charts, graphs, figures, maps and derivers from them	ve meaning	K4
CO3	Asses and work with different plotting libraries		K4
CO4	Apply data visuals to convey trends in data over time using	g tableau	К3
CO5	Design effective data visuals to solve workplace problems		K6

Master of Computer Applications (Integrated)
Fourth Year

	Fourth Year		
Course Code	BMICA0752	LTP	Credit
Course Title	Cryptography and Network Security Lab	0 0 4	2
List of Exper	iments		
Sr. No.	Name of Experiments		CO
1	Write a program to encrypt and decrypt text using the Caes	ar cipher.	CO1
2	Implement Vigenère cipher for encryption and decryption.		CO1
3	Implement columnar transposition cipher.		CO1
4	Write a program to perform frequency analysis on a cipher	text.	CO1
5	Implement Data Encryption Standard (DES) for encryption decryption.	and	CO2
6	Implement AES algorithm for encrypting and decrypting m	nessages.	CO2
7	Implement Triple Data Encryption Standard (DES 3) for er and decryption.	ncryption	CO2
8	Implement Diffie-Hellman Key Exchange between two use	ers.	CO2
9	Write a program for ECC key generation and encryption.		CO3
10	Implement SHA-256 Hash Function to compute the hash of message.	f a given	CO3
11	Implement signing and verification of messages by using D Signature using RSA	Digital	CO3
12	Implement Hash-based Message Authentication Code		CO4
13	Write a program to perform linear cryptanalysis on DES.		CO4
14	Implement a program to split and reconstruct a secret using scheme.	Shamir's	CO4
15	Write a program to encrypt and decrypt using ChaCha20.		CO5
16	Simulate a TLS handshake using Python's SSL library.		CO5
17	Implement a simple blockchain hash function using SHA-2	256.	CO5
18	Write a program to generate Bitcoin addresses from private		CO5
Lab Course (Dutcome: After the completions of this course students will	be able to	
CO 1			К3
CO 2	Analyze symmetric and asymmetric encryption technique security.	es for data	K 4
CO 3	Implement secure key exchange protocols		К3
CO 4	1 0 1		K5
CO5	Experiment modern security mechanisms like blockchain		K4

Master of Computer Applications (Integrated) Fourth Year			
Course Code	AMICA0753	LTP	Credit
Course Title	Internet of Things Lab	0 0 4	2
List of Exper	iments	<u> </u>	
Sr. No.	Name of Experiment		CO
1	Installation of Arduino IDE and introduction to tools, assertibraries.	nbly, and	CO2
2	Getting Programming board Info and configuring boot load using Arduino IDE	ler settings	CO2
3	Study and design IoT reference architecture for IoT-based like Smart home	applications	CO2
4	Study Hardware Architecture and Pin Out of Arduino UNO Compare Arduino Uno Arduino Nano and Arduino Mega. Identification of their use case according to a given scenario		CO3
5	Study Hardware Architecture and Pin Out of Node MCU a ESP8266. Identification of their use case according to the g snapshot.	nd	CO3
6	a. Study Pin out Architecture of Sensors and actuators b. DHT 11 Sensor c. MQ 135 Sensor d. MQ 7 Sensor e. MQ 3 Sensor f. Ultrasonic Sensor HC-04 g. Rain Sensor h. Soil moisture Sensor i. PIR Sensor j. LDR Sensor k. Line Sensor l. Colour Sensor m. Servo Motor n. Relay		CO3
7	 a. Working with structures using Arduino IDE b. Working with Variables using Arduino IDE c. Working with Flow control using Arduino IDE d. Working with Digital i/o using Arduino IDE e. Working with Analog i/o using Arduino IDE f. Working with the Time function using Arduino IDE g. Working with Math functions using Arduino IDE h. Working with Random functions using Arduino IDE i. Working with Serial communication using Arduino IDE 		CO3

	j. Working with loops and control statements using Arduino IDE	
	k. Working with PinMode function using Arduino IDE	
	1. Working with analog Read, analog Write, digital Read, digital Write	
	using Arduino IDE, Blinking LED	
	Program using Arduino Uno	
8	Write a program using Arduino Uno to generate a random number	CO3
	between 0 to 25. Use 4 LEDs (Red, Green, Blue, and Yellow) and	
	design LED patterns as	
	(i) if the random number is less than 5 then only the Red LED should	
	glow.	
	(ii) if the random number is between 5-10 then only Blue LED should	
	glow.	
	(iii)if the random number is between 11-20 then only Yellow LED	
	should glow.	
	(iv) if the random number is greater than 20 then only Green LED	
	should glow.	
	"Write a program using Arduino uno for addition of digits of a user-	
	defined number. Example: number is 257 then output should be 14."	
	Write a program to take LED color as input from the user and glow	
	that LED using Arduino Uno.	
9	a. Interfacing of DHT 11 Sensor with Arduino Uno. Implement an	CO3
	LED mechanism for notifying rise in temperature.	
	b. Interfacing of MQ 135/MQ7 Sensor with Arduino Uno. Implement	
	alarm mechanism for notifying rise in amount of hazardous gases in the	
	air.	
	c. Interfacing of MQ 3 Sensor with Arduino Uno. Implement alarm	
1.0	mechanism for checking amount of alcohol in the air	
10	a. Interfacing of Ultrasonic Sensor HC-04 with Arduino Uno.	
	b. Interfacing of Rain Sensor with Arduino Uno. Implement a buzzer	
	mechanism as the sensor identifies rain.	
	c. Interfacing of Soil Moisture Sensor with Arduino Uno.	
	d. Interfacing of PIR Sensor with Arduino Uno.	
	e. Interfacing of LDR Sensor with Arduino Uno.	
	f. Interfacing of LCD with Arduino Uno	
	g. Interfacing of I2C LCD with Arduino Uno	
11	a. Interfacing Bluetooth Module with Arduino Uno	CO3
	b. Connecting Node MCU with Wi-Fi hotspots using Arduino IDE	
	c. Interfacing of DHT 11 Sensor with Node MCU	
	d. Interfacing of MQ 135 Sensor with Node MCU	
	e. Interfacing of MQ 7 Sensor with Node MCU	
	f. Interfacing of MQ 3 Sensor with Node MCU	
12	a. Interfacing of Ultrasonic Sensor HC-04 with Node MCU	CO3
	b. Interfacing of Rain Sensor with Node MCU	
L		

	c. Interfacing of Soil moisture Sensor with Node MCU	
	d. Interfacing of PIR Sensor with Node MCU	
	e. Interfacing of LDR Sensor with Node MCU	
13	a. Sending Data to Thingspeak Cloud Server using Node MCU	CO4
	b. Detection of LPG Gas using MQ6 and Node MCU. Notify	
	Thingspeak server that "LPG gas Leakage has been detected".	
14	Controlling LED with Node MCU using Blynk cloud App.	
15	Development of Mini Project Sample Projects: Introduction to IoT	CO5
	Projects.xlsx	
Lab Course	Outcome: After the completions of this course students will be able to	
CO 1	Describe the functionality of computing, sensing, and actuating components of the Internet of Things.	K2
CO 2	Develop IoT applications using Arduino IDE.	K4
CO 3	Design, develop, and deploy real-time mini projects of IoT Applications.	K4
CO 4	Describe the importance of Technology in the life of common men.	K2
CO5	Design and develop real-time IoT-based solutions for societal needs using appropriate hardware and communication protocols.	K5

Master of Computer Applications (Integrated)					
Course	Fourth Year AMICA0754	LTP	Credits		
	111110110154		Cicuits		
Code					
Course Title	Personality Development and Professional Skills	0 0 4	2		
_	Course Objectives: The primary objective of this course is to equip students with the essential personal and professional skills required to excel in the modern workplace				
Pre-requisite	Basic understanding and foundational knowledge of general con	nmunicati	on skills		
•	Course Contents / Syllabus				
UNIT-I	Foundations of Personal Development		8 hours		
(MBTI), StrengthsFinder. Goal Setting: SMART Goals, Personal Development Plans. Time Management: Prioritization, Scheduling, Avoiding Procrastination. Stress Management: Techniques for Managing Stress, Mindfulness, and Relaxation Exercises. Communication Skills Verbal Communication: Public Speaking, Group Discussions, Debating. Non -Verbal Communication: Body Language, Eye Contact, Gestures. Listening Skills: Active Listening, Feedback Techniques. Presentation Skills: Creating Effective Presentations, Using Visual Aids, Storytelling					
UNIT-II	Interpersonal and Professional Skills		8 hours		
Interpersonal Skills, Teamwork: Role of a Team Player, Group Dynamics, Conflict Resolution, Leadership Skills: Leadership Styles, Motivating Team Members, Decision Making. Networking Skills: Building Professional Relationships, Networking Strategies, Use of Social Media, Professional Etiquette, Corporate Etiquette: Professional, Behavior, Office Etiquette, Business Meetings. Email Etiquette: Professional Email Writing, Common Mistakes to Avoid. Telephone Etiquette: Handling Professional Calls, Voicemail Etiquette. Dining Etiquette: Business Dining Rules, Table Manners.					
UNIT-III	Aptitude and Logical Reasoning		8 hours		
Aptitude Skills, Quantitative Aptitude: Basic Mathematics, Data Interpretation. Logical Reasoning: Analytical Puzzles, Logical Deductions. Verbal Ability: Grammar, Vocabulary, Reading Comprehension					
UNIT-IV	Career Readiness and Interview Preparation		8 hours		
Interview Preparation, Resume Writing: Crafting an Effective Resume, Cover Letter Writing.					

Interview Preparation, Resume Writing: Crafting an Effective Resume, Cover Letter Writing. Mock Interviews: HR Round, Technical Round, Stress Interviews. Group Discussions: Techniques to Excel, Common Topics, Role of a Moderator, Personal Interview Tips: Dressing for Success, Answering Common Questions, Handling Unexpected Questions, Soft Skills Development, Creativity and Innovation: Brainstorming Techniques, Creative Problem Solving. Emotional Intelligence: Understanding Emotions, Empathy, Handling Relationships. Adaptability and Flexibility: Coping with Change, Learning Agility. Critical Thinking: Evaluating Information, Problem -Solving Strategies.

UNIT-V	Practical Workplace Skills and Ethics	8 hours		
Digital Literacy and Online Presence, Professional Use of Social Media: LinkedIn Profile				
Optimization, Building an Online Portfolio. Cyber Etiquette: Safe Online Practices, Digital				
_	nagement. Blogging and Content Creation: Writing for the Web, Creatin	_		
Content, World	kplace Skills, Project Management: Basics of Project Management, Too	ols like MS		
Project, Agile	Methodology. Time and Task Management Tools: Using Tools like Tre	ello, Asana,		
and Calendar	Apps. Financial Literacy: Basic Financial Planning, Understanding Sala	ries, Taxes,		
Ethics and Va	alues, Workplace Ethics: Integrity, Accountability, Professional Conduct	. Diversity		
and Inclusion: Understanding Diversity, Promoting Inclusivity, Corporate Social Responsibility (CSR): Understanding CSR, Participating in CSR Activities				
Course outcome: After completion of this course students will be able to				
CO 1	Develop self-awareness, set personal goals, and manage time and stress effectively.	K1, K2		
CO 2	Communicate effectively, work well in teams, and practice professional etiquette in various settings.	K3, K4		
CO 3	Enhance quantitative, logical, and verbal reasoning skills for effective problem-solving and decision-making	K3, K4		
CO 4	Create impactful resumes, perform confidently in interviews and group discussions, and develop critical soft skills	K 6		
CO 5	Apply project management principles, understand financial literacy, and demonstrate ethical behavior and digital professionalism	К3		
Text books:				
1. The 7 H	labits of Highly Effective People, by Stephen R. Covey			
2. A Modern Approach to Verbal & Non-Verbal Reasoning, by Dr. R.S. Aggarwal				
NPTEL/ Youtube/ Faculty Video Link:				
UNIT 1	https://www.youtube.com/watch?v=sO8eGL6SFsA&pp=ygUoU29mdHd	hcmUgVG		
	<u>VzdGluZyBhbmQgQXBwbGljYXRpb25zIGNvdXJzZQ%3D%3D</u>			
UNIT 2	https://www.youtube.com/watch?v=sbW4RThXNL8&pp=ygUoU29mdH	dhcmUgV		
	GVzdGluZyBhbmQgQXBwbGljYXRpb25zIGNvdXJzZQ%3D%3D			
UNIT 3	https://www.youtube.com/watch?v=xOB5ftSEv0c&list=PLrpK1inhO61VDiW_RBhkizmTYyUE0eoAF&pp=iAQB			
UNIT 4	https://youtu.be/zEgVjx851Ws			

Master of Computer Applications (Integrated)					
Fourth Year					
Course	AMICA0801	LTP	Credits		
Code					
Course Title	Augmented & Virtual Reality -3D	310	4		
components of	ectives: The objective of this course is to explain how Unity f a VR app, including tracking, teleporting, interacting with virtual w Unity's AR Foundation supports building AR apps.				
	: A strong foundation in mathematics, programming, and content	creation			
_	Course Contents / Syllabus				
UNIT-I	Introduction to Augmented Reality		8 hours		
between AR	to Augmented Reality, Technology and features of augmented and VR, Challenges with Augmented Reality, Augmented Augmented reality methods.	•			
UNIT-II	Introduction to Virtual Reality		8 hours		
	o Virtual Reality, Technology and features of Virtual reality, di llenges with Virtual Reality, Virtual Reality systems and functio Fundamentals of Unity Game Engine				
and VR, Chalmethods. UNIT-III Exploring Un windows, vari	llenges with Virtual Reality, Virtual Reality systems and function	Project, an	8 hours d Inspector om scratch		
and VR, Chalmethods. UNIT-III Exploring Unwindows, variimporting 3D use in the proj	Fundamentals of Unity Game Engine ity's interface and tools: Scene view, Game view, Hierarchy, Flous tools Transform, Creating and organizing scenes and objects models, textures, audio files, and other resources into Unity, and ject.	Project, an	8 hours d Inspector com scratching them for		
and VR, Chalmethods. UNIT-III Exploring Un windows, variimporting 3D	Fundamentals of Unity Game Engine ity's interface and tools: Scene view, Game view, Hierarchy, Flous tools Transform, Creating and organizing scenes and objects models, textures, audio files, and other resources into Unity, and	Project, an	8 hours d Inspector om scratch		
and VR, Chalmethods. UNIT-III Exploring Unwindows, variimporting 3D use in the projunity UNIT-IV Importance of Challenges of	Fundamentals of Unity Game Engine ity's interface and tools: Scene view, Game view, Hierarchy, Plans tools Transform, Creating and organizing scenes and objects models, textures, audio files, and other resources into Unity, and ject. Introduction to Vuforia f Vuforia in AR development, Basic features of Vuforia, Conference of Vuforia, how to create a Vuforia developer account, Setting	Project, and in Unity frod optimizing	8 hours d Inspector om scratch ng them for 8 hours of Vuforia		
and VR, Chalmethods. UNIT-III Exploring Unwindows, variimporting 3D use in the projunity UNIT-IV Importance of Challenges of	Fundamentals of Unity Game Engine ity's interface and tools: Scene view, Game view, Hierarchy, Flous tools Transform, Creating and organizing scenes and objects models, textures, audio files, and other resources into Unity, and ject. Introduction to Vuforia f Vuforia in AR development, Basic features of Vuforia, Control of the cont	Project, and in Unity frod optimizing	8 hours d Inspector om scratch ng them for 8 hours of Vuforia		
and VR, Chalmethods. UNIT-III Exploring Unwindows, variimporting 3D use in the projunitarion of Challenges of application de UNIT-V Marker-base pose and iden real world exallenges of application de Unitr-V	Fundamentals of Unity Game Engine ity's interface and tools: Scene view, Game view, Hierarchy, Flous tools Transform, Creating and organizing scenes and objects models, textures, audio files, and other resources into Unity, and ject. Introduction to Vuforia f Vuforia in AR development, Basic features of Vuforia, Confe Vuforia, how to create a Vuforia developer account, Setting evelopment used Image Target. Augmented Reality & Virtual Reality Application d approach- Introduction to marker-based tracking, types of matification, visual tracking, Marker-less approach- Localization amples. Advantages and Disadvantages of AR and VR technological contents are contents.	Project, and in Unity free doptimizing in Properts graph varies and based augments of the property of the project, and the project of the project of the project of the project, and the project of	8 hours d Inspector om scratch ng them for 8 hours of Vuforia ria Engine 8 hours		
and VR, Chalmethods. UNIT-III Exploring Unwindows, variimporting 3D use in the projunitarion of Challenges of application de UNIT-V Marker-base pose and idented world exalmed world exalmed in the projunitarion of Challenges of application de UNIT-V	Fundamentals of Unity Game Engine ity's interface and tools: Scene view, Game view, Hierarchy, Flous tools Transform, Creating and organizing scenes and objects models, textures, audio files, and other resources into Unity, and ject. Introduction to Vuforia f Vuforia in AR development, Basic features of Vuforia, Confe Vuforia, how to create a Vuforia developer account, Setting evelopment used Image Target. Augmented Reality & Virtual Reality Application d approach- Introduction to marker-based tracking, types of matification, visual tracking, Marker-less approach- Localization amples. Advantages and Disadvantages of AR and VR technolocation VR.	Project, and in Unity free doptimizing in Properts graph varies and based augments of the property of the project, and the project of the project of the project of the project, and the project of	8 hours d Inspector from scratch ing them for 8 hours of Vuforia ria Engine 8 hours rker camera gmentation althcare and		
and VR, Chalmethods. UNIT-III Exploring Unwindows, variimporting 3D use in the projunitarion defendable of application d	Fundamentals of Unity Game Engine ity's interface and tools: Scene view, Game view, Hierarchy, Flous tools Transform, Creating and organizing scenes and objects models, textures, audio files, and other resources into Unity, and ject. Introduction to Vuforia f Vuforia in AR development, Basic features of Vuforia, Confe Vuforia, how to create a Vuforia developer account, Setting evelopment used Image Target. Augmented Reality & Virtual Reality Application d approach- Introduction to marker-based tracking, types of matification, visual tracking, Marker-less approach- Localization amples. Advantages and Disadvantages of AR and VR technologation VR. me: After completion of this course students will be able to Compare AR and VR experiences	Project, and in Unity free doptimizing in Properts graph varies and based augments of the property of the project, and the project of the project of the project of the project, and the project of	8 hours d Inspector from scratch ing them for 8 hours of Vuforia ria Engine 8 hours rker camera gmentation althcare and		
and VR, Chalmethods. UNIT-III Exploring Unwindows, variimporting 3D use in the projunitarion of Challenges of application de UNIT-V Marker-base pose and idented world exalmed world exalmed in the projunitarion of Challenges of application de UNIT-V	Fundamentals of Unity Game Engine ity's interface and tools: Scene view, Game view, Hierarchy, Flous tools Transform, Creating and organizing scenes and objects models, textures, audio files, and other resources into Unity, and ject. Introduction to Vuforia f Vuforia in AR development, Basic features of Vuforia, Confe Vuforia, how to create a Vuforia developer account, Setting evelopment used Image Target. Augmented Reality & Virtual Reality Application d approach- Introduction to marker-based tracking, types of manufication, visual tracking, Marker-less approach- Localization amples. Advantages and Disadvantages of AR and VR technologication VR. ome: After completion of this course students will be able to	Project, and in Unity free doptimizing in Properts graph varies and based augments of the property of the project, and the project of the project of the project of the project, and the project of	8 hours d Inspector from scratch, ing them for 8 hours of Vuforia, iria Engine, 8 hours rker camera gmentation, althcare and		

CO5	Analyzing real-world examples of marker-based and marker less augmented reality applications	K4			
Text books:					
1. "Practic	1. "Practical Augmented Reality: A Guide to the Technologies, Applications, and Human Factors				
for AR and VR", by Steve Aukstakalnis, Addison-Wesley Professional, September 2016					
2. "Designing Virtual Systems: The Structured Approach", by Gerard Jounghyun Kim, 2005					
3. "Human-Centered Design for Virtual Reality", by Jason Jerald ,September 2015					
Reference Books:					
1. "Fundamentals of Computers", by E. Balagurusamy, 8th Edition, McGraw-Hill Inc, 2021					
2. Augmented Reality for Developers: Build practical augmented reality applications with Unity,					
by Jonathan Linowes, Krystian Babilinski, 9th October 2017.					
NPTEL/ YouTube/ Faculty Video Link:					
UNIT 1	https://youtu.be/Phdlo2Hmkqk?si=kv42bMNK0T0-VCeO				
UNIT 2	https://youtu.be/FyHrIW2FdTg?si=V9364YfLU94WPcG3				
UNIT 3	https://youtu.be/gVDdOucyZrk?si=hgTUp1F-OOLfLXAG				
UNIT 4	https://youtu.be/eBG3WsfHjRk?si=0dFlEElUmfk7yTwp				
UNIT 5	https://youtu.be/qAaUSmVfpaU?si=rCGjKnCQZA0THq6S				

	Master of Computer Applications (Integrated) Fourth Year		
Course		LTP	Credits
Code			
Course Title	Blockchain Technology	310	4
Components, aims at unders Pi and study a	architecture, network communications and applications protocols astanding various hardware for IoT, programming concepts using Ardabout applications of IoT.	of IoT.	Course also
Pre-requisite	: Basic Electronics and C programming Course Contents / Syllabus		
UNIT-I	Introduction to Blockchain		8 hours
consensus me block chains:	evolution of blockchain, How Blockchain works Basic concepts echanisms, cryptography, Key components-blocks, chains, nodes public, private, consortium, Practical applications, public and prival clockchain, Myths about Bitcoin.	, miners	s, Types of
UNIT-II	Blockchain vs shared Database		8 hours
Chain and the	Public Ledgers, Blockchain as Public Ledgers Block in a Blockchain ELongest Chain - Permissioned Model of Blockchain, Cryptograph a hash function-Hash pointer and merkle tree.		
TIONOTHOS OF	a mash function-frash bomici and merkic nec.		
UNIT-III	Blockchain Platforms and Ecosystems		8 hours
UNIT-III Hyperledger - Ethereum Vir applications,		Contracts	m network, s, usage and
UNIT-III Hyperledger - Ethereum Vir applications,	Blockchain Platforms and Ecosystems - Architecture of Hyperledger fabric v1.1- chain code- Ethereum: tual Machine (EVM). Ethereum vs Bitcoin. Introduction to Smart C Working Principle, Law and regulations. Block Chain tools a	Contracts	m network, s, usage and relopment -
UNIT-III Hyperledger Ethereum Vir applications, Development UNIT-IV	Blockchain Platforms and Ecosystems - Architecture of Hyperledger fabric v1.1- chain code- Ethereum: tual Machine (EVM). Ethereum vs Bitcoin. Introduction to Smart C Working Principle, Law and regulations. Block Chain tools a environments: Truffle, Remix, Blockchain APIs and libraries.	Contracts nd Dev	m network, s, usage and elopment -
UNIT-III Hyperledger Ethereum Vir applications, Development UNIT-IV	Blockchain Platforms and Ecosystems - Architecture of Hyperledger fabric v1.1- chain code- Ethereum: tual Machine (EVM). Ethereum vs Bitcoin. Introduction to Smart C Working Principle, Law and regulations. Block Chain tools a environments: Truffle, Remix, Blockchain APIs and libraries. Decentralization using blockchain and full ecosystem decentralization: Smart contract, Decentralization	Contracts nd Dev	m network, s, usage and elopment - 8 hours autonomous
UNIT-III Hyperledger Ethereum Vir applications, Development UNIT-IV Blockchain a organization (UNIT-V cryptocurrence and public ser Scalability ar algorithms, T	Blockchain Platforms and Ecosystems - Architecture of Hyperledger fabric v1.1- chain code- Ethereum: tual Machine (EVM). Ethereum vs Bitcoin. Introduction to Smart C Working Principle, Law and regulations. Block Chain tools a environments: Truffle, Remix, Blockchain APIs and libraries. Decentralization using blockchain and full ecosystem decentralization: Smart contract, Decentra (DAO), Decentralized applications - Platforms for decentralization.	alized a	m network, s, usage and elopment - 8 hours autonomous 8 hours Government Challenges-
UNIT-III Hyperledger Ethereum Vir applications, Development UNIT-IV Blockchain a organization (UNIT-V cryptocurrence and public ser Scalability ar algorithms, T	Blockchain Platforms and Ecosystems - Architecture of Hyperledger fabric v1.1- chain code- Ethereum: tual Machine (EVM). Ethereum vs Bitcoin. Introduction to Smart C Working Principle, Law and regulations. Block Chain tools a environments: Truffle, Remix, Blockchain APIs and libraries. Decentralization using blockchain and full ecosystem decentralization: Smart contract, Decentra DAO), Decentralized applications - Platforms for decentralization. Use Cases and Applications - Financial services eies, cross-border payments, DeFi, Supply chain management, Healt vices, Emerging applications: NFTs, IoT integration. Futuristic Tremed interoperability, Quantum computing and blockchain, Advanche future of blockchain regulation and governance.	contracts nd Dev alized a thcare, C nds and c nces in	m network, s, usage and elopment - 8 hours autonomous 8 hours Government Challenges-

CO 3	Develop and deploy blockchain applications using smart contracts,	K4
003	Ethereum, Hyperledger Fabric, and related development tools.	N4
	Analyse the blockchain ecosystem with a focus on smart contracts,	
CO 4	decentralizeed autonomous organization (DAOs), decentralized	K4
	applications, and supporting platforms.	
CO. 5	Evaluate current and emerging blockchain applications across sectors	T 7.4
CO 5	and assess future trends and challenges in the technology's evolution.	K4
Text books:	C Cy	
1. "Block	Chain for dummies", by Manav Gupta, Second IBM Limited Edition, 2018,	John Wiley
& Sons	•	•
2. "Bitcoi	n and Cryptocurrency Technologies: A Comprehensive Introduction",	by Arvind
	nan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfede	•
•	sity Press, 2016.	
Reference Bo	ooks:	
1. "Blocke	chain: Blueprint for a New Economy", by Melanie Swan, First edition, 201	5, O'Reilly
Media.		•
2. "Bitcoi	n: Programming the Open Blockchain", by Andreas M. Antonopoulos,	Mastering,
	edition, 2017, O'Reilly Media.	<u> </u>
NPTEL/ You	tube/ Faculty Video Link:	
UNIT 1	https://nptel.ac.in/courses/106/104/106104220/	
UNIT 2	https://nptel.ac.in/courses/106/105/106105184/	
UNIT 3	https://archive.nptel.ac.in/courses/106/105/106105235/	
UNIT 4	https://archive.nptel.ac.in/courses/106/105/106105235/	
UNIT 5	http://digimat.in/nptel/courses/video/110105121/L01.html	

Course AMICA0803		Master of Computer Applications (Integrated)		
Code Course Title Mobile Applications Development	Course	Fourth Year AMICA0803	LTP	Credits
Course Title Mobile Applications Development 310 4 Course Objectives: The objective of this course is to provide the basic understanding of the fundamentals of Android operating systems & Android software development tools. Pre-requisites: Basic Knowledge of Object Oriented Programming Concepts through Java & XMI Course Contents / Syllabus UNIT-I Introduction to Android Operating System 8 hou Android OS and Features — Android development framework, Installing and running application on Android Studio, Creating AVDs, Types of Android application, Creating Activities, Activity Lic Cycle, Activity states, monitoring state changes. UNIT-II Android application components 8 hou Android Manifest file, Externalizing recourses like Simple Values, Drawables, Layouts, Menus, et Building User Interfaces: Fundamental Android UI design, Layouts — Linear, Relative, Grid at Table Layouts. User Interface (UI) Components. UNIT-III Fragments 8 hou Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding removing and replacing fragments with fragment transactions, interfacing between fragments are Activities. UNIT-IV Intents and Broadcasts UNIT-IV Intents and Broadcasts UNIT-V Database connectivity using SQLite 8 hou Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and deleting data Course outcome: After completion of this course students will be able to CO1 Analyze architecture of android and current trends in mobile operating systems. CO2 Apply suitable software tools and APIs for the development User Interface of a particular mobile application. CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database. K5			211	
Course Objectives: The objective of this course is to provide the basic understanding of the fundamentals of Android operating systems & Android software development tools. Pre-requisites: Basic Knowledge of Object Oriented Programming Concepts through Java & XMI Course Contents / Syllabus UNIT-I Introduction to Android Operating System 8 hou Android OS and Features — Android development framework, Installing and running application on Android Studio, Creating AVDs, Types of Android application, Creating Activities, Activity Li Cycle, Activity states, monitoring state changes. UNIT-II Android application components 8 hou Android Manifest file, Externalizing recourses like Simple Values, Drawables, Layouts, Menus, et Building User Interfaces: Fundamental Android UI design, Layouts — Linear, Relative, Grid at Table Layouts. User Interface (UI) Components. UNIT-III Fragments Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, addin removing and replacing fragments with fragment transactions, interfacing between fragments at Activities. UNIT-IV Intents and Broadcasts 8 hou Using intents to launch Activities, Types of Intents, Passing data to Intents, Getting results fro Activities, Broadcast Receivers — Using Intent filters to service implicit Intents, Resolving Intefilters. UNIT-V Database connectivity using SQLite 8 hou Introduction to SQLite database, creating and opening a database, creating tables, inserting retrievir and deleting data Course outcome: After completion of this course students will be able to CO1 Analyze architecture of android and current trends in mobile operating systems. CO2 Apply suitable software tools and APIs for the development User Interface of a particular mobile application. CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database. K5		Mahila Angliastiana Davalanmant	210	4
Fundamentals of Android operating systems & Android software development tools. Pre-requisites: Basic Knowledge of Object Oriented Programming Concepts through Java & XMI Course Contents / Syllabus UNIT-I Introduction to Android Operating System 8 hou Android OS and Features — Android development framework, Installing and running application on Android Studio, Creating AVDs, Types of Android application, Creating Activities, Activity Li Cycle, Activity states, monitoring state changes. UNIT-II Android application components 8 hou Android Manifest file, Externalizing recourses like Simple Values, Drawables, Layouts, Menus, et Building User Interfaces: Fundamental Android UI design, Layouts — Linear, Relative, Grid at Table Layouts. User Interface (UI) Components. UNIT-III Fragments 8 hou Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding removing and replacing fragments with fragment transactions, interfacing between fragments at Activities. UNIT-IV Intents and Broadcasts 8 hou Using intents to launch Activities, Types of Intents, Passing data to Intents, Getting results fro Activities, Broadcast Receivers — Using Intent filters to service implicit Intents, Resolving Intefilters. UNIT-V Database connectivity using SQLite 8 hou Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and deleting data Course outcome: After completion of this course students will be able to CO1 Analyze architecture of android and current trends in mobile operating systems. CO2 Apply suitable software tools and APIs for the development User Interface of a particular mobile application. CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database. K5		•		
Course Contents / Syllabus	•	3		ding of the
Android OS and Features — Android development framework, Installing and running application on Android Studio, Creating AVDs, Types of Android application, Creating Activities, Activity Lic Cycle, Activity states, monitoring state changes. UNIT-II Android application components 8 hou Android Manifest file, Externalizing recourses like Simple Values, Drawables, Layouts, Menus, et Building User Interfaces: Fundamental Android UI design, Layouts — Linear, Relative, Grid at Table Layouts. User Interface (UI) Components. UNIT-III Fragments 8 hou Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding removing and replacing fragments with fragment transactions, interfacing between fragments at Activities. UNIT-IV Intents and Broadcasts 8 hou Using intents to launch Activities, Types of Intents, Passing data to Intents, Getting results fro Activities, Broadcast Receivers — Using Intent filters to service implicit Intents, Resolving Intentiliters. UNIT-V Database connectivity using SQLite 8 hou Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and deleting data Course outcome: After completion of this course students will be able to CO1 Analyze architecture of android and current trends in mobile operating systems. CO2 Apply suitable software tools and APIs for the development User Interface of a particular mobile application. K4 CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database.	Pre-requisite	· · · · · · · · · · · · · · · · · · ·	hrough Ja	va & XML
Android OS and Features — Android development framework, Installing and running application on Android Studio, Creating AVDs, Types of Android application, Creating Activities, Activity Li Cycle, Activity states, monitoring state changes. UNIT-II Android application components 8 hou Android Manifest file, Externalizing recourses like Simple Values, Drawables, Layouts, Menus, et Building User Interfaces: Fundamental Android UI design, Layouts — Linear, Relative, Grid at Table Layouts. User Interface (UI) Components. UNIT-III Fragments 8 hou Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, addingenoving and replacing fragments with fragment transactions, interfacing between fragments at Activities. UNIT-IV Intents and Broadcasts 8 hou Using intents to launch Activities, Types of Intents, Passing data to Intents, Getting results from Activities, Broadcast Receivers — Using Intent filters to service implicit Intents, Resolving Intefilters. UNIT-V Database connectivity using SQLite 8 hou Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and deleting data Course outcome: After completion of this course students will be able to CO1 Analyze architecture of android and current trends in mobile operating systems. CO2 Apply suitable software tools and APIs for the development User Interface of a particular mobile application. CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database.	IINIT-I			8 hour
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Activities. UNIT-IV Intents and Broadcasts Using intents to launch Activities, Types of Intents, Passing data to Intents, Getting results fro Activities, Broadcast Receivers — Using Intent filters to service implicit Intents, Resolving Intefilters. UNIT-V Database connectivity using SQLite 8 hou Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and deleting data Course outcome: After completion of this course students will be able to CO1 Analyze architecture of android and current trends in mobile operating systems. CO2 Apply suitable software tools and APIs for the development User Interface of a particular mobile application. CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database. K5	UNIT-III Creating fragr	Fragments nents, Lifecycle of fragments, Fragment states, Adding fragment		•
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CO1 Analyze architecture of android and current trends in mobile operating systems. CO2 Apply suitable software tools and APIs for the development User Interface of a particular mobile application. CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. CO5 Develop apps for mobile devices using SQLite Database. K4 K4 K3 K3 K6 CO5 Develop apps for mobile devices using SQLite Database.	and deleting d	ata	es, insertin	g retrieving
Systems. CO2 Apply suitable software tools and APIs for the development User Interface of a particular mobile application. CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database. K4 K3 K3 K6 K5	Course outco	me: After completion of this course students will be able to		
Interface of a particular mobile application. CO3 Discuss the lifecycle of fragments. CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database. K3 K2 K6 CO5 Develop apps for mobile devices using SQLite Database.	CO1	•	ating	K4
CO4 Synthesis intents and broadcast receivers in android application. K6 CO5 Develop apps for mobile devices using SQLite Database. K5		Apply suitable software tools and APIs for the development User		К3
CO5 Develop apps for mobile devices using SQLite Database. K5	CO2	•		
	CO2	Discuss the lifecycle of fragments.		K2
Posset le colons	CO2 CO3 CO4	Discuss the lifecycle of fragments. Synthesis intents and broadcast receivers in android application.		K2 K6
L PROPERTORAL ADDITION A ADDITIONAL PARADOMENTAL DAY PATA BUANAR BUON HILL	CO2 CO3 CO4 CO5 Text books:	Discuss the lifecycle of fragments. Synthesis intents and broadcast receivers in android application.	2012	K2 K6

2. Android	l Application Development for Java Programmers, by James C Sheusi, 1st edition,
Februar	y 2013
Reference Bo	oks:
1. Beginni	ng Android 4 Application Development, by Wei-Meng Lee,1st edition, March 2012
2. Android	Application Development (with Kitkat Support), by Black Book, May 2014
3. Android	Programming: Pushing the Limits, by Erik Hellman, Illustrated edition, November 2013
NPTEL/ You	tube/ Faculty Video Link:
UNIT 1	https://www.youtube.com/watch?v=fzQcQV0UCUM&t=9s
UNIT 2	https://www.youtube.com/watch?v=W2Xn42Id2V4
UNIT 3	https://www.youtube.com/watch?v=DmemBQNfqGM&t=9s
UNIT 4	https://www.youtube.com/watch?app=desktop&v=dYt763QgaTg&t=13m38s

	Master of Computer Applications (Integrated)			
	Fourth Year			
Course	AMICA0804	LTP	Credits	
Code				
Course Title	Cognitive Ability	300	3	
logical reasor enabling them thinking.	ctives: The objective of this course is to develop students' quanting skills through number theory, analytical puzzles, and but to solve real-world and competitive exam problems with speed,	isiness m	athematics,	
Pre-requisite	: Basic understanding of elementary mathematics			
	Course Contents / Syllabus			
UNIT-I	Speed Math and Basic Number System		8 hours	
Classification Direction and	of number, Divisibility Rule, Factors, Factorization, HCF & LC Sense	CM, It's A	Application,	
UNIT-II	Advance Number System and Logical Reasoning		8 hours	
•	ast two digits, Remainder Theorem, Trailing zero's, Highest pos and Letter Series	wer, Bloc	d Relation,	
UNIT-III	Business Math and Logical Reasoning-I		8 hours	
Alpha numeri	c series, Coding Decoding, Percentage, Ratio and Proportion, Pa	rtnership,	Problem of	
UNIT-IV	Business Math and Logical Reasoning - II		8 hours	
Profit and Los	s, Discount, Simple Interest and Compound Interest, Clock and C	Calendar		
UNIT-V	Arithmetic		8 hours	
Average, Mix and Stream	sture & Allegation, Time and Work, Pipe and Cistern, Time spec	ed and dis	tance, Boat	
Course outco	me: After completion of this course students will be able to			
CO1	Apply fundamental number theory concepts such as divisibility, LCM, remainder theorem, and cyclicity to solve quantitative proefficiently.		К3	
CO2	Solve problems involving logical reasoning and analytical think including direction sense, blood relations, series patterns, and till based puzzles like clocks and calendars.	_	К3	
CO3	Solve the problems involving percentage, ratio, proportion, partiproblem of ages and coding decoding.	nership,	К3	
CO4	Solve real-life business math problems involving percentages, p loss, discounts, interest calculations, averages, mixtures, and rat using appropriate mathematical methods		К3	

CO5	Solve quantitative aptitude problems involving time and work, wages, pipes and cisterns, speed-distance-time, and race-related scenarios, using mathematical formulas and real-world applications.	К3	
Reference Bo	ooks:		
Quicker math, by M. Tyra (BSC publication co. Pvt. Ltd)			
Quantitative A	Aptitude, by RS Aggarwal		
Verbal & Non-Verbal Reasoning, by RS Aggarwal			
Quantitative A	Quantitative Aptitude - Quantum CAT, by Sarvesh K Verma		

	Master of Computer Applications (Integrated) Fourth Year		
Course	AMCA0805	LTP	Credits
Code			
Course Title	Software Project Management	300	3
Course Objectively management, to handle reso	ctives: This course aims to provide students with the skills and kn nage all phases of a software project, focusing on planning, estim quality assurance, and post-project evaluation. By the end, studen urces, mitigate risks, and ensure project success.	nowledge nation, ris	to sk e equipped
	s: Basic understanding of software development methodologies, p		
principles, fur	damental mathematics and statistics, and strong problem-solving	skills be	fore
enrolling in the effectively.	is course. This foundation will help them apply project managem	ent techr	iques
one on the same	Course Contents / Syllabus		
UNIT-I	Introduction to Software Project Management		8 hours
Introduction to	Software Project Management (SPM) - The Software Developm	nent Life	Cycle
(SDLC) - Proj	ect Management Process Groups: Initiation, Planning, Execution	, Monito	ring, and
Closing - Role	of Project Manager - Project Life Cycle and Product Life Cycle	- Project	Scope and
Planning - Ris	k Management in Software Projects		
UNIT-II	Software Project Estimation		8 hours
Software Proje	ect Estimation Techniques - Function Point Analysis - Use Case I	Points - C	COCOMO
J	ation Process and Methods (Top-down and Bottom-up) - Resource		
Scheduling			
UNIT-III	Project Scheduling and Tracking		8 hours
Scheduling in	Software Projects - Gantt Charts and PERT Charts - Critical Path	Method	(CPM) and
Project Evalua	tion and Review Technique (PERT) - Earned Value Managemen	t (EVM)	- Resource
T 1' 1	Allegation Duamas Manitarina and Danastina Matrice and	l KPIs fo	or Tracking
_	Allocation - Progress Monitoring and Reporting - Metrics and		
Project Health			0.1
_			8 hours
Project Health UNIT-IV	Quality Assurance and Risk Management		
Project Health UNIT-IV Software Qua	Quality Assurance and Risk Management lity Assurance (SQA) - Types of Testing: Unit Testing, Integrat	ion Testi	ng, System
Project Health UNIT-IV Software Qua Testing - Risk Strategies - So	Quality Assurance and Risk Management	ion Testi	ng, System Mitigation
Project Health UNIT-IV Software Qua Testing - Risk	Quality Assurance and Risk Management lity Assurance (SQA) - Types of Testing: Unit Testing, Integrat Management in Software Projects - Risk Identification, Assessm	ion Testi	ng, System Mitigation
Project Health UNIT-IV Software Qua Testing - Risk Strategies - So Process UNIT-V	Quality Assurance and Risk Management lity Assurance (SQA) - Types of Testing: Unit Testing, Integrat Management in Software Projects - Risk Identification, Assessm ftware Metrics and Measurement - Configuration Management - C Software Project Closure and Post-Project Activities	ion Testi nent, and Change M	ng, System Mitigation Ianagemen 8 hours
Project Health UNIT-IV Software Qua Testing - Risk Strategies - So Process UNIT-V Software Proj	Quality Assurance and Risk Management lity Assurance (SQA) - Types of Testing: Unit Testing, Integrat Management in Software Projects - Risk Identification, Assessn ftware Metrics and Measurement - Configuration Management - Configuration - Configuration - Configuration - Configuration -	ion Testi nent, and Change M	ng, Systen Mitigation Ianagemen 8 hours t Handove

Course outco	me: After completion of this course students will be able to	
CO1	Discuss the principles of Software Project Management	K2
CO2	Apply project estimation techniques to software development projects	К3
CO3	Develop skills in scheduling, tracking, and monitoring the progress of software projects	K4
CO4	Implement quality assurance and manage risks in software projects	K4
CO5	Analyzing software project closure and post-project activities, ensuring continuous improvement	K4
Text books:		
1. "Softwa	are Project Management" by Bob Hughes and Mike Cotterell, Ingram short	t title, 2009.
2. "Softwa 2023	are Engineering: A Practitioner's Approach", by Roger S. Pressman, M	cGraw-Hill
	are Engineering: Theory and Practice", by Shari Lawrence Pfleeger and earson, 2009	Joanne M.
Reference Bo	ooks:	
1. The Art	t of Project Management", by Scott Berkun, Shroff, 2005.	
2. Project	Management for Software Engineers", by Steve McConnell, Microsof	t Press US,
1997		
NPTEL/ You	tube/ Faculty Video Link:	
UNIT 1	https://archive.nptel.ac.in/courses/106/105/106105218/	
UNIT 2	https://archive.nptel.ac.in/courses/106/105/106105218/	
UNIT 3	https://www.youtube.com/watch?v=CEBO4k6Tnqg	
UNIT 4	https://www.youtube.com/watch?v=xLAcx4-9Bmg	
UNIT 5	https://www.youtube.com/channel/UCRV5IZI5OD7y3z5rExHTsgg	

	Master of Computer Applications (Integrated) Fourth Year		
Course	AMICA0811	LTP	Credits
Code			
Course Title	Programming for Data Analytics	300	3
business decis data mining se analyse Big D		siness pro	blems. Use
Pre-requisite	: Basic Knowledge of Python		
	Course Contents / Syllabus		
UNIT-I	Introduction to Data Analytics		8 hours
successful ana model plannin UNIT-II	tools, applications of data analytics. Data Analytics Lifecycle: alytic projects, various phases of data analytics lifecycle – discovery, model building, communicating results, operationalization. Data Visualization using Python	ery, data j	preparation, 8 hours
of frames, and multiple Pyth Merging, Data	ges for Data Analysis: Numpy, Scipy, Matplotlib, Plotly, NLTK. alytical roles, File handling and reading data for processing, Pre-paon frameworks, Data Formatting, Data Manipulation, Data reshaping, Data Wrangling, Aggregation functions.	processing	g data using ation, Data
UNIT-III	Data Engineering Foundation		8 hours
_	a database (SQLite) using Python, Sending DML and DDL querie Python Program, Handling errors, NOSQL query using Mongo	-	_
UNIT-IV	Introduction To TensorFlow And AI		8 hours
TensorFlow I TensorFlow A TensorFlow, I	Using TensorFlow for AI Systems, Up and Running with TensorBasics, Convolutional Neural Networks, Working with Text a Visualization, Word Vectors, Advanced RNN, and Embedabstractions and Simplifications, Queues, Threads, and Readir Exporting and Serving Models with TensorFlow.	and Sequ Iding Vi	ences, and sualization. Distributed
UNIT-V	Deep Learning With Keras	-	8 hours
Adversarial N GANs, Variat	dvanced Deep Learning with Keras, Deep Neural Networks, Auto- etworks (GANs), Improved GANs, Disentangled Representation Contained Autoencoders (VAEs), Deep Reinforcement Learning, Policeme: After completion of this course students will be able to	GANs, Cro	oss-Domain
	-		
CO1	Discuss various concepts of data analytics pipeline		K2

CO2	Install, Code, and Use Python & R Programming Language in R Studio	K1
002	IDE to perform basic tasks on Vectors, Matrices, and Data frames.	
CO3	Understand the basic concept of MongoDB.	K2
CO4	Understand and apply the concept of the RNN and TensorFlow.	K2
CO5	Understand and evaluate the concept of Keras in deep learning.	K4
Text books:		
1. "Python	Data Science Handbook: Essential Tools for Working with Data", by Jake	
Vanderl	Plas.	
2. Intellige	ent Data Analysis, Springer by Michael Berthold, David J.	
Reference Bo	oks:	
1. "Python	for Data Analysis" by Wes McKinney	
2. Intellige	ent Data Analysis", Springer by Michael Berthold, David J. Hand	
NPTEL/ You	tube/ Faculty Video Link:	
UNIT 1	https://www.youtube.com/watch?v=jPAqc9QNTLE	
UNIT 2	https://www.youtube.com/watch?v=mjmSaQfCmR0	
UNIT 3	https://hevodata.com/learn/data-engineering-and-data-engineers/	
UNIT 4	https://www.youtube.com/watch?v=IjEZmH7byZQ	
UNIT 5	https://www.youtube.com/watch?v=pWp3PhYI-OU	

	Master of Computer Applications (Integrated)		
	Fourth Year		
Course	AMICA0812	LTP	Credits
Code			
Course Title	Search Engine Optimization	300	3

Course Objectives: To introduce students how digital marketing have disrupted the way businesses sell and purchase to consumers. To help students to Recognize how marketers use the Google SEO Projects to influence purchase decisions on digital platforms using digital content and tools. To help students to Appreciate the benefits of integrating traditional and digital marketing with the Google SEO of selling and purchasing marketing strategies. To Identify the benefits of search to a business of using social media to engage an audience.

Pre-requisites: Basic Marketing Concepts and Knowledge of Computers.

Course Contents / Syllabus

UNIT-I Introduction to Digital Marketing

8 hours

Fundamentals of Marketing: Journey from Traditional Marketing to Digital Marketing, Digital Marketing Metrics and Channels, Customer Centricity, Designing a Web Presence, Social Media Marketing, Search Engine Optimization (SEO), Search Engine Marketing (SEM), Content Marketing, User Nurturing

UNIT-II Google Capstone SEO Project I

8 hours

Gauging a Site's Opportunity for Improvement, identifying a Potential Client, Create an SEO Pitch, Resources, Develop Kickoff Questions

Initial Research Phase, developing a Persona – User/Buyer Persona Template, Performing Keyword Research, Keyword Research Example & Template

Conducting a Competitive Analysis – Keyword Competitive Analysis Template

UNIT-III Google Capstone SEO Project II

8 hours

Conducting a Content Audit and Technical Review, Competitive Content Analysis, Competitive Analysis Template, Internal Content Audit, Internal Content Audit Template, Keyword Mapping, Keyword Mapping Template, Technical SEO, Error Tracking Template, Technical Audit Template.

UNIT-IV Search Advertising

8 hours

Search Basics: Search, Intent, Market, the Bidding Process Google AdWords: Pros and Cons, Google's Take on Auction Ads: Payment Models, Pre-campaign Budgeting, Google's Take on Bidding, Audiences and Tools: Basic Campaign Setup, Targeting, Budgeting, Timing, and Rotation Google Ads Campaigns: Keyword Optimization, Optimizing Ad Copy, Negative Keywords.

UNIT-V Social Media Advertising

8 hours

Case Study: City Shopping Center, Objectives, PPC Hero, Pros and Cons of Top Social Media Advertising Platforms Facebook: Payment Models and Ad Elements, Introduction to Facebook Ads Manager. Instagram: Who Advertises on Instagram, Instagram Ad Features

Twitter: Ad Types, Campaign Types, Creative Best Practices, Ads Manager, Tweet Analytics and Customer Insights.

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

G 0.1	D '1 . '	17.0
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.	К3
CO4	Evaluate the benefits of search advertising for a business that uses social media to target an audience.	K2
CO5	Implement an active social media community by using social media advertising.	К3
Text books:		
1. "Digital	Marketing for Dummies", by Ryan Deiss& Russ Henneberry John Wiley &	& Sons, Inc.
2. "Youtili	ty", Gildan Media, by Jay Baer LLC.	
3. "Epic C	ontent Marketing", by Joe Pulizzi McGraw Hill Education.	
Reference Bo	oks:	
1. "The A1	rt of SEO: Mastering Search Engine Optimization", by Eric Enge, Stepha	n Spencer,
Jessie S	tricchiola Fourth Edition (Grayscale Indian Edition) Paperback – 30 Septe	mber 2023
2. "Produc	t-Led SEO: The Why Behind Building Your Organic Growth Strategy	y", by Eli
Schwart	zz Paperback – 27 April 2021	
NPTEL/ You	tube/ Faculty Video Link:	
UNIT 1	https://www.youtube.com/watch?v=XO6MSb9-s1k	
UNIT 2	https://www.youtube.com/watch?v=FGF8RusTIQ0	
UNIT 3	https://www.youtube.com/watch?v=R8tator_HI0	

https://www.youtube.com/watch?v=8jeOKv5UOa0

https://www.youtube.com/watch?v=EmQf1J29Z58

UNIT 4

UNIT 5

	Master of Computer Applications (Integrated)		
	Fourth Year		
Course	AMICA0813	LTP	Credits
Code			
Course Title	Administering cloud and App Using Sales force	300	3
administration	ctives: Understand the concepts of cloud and will be able to a large the context to Sales force.		-
Pre-requisites	s: Creative thinking which is being used in your business areas.		
	Course Contents / Syllabus		
UNIT-I	Introduction to Cloud		8 hours
_	oud Admin Certification Prep: Setup and Data, Marketing Cloud	l Admin C	Certification
•	ng, Channels, and Maintenance.		
UNIT-II	Lightning & Sales force App Experience Customization		8 hours
Lightning Experience Customization, Service Cloud for Lightning Experience, App Exchang Solutions, Data Security, Identity Basics, Security Specialist.			Exchange
UNIT-III	Sales force Administration		8 hours
-	ashboards for Lightning Experience, Create Reports and Dash magers, Lightning Experience Reports & Dashboards Specialist	boards for	Sales and
UNIT-IV	Lightning Experience		8 hours
Sales force M	obile App Customization, Chatter Administration for Lightning	Experience	e, Leads &
Opportunities	for Lightning Experience, Pick list Administration, Duplicate M	Ianageme	nt, Formula
-	d Functions, Sales force Flow, Screen Flow Distribution, I	Lightning	Experience
Productivity.			
UNIT-V	Learn Admin Essential s in Lightning Experience		8 hours
Application L	ifecycle and Development Models, Change Set Development Models	del, Org D	evelopment
	ge Development Model.		
Course outco	me: After completion of this course students will be able to		
CO1	Discuss basic working environment of Salesforce.		K2
	Describe the concepts of Lightning & Salesforce App Experience	ce	K2
CO2	Customization.		
CO3	Recognize with concepts reports chatter administration.		K 1
CO4	Discuss the concepts of Lightning Experience.		K2
CO5	Implement Admin Essentials in Lightning Experience.		К3
Text books:			
	ner Relationship Management: Concepts and Cases", by Alok), PHI Learning, 2018.	Kumar R	ai (Second
	mer Relationship Management", by Bhasin (Wiley Dreamtech),	,2019.	
Reference Bo			

1. "Salesforce for beginners", by Shaarif Sahaalane Amazon (Online edition).		
2. "Learn	ing Salesforce Development with Apex: Write, Run and Deploy Apex Code with Ease",	
by Paul Battisson 10 August 2020		
NPTEL/ Youtube/ Faculty Video Link:		
UNIT 1	https://www.youtube.com/watch?v=bxtqhfyoTjY&list=PLaGX-	
	30v1lh1BaUKgXa05gqrOP0vUg_6i&index=1	
UNIT 2	https://www.youtube.com/watch?v=ZkQwm-6lsIw&list=PLaGX-	
	30v1lh1BaUKgXa05gqrOP0vUg_6i&index=3	
UNIT 3	https://www.youtube.com/watch?v=65QivvdfjGs&list=PLaGX-	
	30v1lh1BaUKgXa05gqrOP0vUg_6i&index=5	
UNIT 4	https://www.youtube.com/watch?v=65QivvdfjGs&list=PLaGX-	
	30v1lh1BaUKgXa05gqrOP0vUg_6i&index=6	
UNIT 5	https://www.youtube.com/watch?v=65QivvdfjGs&list=PLaGX-	
	30v1lh1BaUKgXa05gqrOP0vUg_6i&index=8	

Master of Computer Applications (Integrated) Fourth Year			
Course Code	AMICA0851	LTP	Credit
Course Title	Project Based on Augmented & Virtual Reality -3D Lab	0 0 4	2
List of Exper	iments		
Sr. No.	Name of Experiment		CO
1	Installation of Unity and Visual Studio, setting up Unity for AR development.		CO1
	Develop a scene in Unity that includes: i. a cube, plane and sphere, apply transformations on the 3 game objects. ii. add a video and audio source.		CO1
3	Develop a scene in Unity that includes a cube, plane and sphere. Create a new material and texture separately for three Game objects. Change the colour, material and texture of each Game object separately in the scene		CO2
4	Develop a scene in Unity that includes a sphere and plane. Apply Rigid body component, material and Box collider to the game Objects		CO2
5	Develop a simple UI(User interface) menu with images, canvas, sprites and button.		CO3
6	Study of different Game engines		CO3
7	Explore projects in Unity 2D and 3D		CO3
8	Create a real-world app using AR		CO4
9	Develop a VR game where users can interact with objects.		CO5
10	Project on Augmented Reality and Virtual Reality		CO5
Lab Course (Dutcome: After the completions of this course students will	be able to	
CO 1	Discuss the fundamental concepts of AR and VR, including history, applications, and hardware/software requirements.	uding their	K2
CO 2	Develop simple AR/VR applications using Unity and relevant SDKs.		K4
CO 3			К3
CO 4	Draw various UML diagrams, and associations among them and identify the logical sequence of activities undergoing in a system, and represent them pictorially		К3
CO5	Apply modern engineering tools for specification implementation and testing	n, design,	К3

Master of Computer Applications (Integrated) Fourth Year			
Course Code	AMICA0852 L T	P	Credit
Course Title	Blockchain Technology Lab 0 0	4	2
List of Exper	iments	ı	
Sr. No.	Name of Experiment		CO
1	Create a simple storage contract with set() and get() functions.		CO1
2	Store and retrieve a string variable in a smart contract.		CO1
3	Implement a counter with increment and decrement functions.		CO1
4	Deploy a contract using MetaMask on a public Ethereum testnet (e.g., Goerli).		CO2
5	Write a contract that accepts Ether with a deposit() and shows balance	e.	CO2
6	Implement a function to withdraw Ether to a user-specified address.		CO2
7	Create a basic voting contract with vote counting logic.		CO3
8	Apply access control by restricting a function to only the contract owner.		CO3
9	Add a function to change the contract owner securely.		CO3
10	Store and retrieve user-submitted messages in an array.		CO4
11	Build a basic To-Do List contract with task completion functionality		CO4
12	Use mappings to associate user addresses with values (e.g., balances)).	CO4
13	Define and use a struct (e.g., Student with name, age, grade) in contract.	a	CO5
14	Emit and log events for user actions like payments or submissions.		CO5
15	Implement a function with time-based access control using blo timestamp.		CO5
16	Create a donation contract that records donor addresses and amour using mappings	nts	CO5
17	Build a simple lottery contract where users enter by paying ETH, and winner is selected randomly.	l a	CO5
Lab Course (Outcome: After the completions of this course students will be able to		
CO1	Apply the basic concepts of blockchain, Ethereum, and smart contract to practical scenarios.	S	К3
CO2	Demonstrate the ability to write and deploy basic smart contracts using Solidity on Remix IDE.		
CO3	Develop smart contracts with state variables, functions, modifiers, an event logging to interact with users and handle transactions.	d	K4

CO4	Analyze and implement secure access controls, ownership logic, and Ether transfer mechanisms in smart contracts.	K4
CO5	Design smart contracts that interact with other contracts and use complex data structures (e.g., arrays, mappings, structs).	K4

Master of Computer Applications (Integrated) Fourth Year			
Course Code	AMICA0853	LTP	Credit
Course Title	Mobile Applications Development Lab	0 0 4	2
List of Exper	iments	,	
Sr. No.	Name of Experiment		CO
1	Installation of Android Studio.		CO1
2	Development of basic Android Application.		CO1
3	Create an application that takes the name from a text box and shows hello message along with the name entered in text box, when the user Click the OK button.		CO2
4	Create a screen that has input boxes for User Name, Password, Address, Gender (radio buttons for male and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a Submit button. On Clicking the submit button, print all the data below the submit button (use any layout).		CO2
5	Create an android application Using Fragments.		CO3
6	Design an android application to create page using Intent and one Button and Pass the Value from one Activity to second Activity.		CO4
7	Design an android application send SMS using Intent.		CO4
8	Design an android application using Radio buttons.		
9	Design an android application for menu.		CO4
10	Create a registration application that store the user details in a database table.		CO5
Lab Course (Dutcome: After the completions of this course students will	be able to	
CO1	Describe the working of Android OS Practical		K2
CO2	Develop User Interfaces.		K6
CO3	Deploy and maintain the Android Application.		K6
CO4	Create URL related applications		K4
CO5	Implement SQLite is embedded in Android, making it an es for mobile developers.	sential skill	К3