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

Affiliated to

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

Evaluation Scheme & Syllabus

For

MCA(Integrated)

First Year

(Effective from the Session: 2025-26)

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

MCA(Integrated)

Evaluation Scheme

SEMESTER-I

Sl. No.	Subject Codes	Subject	Types of Subjects	Periods		Evaluation Schemes					End Semester		Total	Credit
				L	T	P	CT	TA	TOTAL	PS	TE	PE		
1	CMICA0104	Matrices and Calculus	Mandatory	3	1	0	30	20	50		100		150	4
2	CMICA0102	Proficiency in Workplace Communication	Mandatory	3	0	0	30	20	50		100		150	3
3	CMICA0101	C Programming	Mandatory	3	1	0	30	20	50		100		150	4
4	CMICA0103	Digital Logic Design	Mandatory	3	0	0	30	20	50		100		150	3
5	CMICA0155	Computer Fundamentals and Office Automation Lab	Mandatory	0	0	8				50		100	150	4
6	CMICA0153	Digital Logic Design Lab	Mandatory	0	0	4				50		50	100	2
7	CMICA0152	Proficiency in Workplace Communication Lab	Mandatory	0	0	4				50		50	100	2
8	CMICA0151	C Programming Lab	Mandatory	0	0	4				50		50	100	2
9		*Massive Open Online Courses	*MOOCs											
		TOTAL							200	200	400	250	1050	24

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

Sr. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	CMC0021	C Programming Course	Infosys Wingspan (Infosys Springboard)	8h 49m	
2	CMC0020	Computer Fundamentals 101	Infosys Wingspan (Infosys Springboard)	8h 18m	

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.

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR
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MCA(Integrated)

Evaluation Scheme

SEMESTER-II

Sl. No.	Subject Codes	Subject	Types of Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	TOTAL	PS	TE	PE		
1	CMICA0204	Applications of Calculus	Mandatory	3	1	0	30	20	50		100		150	4
2	CMICA0203	Design Thinking-I	Mandatory	3	1	0	30	20	50		100		150	4
3	CMICA0202	Skills for Career Enhancement	Mandatory	3	0	0	30	20	50		100		150	3
4	CMICA0201	Internet and Web Designing	Mandatory	3	1	0	30	20	50		100		150	4
5	CMICA0255	Problem Solving Using Python Lab	Mandatory	0	0	8				50		100	150	4
6	CMICA0251	Internet and Web Designing Lab	Mandatory	0	0	4				50		50	100	2
7	CMICA0252	Skills for Career Enhancement Lab 1	Mandatory	0	0	4				50		50	100	2
8	CMICA0259	Activity Based Learning	Mandatory	0	0	2				50			50	1
		*Massive Open Online Courses	*MOOCs											
		TOTAL							200	200	400	200	1000	24

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

S. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	CMC0019	Design Thinking	Infosys Wingspan (Infosys Springboard)	3h 31m	
2	CMC0001	Next Gen Technologies	Infosys Wingspan (Infosys Springboard)	10h 14m	0.5

PLEASE NOTE: -

- **Internship(2-3weeks) shall be conducted during summer break after II semester and will be assessed during III semester**
- Activity based on qualitative & quantitative analysis of dataset

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.

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Course Code: CMICA0104	Course Name: Matrices and Calculus	L	T	P	C
Course Offered in: MCA-Integrated		3	1	0	4

Pre-requisite: Linear equations and inequalities, Quadratic equations Functions (linear, quadratic, and polynomial), Graphing functions (linear, quadratic, and polynomial), Trigonometry (basic identities and equations), Basic geometry (points, lines, planes, angles)

Course Objectives: Enable students to understand the basic concept of matrix and determinants and their applications. Enable the students to understand the basic concept of sets relations, functions and limit and continuity of functions and their applications.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Apply the concept of matrix and determinants to find the solution of system of linear equation	K3
CO2	Analyze the concept of sets relations and functions to solve problems based on sets and functions	K3
CO3	Evaluate the limit and continuity of various functions.	K3
CO4	Apply the concept of differentiation to find the derivative of different type functions, rate of change and maxima and minima.	K3
CO5	Evaluate the problems of Profit, Loss, Number & Series, Coding & decoding.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	2	1	-	-	-	1
CO2	3	1	1	-	-	-	-	1
CO3	3	2	1	-	-	-	-	-
CO4	3	2	2	-	-	-	-	1
CO5	3	2	2	-	-	-	-	1

Course Contents / Syllabus

Module 1	**MATRIX AND DETERMINANTS**	**10 hours**

MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Determinants: Definition, Minors, Cofactors, Properties of Determinants. Adjoint, Inverse and solution of system of linear equations.

Module 2	**SETS, RELATIONS, AND FUNCTIONS**	**10 hours**

Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications. Properties of Relations, Equivalence Relation, Partial Order and Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite, and Inverse Functions.

Module 3	**LIMITS AND CONTINUITY**	**10 hours**

Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem.

Module 4	**DIFFERNTIATION**	**10 hours**

Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Indeterminate Forms, L' Hospitals Rule, Maxima & Minima of Single Variable Function

Module 5	**APTITUDE-I**	**8 hours**

Simplification, Percentage, Profit, loss &discount, Average, Number& Series, Coding & decoding, Time and Work.

	Total Lecture Hours	**48 hours**

Textbook:

S. No	Book Title:	Author
1	NCERT, "Mathematics - Textbook for Class XI", January 2019	NCERT Publication
2	NCERT, "Mathematics Part I - Textbook for Class XII", Jan 2019	NCERT Publication
3	BCA Mathematics Volume -1&2", Krishna Publications"	J.P. Chauhan, Rishi Kumar

Reference Books:		
S. No	**Book Title:**	**Author**
1	"Elementary Engineering Mathematics"	B.S. Grewal
2	NCERT, "Mathematics Part II - Textbook for Class XII"	NCERT Publication, Jan 2019
3	"Quantitative Aptitude"	R.S. Agrawal

NPTEL/ YouTube/ Faculty Video Link:	
Module 1	https://www.youtube.com/watch?v=rS9AwyRbB7g https://www.youtube.com/watch?v=7SQbz96xUyg
Module 2	https://www.youtube.com/watch?v=DzWwkvGrmFk https://www.youtube.com/watch?v=NaHMl8avG04
Module 3	https://youtu.be/7WxUaH-50Vw https://youtu.be/tQxk5IX9S_8
Module 4	https://youtu.be/hswdwcNhQ0g https://youtu.be/EkkATH3W1Mo
Module 5	https://www.GovernmentAdda.com

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Course Code: CMICA0102	Course Name: Proficiency in Workplace Communication	L	T	P	C
Course Offered in: MCA-Integrated		**3**	**0**	**0**	**3**

Pre-requisite: Understanding of basic English language.

Course Objectives: To improve proficiency in the English language to the Intermediate level of CEFR (Common European Framework of Languages), To motivate students to look within and create a better version of 'self', To introduce the key concepts of life skills and train for career enhancement.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Identify key concepts of workplace communication skills.	K2
CO2	Practice effective listening skills.	K3
CO3	Acquire fluency and spontaneity while speaking.	K3
CO4	Read and interpret simple written texts.	K2
CO5	Produce clear and detailed texts on a variety of topics.	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1	1	-	-	3	1	2	2
CO2	1	2	-	-	3	-	2	2
CO3	1	2	1	-	3	-	2	3
CO4	1	2	-	-	2	-	1	2
CO5	2	2	1	1	3	1	2	3

Course Contents / Syllabus

Module 1	**Introduction to Workplace Communication**	**8 hours**

Importance of Communicating in English, Basics of Language Acquisition: Introduction to the Four Skills, Listening vs. Hearing: The Importance of Active Listening , The Art of Speaking: Effects of Accent, Pronunciation, and Vocabulary, Importance of Reading Skills: From Gaining to Retaining Employment, Elements of Effective Writing: Sentence, Phrases, and Clauses

Module 2	**Learning Workplace Communication Strategies**	**8 hours**

Strategies of Active Listening: Repeat, Reflect, and Respond, Strategies of Effective Speaking: Pitch, Pace, Pause, Projection, and Passion, Strategies of Effective Reading: Skimming and Scanning, Strategies of Effective Writing: Record, Reduce, Recite, Reflect, and Review.

Module 3	**Enhancing Workplace Communication Skills**	**10 hours**

Listening for Specific Purposes at Workplace, Mastering Speech Formation: Word stress, Rhythm, and Pauses, Reading with a Purpose: Comprehension, Fluency, and Analysis, Nuances of Effective Writing: Spelling, Capitalisation, Punctuation, and Sentence Structure

Module 4	**Applying Workplace Communication Skills in Context**	**10 hours**

Listen to Lead: Formal and Informal Workplace Communication, Presentation: Verbal and Non-verbal Skills, Understanding Infographics, Paragraph Formulation: Responding to Workplace Messages

	Total Lecture Hours	**36 hours**

Textbook:

S. No	Book Title	Author
1	"English for Everyone"	Express Publishing
2	"Communicative English"	Macmillan
3	"English for Communication"	Cambridge University Press
4	ABC Workbook, Meerut, 2023	NIET Publishing House

Reference Books:

S. No	Book Title	Author
1	Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Norman Whitby, Cambridge University Press, 2013, UK.	Norman Whitby
2	Listening in the Language Classroom by John Field, Cambridge University Press, 2021, UK.	John Field
3	Speaking: Second Language Acquisition, from Theory to Practice by William Littlewood, Cambridge University Press, 2022, UK.	William Littlewood
4	Second Language Writing in Transitional Spaces: Teaching and Learning Across Languages and Cultures edited by Viniti Vaish and Guangwei Hu, Routledge, 2019, UK.	Viniti Vaish and Guangwei Hu
5	The Writing Revolution: A Guide to Advancing Thinking Through Writing in All Subjects and Grades Jossey-Bass, 2022, USA.	Judith C. Hochman and Natalie Wexler
6	The Cambridge Handbook of Corrective Feedback in Second Language Learning and Teaching edited by Hossein Nassaji and Eva Kartchava, Cambridge University Press, 2021, UK	Hossein Nassaji and Eva Kartchava
7	IELTS 11: General Training with answers. Cambridge English, 2018	

NPTEL/ YouTube/ Faculty Video Link:	
Module 1	https://www.youtube.com/watch?v=JIKU_WT0Bls
Module 2	https://www.youtube.com/watch?v=6Ql5mQdxeWk
Module 3	https://www.youtube.com/watch?v=fE_cS75Lcvc
Module 4	https://www.memrise.com
Module 5	https://englishtest.duolingo.com/applicants

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Course Code: CMICA0101	**Course Name:** C Programming	**L**	**T**	**P**	**C**
Course Offered in: MCA-Integrated		**3**	**1**	**0**	**4**

Pre-requisite: Basic knowledge of computers

Course Objectives: The objective of a C programming course is to provide students with a solid foundation in the C programming language. The course aims to familiarize students with the syntax, concepts, and principles of C programming, as well as develop their ability to write efficient and effective C code.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	Apply the fundamentals of C programming to recognize tokens, operators, data types in developing basic C programs.	K3
CO2	Implement control structures, loops, functions, recursion, and storage classes to develop structured C programs solving basic computational problems	K4
CO3	Apply pointers, arrays, and string manipulations to perform memory-efficient operations and solve problems using modular C programming techniques.	K4
CO4	Develop programs using structures, unions, and dynamic memory allocation to handle complex data and optimize memory usage in C.	K4
CO5	Implement file handling, sorting, searching, and command-line argument techniques to manage data input/output efficiently in C programs.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	3	2	2	2	1	1	-	1
CO2	3	3	2	3	2	1	-	2
CO3	3	3	3	3	2	2	-	2
CO4	3	2	3	3	2	2	-	2
CO5	3	3	3	3	3	3	-	3

Course Contents / Syllabus

Module 1	**Basic Concepts of C Programming**	**8 hours**

Introduction to Algorithm and C Program: Programming using C: Concepts of Algorithm and Flowchart, Translator and its types, Applications of C programming, Structure of C program, Overview of compilation and execution process in an IDE, Transition from algorithm to program, Syntax, logical errors and Run time errors, object and executable code **Tokens & Operators:** Keywords, identifiers, constant, Operators and their types, Arithmetic expressions and precedence: Operators precedence and associativity, type conversion, mixed operands.
Data Types & Variables: Basic data types, type modifiers, variable declaration, memory allocation

Module 2	**Control Structures and Functions**	**8 hours**

Conditional Branching: if, else-if, nested if - else, switch statements, use of break, and default with switch
Iteration and loops: Concept of loops, for, while and do- while, multiple loop variables, use of break and continue statements, nested loop
Functions: Concept of Sub-programming, function, types of functions, passing parameters to functions: call by value Definition
Recursion: Definition, Types of recursive functions, Tower of Hanoi problem
Storage Classes: scope of variable, local and global variables, Nesting of Scope, Auto, Register, Static and Extern

Module 3	**Array and Pointers**	**8 hours**

Pointers: Defining and declaring pointer, pointer arithmetic and scaling, Pointer Aliasing. call by reference
Arrays: Array notation and representation (one and two dimensional), array using pointers, manipulating array elements,2-D array s used in matrix computation. Sorting and searching algorithms
Strings: Introduction, initializing strings, accessing string elements, Array of strings, Passing strings to functions, String manipulation functions.

Module 4	**Derived Data Types and Memory Management**	**8 hours**

Structure: Introduction, Initializing, defining, and declaring structure, accessing members, Operations on individual members, Operations on structures, Structure within structure, Array of structure

Union: Introduction, Initializing, defining, and declaring structure, Accessing members, Operations on individual members, Operations on Union, Difference between Structure and Union
Dynamic Memory Allocation: Introduction, Library functions– malloc (), calloc(), realloc() and free ()

Module 5	**File Management**	**8 hours**

File Handling: File Types, File operations, File pointer, File opening modes, File handling functions, Command Line Arguments, File handling through command line arguments, Record I/O in files,

	Total Lecture Hours	**40 hours**

Textbook:

S. No	**Book Title**	**Author**
1.	"C: The Complete Reference", McGraw Hill Education,4th Edition 2022	Herbert Scheldt
2.	"Programming in ANSI C", 9th Edition, McGraw-Hill Education India, 2024.	E Balagurusamy
3.	"Let Us C", BPB publication, 16th Edition, 2018	Yashwant P. Kanetkar

Reference Books:

S. No	**Book Title**	**Author**
1.	Modern C, Third Edition", Manning Publications,3rd Edition ,2023	Jens Gustedt
2.	Head First C: A Brain-Friendly Guide" by David Griffiths, Shroff/O'Reilly, 1st Edition ,2022	David Griffiths, Shroff/O'Reilly
3.	"C Programming in Easy Steps", In Easy Steps Limited, 5th Edition ,2022.	Mike McGrath

NPTEL/ YouTube/ Faculty Video Link:

Module 1	https://www.youtube.com/watch?v=KnvbUiSxvbM&list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&ab_channel=Programiz
Module 2	https://www.youtube.com/watch?v=JYHpD9huNR4&list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&index=25&ab_channel=Programiz
Module 3	https://www.youtube.com/watch?v=MOeGnamlUP4&list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&index=19&ab_channel=Programiz
Module 4	https://www.youtube.com/watch?v=zmRxC7gYw-g&list=PLBlnK6fEyqRiteqwlMLXYtZ16xXDR7MO0&ab_channel=NesoAcademy
Module 5	https://www.youtube.com/watch?v=UxifZwjd5xU&ab_channel=GateSmashers https://www.youtube.com/watch?v=VM7s1k0s7kk&list=PLzx1ARJOmyed-PYHMduhZDQ4eKXmWJj_T&ab_channel=SmartLogicAcademy

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Course Code: CMICA0103	Course Name: Digital Logic Design	L	T	P	C
Course Offered in: MCA-Integrated		**3**	**0**	**0**	**3**

Pre-requisite: Basic knowledge of mathematics, physics & basic electronics.

Course Objectives: This course is intended to provide the students with a comprehensive understanding of the fundamental of digital logic circuit. The design of circuits and systems whose input and outputs are represented as discrete variables. Industry runs the entire automatic system because of digital electronics. It plays a critical role in the success of businesses. It enhances communication, increases efficiency, enables remote work, and enhances security.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Apply concepts of Digital Binary System and implementation of Gates.	K3
CO2	Analyze and design of Combinational logic circuits.	K4
CO3	Analyze and design of Sequential logic circuits with their applications.	K4
CO4	Analyze the design of finite state machine.	K4
CO5	Implementation of IoT devices with sensors.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	3	1	-	-	1
CO2	3	3	2	3	1	-	-	1
CO3	3	3	3	2	1	1	-	1
CO4	2	3	3	2	1	1	-	1
CO5	2	2	3	3	2	2	1	2

Course Contents / Syllabus

Module 1	**Digital System and Binary Numbers**	**8 hours**

Number System and its arithmetic, signed binary numbers, compliments, Binary codes, Cyclic codes, Hamming Code, Simplification of Boolean Expression: K-map method up to five variables, SOP and POS Simplification Don't Care Conditions, Logic Gate, NAND and NOR Gate.

Module 2	**Combinational Logic**	**8 hours**

Combinational Circuits: Analysis Procedure, Design Procedure, Code Converter, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, Demultiplexers

Module 3	**Sequential Logic and Its Applications**	**8 hours**

Sequential Circuits: Latches & Flip Flops, Characteristic Equations of Flip Flops, Excitation Table of Flip Flops, Flip Flop Conversion, Registers, Shift Registers, Synchronous and Asynchronous Counters, Other Counters: Johnson &Ring Counter

Module 4	**Finite State Machine**	**8 hours**

Introduction to finite state machine: Pulse and fundamental mode of operation, realization of state table from verbal description, state diagram& Transition matrix, Mealy and Moore model machine, Hazards.

Module 5	**Introduction to IoT**	**8 hours**

Introduction to IoT: What is IoT, Impact of IoT, IoT Challenges. IoT network architecture & design: M2M. 'Things' in IoT: Sensors, Actuators, Smart objects, Basics of Sensor Networks. Communicating smart objects: Arduino Uno, Node mcu esp8266, interfacing with sensors.

	Total Lecture Hours	**40 hours**

Textbook:

S. No	Book Title	Author
1	"Digital Design," Pearson Education 6th Edition, 2017	M. Morris Mano and M. D. Ciletti
2	"Digital Logic & State Machine Design", Oxford University Press, 3rd Edition, 2016	David J. Comer
3	"Modern Digital Electronics," Tata McGraw Hill Publication, 5th Edition,2022	R P Jain & Kishore Sarawadekar

4.	IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things, Pearson India Pvt. Ltd., 1st Edition, 2018.	D. Hanes, G. Salgueiro, P. Grossetete, R. Barton, J. Henry

Reference Books:

S. No	Book Title	Author
1	"Digital Circuits and Design," Pearson Education, 1st Edition, 2016	D P Kothari and J.S. Dhillon
2	"Fundamentals of Digital Circuits," PHI Learning Pvt. Ltd., 3th Edition, 2016	A. Anand Kumar

NPTEL/ YouTube/ Faculty Video Link:

Module 1	https://www.youtube.com/playlist?list=PL803563859BF7ED8C
Module 2	https://www.youtube.com/playlist?list=PLbRMhDVUMnge4gDT0vBWjCb3Lz__0HnYKkX
Module 3	https://www.youtube.com/playlist?list=PL53575D0244F058EB
Module 4	www.youtube.com/watch?v=urUBLmXFKl0&list=PLgMDNELGJ1CaBrefq-__0eYatfOnoncW0y
Module 5	https://youtu.be/WUYAjxnwjU4?si=NzwouDSZZdwPLwuL

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Course Code: CMICA0155	Course Name: Computer Fundamentals and Office Automation Lab	L	T	P	C
Course Offered in: MCA-Integrated		**0**	**0**	**8**	**4**

Pre-requisite: Basic Knowledge of Computer

Course Objectives: To develop understanding of windows, provide an in-depth training in use of office automation, internet, and internet tools, to familiarize the students to develop documents, spreadsheets, make effective presentations with the help of MS-PowerPoint.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	State the functionalities of windows.	K1
CO2	Explain the word processing skills	K2
CO3	Analyzing the data using excel worksheet.	K4
CO4	Determine power point presentation and present data in an effective manner.	K3
CO5	Apply basic working of internet and email.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	2	1	-	-	-	1
CO2	2	2	1	1	-	-	-	1
CO3	3	2	2	2	**1**	-	**2**	1
CO4	2	3	3	2	2	1	-	2
CO5	2	2	1	3	1	-	2	3

Course Contents / Syllabus

Module 1	**Overview of Computer System**	**8 hours**

Characteristics of Computer System, Block diagram of computer system. Types of computer system and their features- Minicomputer, Micro Computer, Mainframe Computer, Super computer. Types of Programming Languages (Machine Language, Assembly Language, High Level Language). Data Organization, Drives, Files,
Types of Memory- (Primary and Secondary) RAM, ROM, PROM, EPROM and EEPROM.
Secondary Storage Devices- Directories Secondary Storage Devices (Floppy disk, Compact disk, Hard Disk, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display).

Module 2	**Windows**	**8 hours**

Installation of Windows, Starting and Shutdown windows, Basic Elements of Windows, Working with Menus Dialogue Boxes, Window Applications, Program Manager, File Manager, Print Manager, Control Panel, Write, Paint Brush, Accessories including Calculator, Calendar, Clock, Notepad, Recorder.

Module 3	**Word Processor and Spreadsheet Tool**	**8 hours**

Salient features of Word Processing, File, Edit, View, Insert, Format, Tools, Tables, Window Options, Spreadsheet Tool-Excel Worksheet, Data Entry, Editing, Cell Addressing ranges, Commands, Menus, Copying & Moving Cell Content.

Module 4	**Microsoft PowerPoint**	**8 hours**

Starting MS-Power Point, different Bars, Different Types of Views, and Exiting MS- PowerPoint Creating New Presentation, working with Slides, Applying Design templates, Applying Custom Animations, and Applying Slide Transitions. Saving A Presentation running a Presentation, closing a Presentation and Opening an Existing Presentation.

Module 5	**MS-Access, Internet, and E-mail**	**8 hours**

Introduction to Ms.-Access, uses and components of MS Access, Benefits and Limitations of using MS Access, Creating tables, Evolution of Internet, Internet Applications, E-mail.

	Total Lecture Hours	**60 hours**

Textbook:

S. No	Book Title	Author
1	'Fundamentals of Computers',5th Edition, PHI, 2010.	V. Raja Raman
2	'Teach Yourself Microsoft Office 2000', Techmedia, 1999.	Perry G

3	' Information Technology for Management ',4th Edition, John Wiley & Sons, 2006.	Turban, Mclean and Wetherbe
4	'Mastering MS Office 2000 Professional', 3rd Edition, BPB Publication, 2006.	G.Courter

Reference Books:

S. No	**Book Title**	**Author**
1	"Computer Fundamentals: A Comprehensive Approach" ,2009	Dr. Harrold J. Willis and Dr. Henry R. Webster
2	"Introduction to Computer Science" ,2011	Harold Abelson and Gerald Jay Sussman
3	"Microsoft Office Automation: A Guide to Automating Microsoft Office Applications" ,2023	Michael R. Groh

NPTEL/ YouTube/ Faculty Video Link:

Module 1	https://www.youtube.com/watch?v=JVwO6ZnXVg0&list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp&index=2
Module 2	https://www.youtube.com/watch?v=kRPE2T1cuOo&list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp&index=9
Module 3	https://www.youtube.com/watch?v=KzS2ivdiSS8&list=PLWPirh4EWFpF_2T13UeEgZWZH__c8nHBuXp&index=26
Module 4	https://www.youtube.com/watch?v=dQngpAF8pJs
Module 5	AEXL - Video 88 (youtube.com)

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY

GREATER NOIDA-201306

(An Autonomous Institute)

School of Computer Applications

LAB Course Code: CMICA0155	**LAB Course Name:** Computer Fundamentals and Office Automation Lab	**L**	**T**	**P**	**C**
Course Offered in: MCA-Integrated					
Pre-requisite: Basic Knowledge of Computer					

Course Objectives:

To develop understanding of windows, provide an in-depth training in use of office automation, internet, and internet tools, to familiarize the students to develop documents, spreadsheets, make effective presentations with the help of MS-PowerPoint.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	State the functionalities of windows.	K1
CO2	Explain the word processing skills	K2
CO3	Analyzing the data using excel worksheet.	K4
CO4	Determine power point presentation and present data in an effective manner.	K3
CO5	Apply basic working of internet and email.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	3	2	2	1	-	-	-	1
CO2	2	2	1	1	-	-	-	1
CO3	3	2	2	2	1	-	2	1
CO4	2	3	3	2	2	1	-	2
CO5	2	2	1	3	1	-	2	3

List Of Practical's

1.Create a new Word document and type some text.

2. Open the document MYBOOK.DOC and perform the following task.

i. Note down the default margins of MYBOOK.DOC

ii. Format the first paragraph with the following measurements: Alignment: justified Indentation: Left:0.4", Right:0.4" Special: First line by 0.5" Line spacing: 1.5 lines

iii. At the end of MYBOOK.DOC type:
MANKU IS A ROBOT NOT A HUMAN BEING.
Make 12 copies of the statement written above and apply all the text attributes

3. Create a Table in MS Word.

4. Enter some subjects' marks and find the Total Number & Average using Formula.

5. Using the Students Mark sheet find HOW MANY SUBJECTS 1 PAPER GREATER THAN 20?

6. Apply the Vlookup formula in Excel.

7. Using Sales Dataset
Which Sales Man Jan Sales 2000, & Feb Sales is 2500? (Using VLookup) How Many sales Man sales Jan Months Sales >2000 & March Sales <=1500?

8. Create charts using the mark sheet dataset.

9. Create a PPT with the following description - PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines, and Arrows

10.Create a PPT with the following description - include Hyperlinks, Inserting–Images, Clip Art, Audio, Video, Objects, Tables, and Charts.

11.Create a table in MS Access.

12. Create a table in MS Access and also create primary key and show the relationship.

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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LAB Course Code: CMICA0153	**LAB Course Name:** Digital Logic & Circuit Design Lab	**L**	**T**	**P**	**C**
Course Offered in: MCA-Integrated		**0**	**0**	**4**	**2**

Pre-requisite: Basic knowledge of mathematics, physics & basic electronics

Course Objectives: Understand the basic working of logic gates and sensors.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	Apply concepts of Digital Binary System and implementation of Gates	K3
CO2	Analyze and design of Combinational logic circuits	K4
CO3	Analyze and design of Sequential logic circuits with their applications	K3
CO4	Implement the Design procedure of Synchronous & Asynchronous Sequential Circuits	K3
CO5	Implementation of IoT devices with sensors	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	3	2	2	3	1	-	1	2
CO2	3	3	3	3	1	-	1	2
CO3	3	3	3	3	1	-	1	2
CO4	3	3	3	3	1	1	1	2
CO5	3	3	3	3	2	1	2	3

List Of Practical's

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, Concept of Vcc and ground, verification of the truth tables of AND, OR, NOT, NAND, NOR, XOR, XNOR logic gates.
2. Implementation of the given Boolean function using logic gates in both SOP and POS forms. Y = ABC'+A'B'C+(A+B) (A'+B'+C)
3. Design and implementation of
   a. Half adder using logic Gate
   b. Full adder using logic Gate
   c. full subtractor using logic Gate 4-bit parallel adder using 7483 IC.
4. Implementation and verification of
   a. Decoder using logic gates.
   b. Encoder using logic gates
   c. 3x8 decoder using 2x4 decoder
   d. 16x4 Encoder using 4x2 Encoder
5. Design and Implementation of
   a. Binary to Decimal code convertor
   b. Binary to Octal code convertor
   c. Binary to Hexadecimal code convertor
   d. Binary to Gray code convertor Binary to BCD code convertor
6. Design and Implementation of
   a. Decimal to Binary code convertor
   b. Octal to Binary code convertor
   c. Hexadecimal to Binary Code Convertor
   d. Gray Code to Binary Code Convertor BCD to Binary code convertor
7. Design and Implementation of
   a. 1-bit Magnitude comparator
   b. 2-bit Magnitude comparator
8. Design and Implementation of

a. 2-bit Binary Multiplier b. 4-bit Binary Multiplier
9. Design and Implementation of a. 4:1 Multiplexer using logic gates. b. 1:4 Demultiplexer using logic gates c. 8 x1 Mux using 4x1 Mux d. 1x8 Demux using 1x4 DeMux
10. Design and implement a circuit of Mux which is use as – a. OR Gate b. AND Gate c. NOT Gate d. XOR Gate e. XNOR Gate
11. Verification of state tables of RS, JK, T and D flip-flops using a. NAND gates b. NOR gate
12. Design a D flip flop using a. T flip flop b. JK flip flop
13. Design and implementation of - a. 4-bit up counter Asynchronous counter b. 4-bit down Asynchronous counter c. 4-bit up and down Asynchronous counter d. Decade Ripple counter
14. Design and implementation of - a. 3-bit Synchronous up counter b. 4-bit Synchronous down counter c. 4-bit Synchronous up and down counter d. MOD-6 Synchronous Counter
15. Install the Arduino IDE in your PC / Laptop and implement - a. Interfacing of Arduino with LED b. Interfacing of Arduino with Push Buttons. c. Interfacing of Arduino with LCD.
16. Implement the Interfacing of Arduino with a. Ultrasonic Sensor b. Rain Sensor c. Humidity Sensor d. LDR Sensor
17. Implement the Interfacing of Node MCU with a. LED b. Push Buttons. c. LCD.
18. Implement the Interfacing of Node MCU with a. Ultrasonic Sensor b. Rain Sensor
19. Mini Project List Design and implement a smart Agriculture system Design and Implementation of Sequencing counter Design and Implementation of Smart traffic light signal Design and implementation of Arduino Security Alarm System Design and implementation of Arduino Digital Dice

Design and implementation of smart light system Design and implementation of Gaming Alarm Design and implementation of Automated Plant Watering System Design and Implementation of Weather Station Design and Implementation of water saving system
Total Hours: 40 hrs.

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LAB Course Code: CMICA0152	LAB Course Name: Proficiency in Workplace Communication Lab	L	T	P	C
Course Offered in: MCA-Integrated		**0**	**0**	**4**	**2**

Pre-requisite: Understanding of basic English language.

Course Objectives:

To improve proficiency in the English language to Intermediate level (B1/B2) of CEFR (Common European Framework of Languages). To impart business communication skills. To motivate students to look within and create a better version of 'self. 'To introd uce the key concepts of ethics, etiquette, and life skills.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	Improve proficiency in English to the next level of CEFR.	K1
CO2	Develop business communication skills.	K3
CO3	Demonstrate improved versions of themselves.	K4
CO4	Acquire the concepts to cope better at the workplace.	K4
CO5	Participate in the placement process with confidence.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1	2	1	1	2	-	1	3
CO2	1	2	2	1	3	1	2	2
CO3	1	2	2	1	2	1	2	3
CO4	1	3	2	1	3	2	2	3
CO5	1	2	2	2	3	2	2	3

List Of Practical's

Introduction to the course and the evaluation scheme:

- Students will gain knowledge about the course and examination pattern.

Anubhav Activities:

- Students will gain confidence in expressing themselves in public, overcome inhibitions in a fun way, and develop a sense of freedom and creativity.

ConvoQuest: Interactive Listening Challenge:

- Students will gain confidence in listening, understanding, and responding accurately to conversations and questions by the peers. Regular practice will enhance memory retention and recollection of conversational details.

Telephone Game:

- Students will learn to listen and pass a message verbatim from one person to another in a chain, with each person whispering or speaking softly to the next. The students learn deep listening, remembering, recalling, and speaking clearly in a low voice.

Reading to get the central idea:

- Students will learn to deduce information from texts and learn analytical thinking

Sentence Unscrambling:

- Students will arrange a set of scrambled words and phrases into coherent sentences focusing on proper sentence structure and punctuation.

Spot the Difference:

- Students will listen to two similar passages with subtle differences and identify discrepancies, sharpening attentive listening and analytical skills.

Small Talk through Role Plays:

- Students will learn to engage in initiating a conversation.

Context Clue Quest:

- Students will learn to use context clues to determine the meaning of unfamiliar words in a passage promoting vocabulary acquisition and reading fluency.

Sentence Construction:

- Students will learn to fill in blanks to complete sentences enhancing their understanding of syntax and vocabulary usage. It will improve their ability to construct coherent and contextually appropriate sentences.

Sound Safari:

- Students will be able to identify sounds/words of similar pronunciation and decipher their meanings within a specific environment or scenario.

Storytelling Slam:

- Students will share personal anecdotes or fictional stories in a competitive setting focusing on narrative structure vivid description and engaging delivery. It will improve their oral fluency and coherence and increase creativity in verbal expression.

Reading Detective Challenge:

- Students will learn to analyse a passage for implicit meanings identify the author's tone and apply advanced reading comprehension strategies and critical reading skills.

Word Association Chain:

- Students will learn to retain vocabulary improve writing speed and enhance their ability to make semantic connections based on auditory input.

Jigsaw:

- Students will listen to fragmented information and reconstruct the complete message.

Scenario Sketches:

- The students will learn to act out short scenarios based on provided prompts improvising dialogue and actions to create realistic interactions promoting creativity and confidence in spoken expression

Information Treasure Hunt:

- Students will practice skimming and scanning techniques to quickly identify key information and overall themes in short paragraphs. It will enhance their ability to efficiently extract relevant details and main ideas from written material improving their reading comprehension and time management skills.

Paragraph Powerhouse:

- Students will learn to construct cohesive and coherent paragraphs by organising their thoughts and using topic sentences supporting details and concluding sentences. This activity will enhance their ability to develop and express complex ideas in written form.

Extempore and JAM:

- Students will learn to speak confidently in public using various verbal and non-verbal aspects of speech. Students will gain awareness of speaking in a professional environment and enhance their overall communication in English

Decoding infographics:

- Students will improve their ability to interpret and analyse information presented in diagrams graphs and pie charts.

Analysing Speech/Ted Talks:

- Students will be able to improve their listening by analysing speeches by famous personalities/TED Talks on subjects related to technology/science.

Guess the Emotion (Short Audio Clips):

- Students will be able to identify emotional cues in speech. It will improve their understanding of non-verbal communication refine their emotional intelligence and enhance their empathetic listening skills.

Decoding the Audio:

- Participants will enhance their speaking skills by accurately decoding and interpreting spoken messages and identifying key information. It will improve their ability to understand spoken English in various contexts aiding in effective communication and comprehension

Sharing your views in a group discussion:

- Students will enhance their ability to express their opinions actively listen to others and engage in constructive discussions to develop well-rounded perspectives.

Situation based Role Play writing:

- Students will write role plays to practice effective communication strategies, develop empathy and understanding, and improve their writing skills and ability to handle real-life situations through role-playing exercises.

- **Role Play Activity:** Students will present their role-play, which will further help them improve their speaking skills.

Total Hours: 40 hrs.

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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LAB Course Code: CMICA0151	**LAB Course Name:** C Programming Lab	**L**	**T**	**P**	**C**
Course Offered in: MCA-Integrated		**0**	**0**	**4**	**2**

Pre-requisite: Basic knowledge of computers

Course Objectives:

The objective of a C programming course is to provide students with a solid foundation in the C programming language. The course aims to familiarize students with the syntax, concepts, and principles of C programming, as well as develop their ability to write efficient and effective C code.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	Implement and trace the execution of conditional and iteration programs.	K3
CO2	Demonstrate use of arrays, strings, functions, and recursion.	K3
CO3	Solve the complex problem by using array and structure.	K3
CO4	Compare and contrast between Structure and union along with concepts of dynamic memory allocation	K4
CO5	Apply the concepts of File Handling	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	3	2	2	2	1	1	1	1
CO2	3	3	2	2	2	1	1	2
CO3	3	3	3	3	2	2	1	2
CO4	3	2	3	3	2	2	1	2
CO5	3	3	3	3	2	2	1	3

List Of Practical's

1. Write a C program that simulates a simple calculator capable of performing basic arithmetic operations
2. Develop a calculator application that performs conversions between different number systems
3. Write a program in C to evaluate the given polynomial equation
4. Write a program (write a program) in C to calculate pow (x,n)
5. Write a program in C to find largest number among three numbers
6. Write a program in C to find roots of a quadratic equation
7. Write a program in C to check leap year. Evaluate all the cases
8. Write a program in C to check whether a number is positive or negative
9. Write a program in C to check whether a character is an alphabet or not
10. Write a program in C to make a simple calculator using switch...case
11. Write a program in C to check whether a number is even or odd
12. Write a program in C to check whether a character is a vowel or consonant
13. Write a program in C to find the largest number among three numbers
14. Write a program in C to check whether a number is positive or negative
15. Write a program in C to calculate the sum of natural numbers
16. Write a program in C to find factorial of a number
17. Write a program in C to generate multiplication table
18. Write a program in C to display Fibonacci sequence
19. Write a program in C to find gcd of two numbers
20. Write a program in C to find lcm of two numbers

21. Write a program in C to display characters from a to z using loop
22. Write a program in C to reverse a number using looping concepts
23. Write a program in C to check whether a number is palindrome or not
24. Write a program in C to check whether a number is prime or not
25. Write a program in C to check Armstrong number
26. Write a program in C to display Armstrong number between two intervals
27. Write a program in C to display factors of a number
28. Write a program in C to calculate the sum of natural numbers
29. Write a program in C to find factorial of a number
30. Write a program in C to convert binary number to decimal and vice-versa
31. Write a program in C to display a diamond-shaped pattern
32. Write a program in C to display Floyd's triangle
33. Write a program in C to display pascal triangle
34. Write a program in C to print star patterns
35. Write a program in C to print pyramid patterns
36. Write a C program that performs grade calculation for multiple students
37. Design a C program with hierarchical menu system for geometric calculations
38. Write a program in C to display prime numbers between intervals using function
39. Write a program in C to check whether a number can be expressed as sum of two prime numbers
40. Write a program in C to check prime or Armstrong number using user-defined function
41. Develop a menu-driven C program to manage student records
42. Write a program in C to find the sum of natural numbers using recursion
43. Write a program in C to find factorial of a number using recursion
44. Write a program in C to find GCD using recursion
45. Write a program in C to calculate the power using recursion
46. Write a program in C to find the sum of natural numbers using recursion
47. Write a program in C to add two number using recursion
48. Write a program in C to find sum of digit of number using recursion
49. Write a program in C which will remove any given character from a string
50. Write a program in C to find the frequency of characters in a string
51. Write a program in C to count the number of vowels, consonants and so on
52. Write a program in C to remove all characters in a string except alphabets
53. Write a program in C to find the length of a string
54. Write a program in C to concatenate two strings
55. Write a program in C to copy string without using strcpy()
56. Write a program in C to sort elements in lexicographical order (dictionary order)
57. Write a program in C to find the frequency of characters in a string
58. Write a program in C to count occurrence of a given character in a string
59. Write a program in C to check if two strings are anagram
60. Write a program in C to check a string is palindrome or not
61. C program to check given character is vowel or consonant
62. Write a program in C program to check given character is digit or not
63. Write a program in C program to replace the string space with a given character
64. Write a program in C program to convert lowercase char to uppercase of string
65. Write a program in C program to convert lowercase vowel to uppercase in string
66. Write a program in C program to delete vowels in a given string

67. Write a program in C program to count occurrence of vowels & consonants in a string
68. Write a program in C program to print the highest frequency character in a string
69. Write a program in C program to replace first occurrence of vowel with '-' in string
70. Write a program in C program to count alphabets, digits and special characters
71. Write a program in C program to separate characters in a given string
72. Write a program in C program to remove blank space from string
73. Write a program in C program to count blank space from string
74. Write a program in C program to concatenate two strings
75. Write a program in C program to remove repeated character from string
76. Write a program in C program to calculate sum of integers in string
77. Write a program in C program to print all non-repeating character in string
78. Write a program in C program to copy one string to another string
79. Write a program in C program to sort characters of string
80. Write a program in C program to sort character of string in descending order
81. Write a program in C to calculate average using arrays
82. Write a program in C to find largest element in an array
83. Write a program in C to search an element from given array
84. Write a program in C to add two matrices using multi-dimensional arrays
85. Write a program in C to multiply two matrices using multi-dimensional arrays
86. Write a program in C to find transpose of a matrix
87. Write a program in C to access array elements using pointer
88. Write a program in C to find largest number using dynamic memory allocation
89. Write a program in C to calculate average using arrays
90. Write a program in C to find largest element in an array
91. Given an array containing numbers from 1 to 100 with one number missing, write a C program to find the missing number efficiently
92. Given an array containing numbers from 1 to 100 where multiple numbers may be duplicated, write a C program to identify and display all the duplicate numbers
93. Write a program in C to remove duplicate elements form array in C
94. Write a C program to find and display the numbers that appear in Array 1 but are not present in Array 2
95. Write a program in C for, how to compare two array is equal in size or not
96. Write a program in C to find largest and smallest number in array
97. Write a program in C to find second highest number in an integer array
98. Write a program in C to find top two maximum number in array
99. Write a C program to print array in reverse Order
100. Write a C program to reverse an Array in two ways
101. Write a C Program to calculate length of an array
102. Write a C program to insert an element at end of an Array
103. Write a C program to insert element at a given location in Array
104. Write a C Program to delete element at end of Array
105. Write a C Program to delete given element from Array
106. Write a C Program to delete element from array at given index
107. Write a C Program to find sum of array elements
108. Write a C Program to print all even numbers in array
109. Write a C Program to print all odd numbers in array
110. Write a C program to perform left rotation of array elements by two positions
111. Write a C program to perform right rotation in array by 2 positions
112. Write a C Program to merge two arrays
113. Write a C Program to find highest frequency element in array

114. Write a C Program to Store Information of a Student Using Structure
115. Develop a C program that Dynamically allocates memory for storing multiple instances of the structure using pointers and malloc (or calloc)
116. Write a C Program to Add Two Distances (in inch-feet system) using Structures
117. Write a C program to define a union for student information containing roll number, name, and marks. Demonstrate how memory is shared in a union.
118. Create a union for employee information with fields: emp_id, salary, and name. Input values for each field and print them to show how union stores only one value at a time.
119. Demonstrate accessing a union variable through pointer dereferencing.
120. Use a union within a structure to represent different types of bank accounts (e.g., savings and current). Input account type and show relevant fields using union.
121. Write a C program to write a sentence to a text file
122. Develop a C program to read and display the first line of a file
123. Develop a C program to write record data to a file
124. Write a C program to Read the last Line from a File
125. Write a C program to copy one file into another
126. Write a C program to write a structure into a file and display its content
127. Write a C program to search a record in a file
128. Write a program in C to read an existing file
129. Write a program in C to write multiple lines to a text file
130. Write a program in C to read the file and store the lines in an array
131. Write a program in C to find the number of lines in a text file
132. Write a program in C to find the content of a file and the number of lines in a text file
133. Write a program in C to count the number of words and characters in a file
134. Write a program in C to list all files and sub-directories in a directory
135. Write a program in C to count number of lines in a file
136. Write a program in C to merge contents of two files into a third file
137. Write a program in C to count number of lines, words, characters, blank space in a file
138. Write a program in C to Shutdown Computer in Linux
139. Create a C program that simulates basic functionalities of an ATM system
140. Develop a C program to manage the information of workers or employees in an organization using file handling
141. Design a C program that helps a library in-charge efficiently manage books and customers
Total Hours: 40 hrs.

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: CMICA0204	Course Name: Applications of Calculus	L	T	P	C
Course Offered in: MCA-Integrated		3	1	0	4

Pre-requisite: Students should have a good understanding of functions, equations, and inequalities, as well as basic calculus concepts such as limits, derivatives, and integrals. Additionally, students should be familiar with concepts from trigonometry, including identities, equations, and graphs of trigonometric functions

Course Objectives: Enable the students to understand the basic concept of Integration. Enable the students to understand the basic concept of differential equations and their solutions. Enable the students to understand the basic concept of partial order relations and lattices. Enable the students to understand the basic concept of partial differentiation and their applications.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	Apply concept of integration to evaluate definite integrals.	K3
CO2	Apply the concept of differentiation and integration to find the solution of differential equations.	K3
CO3	Understand the concept of partial order relations and lattices to solve various problems based on it.	K3
CO4	Apply the concept of partial differentiation of functions of two variables to find the derivative of different type functions, and maxima and minima.	K3
CO5	Solve the problems of Ratio, Proportion & Partnership, Problem of ages, Allegation & Mixture, Direction, Blood relation, Simple & Compound interest, Permutation & Combination.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	2	1	-	-	-	1
CO2	3	3	3	1	-	-	-	1
CO3	3	2	1	-	-	-	-	1
CO4	3	2	2	1	-	-	-	1
CO5	3	2	2	-	-	-	-	1

Course Contents / Syllabus

Module 1	**INTEGRATION**	**10 hours**

Basic concept of Integral, Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, definite Integral, Fundamental Theorem of Calculus (without proof), Basic properties of definite integral.

Module 2	**DIFFERENTIAL EQUATION**	**10 hours**

Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type: $\frac{dy}{dx} + py = q$, where p and q are functions of x, Introduction of Second order Linear differential equation and C.F., P.I. for exponential and trigonometric functions.

Module 3	**PARTIAL ORDER RELATIONS AND LATTICES**	**10 hours**

Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub, and lattices Lattices & Algebraic Systems, Principle of Duality, Basic Properties, Sublattices, Distributed & Complemented Lattices.

Module 4	**FUNCTIONS OF SEVERAL VARIABLES**	**10 hours**

Partial Differentiation, Change of Variables, Chain Rule, Extrema of Functions of two variables, Euler's Theorem for homogeneous functions.

Module 5	**APTITUDE-II**	**8 hours**

Ratio, Proportion & Partnership, Problem of ages, Allegation & Mixture, Direction, Blood relation, Simple & Compound interest, Permutation & Combination.

	Total Lecture Hours	**40 hours**

Textbook:

S. No	Book Title:	Author:
1	"BCA Mathematics Volume -1&2", Krishna Publications	J. P. Chauhan, Sharad Kumar

2	NCERT, "Mathematics Part I - Textbook for Class XII," Jan 2019	NCERT Publication
3	NCERT, "Mathematics Part II - Textbook for Class XII," Jan 2019	NCERT Publication

Reference Books:

S. No.	**Book Title:**	**Author:**
1	"Elementary Engineering Mathematics"	B.S. Grewal
2	NCERT, "Mathematics - Textbook for Class XI", Jan 2019	NCERT Publication
3	"Differential Equations"	G.F. Simmons
4	"Quantitative Aptitude"	R.S. Aggrawal

NPTEL/ YouTube/ Faculty Video Link:

Module 1	https://www.youtube.com/playlist?list=PLbu_fGT0MPstBzAW5gGWLltksM_yAs3si https://youtu.be/z0ajJjA3_Ns
Module 2	https://youtu.be/f-4tMNFUqyU https://youtu.be/AX_0jNDIi9I
Module 3	https://www.youtube.com/watch?v=LUjb0tgE_uo https://www.youtube.com/watch?v=DZEG3YgJbL0&list=PLEjRWorvdxL5-D6xREVQ7a-EZMJLO7N8j
Module 4	https://www.youtube.com/watch?v=-LdChGbNbP4 https://www.youtube.com/watch?v=n2wyqq-K7_A
Module 5	https://www.GovernmentAdda.com

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Course Code: CMICA0203	Course Name: Design Thinking-I	L	T	P	C
Course Offered in: MCA Integrated		3	1	0	4

Pre-requisite: None

Course Objectives: The objective of this course is to familiarize students with the design thinking process as a tool for breakthrough innovation. It aims to equip students with design thinking skills and ignite their minds to create innovative ideas as develop solutions for real-time problems.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	Develop a strong understanding of the design process and apply it in a variety of business settings	K1
CO2	Analyze self, culture, and teamwork to work in a multidisciplinary environment and exhibit empathetic behavior	K3
CO3	Formulate specific problem statements of real-time issues and generate innovative ideas using design tools	K4
CO4	Apply critical thinking skills to arrive at the root cause from a set of likely causes	K4
CO5	Demonstrate an enhanced ability to apply design thinking skills for the evaluation of claims and arguments	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	3	2	2	2	1	2
CO2	1	2	2	1	3	1	2	3
CO3	2	3	3	2	2	1	1	2
CO4	2	3	2	2	1	1	1	2
CO5	2	3	3	2	1	1	1	3

Course Contents / Syllabus

Module 1	**Introduction**	**8 hours**

An overview of future skills, introduction to design thinking, traditional problem solving versus design thinking, history of design thinking, wicked problems. Innovation and creativity, the role of innovation and creativity in organizations, creativity in teams and their environments, design mindset. Introduction to elements and principles of design, 13 Musical Notes for Design Mindset, Examples of Great Design, Design Approaches across the world.

Case Studies: Mumbai Dabbawallas, Gillette, Singapore, Bengaluru, Bahubali, Google, Embrace Incubator

Activity: Observation, Wicked Problem

Module 2	**Ethical Values and Empathy**	**8 hours**

Understanding humans as a combination of I (self) and body, basic physical needs up to actualization, prosperity, the gap between desires and actualization. Understanding culture in family, society, institution, startup, socialization process. Ethical behavior: effects on self, society, understanding core values and feelings, negative sentiments and how to overcome them, definite human conduct: universal human goal, developing human consciousness in values, policy, and character.

Understanding stakeholders, techniques to empathize with, identify key user problems. Empathy tools- Interviews, empathy maps, emotional mapping, immersion and observations, Emotional Intelligence, customer journey maps, classifying insights after Observations, Classifying Stakeholders.

Case Studies: Pure-it, Royal Enfield, Big Basket, Air-bnb.

Activity: Moccasin Walk, Persona, Empathy map, Journey Map

Module 3	**Problem Statement and Ideation**	**8 hours**

Defining the problem statement, creating personas, Point of View (POV) statements. Research identifying drivers, information gathering, target groups, samples, and feedbacks. Idea Generation basic design directions, Themes of Thinking, inspirations and references, brainstorming, inclusion, sketching and presenting ideas, idea evaluation, double diamond approach, analyze – four W's, 5 why's, "How Might We", Defining the problem using Ice-Cream Sticks, Metaphor & Random Association Technique, Mind-Map, ideation activity games - six thinking hats, million-dollar idea, introduction to visual collaboration and brainstorming tools - Mural, JamBoard.

Case Studies: The Good Kitchen, Flipkart, Uber, Redbus, Big Bazaar

Activity: 5 Why, HMW, Brainstorming, Six Thinking Hats, 30 Circles, paper prototype

Module 4	**Critical Thinking**	**8 hours**

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

Case Studies: Byju's, Maggi noodles, Tata Nano

Activity: debate, role play

Module 5	**Logic and Argumentation**	**8 hours**

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

Case Studies: Aadhaar Card, Demonetization, Odd-Even Policy, Jio

Activity: Logical Fallacy Detective, Fact-Checking Challenge

	Total Lecture Hours	**40 hours**

Textbook:

S. No	**Book Title**	**Author**
1	UnMukt : Science & Art of Design Thinking, 2020, Polaris	Arun Jain
2	Solving Problems with Design Thinking – Ten Stories of What Works,2013, Columbia Business School Publishing	Jeanne Liedta, Andrew King and Kevin Benett
3	A Foundation Course in Human Values and Professional Ethics, First Edition, 2009, Excel Books: New Delhi	RR Gaur, R Sangal, G P Bagaria

Reference Books:

S. No	**Book Title**	**Author**
1	101 Design Methods: A Structured Approach for Driving Innovation in Your Organization, 2013, John Wiley and Sons Inc, New Jersey	Vijay Kumar
2	I. (2013). Design thinking for strategic innovation: What they can't teach you at business or design school. John Wiley & Sons.	Mootee
3	Basics Design 08: Design Thinking, 2010, AVA Publishing SARoger L. Martin,	Gavin Ambrose and Paul Harris
4	Design of Business: Why Design Thinking is the Next Competitive Advantage, 2009, Harvard Business Press, Boston MA	

NPTEL/ YouTube/ Faculty Video Link:

Module 1	https://youtu.be/rUUuhnLkJ2s?si=_XCHnDbt_U1z0Frx https://www.youtube.com/watch?v=ldYzbV0NDp8 https://www.youtube.com/watch?v=0Fi83BHQsMA
Module 2	https://www.youtube.com/watch?v=q654-kmF3Pc http://www.uhv.org.in/ https://swayam.gov.in/nd1_noc19_mg60/preview
Module 3	https://www.udemy.com/course/design-thinking-for-beginners/ https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them
Module 4	https://www.forbes.com/sites/sap/2016/08/25/innovation-with-design-thinking-demands-critical-thinking/#340511486908 https://www.criticalthinking.org/pages/defining-critical-thinking/766
Module 5	https://www.udemy.com/course/critical-thinker-academy/ https://swayam.gov.in/nd2_aic19_ma06/preview

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Course Code: CMICA0202	**Course Name: Skills for Career Enhancement**	**L**	**T**	**P**	**C**
Course Offered in: MCA-Integrated		**3**	**0**	**0**	**3**

Pre-requisite: The students should have completed the Proficiency in Workplace Communication course in the first semester

Course Objectives:

- To improve proficiency in Business English to the Intermediate level of CEFR.
- To understand the basic nuances of communication, both verbal and non-verbal.
- To train for career enhancement.
- To introduce the key concepts of ethics, etiquette, and life skills.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	Understand the role and importance of various communication skills essential for career development.	K2
CO2	Develop and apply effective listening skills in both personal and professional contexts.	K6
CO3	Demonstrate fluency and spontaneity while speaking.	K3
CO4	Read and interpret complex written texts.	K2
CO5	Construct clear and concise texts on a variety of topics.	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	1	1	1	1	3	1	2	2
CO2	1	1	1	1	3	1	1	2
CO3	1	1	1	1	3	1	1	2
CO4	1	2	1	1	3	1	1	2
CO5	1	1	1	1	3	1	1	2

Course Contents / Syllabus

Module 1	**The Role of Communication in Career Development**	**6 hours**

- Introduction to the course
- Benefits of active listening in personal and professional contexts
- Professional self-introduction
- Identifying main ideas in professional documents
- Organizing ideas logically.

Module 2	**Building Interpersonal Skills**	**6 hours**

- Importance of first impressions
- Overcoming barriers to effective listening: Distractions, preconceptions, and multitasking
- Engaging in small talk
- Interpreting non-verbal cues in texts

- Writing short responses and reflections

Module 3	Digital Communication Skills	8 hours

- Listening to webinars and online meetings
- Speaking clearly in virtual meetings
- Evaluating the evidence and logic of digital content
- Note-taking
- Digital writing: Ethics and etiquette
- Self-presentation guidelines

Module 4	Facing Communication Challenges	8 hours

- Common communication pitfalls
- Miscommunication and misunderstanding
- Paraphrasing, summarizing, and reflecting
- Handling interruptions and objections
- Balancing reading speed with understanding
- Managing tone in professional communication

Module 5	Speaking spontaneously and comfortably	8 hours

- Analyzing effective presentations for structure, style, and delivery
- The hook: Engaging in opening techniques
- Delivering a clear message
- Developing/researching content
- Designing effective presentation slide

	Total Lecture Hours	40 hours

Textbook:

S. No	Book Title	Author
1	ABC Workbook, NIET Publishing House, Meerut, 2023	NIET Publishing House
2	Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Cambridge University Press, 2013, UK.	Norman Whitby
3	Listening in the Language Classroom, Cambridge University Press, 2021, UK.	John Field

Reference Books:

1	Speaking: Second Language Acquisition, from Theory to Practice, Cambridge University Press, 2022, UK.	William Littlewood

2	Second Language Writing in Transitional Spaces: Teaching and Learning Across Languages and Cultures edited by, Routledge, 2019, UK.	Viniti Vaish and Guangwei Hu
3	The Writing Revolution: A Guide to Advancing Thinking Through Writing in All Subjects and Grades by, 2022, USA.	Judith C. Hochman and Natalie Wexler, Jossey-Bass
4	The Cambridge Handbook of Corrective Feedback in Second Language Learning and Teaching edited by, Cambridge University Press, 2021, UK	Hossein Nassaji and Eva Kartchava
5	IELTS 11: General Training with answers. Cambridge English, 2018	Cambridge English

NPTEL/ YouTube/ Faculty Video Link:

1	http://promeng.eu/downloads/training-materials/ebooks/soft-skills/effective-communication-skills.pdf
2	http://ncert.nic.in/textbook/pdf/iees101.pdf
3	https://www.youtube.com/watch?v=JIKU_WT0Bls
4	https://www.youtube.com/watch?v=6Ql5mQdxeWk
5	https://www.youtube.com/watch?v=fE_cS75Lcvc

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Course Code: CMICA0201	Course Name: Internet and Web Designing	L	T	P	C
Course Offered in: MCA-Integrated		3	1	0	4

Pre-requisite: Students should have a basic understanding of computer fundamentals, including operating systems, hardware, and software

Course Objectives: This course is intended to teach the basics of the internet and familiarize students to publish content over the web by using access technologies and web protocols. It explores the principles of creating an effective webpage using the 'language of the web'- HTML and the security issues of browsers.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Analyze the basic working scheme of the Internet and the World Wide Web and the requirements of effective web design	K2
CO2	Analyz**e** various access network technologies, DNS operations, IP routing protocols, and web hosting methods,	K4
CO3	Develop web pages using the basic HTML features with different layouts as per need of applications	K6
CO4	Create a well structured and visually appealing web page using CSS.	K6
CO5	Demonstrate the basic concepts of network and security issues.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	2	2	1	-	-	2
CO2	3	3	2	2	1	-	1	2
CO3	3	2	3	3	2	1	-	2
CO4	2	2	3	3	2	1	-	2
CO5	2	3	2	2	1	-	2	3

Course Contents / Syllabus

Module 1	**Internet and Overview of WWW**	**8 hours**

Introduction to Internet, Basic Internet Terminology, ARPANET, World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page **Overview of Protocols** – Simple Mail Transfer Protocol, Gopher, Telnet, FTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts

Web Server -Client-Side Scripting and Server-side Scripting, Accessing Web servers, IIS, Apache web server.

Module 2	**Access Network Architecture**	**8 hours**

Access Network Architectures: Access network characteristics. Differences between Access Networks, Voice grade modems, ADSL, Cable Modems, and Frame Relay.

DNS: Domain Names. Resolving Domain Names to IP addresses (DNS operation). Registering Domain Names and solving Domain name disputes. Function of IP routing protocols (OSPF and BGP4). Implications of future Internet growth on routing protocol performance. Web Publishing or Hosting

Module 3	**HTML**	**8 hours**

Basics of HTML, formatting, and fonts, commenting code, color, hyperlink, lists, tables, images, forms, XHTML, Meta tags, Character entities, frames and frame sets, HTML Forms, Browser architecture and Web site structure. Overview and features of latest version of HTML.

Module 4	**Cascading Style Sheet**	**8 hours**

Style sheets: Need for CSS, introduction to CSS, basic syntax, and structure, using CSS, background images, colors, and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2, Overview and feature s of latest version of CSS.

Module 5	**Web Security**	**8 hours**

Web Security: Security Issues on web, Importance of Firewall, components of Firewall, Transaction security, Emerging client server, Security Threats, Network Security, Factors to consider in Firewall design, Limitation of Firewalls. Internet Security, Management Concepts and Information Privacy and Copyright Issues

		Total Lecture Hours | **40 hours**
Textbook:		
S. No	**Book Title**	**Author**
1	"Web Technologies: TCP/IP, Web/ Java Programming, and Cloud Computing", Third Edition, McGraw Hill Education, 2013	Achyut Godbole, Atul Kahate
2	Developing Web Applications, Wiley-India Private Limited, 2011.	Ralph Moseley and M. T. Savaliya
3	Complete Reference HTML, TMH, 2002	T.A. Powell
4	D. Comer, "The Internet Book," Pearson Education, 2009	D. Comer
Reference Books:		
S. No	**Book Title**	**Author**
1	"Web Design for Dummies," For Dummies ,2012	Lisa Lopuck
2	"Internet and World Wide Web How to program," 5th Edition, Pearson Education, 2011.	Paul J. Deitel, Harvey M. Deitel, and Abbey Deitel
4	M. L. Young, "The Complete reference to Internet," Tata McGraw Hill, 2007.	M. L. Young
3	"HTML and CSS: Design and Build Websites," Wiley,2011	Jon Duckett
NPTEL/ YouTube/ Faculty Video Link:		
Module 1	Introduction to Web Design - Fundamentals & Basics - YouTube	
Module 2	Introduction to Internet IT Class 9 | Information & Communication Technology Skills Class 9 IT 402 - YouTube	
Module 3	https://youtu.be/HcOc7P5BMi4?si=VkLKtVeVDkreDZIc	
Module 4	https://youtu.be/ESnrn1kAD4E?si=l7WzhEmX6-KDVj_8	
Module 5	https://youtu.be/JoeiLuFNBc4?si=qz9_kgjvOS4-q8Vk	

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Course Code: CMICA0255	**Course Name:** Problem Solving Using Python Lab	**L**	**T**	**P**	**C**
Course Offered in: MCA-Integrated		**0**	**0**	**8**	**4**

Pre-requisite: Students should have a basic understanding of computer programming concepts. Additionally, Student should be familiar with basic mathematical concepts.

Course Objectives: To provide Basic knowledge of Python programming and to implement programming skill for solving real world problems.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Learn the foundational python programming skills.	K2
CO2	Describe the concepts of decision and iterative control statements	K3
CO3	Provide with comprehensive grasp of user defined functions and modules in python	K3
CO4	Provide with hands-on skills in python sequence data structures –lists, tuples, set and dictionaries	K4
CO5	Explain exceptional handling and file operations in python.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	3	2	2	3	1	1	1	2
CO2	3	3	2	3	1	1	1	2
CO3	3	2	3	3	2	1	1	2
CO4	3	3	3	3	2	1	1	3
CO5	3	2	2	3	2	2	1	3

Course Contents / Syllabus

Module 1	**Basics of python programming**	**7 hours**

Problem Solving, Techniques, Algorithm, building blocks of algorithms (statements, state, control-flow, functions), Notation, Flow chart, Pseudocode, programming language, Categories of programming languages A Brief History of Python, Applications areas of python, The Programming Cycle for Python, Python IDE, Interacting with Python Programs. Elements of Python: keywords and identifiers, variables, data types and type conversion, operators in python, expressions in python

Module 2	**Decision Control Statements**	**4 hours**

Conditionals: Conditional statement in Python (if-else statement, its working and execution) Nested-if statement and elif statement in Python, Expression Evaluation & Float Representation. Loops: Purpose and working of loops, while loop, For Loop, Nested Loops, Break and Continue, pass statement.

Module 3	**Function and Modules**	**6 hours**

Introduction of Function, calling a function, Function arguments, built in function, scope rules Passing function to a function, recursion, Lambda functions Modules and Packages: Importing Modules, writing own modules, Standard library modules, dir() Function, Packages in Python

Module 4	**Basic Data structures in Python**	**5 hours**

Strings: Basic operations, Indexing and Slicing of Strings, Comparing strings. Regular expressions. Python Basic Data Structure: Sequence, Unpacking Sequences, Mutable Sequences, Lists, looping in lists, Tuples, Sets, Dictionaries. Map, filter, Reduce, Comprehension

Module 5	**File and Exception handling**	**4 hours**

Files and Directories: Introduction to File Handling in Python, Reading and Writing files, Additional file methods, Working with Directories. Exception Handling, Errors, Run Time Errors, Handling IO Exception, Try-except statement, Raise

	Total Lecture Hours	**26 hours**

Textbook:

S. No	**Book Title**	**Author**
1.	Beginning Python-From Novice to Professional	Magnus Lie Hetland
2.	Python Programming using Problem solving approach	Reema Thareja
3.	Fundamentals of Python: First Programs	Kenneth A. Lambert

Reference Books:

S. No	Book Title	Author
1.	Introduction to Computation and Programming Using Python	John V Guttag
2.	Introduction to Computer Science using Python: A Computational Problem-Solving Focus	Charles Dierbach
3.	Think Python: How to Think Like a Computer Scientist	Allen B. Downey

NPTEL/ YouTube/ Faculty Video Link:

Module 1	https://nptel.ac.in/courses/106/106/106106182/
Module 2	https://nptel.ac.in/courses/106/106/106106212/ https://www.youtube.com/watch?v=PqFKRqpHrjw
Module 3	https://nptel.ac.in/courses/106/106/106106145/ https://www.youtube.com/watch?v=m9n2f9lhtrw https://www.youtube.com/watch?v=oSPMmeaiQ68
Module 4	https://nptel.ac.in/courses/106/106/106106145/ https://www.youtube.com/watch?v=ixEeeNjjOJ0&t=4s
Module 5	https://nptel.ac.in/courses/106/106/106106145/ https://www.youtube.com/watch?v=NMTEjQ8-AJM

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LAB Course Code: CMICA0255	**LAB Course Name:** Problem Solving Using Python Lab	**L**	**T**	**P**	**C**
Course Offered in: MCA-Integrated					

Pre-requisite: Students should have a basic understanding of computer programming concepts. Additionally, Student should be familiar with basic mathematical concepts.

Course Objectives:

To enhance students' problem-solving skills by guiding them in writing efficient and functional Python code, implementing object-oriented programming (OOP) principles, and applying Python to practical, real-world applications.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Write simple python programs.	K2
CO2	Construct decision making and iterative programs Explain user defined functions and modules in python	K3
CO3	Develop user defined functions and modules in python	K3
CO4	Illustrate python programs using sequence data structures.	K4
CO5	Analyze exception handling programs and file operations in python.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	3	2	2	3	1	1	1	2
CO2	3	3	2	3	1	1	1	2
CO3	3	2	3	3	2	1	1	2
CO4	3	3	3	3	2	1	1	3
CO5	3	2	2	3	2	2	1	3

List Of Practical's (Indicative & Not Limited To)

1. Python Program to Print Statement
2. Swap two variables without using a temporary variable.
3. Check if a given number is even or odd.
4. Find the largest of three numbers.
5. Convert a string to an integer.
6. WAP to demonstrate implicit and explicit type conversion.
7. Convert Revenue to Currency Format
8. Write a program to Calculate Sum of 5 Subjects and Find Percentage (Max Mark in each subject is 100).
9. Write a program to find gross salary.
10. Write a program to Calculate Area of Rectangle, Square, Scalene Triangle and Right-angle Triangle
11. Write a program to find the perimeter of a circle, rectangle, and triangle.
12. Write a program to Compute Simple Interest.
13. Write a program to swap the values of two variables with and without using third variable.
14. Write a program to perform arithmetic operations on a = 8, b = 3.
15. Write a program to apply relational operations on a=8, b=3.
16. Write a program to apply assignment operations on a=8, b=3.
17. Write a program to apply logical operations on a=8, b=3.
18. Write a program to apply bitwise operations on a=8, b=3.
19. Write a program to apply identity operators.
20. Write a program to Swap the Contents of two Numbers using Bitwise XOR Operation

21. WAP to find the absolute value of the given number.
22. Write a program to Add two Complex Numbers.
23. Write a Program to find roots of a quadratic expression.
24. Program to calculate the average of a list of numbers using the division operator.
25. Program to compare two numbers and determine if they are equal.
26. Program to compare two numbers and determine whether they are greater than or less than.
27. Program to check if a given string is equal to a specific value.
28. Program to calculate compound interest using compound assignment operators.
29. Program to check if a given number is odd or even using bitwise operators.
30. Write a program to Accept two Integers and Check if they are Equal.
31. Write a program to Check if a given Integer is Positive or Negative and Odd or Even.
32. Write a program to Check if a given Integer is Divisible by 7 or not.
33. Write a program to find the greatest of three numbers using else if ladder.
34. Write a program to find the greatest of three numbers using Nested if.
35. Write a program to convert an Upper-case character into lower case and vice-versa.
36. Write a program to check weather an entered year is leap year or not.
37. Write a Program to check whether an alphabet entered by the user is a vowel or a constant.
38. Write a program to print day according to the day number entered by the user.
39. Write a program to print color name, if user enters the first letter of the color name.
40. Write a program to Simulate Arithmetic Calculator.
41. Write a menu driven program for calculating area of different geometrical figures such as circle, square, rectangle, and triangle.
42. WAP that accepts the marks of 5 subjects and finds the percentage marks obtained by the student. It also prints grades according to the following criteria: Between 90-100% Print 'A', 80-90% Print 'B', 60-80% Print 'C', 50-60% Print 'D', 40-50% Print 'E', Below 40% Print 'F'.
43. WAP to enter a character and then determine whether it is a vowel, consonants, or a digit.
44. Write a program to display all even numbers from 1 to 20
45. Write a program to print all the Numbers Divisible by 7 from 1 to 100.
46. Write a program to print table of any number.
47. Write a program to Find the Sum of first 50 Natural Numbers using for Loop.
48. Write a program to calculate factorial of a given number using for loop and using while loop.
49. Write a program to count the sum of digits in the entered number.
50. Write a program to find the reverse of a given number.
51. Write a program to Check whether a given Number is Perfect Number.
52. Write a program to Print Armstrong Number from 1 to 1000.
53. Write a program to Compute the Value of X^n.
54. Write a program to Calculate the value of ${}^nC_r$.
55. Write a program to generate the Fibonacci Series.
56. Write a program to check whether a given Number is Palindrome or Not.
57. Write a program to Check whether a given Number is an Armstrong Number.
58. Write a program to print all prime numbers from 1- 500.
59. Write a program to find the Sum of all prime numbers from 1-1000.
60. Write a program to display the following pattern: *
61. Write a program to display the following pattern:

```
*
* *
* * *
* * * *
* * * * *
```

62. Write a program to display the following pattern:

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

63. Write a program to display the following pattern:

```
A
B B
C C C
D D D D
E E E E E
```

64. Write a program to display the following pattern:

```
* * * * *
* * * *
* * *
* *
*
```

65. Write a program to display the following pattern:

```
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

66. Write a program to display the following pattern:

```
    *
  * * *
* * * * *
* * * * * * *
```

67. Write a program to display the following pattern:

```
* * * * * * * * *
  * * * * * * *
    * * * * *
```

```
* * *
*
```

68. Write a program to display the following pattern (Pascal Triangle):

```
        1
      1   1
    1   2   1
  1   3   3   1
1   4   6   4   1
```

69. Write a program to display the following pattern:

```
  1
 2 3
4 5 6
7 8 9 10
```

70. Write a program to display the following pattern:

```
A
B C
D E F
G H I J
K L M N O
```

71. Write a program to Find the Sum of A.P Series.

72. Write a program to Find the Sum of G.P Series.

73. Write a program to Find the Sum of H.P Series.

74. Write a program to print the following sequence of integers. 1, 2, 4, 8, 16, 32

75. Write a program to find the Sum of following Series:
(1*1) + (2*2) + (3*3) + (4*4) + (5*5) + ... + (n*n)

76. Write a program to find out L.C.M. of two numbers.

77. Write a program to find out H.C.F. of two numbers.

78. Python Program to Accept Three Digits and Print all Possible Combinations from the Digits.

79. Python Program to Print Odd Numbers within a Given Range.

80. Python Program to Find the Smallest Divisor of an Integer.

81. Python Program to Count the Number of Digits in a Number

82. Python program to find GCD between two given integer numbers.

83. Write a Python function to find the Max of three numbers.

84. Write a Python function to sum all the numbers in a list.
Sample List: (8, 2, 3, 0, 7) Expected Output: 20

85. Write a Python program to reverse a string. Sample String: "1234abcd"
Expected Output: "dcba4321"

86. Write a Python function to check whether a number falls in each range.

87. Write a Python function that accepts a string and calculate the number of upper-case letters and lower-case letters. Sample String:

'The quick Brow Fox' Expected Output:

No. of Upper-case characters: 3 No. of Lower-case Characters: 1

88. Write a Python function that takes a number as a parameter and check the number is prime or not.
89. Write a Python function that checks whether a passed string is palindrome or not.
90. Implement a function to check if two strings are anagrams of each other.
91. Python function to display all the Armstrong number from 1 to n.
92. Write a program using recursion to compute factorial of a given number.
93. Write a program to print Fibonacci Series using recursion.
94. Write a program to calculate sum of numbers 1 to N using recursion.
95. Write a program to Find Sum of Digits of the Number using Recursive Function.
96. Write a program to print Tower of Hanoi using recursion.
97. Python Program to Determine How Many Times a Given Letter Occurs in a String Recursively
98. Python Program to Find the Binary Equivalent of a Number Recursively
99. WAP to compute the sum of all the elements of the list using reduce () function.
100. Write a program to import all objects from a module, specific objects from module and provide custom import name to the imported object from the module.
101. Create a python package having at least two modules in it.
102. Create a python package having at least one sub package in it.
103. Python program to check whether the string is Symmetrical or Palindrome
104. WAP to remove i'th character from string in Python
105. Python program to Check if a Substring is Present in a Given String
106. Python program to print even length words in a string
107. Python program to accept the strings which contains all vowels
108. Remove all duplicates from a given string in Python
109. Python Program to Form a New String where the First Character and the Last Character have been Exchanged
110. Python Program to Count the Number of Vowels in a String
111. Python Program to Take in a String and Replace Every Blank Space with Hyphen
112. Python Program to Calculate the Length of a String Without Using a Library Function
113. Python Program to Remove the Characters of Odd Index Values in a String
114. Python Program to Calculate the Number of Words and the Number of Characters Present in a String
115. Python Program to Take in Two Strings and Display the Larger String without Using Built-in Functions
116. Python Program to Check if a String is a Pangram or Not (A pangram is a sentence that uses all 26 letters of the English alphabet at least once. like" The quick brown fox jumps over the lazy dog")
117. Python Program to Accept a Hyphen Separated Sequence of Words as Input and Print the Words in a Hyphen-Separated Sequence after Sorting them Alphabetically-
118. Python Program to Form a New String Made of the First 2 and Last 2 characters From a Given String
119. Python Program to Count the Occurrences of Each character in each String Sentence
120. Python Program to Check if a Substring is Present in each String
121. Python Program to Find the Most Repeated Word in a String.
122. Write a python program to check the validity of a password given by the user. The password should satisfy the following criteria: i) Contain at least 1 letter between a and z. ii) Contain at least 1 number between 0 and 9. iii) Contain at least 1 letter between A and Z. iv) Contain at least 1 character from $, #, @. v) Maximum length of password 6. vi) Maximum length of password:12.
123. Write a python program to validate mobile number.
124. Program to interchange first and last elements in a list

125. WAP to find min, max and average of elements of a list having numeric data
126. Program to check if element exists in list
127. Program for Reversing a List
128. Program to Multiply all numbers in the list
129. Program to find smallest and largest number in a list
130. Program to find second largest number in a list
131. Program to print all even numbers in a range
132. Program to print all negative numbers in a range
133. Program to Remove multiple elements from a list in Python
134. Program to Cloning or Copying a list
135. Program to Count occurrences of an element in a list
136. Program to find Cumulative sum of a list
137. Program to Break a list into chunks of size N in Python
138. Python Program to transpose of Matrix.
139. Python Program to Add and Multiply Two Matrices.
140. Program to get K^{th} Column of Matrix
141. WAP to print all even numbers of a list using list comprehension.
142. WAP that prompts user to enter an alphabet and then print all the words that starts with that alphabet from the list of words.
143. Write a program to calculate square of numbers up to n using list comprehension.
144. Python program to Find the size of a Tuple
145. Python – Maximum and Minimum K^{th} elements in Tuple
146. Create a list of tuples from given list having number and its cube in each tuple
147. Python Program to Count the Number of Vowels Present in a String using Sets
148. Python Program to Check Common Letters in Two Input Strings
149. Python Program that Displays which Letters are in the First String but not in the Second
150. Python Program to Add a Key-Value Pair to the Dictionary
151. Python Program to Concatenate Two Dictionaries into One.
152. Python Program to Check if a Given Key Exists in a Dictionary or Not
153. Python Program to Generate a Dictionary that Contains Numbers (between 1 and n) in the Form (x,x*x).
154. Python program to create an instance of an Ordered dict using a given dictionary. Sort the dictionary during the creation and print the members of the dictionary in reverse order.
155. Python Program to Sum All the Items in a Dictionary
156. WAP to create dictionary which has characters of given string as keys and frequency of characters as values.
157. Python Program to Map Two Lists into a Dictionary
158. Write a program Filtering even numbers from a list using tuple comprehension
159. Creating a list of tuples from two lists using comprehension function
160. Extracting the first character from each word in a list of strings
161. Swapping keys and values in a dictionary
162. Filtering even numbers from a dictionary:
163. Python program to read file word by word
164. Python program to read character by character from a file
165. Python – Get number of characters, words, spaces, and lines in a file
166. Program to Find 'n' Character Words in a Text File
167. Python Program to obtain the line number in which given word is present
168. Count number of lines in a text file in Python
169. Python Program to remove lines starting with any prefix
170. Python Program to Eliminate repeated lines from a file
171. Python Program to read List of Dictionaries from File
172. Python – Append content of one text file to another
173. Python program to copy odd lines of one file to other
174. Python Program to merge two files into a third file
175. Python program to Reverse a single line of a text file

176. Python program to reverse the content of a file and store it in another file
177. Python Program to handle divide by zero exception.
178. WAP to handle multiple exception.
179. Python program to combine each line from first file with the corresponding line in second file.
180. Write a program to copy the contents of one file to another.
181. Write a program to print First 5 lines in a file
182. a) Write a program to catch the following exception: i) Value error ii) Index error iii) Name error iv) Type Error v) Divide zero error b) Write a program to create user defined exceptions. c) Write a program to understand the use of else and finally block with try block. d) Write a python program that uses raise and exception class to throw an exception.

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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LAB Course Code: CMICA0251	LAB Course Name: Internet and Web Designing Lab	L	T	P	C
Course Offered in: MCA-Integrated		0	0	4	2

Pre-requisite: Students should have a basic understanding of computer fundamentals, including operating systems, hardware, and software

Course Objectives:

This course is intended to teach the basics of the internet and familiarize students to publish content over the web by using access technologies and web protocols. It explores the principles of creating an effective webpage using the 'language of the web'- HTML and the security issues of browsers.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Understand the structure and syntax of HTML to create well-formed web pages.	K2
CO2	Develop static websites using HTML elements such as forms, tables, lists, links, and multimedia.	K6
CO3	Apply CSS to enhance the presentation of HTML documents through styling and layout techniques.	K3
CO4	Demonstrate responsive web design using modern CSS features.	K3
CO5	Apply HTML and CSS to design user-friendly, accessible, and visually appealing web interfaces.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	1	-	-	1
CO2	3	2	2	2	2	-	-	2
CO3	2	2	3	3	2	-	-	2
CO4	2	2	3	3	2	1	-	3
CO5	2	3	3	3	3	1	2	3

List Of Practical's (Indicative & Not Limited To)

1. Design a page having suitable background color and text color with the title "My First Web Page" using all the attributes of the Font tag.
2. Create an HTML document giving details of your [Name, Age] [Address, Phone] and [Register Number, Class] aligned in the proper order using alignment attributes of the Paragraph tag.
3. Write HTML code to design a page containing some text in a paragraph by giving a suitable heading style.
4. Create a page to show different character formatting (B, I, U, SUB, SUP) tags.
   viz: log b mp= p logb m
5. Write HTML code to create a Web Page that contains an Image at its center
6. Create a web page with an appropriate image towards the left-hand side of the page, when the user clicks on the image another web page should open
7. Create web Pages using Anchor tag with its attributes for external Links
8. Create a web page for internal links; when the user clicks on different links on the webpage it should go to the appropriate locations/sections in the same page.
9. Write an HTML code to create a web page with pink color background and display a moving message in red color.
10. Create a web page with an appropriate image towards the left-hand side of the page, when user clicks on the image another web page should open.
11. Create a web page, showing an ordered list of all second semester courses and style, it using CSS.
12. Create a web page to apply internal CSS to change background color and font.
13. Create a web page to apply external CSS to style paragraphs and headings

14.Create a web page, showing an unordered list of names of all the Diploma Programmes (Branches) in your institution and apply suitable CSS.

15.Create a HTML document containing a nested list showing a content page of any book.

16. Create a web page to show fixed, relative, absolute, and sticky positioning in CSS

17. Create the following table in HTML with Dummy Data:

Reg. Number	Student Name	Year/Semester	Date of Admission

18. Create a web page which divides the page in two equal frames and place the audio and video clips in frame-1 and frame-2 respectively.

FRAME-1	FRAME-2

19. Create a web page to show CSS hover effect on buttons.

20. Write a HTML code to create a Bank Registration Form and apply styling.

21. Create a static website using HTML and CSS

Total Hours: 40 hrs.

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LAB Course Code: CMICA0252	LAB Course Name: Skills for Career Enhancement Lab 1	L	T	P	C
Course Offered in: MCA Int		0	0	4	2

Pre-requisite: The students should have completed the Proficiency in Workplace Communication course in the first semester

Course Objectives:

- To improve proficiency in Business English to the Intermediate level of CEFR.
- To understand the basic nuances of communication, both verbal and non-verbal.
- To train for career enhancement.
- To introduce the key concepts of ethics, etiquette, and life skills.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Understand the role and importance of various communication skills essential for career development.	K2
CO2	Develop and apply effective listening skills in both personal and professional contexts.	K6
CO3	Demonstrate fluency and spontaneity while speaking.	K3
CO4	Read and interpret complex written texts.	K2
CO5	Construct clear and concise texts on a variety of topics.	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1	1	1	1	3	1	2	2
CO2	1	1	1	1	3	1	1	2
CO3	1	1	1	1	3	1	1	2
CO4	1	2	1	1	3	1	1	2
CO5	1	1	1	1	3	1	1	2

List Of Practical's

1. **Introduction to the course and the evaluation scheme**

Students will gain knowledge about the Examination pattern.

2. **Active Listening Role-Play**

Students pair up and take turns playing the roles of speaker and listener in various scenarios. They practice active listening techniques such as paraphrasing and asking clarifying questions.

3. **Professional Self-Introduction**

Students prepare and deliver brief introductions, focusing on clarity and professionalism. They receive peer feedback on content and delivery.

4. **Annotating Professional Documents**

Students read sample professional documents and practice annotating them to highlight main ideas, key terms, and important details. This activity enhances their reading comprehension and analytical skills.

5. **Writing Reflective Journal Entries**

Students maintain a reflective journal throughout the session, documenting their learning experiences, insights, and reflections on communication practices. This activity encourages self-awareness and critical thinking while strengthening writing skills.

6. **Active Listening in Group Networking Sessions**

Students participate in group networking sessions where they actively listen to others' introductions and conversations. They practice building connections based on what they hear.

7. Small Talk Practice Sessions Students participate in small group discussions where they practice initiating and sustaining small talk conversations.
8. Reading for Tone and Intention Students will read paragraphs of different genres and try to comprehend the tone and intention of the writer.
9. Writing Responses to Common Text Messages Students practice writing short and effective text responses to hypothetical scenarios or prompts. They learn to convey their message clearly and concisely.
10. Listening Comprehension Quiz Students listen to a recorded webinar or online meeting and then take a comprehension quiz based on the content discussed.
11. Virtual Panel Discussion Students participate in a virtual panel discussion on a topic related to digital communication. Each student takes on a role and presents their perspective clearly and confidently, fostering effective communication skills in virtual settings.
12. Analyzing Digital Content Students analyze online articles or posts and evaluate the evidence and logic presented.
13. Creating Digital Etiquette Guides Students research and compile guidelines for digital writing ethics and etiquette. They create informative documents or presentations outlining best practices for communication in digital environments.
14. Identifying Barriers to Effective Listening Students participate in a listening exercise where they encounter various barriers such as distractions, preconceptions, and multitasking. They reflect on how these barriers affect their ability to listen effectively and discuss strategies for overcoming them.
15. Role-Playing Handling Interruptions and Objections Students engage in role-play where they practice handling interruptions in professional conversations. They learn to respond calmly and confidently while maintaining control of the discussion, improving their ability to manage challenging communication situations.
16. Speed-Reading and Comprehension Exercise Students engage in a speed-reading exercise where they read a passage at an accelerated pace. They then reflect on their comprehension and discuss strategies for balancing reading speed with understanding effectively.
17. Miscommunication Reflection Students reflect on instances of miscommunication in writing. They learn to avoid miscommunication.
18. Listen and speak Participants will listen to their peers reading aloud and write down the gist; and will repeat verbatim what is read.
19. Choosing a topic and speaking on it Students experiment with different opening techniques, such as storytelling, asking a thought-provoking question, or sharing a surprising statistic, to hook the audience's attention at the beginning of their presentations. They receive feedback on the effectiveness of their openings.
20. Group Talk Students find out relevant and trending presentation topics from their field and justify their choice.
21. Hansei Activity The students will reflect on the course and share their key learnings.
Total Hours: 40 hrs.

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LAB Course Code: CMICA0259	**LAB Course Name:** Activity Based Learning	**L**	**T**	**P**	**C**
Course Offered in: MCA-Integrated		**0**	**0**	**2**	**1**

Pre-requisite: Basic HTML Knowledge.

Course Objectives:

The objective of this course is to provide participants with the foundational knowledge and practical skills needed to design, develop, and deploy web-based applications.

Course Outcome: After completion of the course, the student will be able to		**Bloom's Knowledge Level (KL)**
CO1	Analyze the basic working scheme of the Internet and the World Wide Web and the requirements of effective web Design.	K2
CO2	Apply the web and Internet technologies.	K4
CO3	Demonstrate the basic concepts of network.	K4
CO4	Analyze the security issues.	K4
CO5	Develop web pages using the basic HTML features with different layouts as per need of applications	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	3	2	2	2	1	1	1	2
CO2	3	3	2	3	2	2	1	3
CO3	3	2	2	2	1	1	1	2
CO4	2	3	2	3	2	2	3	2
CO5	3	2	3	3	2	2	1	3

List Of Practical's (Indicative & Not Limited To)

1. Mobile App for Fitness Tracking: Design a UI for a mobile app that allows users to track their fitness activities, set goals, and monitor their progress. Include features like workout logging, meal tracking, and social sharing.

2. E-commerce Website Redesign: Redesign the user interface of an existing e-commerce website to improve the overall user experience. Focus on creating a visually appealing design, optimizing product search, and filtering, and streamlining the checkout process.

3. Social Media Dashboard: Create a UI for a social media management dashboard that allows users to schedule posts, monitor analytics, and engage with their audience across multiple social media platforms.

4. Virtual Reality Game Menu: Design a UI for a virtual reality (VR) game menu system. Consider the unique challenges of designing interfaces for VR, such as spatial navigation and interaction.

5. Smart Home Control Panel: Create a UI for a smart home control panel that allows users to control various connected devices, such as lighting, temperature, security systems, and entertainment systems.

6. Educational Platform: Design a UI for an online educational platform that offers courses, quizzes, and interactive learning materials. Focus on creating a user-friendly interface that encourages engagement and provides a seamless learning experience.

7. Travel Planning App: Design a UI for a travel planning app that helps users discover destinations, plan itineraries, book accommodations, and find local attractions and activities.

8. Financial Management Dashboard: Create a UI for a financial management dashboard that enables users to track their expenses, manage budgets, view investment portfolios, and generate reports.

9. Music Streaming Service: Design a UI for a music streaming service that allows users to discover and listen to music, create playlists, and personalize their music recommendations.

10. Health and Wellness Journal: Create a UI for a digital health and wellness journal that allows users to track their exercise routines, record their food intake, monitor sleep patterns, and set health goals.

Total Hours: 40 hrs.