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

Affiliated to

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

Evaluation Scheme & Syllabus

For

Master of Computer Applications (Integrated)

First Year

(Effective from the Session: 2024-25)

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

SEMESTER I

S.No	Subject Codes	Subjects	Types of Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	Total	PS	TE	PE		
3 WEEKS COMPULSORY INDUCTION PROGRAM														
1	BMICA0103	Basic Mathematics-I	Mandatory	3	1	0	30	20	50		100		150	4
2	BMICA0102	Proficiency in Workplace Communication	Mandatory	3	0	0	30	20	50		100		150	3
3	BMICA0104	Problem Solving and Algorithmic Thinking	Mandatory	3	1	0	30	20	50		100		150	4
4	BMICA0101	Digital Logic & Circuit Design	Mandatory	3	1	0	30	20	50		100		150	4
5	BMICA0155	Computer Fundamentals and Office Automation Lab	Mandatory	0	0	8				50		100	150	4
6	BMICA0151	Digital Logic & Circuit Design Lab	Mandatory	0	0	4				50		50	100	2
7	BMICA0152	Proficiency in Workplace Communication Lab	Mandatory	0	0	4				50		50	100	2
8	BMICA0159	Activity Based Learning – I	Mandatory	0	0	2				50			50	1
		*Massive Open Online Courses	*MOOCs											
		Total											**1000**	**24**

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

S.No.	Subject Name	Course Name	University/Industry Partner Name	No. of Hours	Credits
1	BMC0002	Next Gen Technologies	Infosys Wingspan (Infosys Springboard)	10h 14m	
2	BMC0041	Microsoft Office 2016	Infosys Wingspan (Infosys Springboard)	31h 54m	

Abbreviation Used:

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

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

S.No	Subject Codes	Subjects	Types of Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	Total	PS	TE	PE		
1	BMICA0203	Basic Mathematics-II	Mandatory	3	1	0	30	20	50		100		150	4
2	BMICA0204	Design Thinking-I	Mandatory	3	1	0	30	20	50		100		150	4
3	BMICA0202X	Skills for Career Enhancement I	Mandatory	3	0	0	30	20	50		100		150	3
4	BMICA0201	Internet and Web Designing	Mandatory	3	1	0	30	20	50		100		150	4
5	BMICA0255	Problem Solving Using Python Lab	Mandatory	0	0	8				50		100	150	4
6	BMICA0251	Internet and Web Designing Lab	Mandatory	0	0	4				50		50	100	2
7	BMICA0252X	Skills for Career Enhancement Lab I	Mandatory	0	0	4				50		50	100	2
8	BMICA0259	Activity Based Learning - II	Mandatory	0	0	2				50			50	1
		*Massive Open Online Courses	*MOOCs											
		TOTAL											**1000**	**24**

PLEASE NOTE: -

- **A 2-3 weeks Internship shall be conducted during summer break after semester-II and will be assessed during semester-III**

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

S.No.	Subject Name	Course Name	University/Industry Partner Name	No. of Hours	Credits
1	BMC0048	HTML - Advanced	IIHT (Infosys Springboard)	6h 21m	
2	BMC0031	Introduction to Python	Infosys Wingspan (Infosys Springboard)	24 h 6 min	

PLEASE NOTE: -

- **A 2-3 weeks Internship shall be conducted during summer break after semester-II and will be assessed during semester-III**

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

Subject Name: Basic Mathematics-I **L-T-P [3-1-0]**

Subject Code: BMICA0103 **Applicable in Department: MCA-Integrated**

Pre-requisite of Subject: 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 Objective: 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 Outcomes (CO)

Course outcome: After completion of this course students 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	K1
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.	K4
CO4	Apply the concept of differentiation to find the derivative of different type functions, rate of change and maxima and minima.	K4
CO5	Solve the problems of Profit, Loss, Number & Series, Coding & decoding.	K4

Syllabus

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

Unit 1	**MATRIX AND DETERMINANTS**	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.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO1
Unit 2	**SETS, RELATIONS AND FUNCTIONS**	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.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO2
Unit 3	**LIMITS AND CONTINUITY**	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.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO3
Unit 4	**DIFFERENTIATION**	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.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO4
Unit 5	**APTITUDE-I**	Simplification, Percentage, Profit, loss &discount, Average, Number& Series, Coding & decoding, Time and Work.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO5

Total	40L		

Textbooks	
Sr. No	**Book Details**
1.	NCERT, “Mathematics - Textbook for Class XI”, NCERT Publication, January 2019
2.	NCERT, Mathematics Part I - Textbook for Class XII, NCERT Publication ,January 2019
3.	NCERT, Mathematics Part II - Textbook for Class XII, NCERT Publication ,January 2014

Reference Books	
Sr. No	**Book Details**
1.	B.S. Grewal, “ElementaryEngineeringMathematics”,34thEd.,1998.
2.	J.P. Chauhan “BCA Mathematics Volume -1&2”, Krishna Publications,2023
3.	R.S. Aggarwal ,”Quantitative Aptitude “,Revised Edition,2024
	Link: NPTEL/YouTube/Faculty Video Link:
UNIT 1	https://www.youtube.com/watch?v=rS9AwyRbB7g https://www.youtube.com/watch?v=7SQbz96xUyg
UNIT 2	https://www.youtube.com/watch?v=DzWwkvGrmFk https://www.youtube.com/watch?v=NaHMl8avG04
UNIT 3	https://youtu.be/7WxUaH-50Vw https://youtu.be/tQxk5IX9S_8
UNIT 4	https://youtu.be/hswdwcNhQ0g https://youtu.be/EkkATH3W1Mo
UNIT 5	https://www.GovernmentAdda.com

Subject Name: Proficiency in workplace communication						**L-T-P [3-0-0]**
Subject Code: BMICA0102						**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Understanding of basic English language.						
Course Objective: 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 Outcomes (CO)						
Course outcome: After completion of this course students 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
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
Unit 1	**Module 1:**	**Introduction to LSRW** Importance of Communicating in English	Interactive Session and discussion	4L+8L		CO1

	Module 2:	Basics of Language Acquisition: Introduction to the Four Skills				CO1
Unit 2	**Module 1:** **Module 2:** **Module 3:** **Module 4:**	**Introduction to Workplace Communication** 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	Interactive Session and Activity	4L+10P	Assignment 1 Speaking & writing activities will be conducted in Labs	CO1 CO1 CO2 CO3
Unit 3	**Module 1:** **Module 2:**	**Learning Workplace Communication Strategies** Strategies of Active Listening: Repeat, Reflect, and Respond Strategies of Effective Speaking: Pitch, Pace, Pause, Projection, and Passion	Interactive Session and Activity	8L+10P	Assignment 2	CO2 CO3

	Module 3: **Module 4:**	Strategies of Effective Reading: Skimming and Scanning Strategies of Effective Writing: Record, Reduce, Recite, Reflect, and Review				CO4 CO5
Unit 4	**Module 1:** **Module 2:** **Module 3:** **Module 4:**	**Enhancing Workplace Communication Skills** 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	Interactive Session and Activity	10L+10P	Assignment 3	CO2 CO3 CO4 CO5
	Module 1:	**Applying Workplace Communication Skills in Context** Listen to Lead: Formal and Informal Workplace Communication	Interactive Session and Activity	10L+10P	Assignment 4 Presentations will be conducted in Labs.	CO2

Unit-5	**Module 2:** **Module 3:** **Module 4:**	Presentation: Verbal and Non-verbal Skills Understanding Infographics Paragraph Formulation: Responding to Workplace Messages				CO3 CO4 CO5
Total				**36L+48P**		

Textbooks	
Sr. No	**Book Details**
1.	"English for Everyone" by Express Publishing
2.	"Communicative English" by Macmillan
3.	"English for Communication" by Cambridge University Press
4.	ABC Workbook, NIET Publishing House, Meerut, 2023
Sr. No	**Book Details**
1.	Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Norman Whitby, Cambridge University Press, 2013, UK.
2.	**Listening in the Language Classroom by John Field, Cambridge University Press, 2021, UK.**
3.	**Speaking: Second Language Acquisition, from Theory to Practice by William Littlewood,** Cambridge University Press**,** 2022, UK**.**
4	**Second Language Writing in Transitional Spaces: Teaching and Learning Across Languages and Cultures edited by Viniti Vaish and Guangwei Hu, Routledge, 2019, UK.**
5	**The Writing Revolution: A Guide to Advancing Thinking Through Writing in All Subjects and Grades by Judith C. Hochman and Natalie Wexler, Jossey-Bass, 2022, USA.**
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
7	IELTS 11: General Training with answers. Cambridge English, 2018
	Link: NPTEL/YouTube/Faculty Video Link:

UNIT 1	**https://www.youtube.com/watch?v=JIKU_WT0Bls**
UNIT 2	**https://www.youtube.com/watch?v=6Ql5mQdxeWk**
UNIT 3	https://www.youtube.com/watch?v=fE_cS75Lcvc
UNIT 4	https://www.memrise.com
UNIT 5	https://englishtest.duolingo.com/applicants

Subject Name: Problem Solving and Algorithmic Thinking	**L-T-P [3-1-0]**
Subject Code: BMICA0104	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Students should have a basic knowledge of mathematics and programming concepts.	
Course Objective- This course provides role of computation in solving the problems, concepts of algorithm, pseudo code and flow chart so that students can prepare the small projects and excel in subjects with programming components with the help of both procedural and object oriented approaches.	

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Understand basics of programming	K2
CO2	Understand the problem-solving process and apply concepts to real-life situations and data-oriented problem analysis	K3
CO3	Use of recursion, searching and sorting algorithm to arrange the data	K3
CO4	Understand to evaluate performance of algorithm	K4
CO5	Understand the concept of Object-Oriented Programming .	K2

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
Unit-1	**Module 1: Introduction of Algorithm**	Introduction of an algorithm and comparison of performance of algorithms, pseudo code, flow chart	Classroom, PPT ,Notes, Smart Board	8L	Assignment	CO1
	Module 2: Conditional Statements	Control Statements- if, if-else and nested if-else statements, switch statements				

	Module 3: Loops	while, for, do-while statements, Loop examples, Information and data, encoding				
Unit-2	**Module 1: Problem Solving and Algorithmic**	Problem Solving and Algorithmic Thinking: Problem definition, Logical reasoning, Problem decomposition, Abstraction. Name binding, Modularization. Data organization .	Classroom, PPT ,Notes, Smart Board	8L	Assignment	CO2
	Module 2: Array	List and Arrays. Logic: Boolean logic, Data Applications of propositional logic				
Unit-3	**Module 1: Searching Techniques**	Factoring and Recursion Techniques, Searching- Linear Search and Binary Search	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO3
	Module 2: Sorting Techniques	Sorting algorithm- Selection Sort, Insertion Sort, Bubble Sort, Merge Sort, Text processing and Pattern matching.				
Unit-4	**Module 1: Asymptotic Notations**	Asymptotic notations-Big-O notation, Omega notation, and Theta notation and their significance, complexity analysis of algorithms-worst case, average case and best case, Introduction to RAM model of computation.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO4
Unit-5	**Module 1: Introduction to OOPs**	Classes and Objects, Object Oriented Methodology: Basic Concepts and Characteristics of OOPs, Advantages and Application of OOPs, Procedural Programming Vs OOPs.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO5

Total	40L		

Textbooks	
Sr. No	**Book Details**
1.	"Introduction to Algorithms" by Thomas H. Cormen
2.	Problem-Solving in Computing: An Introduction" by Mike Clancy
3.	Algorithmic Thinking: A Problem-Solving Approach" by Robert Harper and Eric Roberts

Reference Books	
Sr. No	**Book Details**
1.	David Riley and Kenny Hunt, Computational Thinking for Modern Solver, Chapman & Hall/CRC,2014
2.	R.G. Dromey ,“ How to solve it by Computer”, PHI,2008
3.	Hanly J.R. and Koffman E.B.,’ Problem Solving and Program Design in C’, Pearson Education, 2015
	Link: NPTEL/YouTube/Faculty Video Link:
UNIT 1	https://nptel.ac.in/courses/106105171
UNIT 2	https://www.youtube.com/watch?v=6Zc2bnwW0hQ
UNIT 3	https://www.youtube.com/watch?v=bj911tDlrSE
UNIT 4	https://www.youtube.com/watch?v=7dz8Iaf_weM
UNIT 5	https://www.youtube.com/watch?v=t9WKOcRB63Q&list=PLJ5C_6qdAvBFzL9su5JFX8x80BMhkPy1

Subject Name: Digital Logic & Circuit Design						**L-T-P [3-1-0]**
Subject Code: BMICA0101						**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic knowledge of mathematics, physics & basic electronics.						
Course Objective- 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 Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO1	Apply concepts of Digital Binary System and implementation of Gates.					K3
CO2	Analyse and design of Combinational logic circuits.					K4
CO3	Analyse and design of Sequential logic circuits with their applications.					K4
CO4	Analyse the design of finite state machine.					K4
CO5	Implementation of IoT devices with sensors.					K3
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
UNIT-I	**Digital System and Binary Numbers**	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	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment Program no (1,2)	CO1

		Conditions, Logic Gate , NAND and NOR Gate,				
UNIT-II	**Combinational Logic**	**Combinational Circuits**: Analysis Procedure, Design Procedure, Code Converter, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, Demultiplexers	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment Program no (3 to 10)	CO2
UNIT-III	**Sequential Logic and Its Applications**	**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	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment Program no (11 to 14)	CO3
UNIT-IV	**finite state machine**	**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.	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment Program no (15 to 19)	CO4
UNIT-V	**Introduction to IoT**	**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.	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment	CO5
Total				**40L+20P**		
Textbooks						

Sr. No	Book Details
1.	M. Morris Mano and M. D. Ciletti, “Digital Design”, Pearson Education 6th Edition, 2017
2.	David J. Comer, “Digital Logic & State Machine Design”, Oxford University Press, 3rd Edition, 2016
3.	R P Jain & Kishore Sarawadekar, “Modern Digital Electronics”, Tata McGraw Hill Publication, 5th Edition,2022
4.	D. Hanes, G. Salgueiro, P. Grossetete, R. Barton, J. Henry; IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things, Pearson India Pvt. Ltd., 1st Edition, 2018.
Reference Books	
Sr. No	**Book Details**
1.	D P Kothari and J.S. Dhillon, “Digital Circuits and Design”, Pearson Education, 1st Edition, 2016
2.	A. Anand Kumar, “Fundamentals of Digital Circuits”, PHI Learning Pvt. Ltd., 3th Edition, 2016
	Link: NPTEL/YouTube/Faculty Video Link:
UNIT 1	https://www.youtube.com/playlist?list=PL803563859BF7ED8C
UNIT 2	https://www.youtube.com/playlist?list=PLbRMhDVUMnge4gDT0vBWjCb3Lz 0HnYKkX
UNIT 3	https://www.youtube.com/playlist?list=PL53575D0244F058EB
UNIT 4	www.youtube.com/watch?v=urUBLmXFKl0&list=PLgMDNELGJ1CaBrefq- 0eYatfOnoncW0y
UNIT 5	https://youtu.be/WUYAjxnwjU4?si=NzwouDSZZdwPLwuL

Subject Name: Computer Fundamentals and Office Automation Lab						**L-T-P [0-0-8]**
Subject Code: BMICA0155						**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: Basic Knowledge of Computer						
Course Objective: 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 Outcomes (CO)						
Course outcome: After completion of this course students will be able to:						**Bloom's Knowledge Level(KL)**
CO1	Explain the functionalities of windows.					K1
CO2	Learn the word processing skills					K2
CO3	Use excel work sheet and analyzing the data.					K1
CO4	Determine power point presentation and present data in an effective manner.					K3
CO5	Apply basic working of internet and email.					K4
Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
Unit-1	**Overview of Computer System**	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,.	Classroom, PPT,Notes, Smart Board	4L+10P	Assignment	CO1
	Types of	Types of Memory- (Primary and				

	Memory	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).				
Unit-2	**Windows**	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.	Classroom, PPT, Notes, Smart Board	4L+10P	Assignment Program no (1 to 3)	CO2
Unit-3	**Word Processor and Spreadsheet Tool**	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.	Classroom, PPT, Notes, Smart Board	4L+10P	Assignment Program no (4 to 8)	CO3
Unit-4	**Microsoft PowerPoint**	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.	Classroom, PPT, Notes, Smart Board	4L+10P	Assignment Program no (9,10)	CO4
Unit-5	**MS-Access, Internet and**	Introduction to Ms.-Access, uses and components of MS Access, Benefits	Classroom, PPT, Notes, Smart Board		Assignment	CO5

	E-mail	and Limitations of using MS Access, Creating tables, Evolution of Internet, Internet Applications, E-mail.		4L+10P	Program no (11,12)	
Total				**20L+50P**		

List of Practicals		
Sr No	**Program Title**	**CO Mapping**
1	Create a new Word document and type some text.	CO2
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	CO2
3	Create a Table in MS Word.	CO2
4	Enter some subjects' marks and find the Total Number & Average using Formula.	CO3
5	Using the Students Mark sheet find HOW MANY SUBJECTS 1 PAPER GREATER THAN 20?	CO3
6	Apply the Vlookup formula in Excel.	CO3
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?	CO3
8	Create charts using the mark sheet dataset.	CO3
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	CO4
10	Create a PPT with the following description - include Hyperlinks, Inserting–Images, Clip Art, Audio, Video, Objects, Tables, and	CO4

	Charts.	
11	Create a table in MS Access.	CO5
12	Create a table in MS Access and also create primary key and show the relationship.	CO5

Required Software and Tools

1. **MS Office**

Textbooks

Sr No	Book Details
1.	V. Raja Raman ,'Fundamentals of Computers',5th Edition, PHI, 2010.
2.	Perry G.., 'Teach Yourself Microsoft Office 2000',Techmedia, 1999.
3.	Turban, Mclean and Wetherbe,' Information Technology for Management ',4th Edition, John Wiley & Sons, 2006.
4.	G.Courter, 'Mastering MS Office 2000 Professional', 3rd Edition, BPB Publication, 2006.

Reference Books

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

Links (Only Verified links should be pasted here)

UNIT 1	https://www.youtube.com/watch?v=JVwO6ZnXVg0&list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp&index=2
UNIT 2	https://www.youtube.com/watch?v=kRPE2T1cuOo&list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp&index=9
UNIT 3	https://www.youtube.com/watch?v=KzS2ivdiSS8&list=PLWPirh4EWFpF_2T13UeEgZWZH c8nHBuXp&index=26

UNIT 4	https://www.youtube.com/watch?v=dQngpAF8pJs
UNIT 5	AEXL - Video 88 (youtube.com)

Subject Name: Digital Logic & Circuit Design Lab		**L-T-P [0-0-4]**
Subject Code: BMICA0151		**Applicable in Department: MCA-Integrated**
Course objectives: Understand the basic working of logic gates and sensors.		
Course Outcomes (CO)		
Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Apply concepts of Digital Binary System and implementation of Gates	K3
CO 2	Analyze and design of Combinational logic circuits	K4
CO 3	Analyze and design of Sequential logic circuits with their applications	K3
CO 4	Implement the Design procedure of Synchronous & Asynchronous Sequential Circuits	K3
CO 5	Implementation of IoT devices with sensors	K3

List of Practicals

Sr No	**Program Title**	**CO Mapping**
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.	CO1
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)	CO1
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.	CO2
	Implementation and verification of a. Decoder using logic gates.	

4	b. Encoder using logic gates c. 3x8 decoder using 2x4 decoder 16x4 Encoder using 4x2 Encoder	CO2
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	CO2
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	CO2
7	Design and Implementation of a. 1-bit Magnitude comparator 2 bit Magnitude comparator	CO2
8	Design and Implementation of a. 2-bit Binary Multiplier 4-bit Binary Multiplier	CO2
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 1x8 Demux using 1x4 DeMux	CO2
10	Design and implement a circuit of Mux which is use as – a- OR Gate b- AND Gate c- NOT Gate d- XOR Gate XNOR Gate	CO2
11	Verification of state tables of RS, JK, T and D flip-flops using a. NAND gates. NOR gate	CO3
	Design a D flip flop using	CO3

12	a. T flip flop 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 Decade Ripple counter	CO4
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 MOD-6 Synchronous Counter	CO4
15	Install the Arduino IDE in your PC / Laptop and implement - a. Interfacing of Arduino with LED b. Interfacing of Arduino with Push Buttons. Interfacing of Arduino with LCD.	CO5
16	Implement the Interfacing of Arduino with a. Ultrasonic Sensor b. Rain Sensor c. Humidity Sensor LDR Sensor	CO5
17	Implement the Interfacing of Node MCU with a. LED b. Push Buttons. LCD.	CO5
18	Implement the Interfacing of Node MCU with a. Ultrasonic Sensor Rain Sensor	CO5
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	CO5

	Design and implementation of Automated Plant Watering System Design and Implementation of Weather Station Design and Implementation of water saving system	
Required Software and Tools		
1. Bread Board , Logic Gate ICs ,Arduino Uno, Node NICU , Sensors		

Subject Name: Proficiency in Workplace Communication Lab	**L-T-P [0-0-4]**
Subject Code: BMICA0152	**Applicable in Department: MCA-Integrated**

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 introduce the key concepts of ethics, etiquette, and life skills.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Improve proficiency in English to the next level of CEFR.	K1
CO 2	Develop business communication skills.	K3
CO 3	Demonstrate improved versions of themselves.	K4
CO 4	Acquire the concepts to cope better at the workplace.	K4
CO 5	Participate in the placement process with confidence.	K4

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1	Students will gain knowledge about the course and examination pattern. Students will gain confidence in expressing themselves in public, overcome inhibitions in a fun way, and develop a sense of freedom and creativity.	CO1
2	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.	CO2
3	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.	CO3
4	Students will learn to deduce information from texts and learn analytical thinking.	CO4
5	Students will arrange a set of scrambled words and phrases into coherent sentences focusing on proper sentence structure and punctuation.	CO5
6	Students will listen to two similar passages with subtle differences and identify discrepancies, sharpening attentive listening and analytical skills.	CO2

7	Students will learn to engage in initiating a conversation.	CO3
8	Students will learn to use context clues to determine the meaning of unfamiliar words in a passage, promoting vocabulary acquisition and reading fluency.	CO4
9	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.	CO5
10	Students will be able to identify sounds/words of similar pronunciation and decipher their meanings within a specific environment or scenario.	CO2
11	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.	CO3
12	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.	CO4
13	Students will learn to retain vocabulary, improve writing speed, and enhance their ability to make semantic connections based on auditory input.	CO5
14	Students will listen to fragmented information and reconstruct the complete message.	CO2
15	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.	CO3
16	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.	CO4
17	Students will learn to construct cohesive and coherent paragraphs by organizing 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.	CO5
18	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.	CO2 CO3
19	Students will improve their ability to interpret and analyse information presented in diagrams, graphs, and pie charts.	CO4
20	Students will be able to improve their listening by analyzing speeches by famous personalities/TED Talks on subjects related to technology/science.	CO2 CO4
21	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.	CO2

22	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.	CO3
23	Students will enhance their ability to express their opinions, actively listen to others, and engage in constructive discussions to develop well-rounded perspectives.	CO4
24	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. Students will present their role-play, which will further help them improve their speaking skills.	CO5

Required Software and Tools

1. British Council EnglishScore Mobile App

Subject Name: Activity Based Learning - I		**L-T-P [0-0-2]**
Subject Code: BMICA0159		**Applicable in Department: MCA-Integrated**
Course objectives: The objective of this course is to equip participants with the essential skills and knowledge to effectively analyze data using spreadsheet tools.		
Course Outcomes (CO)		
Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Acquire the skills necessary to navigate Excel	K4
CO 2	Implement formulas and functions	K6
CO 3	Analyze Data using sorting, filtration & conditional formatting.	K4
CO 4	Construct different excel charts.	K6
CO 5	Understand what-if analysis and scenarios, sensitivity analysis, and other classic models.	K2

List of Practicals

Sr No	Program Title	CO Mapping
1	Automating Data Processing and Reporting with Excel.	CO1
2	Excel Dashboards: Visualizing Data for Decision-Making	CO1
3	Advanced Formulas and Functions in Excel: Streamlining Data Analysis.	CO1
4	Excel Macros and VBA: Enhancing Efficiency and Automation.	CO2
5	Financial Modeling and Forecasting with Excel.	CO2
6	Excel for Project Management: Tracking and Analysing Project Data.	CO2
7	Excel for Inventory Management and Control.	CO3

8	Excel for Sales Analysis and Reporting.	CO3
9	Excel for HR Analytics: Unlocking Insights from Employee Data.	CO3
10	Excel for HR Analytics: Unlocking Insights from Employee Data.	CO4
11	Excel for Budgeting and Financial Planning.	CO4
12	Excel for Data Cleansing and Data Quality Management.	CO4
13	Excel for Statistical Analysis: Unlocking Insights from Data.	CO5
14	Excel for Business Intelligence: Leveraging Power Query and Power Pivot.	CO5
15	Excel for PivotTables and Pivot Charts: Analysing Data in a Dynamic Way.	CO5
Required Software and Tools		
1. Excel		

Subject Name: Basic Mathematics –II	**L-T-P [3-1-0]**
Subject Code: BMICA0203	**Applicable in Department: MCA-Integrated**

Pre-requisite of Subject: 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 Objective- Objective of this course is to: 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 Outcomes (CO)

Course outcome: After completion of this course students 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.	K2
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

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
Unit 1	**INTEGRATION**	Basic concept of Integral, Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, definite Integral, Fundamental Theorem of Calculus	Classroom, PPT, Notes, Smart Board	10L	Assignment	CO1

		(without proof), Basic properties of definite integral.				
Unit 2	**DIFFERENTIAL EQUATION**	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	Classroom, PPT, Notes, Smart Board	10L	Assignment	CO2
Unit 3	**PARTIAL ORDER RELATIONS AND LATTICES**	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.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO3
Unit 4	**FUNCTIONS OF SEVERAL VARIABLES**	Partial Differentiation, Change of Variables, Chain Rule, Extrema of Functions of two variables, Euler's Theorem for homogeneous functions.	Classroom, PPT, Notes, Smart Board	10L	Assignment	CO4
Unit 5	**APTITUDE-II**	Ratio, Proportion & Partnership, Problem of ages, Allegation & Mixture, Direction, Blood relation, Simple & Compound interest, Permutation & Combination.	Classroom, PPT, Notes, Smart Board	8L	Assignment	CO5

Total	46L		

Textbooks	
Sr. No	**Book Details**
1.	NCERT, “Mathematics - Textbook for Class XI”, NCERT Publication, Jan 2019
2.	NCERT, “Mathematics Part I - Textbook for Class XII”, NCERT Publication, Jan 2019
3.	NCERT, “Mathematics Part II - Textbook for Class XII”, NCERT Publication, Jan 2014

Reference Books	
Sr. No	**Book Details**
1.	B.S. Grewal, “ElementaryEngineeringMathematics”,34thEd.,1998.
2.	J.P. Chauhan, “BCA Mathematics Volume -1&2”, Krishna Publications.
3.	G.F. Simmons, “Differential Equations”
4.	R.S. Aggrawal, “Quantitative Aptitude”
	Link: NPTEL/YouTube/Faculty Video Link:
UNIT 1	https://www.youtube.com/playlist?list=PLbu_fGT0MPstBzAW5gGWLltksM_yAs3si https://youtu.be/z0ajJjA3_Ns
UNIT 2	https://youtu.be/f-4tMNFUqyU https://youtu.be/AX_0jNDIi9I
UNIT 3	https://www.youtube.com/watch?v=LUjb0tgE_uo https://www.youtube.com/watch?v=DZEG3YgJbL0&list=PLEjRWorvdxL5-D6xREVQ7a-EZMJLO7N8j
UNIT 4	https://www.youtube.com/watch?v=-LdChGbNbP4 https://www.youtube.com/watch?v=n2wyqq-K7_A
UNIT 5	https://www.GovernmentAdda.com

Subject Name: Design Thinking-I	**L-T-P [3-1-0]**
Subject Code: BMICA0204	**Applicable in Department: MCA-Integrated**

Pre-requisite of Subject: To effectively learn and apply Design Thinking, students should have a basic understanding of design principles, human-cantered approach, and problem-solving methodologies. Prior knowledge of design concepts, such as user experience (UX), user interface (UI), and prototyping, can be beneficial. Additionally, students should have basic computer skills, familiarity with digital tools like Sketch, Sigma, or Adobe Creative Suite, and experience with creative problem-solving techniques. A growth mind-set, willingness to take risks, and collaboration skills are also essential for embracing the iterative and empathetic design thinking process.

Course Objective- Objective of this course is to: 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 Outcomes (CO)

Course outcome: After completion of this course students 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	K2
CO2	Analyze self, culture, and teamwork to work in a multidisciplinary environment and exhibit empathetic behavior	K1
CO3	Formulate specific problem statements of real-time issues and generate innovative ideas using design tools	K3
CO4	Apply critical thinking skills in order 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	K1

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
Unit 1	**Introduction**	An overviewof future skills, introduction to design thinking, traditional problem solving versus design thinking, history of design thinking, wicked problems.	Classroom, PPT, Notes, Smart Board	10L	Practical Approach (Discussion and Activities), Workshop at	CO 1

		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.			School of Future Skills Activity related to observation & team building exercise	
Unit 2	**Ethical Values and Empathy**	Understanding humans as a combination of I (self) and body, basic physical needs up to actualization, prosperity, the gap between desires and actualization. Understanding culture in family, society, institution, startup, socialization process. Ethical behavior: effects on self, society, understanding core values and feelings, negative sentiments and how to overcome them, definite human conduct: universal human goal, developing human consciousness in values, policy, and character. Understand stakeholders, techniques to empathize, identify key user problems. Empathy tools-Interviews, empathy maps, emotional mapping, immersion and observations, Emotional Intelligence, customer journey maps, classifying insights after Observations, Classifying Stakeholders, Individual activity- 'Moccasin walk'	Classroom, PPT, Notes, Smart Board	8L	Practical Approach (Discussion and Activities)/ Assignment Activity related to Empathy Map and Journey Mapping	CO 2
Unit 3		Defining the problem statement, creating personas, Point of View (POV) statements. Research identifying drivers, information	Classroom, PPT, Notes, Smart Board	8L	Practical Approach (Discussion and Activities)/	

	Problem Statement and Ideation	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.			Assignment Activity related to Brainstorming and Six Thinking Hats	CO 3
Unit 4	**Critical Thinking**	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.	Classroom, PPT, Notes, Smart Board	6L	Practical Approach (Discussion and Activities)/Assignment Activity related to identifying Biases	CO 4

Unit 5	**Logic and Argumentation**	The argument, claim, and statement, identifying premises and conclusion, truth and logic conditions, valid/invalidarguments, 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	Classroom, PPT, Notes, Smart Board	8L	Practical Approach (Discussion and Activities)/Assignment	CO 5
Total				**40L**		

Textbooks	
Sr. No	**Book Details**
1.	Arun Jain, UnMukt : Science & Art of Design Thinking, 2020, Polaris
2.	Jeanne Liedta, Andrew King and Kevin Benett, Solving Problems with Design Thinking – Ten Stories of What Works,2013,Columbia Business School Publishing
3.	RR Gaur, R Sangal, G P Bagaria, A Foundation Course in Human Values and Professional Ethics, First Edition, 2009, Excel Books: New Delhi
Reference Books	
Sr. No	**Book Details**
1.	Vijay Kumar, 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization, 2013, John Wiley and Sons Inc, New Jersey
2.	Mootee, I. (2013). Design thinking for strategic innovation: What they can't teach you at business or design school. John Wiley & Sons.
3.	Gavin Ambrose and Paul Harris, Basics Design 08: Design Thinking, 2010, AVA Publishing SARoger L. Martin,
4.	Design of Business: Why Design Thinking is the Next Competitive Advantage, 2009, Harvard Business Press, Boston MA
	Link: NPTEL/YouTube/Faculty Video Link:

UNIT 1	https://nptel.ac.in/courses/110/106/110106124/ https://nptel.ac.in/courses/109/104/109104109/
UNIT 2	https://nptel.ac.in/courses/110/106/110106124/ https://swayam.gov.in/nd1_noc19_mg60/preview
UNIT 3	https://nptel.ac.in/courses/110/106/110106124/ https://swayam.gov.in/nd1_noc19_mg60/preview https://www.udemy.com/course/design-thinking-for-beginners/ https://www.designthinking-methods.com/en/
UNIT 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
UNIT 5	https://www.udemy.com/course/critical-thinker-academy/ https://swayam.gov.in/nd2_aic19_ma06/preview

Subject Name: Skills for Career Enhancement I	**L-T-P [3-0-0]**
Subject Code: BMICA0202X	**Applicable in Department: MCA-Integrated**
Pre-requisite of Subject: The students should have completed the Proficiency in Workplace Communication course in the first semester.	
Course Objective- Objective of this course is to: 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 Outcomes (CO)

Course outcome: After completion of this course students 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.	K3
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

Syllabus

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

Unit 1		**The Role of Communication in Career Development**	Interactive session & activities	6L+10P	Assignment 1	
	Module 1:	Introduction to the course				CO1
	Module 2:	Benefits of active listening in personal and professional contexts				CO1
	Module 3:	Professional self-introduction				CO3
	Module 4:	Identifying main ideas in professional documents				CO4
	Module 5:	Organizing ideas logically				CO5
Unit 2		**Building Interpersonal Skills**	Activity (TBL-Task based learning)	6L+10P	Assignment 2 Writing practice exercises in Lab	
	Module 6:	Importance of first impressions				CO1
	Module 7:	Overcoming barriers to effective listening: Distractions, preconceptions, and multitasking				CO2
	Module 8:					CO3
	Module 9:	Engaging in small talk Interpreting non-verbal cues in texts				CO4
	Module 10:	Writing short responses and reflections				CO5

Unit 3		**Digital Communication Skills**	Interactive session/Activity (TBL)	8L+10P	Assignment 3 Activities in Lab	
	Module 11:	Listening to webinars and online meetings				CO2
	Module 12:					CO3
	Module 13:	Speaking clearly in virtual meetings				CO4
	Module 14:	Evaluating the evidence and logic of digital content				CO4
	Module 15:	Note-taking				CO5
	Module 16:	Digital writing: Ethics and etiquette				CO1
		Self-presentation guidelines				
Unit 4		**Facing Communication Challenges**	Interactive session/Activity (TBL)	8L+10P	Assignment 4	
	Module 17:	Common communication pitfalls				CO1
	Module 18:	Miscommunication and misunderstanding				CO2
	Module 19:	Paraphrasing, summarizing, and reflecting				CO2

	Module 20: **Module 21:** **Module 22:**	Handling interruptions and objections Balancing reading speed with understanding Managing tone in professional communication				CO3 CO4 CO5
Unit 5	**Module 23:** **Module 24:** **Module 25:** **Module 26:** **Module 27:**	**Speaking spontaneously and comfortably** 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	Video streaming/Presentation/Activity (TBL)	8L+8P	Assignment 5 Speaking activities will be conducted in the Lab sessions.	CO2 CO3 CO3 CO3 CO4

Total				**36L+48P**		

Textbooks	
Sr. No	**Book Details**
1.	"The Art of Public Speaking" by Stephen E. Lucas
2.	"Communication Skills: A Guide to Effective Communication" by Susan B. Hanley
3.	"Effective Communication: A Practical Guide" by John Baldoni

Reference Books	
Sr. No	**Book Details**
1.	Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Norman Whitby, Cambridge University Press, 2013, UK.
2.	Listening in the Language Classroom by John Field, Cambridge University Press, 2021, UK.
3.	Speaking: Second Language Acquisition, from Theory to Practice by William Littlewood, **Cambridge University Press, 2022, UK.**
4	Second Language Writing in Transitional Spaces: Teaching and Learning Across Languages and Cultures edited by Viniti Vaish and Guangwei Hu, Routledge, 2019, UK.
5	The Writing Revolution: A Guide to Advancing Thinking Through Writing in All Subjects and Grades by Judith C. Hochman and Natalie Wexler, Jossey-Bass, 2022, USA.
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**
7	IELTS 11: General Training with answers. Cambridge English, 2018
	Link: NPTEL/YouTube/Faculty Video Link:
UNIT 1	https://www.youtube.com/watch?v=JIKU_WT0Bls
UNIT 2	https://www.youtube.com/watch?v=6Ql5mQdxeWk

UNIT 3	https://www.youtube.com/watch?v=fE_cS75Lcvc
UNIT 4	https://open-language.en.uptodown.com
UNIT 5	https://www.rosettastone.com/product/mobile-apps/

Subject Name: Internet and Web Designing	**L-T-P [3-1-0]**
Subject Code: BMICA0201	**Applicable in Department: MCA-Integrated**

Pre-requisite of Subject: To successfully study "Internet and Web Designing", students should have a basic understanding of computer fundamentals, including operating systems, hardware, and software.

Course Objective- 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 Outcomes (CO)

Course outcome: After completion of this course students 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

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
Unit-1	**Module 1: Internet and Overview of WWW**	Introduction to Internet, Basic Internet Terminology ,ARPANET, World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment Program no (1,2)	CO1

	Module 2: Types of Protocols	Overview of Protocols – Simple Mail Transfer Protocol, Gopher, Telnet, FTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts				
Unit-2	**Module 1: Access Network**	Access Network Architectures: Access network characteristics. Differences between Access Networks, Voice grade modems, ADSL, Cable Modems, and Frame Relay.	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment Program no (3)	CO2
	Module 2: Domain Names	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 page publishing, Web hosting				
Unit-3	**Module 1: Email**	Introduction of Email, Structure of an E-mail, Starting, setting up a Mail Account, Sending and receiving emails; Accessing sent emails; Using Emails; Document collaboration; Instant Messaging; Netiquettes, Web Based Emails, E- mail Protocols, Mailing List. Web Servers, HTTP request types, System Architecture, Client-Side Scripting and Server side Scripting, Accessing Web servers, IIS, Apache web server.	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment Program no (4)	CO3
Unit-4	**Module 1: Security**	Security Issues on web, Importance of Firewall, components of Firewall, Transaction security, Emerging client server, Security Threats, Network	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment	CO4

	Issues	Security, Factors to consider in Firewall design, Limitation of Firewalls.			Program no (5&6)	
Unit-5	**Module 1: HTML Tags**	Introduction to HTML, Essential Tags, Tags and Attributes, Text Styles and Text Arrangements, Text, Effects, Exposure to Various Tags (DIV, MARQUEE, NOBR, DFN, HR, List tag , Comment, IMG), Color and Background of Web Pages, Lists and their Types, Attributes of Image Tag, Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, Links to External Documents, Different Section of a Page and Graphics, Footnote and E-Mailing, Creating Table, Frame, Form and Style Sheet.	Classroom, PPT, Notes, Smart Board	8L+4P	Assignment Program no (7 to 12)	CO5
Total				**40L+20P**		

Textbooks	
Sr. No	**Book Details**
1.	Achyut Godbole, Atul Kahate "Web Technologies: TCP/IP, Web/ Java Programming, and Cloud Computing", Third Edition, McGraw Hill Education, 2013
2.	Ralph Moseley and M. T. Savaliya, Developing Web Applications, Wiley-India Private Limited, 2011.
3.	T.A. Powell, Complete Reference HTML , TMH, 2002

Reference Books	
Sr. No	**Book Details**
1.	"Web Design for Dummies" by Lisa L. Miller
2.	"Designing Interfaces" by Jenifer Tidwell
3.	"HTML and CSS: Design and Build Websites" by Jon Duckett

	Link: NPTEL/YouTube/Faculty Video Link:
UNIT 1	Introduction to Web Design - Fundamentals & Basics - YouTube
UNIT 2	Introduction to Internet IT Class 9 | Information & Communication Technology Skills Class 9 IT 402 - YouTube
UNIT 3	Computer Networks and Internet Protocol -
UNIT 4	YouTube How the Internet Works in 5 Minutes - YouTube
UNIT 5	Lecture -13 HTML-Part-I (youtube.com)

Subject Name: Problem Solving Using Python Lab **L-T-P [0-0-8]**

Subject Code: BMICA0255 **Applicable in Department: MCA-Integrated**

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

Course Objective- Objective of this course is to: To provide Basic knowledge of Python programming and to implement programming skill for solving real world problems.

Course Outcomes (CO)

Course outcome: After completion of this course students 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

Syllabus

Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
1.	**Basics of python programming**	Problem Solving, Techniques, Algorithm, Building blocks of algorithms (statements, state, controlflow,functions),Notation,Flowchart,Pseudocode,programming language, Categories of programming languages.	Classroom, PPT, Notes, Smart Board	4L+2P	Program no (1 to 29)	CO1
		A Brief History of Python, Applications areas of python, The Programming Cycle for Python, Python IDE, Interacting with		1L+2P		

		Python Programs.				
		Elements of Python: keywords and identifiers, variables, data types and type conversion,		1L+2P		
		operators in python, expressions in python		1L+2P		
2	**Decision Control Statements**	Conditionals: Conditional statement in Python (if-else statement, its working and execution)	Classroom, PPT,Notes, Smart Board	1L+2P	Program no (30 to 85)	CO2
		Nested-if statement and elif statement in Python, Expression Evaluation & Float Representation.		1L+3P		
		Loops: Purpose and working of loops, while loop, For Loop, Nested Loops, Break and Continue, pass statement.		2L+5P		
3	**Function and Modules**	Introduction of Function, calling a function, Function arguments, built in function, scope rules	Classroom, PPT,Notes, Smart Board	1L+3P	Program no (86 to 102)	CO3
		Passing function to a function, recursion, Lambda functions		4L+3P		
		Modules and Packages: Importing Modules, writing own modules, Standard library modules, dir( ) Function, Packages in Python		1L+3P		
4	**Basic Data structures in Python**	Strings: Basic operations, Indexing and Slicing of Strings, Comparing strings	Classroom, PPT,Notes, Smart Board	1L+2P	Program no (103 to 162)	CO4
		Regular expressions. Python Basic Data Structure: Sequence, Unpacking Sequences, Mutable Sequences		1L+3P		
		Lists, Looping in lists, Tuples,Sets,Dictionaries.Map,filter,Reduce, Comprehension		3L+4P		
5	**File and Exception handling**	Files and Directories: Introduction to File Handling in Python, Reading and Writing files, Additional file methods, Working with	Classroom, PPT,Notes, Smart Board	2L+4P		

		Directories. Exception Handling, Errors, Run Time Errors, Handling IOException, Try-except statement, Raise		2L+4P	Program no (163 to 182)	CO5
Total				**26L+44P**		

Subject : Problem Solving Using Python Lab		**L-T-P [0-0-8]**
Course Objective: 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 Outcomes (CO)		
Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Write simple python programs.	K2
CO 2	Construct decision making and iterative programs Explain user defined functions and modules in python	K3
CO 3	Develop user defined functions and modules in python	K3
CO 4	Illustrate python programs using sequence data structures.	K4
CO 5	Analyse exception handling programs and file operations in python.	K4

Lab Experiments

Sr No	**Program Title**	**CO Mapping**
1	Python Program to Print Statement	CO 1
2	Swap two variables without using a temporary variable.	CO 1
3	Check if a given number is even or odd.	CO 1
4	Find the largest of three numbers.	CO 1
5	Convert a string to an integer.	CO 1
6	WAP to demonstrate implicit and explicit type conversion.	CO 1
7	Convert Revenue to Currency Format	CO 1
8	Write a program to Calculate Sum of 5 Subjects and Find Percentage (Max Mark in each subject is 100).	CO 1

9	Write a program to find gross salary.	CO 1
10	Write a program to Calculate Area of Rectangle, Square, Scalene Triangle and Right-angle Triangle..	CO 1
11	Write a program to find the perimeter of a circle, rectangle and triangle.	CO 1
12	Write a program to Compute Simple Interest.	CO 1
13	Write a program to swap the values of two variables with and without using third variable.	CO 1
14	Write a program to perform arithmetic operations on a = 8, b = 3.	CO 1
15	Write a program to apply relational operations on a=8, b=3.	CO 1
16	Write a program to apply assignment operations on a=8, b=3.	CO 1
17	Write a program to apply logical operations on a=8, b=3.	CO 1
18	Write a program to apply bitwise operations on a=8, b=3.	CO 1
19	Write a program to apply identity operators.	CO 1
20	Write a program to Swap the Contents of two Numbers using Bitwise XOR Operation	CO 1
21	WAP to find the absolute value of the given number.	CO 1
22	Write a program to Add two Complex Numbers.	CO 1
23	Write a Program to find roots of a quadratic expression.	CO 1
24	Program to calculate the average of a list of numbers using the division operator.	CO 1
25	Program to compare two numbers and determine if they are equal.	CO 1
26	Program to compare two numbers and determine whether they are greater than or less than .	CO 1
27	Program to check if a given string is equal to a specific value.	CO 1
28	Program to calculate compound interest using compound assignment operators.	CO 1
29	Program to check if a given number is odd or even using bitwise operators.	CO 1

30	Write a program to Accept two Integers and Check if they are Equal.	CO 2
31	Write a program to Check if a given Integer is Positive or Negative and Odd or Even.	CO 2
32	Write a program to Check if a given Integer is Divisible by 7 or not.	CO 2
33	Write a program to find the greatest of three numbers using else if ladder.	CO 2
34	Write a program to find the greatest of three numbers using Nested if.	CO 2
35	Write a program to convert an Upper-case character into lower case and vice-versa.	CO 2
36	Write a program to check weather an entered year is leap year or not.	CO 2
37	Write a Program to check whether an alphabet entered by the user is a vowel or a constant.	CO 2
38	Write a program to print day according to the day number entered by the user.	CO 2
39	Write a program to print color name, if user enters the first letter of the color name.	CO 2
40	Write a program to Simulate Arithmetic Calculator.	CO 2
41	Write a menu driven program for calculating area of different geometrical figures such as circle, square, rectangle, and triangle.	CO 2
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'.	CO 2
43	WAP to enter a character and then determine whether it is a vowel, consonants, or a digit.	CO 2
44	Write a program to display all even numbers from 1 to 20	CO 2
45	Write a program to print all the Numbers Divisible by 7 from 1 to 100.	CO 2
46	Write a program to print table of any number.	CO 2
47	Write a program to Find the Sum of first 50 Natural Numbers using for Loop.	CO 2

48	Write a program to calculate factorial of a given number using for loop and also using while loop.	CO 2
49	Write a program to count the sum of digits in the entered number.	CO 2
50	Write a program to find the reverse of a given number.	CO 2
51	Write a program to Check whether a given Number is Perfect Number.	CO 2
52	Write a program to Print Armstrong Number from 1 to 1000.	CO 2
53	Write a program to Compute the Value of X^n.	CO 2
54	Write a program to Calculate the value of ${}^nC_r$.	CO 2
55	Write a program to generate the Fibonacci Series.	CO 2
56	Write a program to check whether a given Number is Palindrome or Not.	CO 2
57	Write a program to Check whether a given Number is an Armstrong Number.	CO 2
58	Write a program to print all prime numbers from 1- 500.	CO 2
59	Write a program to find the Sum of all prime numbers from 1-1000.	CO 2
60	Write a program to display the following pattern: *	CO 2
61	Write a program to display the following pattern: * * * * * * * * * *	CO 2

	* * * * *	
62	Write a program to display the following pattern: 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5	CO 2
63	Write a program to display the following pattern: A B B C C C D D D D E E E E E	CO 2
64	Write a program to display the following pattern: * * * * * * * * * * * * * * *	CO 2
65	Write a program to display the following pattern: 1 2 3 4 5 1 2 3 4 1 2 3 1 2 1	CO 2
66	Write a program to display the following pattern: * * * * * * * * * * * * * * * *	CO 2

67	Write a program to display the following pattern: * 	CO 2
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 1 5 10 10 5 1	CO 2
69	Write a program to display the following pattern: 1 2 3 4 5 6 7 8 9 10	CO 2
70	Write a program to display the following pattern: A B C D E F G H I J K L M N O	CO 2
71	Write a program to Find the Sum of A.P Series.	CO 2
72	Write a program to Find the Sum of G.P Series.	CO 2
73	Write a program to Find the Sum of H.P Series.	CO 2
74	Write a program to print the following sequence of integers. 1, 2, 4, 8, 16, 32	CO 2

75	Write a program to find the Sum of following Series: (1*1) + (2*2) + (3*3) + (4*4) + (5*5) + ... + (n*n)	CO 2
76	Write a program to find out L.C.M. of two numbers.	CO 2
77	Write a program to find out H.C.F. of two numbers.	CO 2
78	Python Program to Accept Three Digits and Print all Possible Combinations from the Digits.	CO 2
79	Python Program to Print Odd Numbers within a Given Range.	CO 2
80	Python Program to Find the Smallest Divisor of an Integer.	CO 2
81	Python Program to Count the Number of Digits in a Number	CO 2
82	Python program to find GCD between two given integer numbers.	CO 2
83	Write a Python function to find the Max of three numbers.	CO 2
84	Write a Python function to sum all the numbers in a list. Sample List : (8, 2, 3, 0, 7) Expected Output : 20	CO 2
85	Write a Python program to reverse a string. Sample String: "1234abcd" Expected Output : "dcba4321"	CO 2
86	Write a Python function to check whether a number falls in a given range.	CO 3
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	CO 3
88	Write a Python function that takes a number as a parameter and check the number is prime or not.	CO 3
89	Write a Python function that checks whether a passed string is palindrome or not.	CO 3
90	Implement a function to check if two strings are anagrams of each other.	CO 3
91	Python function to display all the Armstrong number from 1 to n.	CO 3

92	Write a program using recursion to compute factorial of a given number.	CO 3
93	Write a program to print Fibonacci Series using recursion.	CO 3
94	Write a program to calculate sum of numbers 1 to N using recursion.	CO 3
95	Write a program to Find Sum of Digits of the Number using Recursive Function.	CO 3
96	Write a program to print Tower of Hanoi using recursion.	CO 3
97	Python Program to Determine How Many Times a Given Letter Occurs in a String Recursively	CO 3
98	Python Program to Find the Binary Equivalent of a Number Recursively	CO 3
99	WAP to compute the sum of all the elements of the list using reduce() function.	CO 3
100	Write a program to import all objects from a modules, specific objects from module and provide custom import name to the imported object from the module.	CO 3
101	Create a python package having at least two modules in it.	CO 3
102	Create a python package having at least one sub package in it.	CO 3
103	Python program to check whether the string is Symmetrical or Palindrome	CO 4
104	Ways to remove i’th character from string in Python	CO 4
105	Python program to Check if a Substring is Present in a Given String	CO 4
106	Python program to print even length words in a string	CO 4
107	Python program to accept the strings which contains all vowels	CO 4
108	Remove all duplicates from a given string in Python	CO 4
109	Python Program to Form a New String where the First Character and the Last Character have been Exchanged	CO 4
110	Python Program to Count the Number of Vowels in a String	CO 4
111	Python Program to Take in a String and Replace Every Blank Space with Hyphen	CO 4

112	Python Program to Calculate the Length of a String Without Using a Library Function	CO 4
113	Python Program to Remove the Characters of Odd Index Values in a String	CO 4
114	Python Program to Calculate the Number of Words and the Number of Characters Present in a String	CO 4
115	Python Program to Take in Two Strings and Display the Larger String without Using Built-in Functions	CO 4
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")	CO 4
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-	CO 4
118	Python Program to Form a New String Made of the First 2 and Last 2 characters From a Given String	CO 4
119	Python Program to Count the Occurrences of Each character in a Given String Sentence	CO 4
120	Python Program to Check if a Substring is Present in a Given String	CO 4
121	Python Program to Find the Most Repeated Word in a String.	CO 4
122	Write a python program to check the validity of a password given by the user. The password should satisy 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. Maximum length of password:12.	CO 4
123	Write a python program to validate mobile number.	CO 4
124	Program to interchange first and last elements in a list	CO 4

125	WAP to find min, max and average of elements of a list having numeric data	CO 4
126	Program to check if element exists in list	CO4
127	Program for Reversing a List	CO 4
128	Program to Multiply all numbers in the list	CO 4
129	Program to find smallest and largest number in a list	CO4
130	Program to find second largest number in a list	CO 4
131	Program to print all even numbers in a range	CO 4
132	Program to print all negative numbers in a range	CO4
133	Program to Remove multiple elements from a list in Python	CO 4
134	Program to Cloning or Copying a list	CO 4
135	Program to Count occurrences of an element in a list	CO 4
136	Program to find Cumulative sum of a list	CO 4
137	Program to Break a list into chunks of size N in Python	CO 4
138	Python Program to transpose of Matrix.	CO 4
139	Python Program to Add and Multiply Two Matrices.	CO 4
140	Program to get K^{th} Column of Matrix	CO 4
141	WAP to print all even numbers of a list using list comprehension.	CO 4
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.	CO 4
143	Write a program to calculate square of numbers upto n using list comprehension.	CO 4
144	Python program to Find the size of a Tuple	CO4

145	Python – Maximum and Minimum K^{th} elements in Tuple	CO 4
146	Create a list of tuples from given list having number and its cube in each tuple	CO 4
147	Python Program to Count the Number of Vowels Present in a String using Sets	CO 4
148	Python Program to Check Common Letters in Two Input Strings	CO 4
149	Python Program that Displays which Letters are in the First String but not in the Second	CO4
150	Python Program to Add a Key-Value Pair to the Dictionary	CO 4
151	Python Program to Concatenate Two Dictionaries into One.	CO 4
152	Python Program to Check if a Given Key Exists in a Dictionary or Not	CO 4
153	Python Program to Generate a Dictionary that Contains Numbers (between 1 and n) in the Form (x,x*x).	CO 4
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.	CO 4
155	Python Program to Sum All the Items in a Dictionary	CO 4
156	WAP to create dictionary which has characters of given string as keys and frequency of characters as values.	CO4
157	Python Program to Map Two Lists into a Dictionary	CO 4
158	Write a program Filtering even numbers from a list using tuple comprehension	CO 4
159	Creating a list of tuples from two lists using comprehension function	CO4
160	Extracting the first character from each word in a list of strings	CO 4
161	Swapping keys and values in a dictionary	CO 4
162	Filtering even numbers from a dictionary:	CO4
163	Python program to read file word by word	CO 5
164	Python program to read character by character from a file	CO 5

165	Python – Get number of characters, words, spaces and lines in a file	CO 5
166	Program to Find ‘n’ Character Words in a Text File	CO 5
167	Python Program to obtain the line number in which given word is present	CO 5
168	Count number of lines in a text file in Python	CO 5
169	Python Program to remove lines starting with any prefix	CO 5
170	Python Program to Eliminate repeated lines from a file	CO 5
171	Python Program to read List of Dictionaries from File	CO 5
172	Python – Append content of one text file to another	CO 5
173	Python program to copy odd lines of one file to other	CO 5
174	Python Program to merge two files into a third file	CO 5
175	Python program to Reverse a single line of a text file	CO 5
176	Python program to reverse the content of a file and store it in another file	CO 5
177	Python Program to handle divide by zero exception.	CO 5
178	WAP to handle multiple exception.	CO 5
179	Python program to combine each line from first file with the corresponding line in second file.	CO 5
180	Write a program to copy the contents of one file to another.	CO 5
181	Write a program to print First 5 line in a file	CO 5
182	a) Write a program to catch the following exception: i) Value error ii) Index error iii) Name error iv) Type error	CO 5

	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.	

Required Software and Tools
1. Jupyter Notebook 2. Google CoLab 3. Python IDLE

Textbooks	
Sr No	**Book Details**
1.	Magnus Lie Hetland, "Beginning Python-From Novice to Professional", Third Edition, Apress, 2009
2.	Reema Thareja," Python Programming using Problem solving approach ", OXFORD Higher education, 2017
3.	Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.
Reference Books	
Sr No	**Book Details**
1	John V Guttag, "Introduction to Computation and Programming Using Python ", Revised and expanded Edition, MIT Press, 2013
2	Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem Solving Focus", Wiley India Edition, 2013.
3	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016

4	Robert Sedgewick, Kevin Wayne, Robert Dondero, “Introduction to Programming in Python: An Inter-disciplinary Approach”, Pearson India Education Services Pvt. Ltd.,2016
Links (Only Verified links should be pasted here)	
UNIT 1	https://nptel.ac.in/courses/106/106/106106182/
UNIT 2	https://nptel.ac.in/courses/106/106/106106212/ https://www.youtube.com/watch?v=PqFKRqpHrjw
UNIT 3	https://nptel.ac.in/courses/106/106/106106145/ https://www.youtube.com/watch?v=m9n2f9lhtrw https://www.youtube.com/watch?v=oSPMmeaiQ68
UNIT 4	https://nptel.ac.in/courses/106/106/106106145/ https://www.youtube.com/watch?v=ixEeeNjjOJ0&t=4s
UNIT 5	https://nptel.ac.in/courses/106/106/106106145/ https://www.youtube.com/watch?v=NMTEjQ8-AJM

Subject Name: Internet and Web Designing Lab	**L-T-P [0-0-4]**
Subject Code:BMICA0251	**Applicable in Department: MCA-Integrated**

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 Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Understand the basic working scheme of the Internet and the World Wide Web and the requirements of effective web design	K1
CO 2	Understand the process of domain registration and web hosting.	K2
CO 3	Demonstrate the management of electronic mail using internet protocols	K2
CO 4	Understand the basics of web security, HTTP and HTTPS.	K4
CO 5	Develop web pages using the basic HTML features with different layouts as per the requirements	K6

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1	Search the same keywords in at least three different search engines and compare their results	CO1
2	Search the same image in at least three different search engines and compare their results	CO1
3	To create an email id to receive and send pictures, and documents. Problem Statement: 1. Create an email account on 2. Add a contact 3. Send an email to multiple people 4. Delete an email	CO2
4	To create an email id to receive and send pictures, and documents. Problem Statement: 1. Email a picture 2. Email a document 3.Advance email settings	CO3

	4.Mail recovery 5. Add signatures	
5	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.	CO4
6	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.	CO4
7	Write HTML code to design a page containing some text in a paragraph by giving a suitable heading style.	CO5
8	Create a page to show different character formatting (B, I, U, SUB, SUP) tags.	CO5
9	Write HTML code to create a Web Page that contains an Image at its center	CO5
10	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	CO5
11	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.	CO5
12	Write an HTML code to create a web page with pink color background and display a moving message in red color.	CO5
Required Software and Tools		
1. Notepad , Chrome		

Subject Name: Skill for Career Enhancement Lab I	**L-T-P [0-0-4]**
Subject Code: BMICA0252X	**Applicable in Department: MCA-Integrated**

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 Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Understand the role and importance of various communication skills essential for career development.	K2
CO 2	Develop and apply effective listening skills in both personal and professional contexts.	K3
CO 3	Demonstrate fluency and spontaneity while speaking.	K3
CO 4	Read and interpret complex written texts.	K2
CO 5	Construct clear and concise texts on a variety of topics.	K6

List of Practicals

Sr No	**Program Title**	**CO Mapping**
1	Students will know how to meet, greet, and strike a conversation.	C01
2	Participants will engage in meaningful conversations, build connections, and create a positive networking atmosphere	C02
3	Participants will overcome stage fear and demonstrate improved delivery, articulation, and emotional expression while engaging the audience with their performance.	C03
4	Participants will improve their ability to think on their feet and deliver impromptu speeches confidently.	C03
5	Participants will develop their persuasive speaking skills, critical thinking, and ability to present logical arguments in a group setting.	C03
6	Participants will demonstrate effective communication, active listening, and adaptability in various scenarios.	C03
7	Enhance students' ability to interpret and use nonverbal cues by engaging in a fun and interactive game that requires them to communicate messages through gestures and facial expressions.	C03

8	Develop students' empathy and observational skills by pairing them up and having one student express different emotions through nonverbal cues while the other student mirrors and identifies the emotions being conveyed.	C04
9	This will foster awareness and appreciation of nonverbal communication by creating a gallery of images showcasing various nonverbal cues. Students will analyse the images, discuss the messages conveyed, and reflect on the impact of different nonverbal cues.	C04
10	This will encourage creativity and self- expression while exploring nonverbal communication. Students will create collages using various art materials to depict different emotions, allowing them to visually communicate nonverbal messages.	C04
11	This will promote teamwork and application of nonverbal communication skills by having students work in groups to create and perform short skits that rely solely on nonverbal cues to convey a story or message. This activity encourages creativity, collaboration, and the understanding of the power of nonverbal communication in storytelling.	C04
12	Participants will demonstrate confidence, effective communication, and interview techniques necessary for successful job interviews	C05
13	This will enhance the student’s critical thinking and preparation for interviews by facilitating a group activity where they brainstorm and discuss potential interview questions related to their field of study ordesired job positions.	C05
14	Provide students with a comprehensive interview experience by forming a panel of interviewers comprising faculty members or industry professionals. Students will take turns being interviewed, receiving feedback and constructive criticism from the panel to improve their interview skills.	C05
15	This will foster self-awareness and improvement by having students record mock interviews using smartphones or video cameras. They will review and assess their own performance, identifying areas of strength and areas that require improvement in their interview skills.	C05
16	Organize a workshop or guest speaker session where students can learn about the latest trends and techniques in interviews, such as behavioral interviewing or video interviews. The workshop will provide practical tips, strategies, and resources to help students excel in their future interviews.	C05
17	This will enhance students' self-awareness and understanding of their personal values by engaging in reflective exercises and group discussions, allowing them to align their actions and behaviors with their core values.	C05
18	This will foster teamwork, communication, and critical thinking skills by assigning students group projects or case studies that require them to collaborate, solve problems, and present their solutions effectively.	C05
19	Participants will enhance their ability to express their opinions, actively listen to others, and engage in constructive discussions to develop well-rounded perspectives.	C05
20	Participants will enhance their ability to express their opinions, actively listen to others, and engage in constructive discussions to develop well-rounded perspectives.	C05
21	The students will be able to respond to behavioral interview questions efficiently.	C05
22	Participants will enhance their ability to deliver engaging presentations, effectively communicate their ideas, and exhibit confidence in public speaking.	C05

23	**Writing Task for the Final Internal Assessment**	C05
24	**Group Presentations for Final Internal Assessment**	C05
Required Software and Tools		
1. British Council English Score Mobile App		

Subject Name: Activity Based Learning-II	**L-T-P [0-0-2]**
Subject Code: BMICA0259	**Applicable in Department: MCA-Integrated**

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 Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO 1	Analyze the basic working scheme of the Internet and the World Wide Web and the requirements of effective web design	K2
CO 2	Apply the web and Internet technologies	K4
CO 3	Demonstrate the basic concepts of network.	K4
CO 4	Analyze the security issues.	K4
CO 5	Develop web pages using the basic HTML features with different layouts as per need of applications	K6

List of Practicals

Sr No	**Program Title**	**CO Mapping**
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.	CO1
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.	CO1
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	CO2
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	CO2

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.	CO3
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.	CO3
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.	CO4
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.	CO4
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	CO5
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.	CO5
Required Software and Tools		
1. Notepad ,Browser		