LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Principles & Programming in C	**MAI-101**	**L**	**T**	**J**	**EST**	**CAT**	**Total**
		3	1	0	80	20	100

Course Objective	The objective of this course is to provide the students with foundations in the basic concepts of C programming and data structures. Also to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might encounter.

Units	Contents (*Theory*)	Hours /week
I	**Introduction to Computing** – Computer Systems-Hardware and Software, Computer Languages, Algorithm, Flowchart, Representation of Algorithm and Flowchart with examples. **Introduction to C–** History of C, Features of C, Structure of C Program, Character Set, C Tokens-Keywords, Identifiers, Constants, Variables, Data types, Operators.	8
II	**Statements**-Selection statements (Decision Making)- if and switch statements with examples, Repetition statements (loops)- while, for, do-while statements with examples, Unconditional statements- break, continue, goto statements with examples.	8
III	**Functions:** Introduction to Functions, Function Declaration, Function Categories, Standard Functions, Parameters and Parameter Passing, Call – by value/reference, Recursion, Global and Local Variables, Storage classes	8
IV	**Arrays:** Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation, Matrices, Strings, String handling functions. **Structure and Union:** Declaration of structure, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, Unions	8
V	**Files:** Introduction, Creating a data file, opening and closing a data file, processing a data file. **Pointers:** Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays	8

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Text Books/ References Book:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
Yashvant P Kanetkar	Let Us C	VII	BPB Publications, New Delhi.
E. Balagurusami	Programming in ANSI C	IV	Tata McGraw Hill
R. S. Salaria	Problem Solving and Programming in C	II	
H.Schildt, Osborne	C Made Easy		McGraw-Hill
Yashwant Kanetkar	Understanding Pointers in C	V	BPB

COURSE OUTCOMES: Students will be able to	
CO1	Understand the purpose of programming.
CO2	Understand the fundamentals of C programming
CO3	Implement different Operations on arrays, functions, pointers, structures, unions and files..

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Data analysis using Python, Numpy, Pandas, Matplotlib and Seaborn	**MAI-102**	**L**	**T**	**J**	**EST**	**CAT**	**Total**
		3	1	0	80	20	100

Course Objective	The objective of this course is to provide the students with foundations in the basic concepts of Data analysis using Python, Numpy, Pandas, Matplotlib and seaborn.

Units	Contents (*Theory*)	Hours /week
I	**Python programming Basic**: Python interpreter, IPython Basics, Tab completion, Introspection, %run command, magic commands, matplotlib integration, python programming, language semantics, scalar types. Control flow.	8
II	**Data Structure, functions, files**: tuple, list, built-in sequence function, dict, set, functions, namescape, scope, local function, returning multiple values, functions are objects, lambda functions, error and exception handling, file and operation systems	8
III	**NumPy: Array and vectorized computation**: Multidimensional array object. Creating ndarrays, arithmetic with numpy array, basic indexing and slicing, Boolean indexing, transposing array and swapping axes, universal functions, array-oriented programming with arrays, conditional logic as arrays operations, file input and output with array.	8
IV	**Pandas:** Pandas data structure, series, DataFrame, Index Object, Reindexing, dropping entities from an axis, indexing, selection and filtering, integer indexes, arithmetic and data alignment, function application and mapping, soring and ranking, correlation and covariance, unique values, values controls and membership, reading and writing data in text format.	8
V	**Visualization with Matplotlib:** Figures and subplots, colors, markers, line style, ticks, labels, legends, annotation and drawing on sublots, matplotlib configuration **Plotting with pandas and seaborn:** line plots, bar plots, histogram, density plots, scatter and point plots, facet grids and categorical data	8

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Text Books/ References Book:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
Mark Lutz	Programming Python		Shroff/Murach, 2016
Michael Urban and Joel Murach	Python Programming	4th Edition, 2010	O`Reilly
David M. Baezly	Python Cookbook	Third edition	O`Reilly
W.Chun	Core Python Programming		Pearson

COURSE OUTCOMES: Students will be able to	
CO1	To learn and understand Python programming basics and paradigm.
CO2	To learn and know the concepts of file handling, exception handling
CO3	To impart the knowledge of Lists, Tuples and Directories..
CO3	To learn about dictionaries in python

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Computer Architecture	MAI-103	L	T	J	EST	CAT	Total
		3	1	0	80	20	100

Course Objective	The main objective this course is to understand the concept of computer system and organization.

Units	Contents (*Theory*)	Hours /week
I	**Fundamentals of Digital Logic** :Boolean Algebra, Logic Gates, Simplification of Logic Circuits: Algebraic Simplification, Karnaugh Maps. Combinational Circuits : Adders, Mux, De-Mux, Sequential Circuits : Flip-Flops (SR, JK & D), Counters : synchronous and asynchronous Counter	8
II	**Computer System:** Comparison of Computer Organization &Architecture, Computer Components and Functions, Interconnection Structures. Bus Interconnections, Input / Output: I/O Module, Programmed I/O, Interrupt Driven I/O, Direct Memory Access	8
III	**Memory System Organization** : Classification and design parameters, Memory Hierarchy, Internal Memory: RAM, SRAM and DRAM, Interleaved and Associative Memory. Cache Memory: Design Principles, Memory mappings, Replacement Algorithms, Cache performance, Cache Coherence. Virtual Memory, External Memory : Magnetic Discs, Optical Memory, Flash Memories, RAID Levels	8
IV	**CPU Organization**: CPU Building Blocks, CPU Registers and BUS Characteristics, Registers and System Bus Characteristics; Instruction Format; Addressing Modes; Interrupts: Concepts and types; Instruction and Execution Interrupt cycle; Hardwired and Micro Program control; Introduction to RISC and CISC	8
V	**Multi-Processor Organization:** Parallel Processing, Concept and Block Diagram, Types (SISD, SIMD, Interconnect network, MIMD, MISD), Future Directions for Parallel Processors, Performance of Processors Pipelining: Data Path, Time Space Diagram, Hazards. Instruction Pipelining, Arithmetic Pipelining	8

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Text Books/ References Book:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
M. Morris Mano, edition	Computer System Architecture	3rd	PHI
Pal Chaudhary	Computer Organisation and architecture		
Liu and Gibson	8086/ 8088 Micro processor Assembly Language		
Tanenbaum	Structured computer organization-		

COURSE OUTCOMES: Students will be able to	
CO1	Describe the fundamental organization of a computer system
CO2	Explain addressing modes, instruction formats and program control statements
CO3	Explain the functional units of a processor
CO4	Distinguish the organization of various parts of a system memory hierarchy

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Soft Skills & Entrepreneurship	**MAI-104**	**L**	**T**	**J**	**EST**	**CAT**	**Total**
		3	1	0	80	20	100

Course Objective	The objective of this course to teach students basics of communication and to enhance their communication skills

Units	Contents (*Theory*)	Hours /week
I	Listening: Barriers of Listening skill -Approaches to Listening –How to improve Listening exercises. Speaking: Paralanguage: Sounds, stress, intonation - Art of conversation – Presentation skills – Public speaking - Expressing Techniques.	8
II	Reading: Kinds of Reading – Causes of reading difficulties – Reading strategies – exercises. Writing: Effective writing– Paragraph, Essay, Reports, Letters, Articles, Notices, Agenda & Minutes.	8
III	Communication: Modes of Communication - Barriers – Interpersonal skills, Negotiation skills Non- Verbal communication – Etiquettes.	8
IV	Group Dynamic skills: Group Discussion– Team building & Team work – Be a manager or leader – Decision making – creativity – Time & Stress management skills.	8
V	Interviews kills: Types of Interviews – Preparing for interview – Preparing a CV – Structuring the interview , Mock Interview _ Quick Tips.	8

Text Books/ References Book:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Sanghi Seema	Improve your communication skills	2nd	
Dr. Alex, K.	Soft sill: know yourself & Know the world		
Ashley, Roderic	How to enhance your employability		

COURSE OUTCOMES: Students will be able to

CO1	Demonstrate critical and innovative thinking.
CO2	Display competence in oral, written, and visual communication.
CO3	Show an understanding of opportunities in the field of communication.

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Introduction to AI, Data Science, Ethics and Foundation of Data Analysis	**MAI-105**	**L**	**T**	**J**	**EST**	**CAT**	**Total**
		3	1	0	80	20	100

Course Objective	The objective of this course is to teach students the concepts of current main conceptual frameworks at use in AI Business Intelligence and Data Analytics..

Units	Contents (*Theory*)	Hours /week
I	**Introduction to Data Science:** Defining Data Science and Big Data, Benefits and Uses of Data Science and Big Data, Facets of Data, Structured Data, Unstructured Data, Natural Language, Machine generated Data, Graph based or Network Data, Audio, Image, Video, Streaming data, Data Science Process, Big data ecosystem and data science, distributed file systems, Distributed programming framework, data integration framework, machine learning framework, No SQL Databases, scheduling tools, benchmarking tools, system deployments	8
II	**Data Science Processes:** Six steps of data science processes, define research goals, data retrieval, cleansing data, correct errors as early as possible, integrating – combine data from different sources, transforming data, exploratory data analysis, Data modelling, model and variable selection, model execution, model diagnostic and model comparison, presentation and automation.	8
III	**Introduction to Machine Learning:** What is Machine Learning, Learning from Data, History of Machine Learning, Big Data for Machine Learning, Leveraging Machine Learning, Descriptive vs Predictive Analytics, Machine Learning and Statistics, Artificial Intelligence and Machine Learning, Types of Machine Learning – Supervised, Unsupervised, Semi-supervised, Reinforcement Learning. Types of Machine Learning Algorithms, Classification vs Regression Problem, Bayesian, Clustering, Decision Tree, Dimensionality Reduction, Neural Network and Deep Learning, Training machine learning systems	8
IV	**Introduction to AI:** What is AI, Turing test, cognitive modelling approach, law of thoughts, the relational agent approach, the underlying assumptions about intelligence,	8

	techniques required to solve AI problems, level of details required to model human intelligence, successfully building an intelligent problem, history of AI	
V	**Introduction to Data Analytics:** Working with Formula and Functions, Introduction to Power BI & Charts, Logical functions using Excel, Analysing Data with Excel.	8

Text Books/ References Book:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Artificial Intelligence 3e: A Modern Approach Paperback	Stuart J Russell & Peter Norvig;		Pearson
Artificial Intelligence Third Edition	Kevin Knight, Elaine Rich, B. Nair		McGrawHill
Artificial Intelligence Third Edition By	Patrick Henry Winston		Addison-Wesley Publishing Company

COURSE OUTCOMES: Students will be able to

CO1	Uses of AI, Ethics present and future
CO2	Introduction to Machine Learning
CO3	Application of AI by domain, Role of AI in society

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Tools & Methodology of IT World	**MAI-106**	**L**	**T**	**J**	**EST**	**CAT**	**Total**
		3	1	0	80	20	100

Course Objective	The main objective is to understand the concepts, techniques and principles of modern communication technology.

Units	Contents (*Theory*)	Hours /week
I	**Introduction and basic concept of modern communication and technology:** CDMA, WLL, GSM, VOIP, Bluetooth, Wi-Fi, Communication Technology: 2G, 3G, 4G, and 5G. Communication over radio, microwave systems, Communication satellite, radar, fiber optics, ISDN -their properties, Geographic Information System (GIS), Components of a GIS - H/ W,S/ W, Data, people, methods, working and application of GIS.	8
II	**Information Security:** Introduction, malicious programs, cryptography, digital signature, Firewall, Users Identification and Authentication, Security awareness and policies, Application areas requiring security. Mobile Commerce: Introduction, Growth, Success Stories of Mobile commerce, Technologies for mobile commerce, M-commerce in India, Digital Marketing.	8
III	**Artificial Intelligence:** Concept of Artificial Intelligence, Introduction to branches of Artificial Intelligence: Machine Learning, Neural Network, Robotics, Natural Language Processing, Expert System, and Fuzzy Logic. Applications of all the branches of AI, General application of AI.	8
IV	**Introduction to IoT:** Characteristics of IoT, physical design of IoT, Logical design of IoT, Functional blocks of IoT, home Automation, Industry applications, Surveillance and other IoT applications. Introduction to Virtual Reality (VR): Definition, Application of VR, Smart Systems, Embedded Systems.	8
V	**Computing and Cloud Computing:** History of Centralized and Distributed Computing, Overview of Distributed Computing, Cluster computing, Grid computing. Introduction to Cloud Computing - Cloud issues and challenges – Properties – Characteristics – Service models, Deployment models. Cloud resources: Network and API. Virtual and Physical computational resources – Data-storage.	8

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Text Books/ References Book:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
Alex Leon & M.Leon	Fundamental of Information Technology		Vikas Publications, New Delhi
Rao M.N.	Cloud Computing		PHI
Internet of Things	Raj Kamal		McGraw Hill
ITL Education Solutions Ltd., Seventh mpression	Introduction to Information Technology		Pearson Education
	Recent Magazines of Computers and Communication.		
Andrew S. Tanenbaum	Computer Networks	4 th	Pearson Education

COURSE OUTCOMES: Students will be able to	
CO1	Know the basic concepts of 2G, 3G technologies.
CO2	Know the application areas of artificial intelligence and concepts IoT.
CO3	Know the concepts of cloud computing.

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Practical				
		Credit		**Marks**		
Programming Lab in C	**MAI-107**	**P**	**J**	**ESP**	**CAP**	**Total**
		4	4	120	80	200

Content:

1. WAP that accepts the marks of 5 subjects and finds the sum and percentage marks obtained by the student.
2. WAP that calculates the Simple Interest and Compound Interest. The Principal, Amount, Rate of Interest and Time are entered through the keyboard.
3. WAP to calculate the area and circumference of a circle.
4. WAP that accepts the temperature in Centigrade and converts into Fahrenheit using the formula C/5=(F-32)/9.
5. WAP that swaps values of two variables using a third variable.
6. WAP that checks whether the two numbers entered by the user are equal or not.
7. WAP to find the greatest of three numbers.
8. WAP that finds whether a given number is even or odd.
9. WAP that tells whether a given year is a leap year or not.
10. WAP that accepts marks of five subjects and finds percentage and prints grades according to the following criteria:
    Between 90-100%----------Print ‘A’
    80-90%----------Print ‘B’
    60-80%----------Print ‘C’
    Below 60%----------Print ‘D’
11. WAP that takes two operands and one operator from the user and perform the operation and prints the result by using Switch statement.
12. WAP to print the sum of all numbers up to a given number.
13. WAP to find the factorial of a given number.
14. WAP to print sum of even and odd numbers from 1 to N numbers.
15. WAP to print the Fibonacci series.
16. WAP to check whether the entered number is prime or not.
17. WAP to find the sum of digits of the entered number.

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Practical				
		Credit		**Marks**		
Operating System Lab	**MAI-108**	**P**	**J**	**ESP**	**CAP**	**Total**
		2	0	30	20	50

Content:

1. Use of basic Unix Shell Commands.
   - Study of logging/logout details.
   - Study of Unix/Linux general purpose utility command list obtained from (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown, banner, wc, sort, cut, touch, file, , grep) commands.
   - dStudy of vi editore
   - Study of Bash shell, Bourne shell and C shell in Unix/Linux operating system.
   - Study of Unix/Linux file system (tree structure).
   - Study of .bashrc, /etc/bashrc and Environment variables
2. Commands related to inode, I/O redirection, piping, process control commands, mails
3. Shell Programming: shell script exercise based on following:
   - Positional parameters
   - Arithmetic
   - If-then-fi, if-then-else-fi, nested if-else
   - Logical operators
   - Else + if equals elif, case structure
   - While ,for loop
   - Meta characters
4. Write a shell script to change date format. Show the time taken in execution of this script.
5. Write a shell script to print file names in directory showing date of creation & serial no. of file
6. Write a shell script to find whether a given number is prime
7. Write a shell script to list all of the directory files in a directory
8. Write a shell script to find factorial of a given number.
9. write an awk script to count number of lines in a file that does not contain vowels
10. write an awk script to find the no of characters ,words and lines in a file

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Practical				
		Credit		**Marks**		
Mini Project in C	**MAI-109**	**P**	**J**	**ESP**	**CAP**	**Total**
		0	2	30	20	50

Note:-Design a project using file to automate the working of an application

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Name of Paper	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Disaster Management	MAI-111						

Course Objective	The Programme has been framed with an intention to provide a general concept in the dimensions of disasters caused by nature beyond human control as well as the disasters and environmental hazards induced by human activities with emphasis on Natural disaster, Man-made disaster.

Units	Contents (*Theory*)	Hours /week
I	**Introduction:** Hazard, Risk, Vulnerability, Disaster; Disaster Management, Meaning, Nature Importance, Dimensions & Scope of Disaster Management, Disaster Management Cycle. National disaster management framework; financial arrangements for Disaster management, International Strategy for Disaster reduction	2
II	**Natural Disasters:** Meaning and nature of natural disasters, their types and effects , Hydrological Disasters - Flood, Flash flood , Drought, cloud burst, Geological Disasters- Earthquakes, Landslides, Avalanches, Volcanic eruptions, Mudflow Unit, Wind related- Cyclone, Storm, Storm surge, tidal waves, Heat and cold Waves, Climatic Change, Global warming, Sea Level rise, Ozone Depletion	2
III	**Man made Disaster:** CBRN – Chemical disasters, biological disasters, radiological disasters, nuclear disasters Fire – building fire, coal fire, forest fire, Oil fire	2
IV	**Types of Man – made Disasters:** Accidents- road accidents, rail accidents, air accidents, sea accidents Pollution and deforestation- air pollution, water pollution, deforestation, Industrial wastewater pollution, deforestation	2
V	**Disaster Determinants:** Factors affecting damage – types, scale population, social status, habitation pattern, physiology and climate. Factors affecting mitigation measures, prediction, preparation, communication, area and accessibility, population, physiology and climate	2

LNCT UNIVERSITY, BHOPAL

Programme:- MCA (AI/ML) **Semester - I** **wef: July 2021**

Text Books/ References Book:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
S.L. Goel	Disaster Administration and Management, Text & Case studies-		Deep and Deep Publications
G. K. Ghosh	Disaster Management		A.P.H. Publishing Corporation
Vinod K Sharma-	Disaster Management		IIPA
S. K .Singh, S.C. Kundu, Shobha Singh	Disaster Management		William Publications

COURSE OUTCOMES: Students will be able to	
CO1	Explain disaster management theory
CO2	To prevent and control Public Health consequences of Disasters
CO3	Reveal unfounded myths about human behavior in disasters.