NOIDA INSTITUTE OF ENGG. & 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 MCA (Integrated)

(Effective from the Session: 2023-2024)

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

MCA (Integrated)

EVALUATION SCHEME

SEMESTER- I

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

List of MOOCs (Coursera) Based Recommended Courses for First Year (Semester-I) MCA(Int.)

S.No.	Subject Code	Course Name	University/Industry Partner Name	No. of Hours
1	BMC0005	Computer Fundamentals 101	Infosys Springboard	8h 18min
2	BMC0006	Introduction to Python	Infosys Springboard	24h 6min

Please Note:-

Activity based learning-I on qualitative & quantitative analysis of dataset.

Abbreviation Used: -

L:Lecture,T:Tutorial,P:Practical,CT:ClassTest,TA:TeacherAssessment,PS:PracticalSessional,TE:TheoryEndSemester Exam.,
PE: Practical End Semester Exam.

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

MCA (Integrated)

EVALUATION SCHEME

SEMESTER- II

S.No	Subject Codes	Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	BMICA0203	Basic Mathematics-II	3	1	0	30	20	50		100		150	4
2	BMICA0204	Design Thinking-I	3	1	0	30	20	50		100		150	4
3	BMICA0202	Skills for Career Enhancement	3	0	0	30	20	50		100		150	3
4	BMICA0201	Internet and Web Designing	3	1	0	30	20	50		100		150	4
5	BMICA0255	Problem Solving Using Python Lab	0	0	8				50		100	150	4
6	BMICA0251	Internet and Web Designing Lab	0	0	4				50		50	100	2
7	BMICA0252	Skills for Career Enhancement Lab	0	0	4				50		50	100	2
8	BMICA0259	Activity Based Learning-II	0	0	2				50			50	1
		MOOCs											
		TOTAL										**1000**	**24**

S. No.	Subject Code	Course Name	University/Industry Partner Name	No. of Hours
1	BMC0001	Design Thinking for Innovation	Infosys Springboard	6h
2	BMC0002	Next Gen Technologies	Infosys Springboard	10h 14min

List of MOOCs (Coursera) Based Recommended Courses for First Year (Semester-II) MCA(Integrated)

PLEASE NOTE: -

I. Internship(2-3weeks) shall be conducted during summer break after II semester and will be assessed during III semester
II. Activity based learning-II on UI development of any web application.

Abbreviation Used: -

L:Lecture,T:Tutorial,P:Practical,CT:ClassTest,TA:TeacherAssessment,PS:PracticalSessional,TE:TheoryEndSemester Exam.,
PE: Practical End Semester Exam.

Branch- MCA INTEGRATED

Subject Code- BMICA0103	**L - T – P** **3 – 1- 0**
Subject Name- Basic Mathematics-I	**Credit - 4**

Course Objective- Objective of this course is to:

1. Enable the students to understand the basic concept of matrix and determinants and their applications.
2. Enable the students to understand the basic concept of sets relations and functions and their applications.
3. Enable the students to understand the basic concept of limit and continuity of functions and their applications
4. Enable the students to understand the basic concept of differentiation and their applications.
5. Enhance the basic aptitude skills of the students.

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

CO1 -. Apply the concept of matrix and determinants to find the solution of system of linear equation.

CO2-. Understand the concept of sets relations and functions to solve problems based on sets and functions.

CO3- Evaluate the limit and continuity of various functions.

CO4- Apply the concept of differentiation to find the derivative of different type functions, rate of change and maxima and minima.

CO5- Solve the problems of Profit, Loss, Number & Series, Coding & decoding.

Course Content

Unit	Module	Topics Covered	Pedagogy	Lecture Required (T=L+P)	Aligned Practical/Assignment/ Lab	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, M.Tutor, Smart Board	10	1.1,1.2,1.3	**CO1**

Unit 2	**SETS, RELATIONSAND 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, M.Tutor, Smart Board	10	2.1,2.2,2.3	**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, M.Tutor, Smart Board	8	3.1,3.2,3.3	**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, M.Tutor, Smart Board	10	4.1,4.2,4.3,4.4	**CO4**
Unit 5	**APTITUDE-I**	Simplification, Percentage, Profit, loss &discount, Average, Number& Series, Coding & decoding, Time and Work.	Classroom, PPT, M.Tutor, Smart Board	8	5.1,5.2,5.3,5.4	**CO5**

References-

Text Books:

1. Mathematics - Textbook for Class XI, NCERT Publication
2. Mathematics Part I - Textbook for Class XII, NCERT Publication
3. Mathematics Part II - Textbook for Class XII, NCERT Publication

Reference Books:

1. B.S. Grewal, “ElementaryEngineeringMathematics”,34thEd.,1998.
2. J.P. Chauhan “BCA Mathematics Volume -1&2”, Krishna Publications.
3. Quantitative Aptitude by R.S. Aggrawal.

Links:

Unit 1 •

https://www.youtube.com/watch?v=rS9AwyRbB7g
https://www.youtube.com/watch?v=7SQbz96xUyg
https://www.youtube.com/watch?v=AMLUikdDQGk
https://www.youtube.com/watch?v=hagIIYC1JiM

Unit 2 •

https://www.youtube.com/watch?v=DzWwkvGrmFk
https://www.youtube.com/watch?v=NaHMl8avG04
https://www.youtube.com/watch?v=WSX2hOtkqrM
https://www.youtube.com/watch?v=PjVCenWEfv4
https://www.youtube.com/watch?v=9bSQd5asTOw
https://www.youtube.com/watch?v=cpq8t1LN27E
https://www.youtube.com/watch?v=h5Lv5ZeNl0g
https://www.youtube.com/watch?v=AI2Y-RpxDC4
https://www.youtube.com/watch?v=e2UcF_Xh3w4
https://www.youtube.com/watch?v=EGlTGECIk10&t=72s
https://www.youtube.com/watch?v=-jiUNRJ8t4g
https://www.youtube.com/watch?v=e2UcF_Xh3w4&t=48s
https://www.youtube.com/watch?v=fEFkKOl4Q0Y&t=68s
https://www.youtube.com/watch?v=Otj-0xdM62Q

Unit 3 •

https://youtu.be/7WxUaH-50Vw
https://youtu.be/tQxk5IX9S_8
https://youtu.be/BGZ1L6JHX34

Unit 4 •

https://youtu.be/hswdwcNhQ0g
https://youtu.be/EkkATH3W1Mo
https://youtu.be/r031pzhBP5c
https://youtu.be/lTtsFrkBsOI
https://youtu.be/_9MVn-Jw2G4
https://youtu.be/ZqHPcKq6VNI

Unit 5

https://www.GovernmentAdda.com

Semester: I
Branch: MCA (Integrated)

Subject Code- BMICA0102	**L - T - P** **3- 0 - 0**
Subject Name- Proficiency in Workplace Communication	**Credit - 3**

Course Objective-

- 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.
- To train for enhanced career prospects.

Course Outcome –

CO1 - Improve proficiency in English to the next level of CEFR.
CO2 - Develop business communication skills.
CO3 - Demonstrate improved versions of themselves.
CO4 - Acquire the concepts to cope better at the workplace.
CO5 - Participate in the placement process with confidence.

Course Content

Module	Topics Covered	Pedagogy	Lecture Required (T=L+P)	Aligned Practical/Assignment/Lab	CO Mapping
I - Reading with Cognitive Skills	**Importance of communicating in English** **Overview of PWC** **Objective:** To motivate the students to acquire the skill of communicating well. **Outcome:** The students realize the importance and understand the course and what is expected of them.	Video Clips of famous personalities who have learnt to communicate well e.g., Kapil Dev, Jahnvi Panwar, APJ Abdul Kalam, etc.	1	Assignment 1: Story Review (PDF of short stories to be shared to encourage reading habits)	**CO1**

	Basics of Workplace Communication • Process • Barriers **Objective:** To facilitate the student's ability to identify and analyse aspects of miscommunication in real-life situations. **Outcome:** The students can identify impediments to effective communication and learn to overcome those.	Video streaming followed by Discussions and problem-solving activities.	1	Humorous video clips on miscommunication - Students will analyse the video clips for a deeper understanding of the nuances of effective and ineffective communication.	**CO2**
	Reading Comprehension **Objective**: To foster students' reading comprehension skills by engaging them in activities that involve comprehending texts - understanding instructions, filling forms, interpreting professional contents. **Outcome:** The students will become adept at navigating diverse texts, understanding, and following directions, and accurately filling out official forms.	Students will participate in reading comprehension exercise.	1	Think-Pair-Share for Reading Comprehension (academic texts, Journals, research papers, general interests, etc.)	**CO3**
	Reading Techniques for Time Management **Objective:** To develop students' ability to quickly locate relevant information in texts. Outcome: Students will learn to read and comprehend faster.	Practice reading a variety of texts and focus on identifying keywords, headings, and topic sentences. Also, to analyse and synthesize information from a selected text and use it for tasks such as	2	Activity 1: Skim and Scan Race Activity 2: Speed Reading Challenge Activity 3: Information Gap Activity	**CO4**

		paraphrasing, note making, chart and table representation.			
	Online Assessment: Apply the various reading techniques to extract information from a given text.	Online Assessment			
	Critical Reading **Objective**: To promote critical thinking and engage students in thoughtful discussions about a selected reading material. **Outcome:** The students will develop skills in identifying key arguments, evaluating evidence, and challenging assumptions.	Group discussion on selected material.	2	Critical Reading Discussion Circle – On short stories, movies, reviews.	**CO3**
	Hansei Session **Objective:** To develop students' cognitive skills and critical thinking. **Outcome:** The students will develop self-awareness, metacognition, and a mindset conducive to growth.	The students will be able to reflect on their reading experiences, evaluate their cognitive skills employed during the process, and identify strategies for improving their comprehension.	1	Hansei activity focused on reading comprehension.	**CO4**
II – Business Writing	**Vocabulary Building** **Objective:** To expand participants' vocabulary and deepen their understanding of word formation. **Outcome:** Students will develop business vocabulary and effectively communicate in various professional settings.	Introduction to the General Service List of Words by Michael West, to familiarize students with word formation concepts in the context of business communication, enhancing their ability to understand	2	Activity 1: Word Association Activity 2: Vocabulary Charades Activity 3: Word Formation Relay using prefixes and suffixes. Activity 4: Root Word Finder	**CO2**

		and create a specialized vocabulary for effective professional interactions.			
	Language Toolbox **Objective:** To enhance language proficiency of the students by helping them bring in variety in their usage of words. **Outcome:** The students will be able to develop good workplace vocabulary and acquire linguistic versatility.	Studying and practising abbreviations, one-word substitutions, homophones, homonyms, synonyms, and antonyms. Students will develop a deeper understanding of these language tools and improve their ability to communicate effectively in various contexts.	1	Activity 1: Homophone Pictionary Activity 2: Synonym and Antonym Match-Up Activity 3: One-Word Substitution Brainstorm Activity 4: Abbreviation Scavenger Hunt Class Assignment: To fill in or identify the corporate terms, cliches and technical terminology in the assigned text.	**CO1**
	Sentence Construction **Objective:** To help the students know the correct sentence construction rules and techniques. **Outcome:** The students will be able to use effective and well-formed sentences.	The students will actively participate in the Sentence Building activities, thereby enhancing their understanding of the requisites of a good sentence.	2	Activity 1: Sculpting a good Sentence. Activity 2: Sentence Construction Masterclass Activity 3: Framing a story using jumbled sentences. Activity 4: Analysing some famous dialogues from the movies/novels.	**CO1**
	Paragraph writing	The students will participate in a blog	2	Writing a blog through Visual and verbal prompts.	**CO1**

	Objective: To make the students understand the fundamental organization of a paragraph. **Outcome:** Students will be able to compose effective paragraphs and express their views and opinions in an organized, and logical manner.	writing activity wherein they will be asked to compose paragraphs based on visual and verbal prompts. Through the activity the students will be familiarised with the important aspects of paragraph writing like unity, coherence, clarity, etc.			
III - Mastering the art of listening and Speaking (Professional & Empathetic Listening)	**Art of Listening** **Objective**: To practice active listening, empathy, and effective communication. **Outcome**: Participants will engage in focused listening and learn to comprehend and respond.	The module includes guided practice sessions, role-plays, and simulations to develop active listening skills and empathy. Reflection and discussion sessions encourage self-awareness and strategy exploration. Instructors provide personalized feedback to refine participants' listening abilities.	3	Activity 1: Listening exercises. Activity 2: Listening to various suggested podcasts. Class Assignment: Task-based listening exercise	**CO4**
	Phonetic Understanding **Objective**: To develop participants' ability to enunciate each sound clearly in Standard Indian English (Neutral Accent). **Outcome**: Participants will improve their auditory perception skills and develop a heightened awareness of the subtle sound	It aims to develop participants' ability to enunciate sounds clearly in Standard Indian English. It includes focused practice on sound production, auditory perception training, and increasing awareness of sound	3	Activity1: Pronunciation exercises in English Activity 2: Identifying the common English words pronounced differently in different regions of the world.	**CO1**

	distinctions in Standard English.	distinctions in Standard English. This pedagogy enhances participants' communication clarity and comprehension in English.			
	Nuances of Speaking **Objective**: To help participants understand, recognize and practice correct intonation, voice modulation, tone, pitch, and accent. **Outcome**: Participants will enhance their ability to differentiate between similar sounds and improve their pronunciation accuracy in Standard English words.	The pedagogy focuses on understanding, recognizing, and practicing correct intonation, voice modulation, tone, pitch, and accent. Through interactive activities and targeted exercises, participants develop a keen awareness of these aspects of speech and apply them in their communication. The outcome is improved differentiation between similar sounds and enhanced pronunciation accuracy in Standard English words.	2	Activity 1: Application-based exercises on the nuances of speaking. Activity 2: Listen to the suggested list of podcasts/ ted talks. Activity 3: Practicing correct pronunciation of commonly mispronounced words.	**CO3**
	Art of Public Speaking **Objective**: To help students speak with confidence in public, using various verbal and non-verbal aspects of speech. **Outcome**: Students will gain awareness of	Through interactive exercises and practical application, students gain awareness of professional speaking and improve their	3	Activity 1: Delivering extempore, speeches on familiar topics. Activity 2: JAM sessions on current affairs and social issues.	**CO5**

	speaking in a professional environment and enhance their overall communication in English.	overall English communication abilities, leading to enhanced public speaking proficiency.			
	Facing an Interview **Objective**: To develop the ability to face an interview. **Outcome**: Students will be able to speak in a professional environment and answer the basic questions of any interview confidently.	It focuses on providing students with practical guidance and training in interview skills through interactive exercises, mock interviews, and feedback sessions.	3	Activity 1: Speaking tests. Activity 2: Mock Interview Sessions Activity 3: Students will be asked to interview and correct each other.	**CO5**
	Hansei Session **Objective:** To foster self-reflection and continuous growth in professional and empathetic listening and speaking skills through a Hansei activity**.** **Outcome:** The participants will reflect on their experiences and learning from the module.	Reflecting on their experiences	1	Hansei Activity: Create a video on a topic that will interest college students incorporating the nuances of speaking that you have learned.	**CO4**
IV - Refining the Triad: (Ethical, Empathetical Leadership & Synergy)	**Leadership role play:** **Objective:** Recognize the values that leaders/celebrities demonstrate. **Outcome**: Students will get motivated to look within and create a better version of	The teaching pedagogy for the Leadership Role Play session involves interactive role-playing activities where students portray leaders or	2	Activity1: Role-play activity (Hansei) Activity 2: Take the colored paper and write about the value that is closest to your heart and how you will demonstrate a leader in your	**CO 4**

	themselves.	celebrities and demonstrate their values and qualities.		life. Online Assessment: Links to videos of some famous leaders and celebrity interviews will be shared. Taking inspiration from them students will work in pairs and will enact and record their interview videos.	
	Etiquette & Ethics: **Objective:** Students will recognize the key features of corporate etiquette **Outcome:** Students will be able to learn and imbibe corporate etiquette in real situations.	The teaching pedagogy for the Etiquette & Ethics module involves interactive discussions, case studies, and role-playing exercises to help students recognize key features of corporate etiquette. Through practical application and guided practice, students will learn and internalize corporate etiquette, enabling them to navigate professional situations with professionalism and confidence.	1	Activity 1: Videos on corporate etiquette and recognizing the key features. Online Assessment: Hansei Activity - Take an interview of various working-class people.	**CO4**
	Emotional Intelligence in real-life workplace scenarios **Objective:** To make students identify and be	It involves experiential learning through discussions, case studies, and	2	Activity 1: Think- Pair-Share activities using various emojis and emotions in different	**CO4**

	aware of emotions by introducing the concepts of values and life skills **Outcome**: Students will be able to harness the emotions and apply it to thinking and problem solving: Manage and regulate emotions.	interactive exercises to help students identify and be aware of their emotions. Through the introduction of values and life skills, students will learn to harness their emotions, apply them to thinking and problem-solving, and effectively manage and regulate their emotions in professional settings.		situations. Activity 2: To show NDTV's Coverage on the lead actress of "SECRET SUPERSTAR" Zaira Wasim and her battle with Anxiety and Depression. Activity 3: To talk to people (blue collar) and to film them about their hardships.	
	Hansei Activity **Objective:** To promote self-reflection and continuous growth in ethical leadership, empathetic leadership, and creating synergy through a Hansei activity. **Outcome:** The students will be able to reflect on their experiences and learning from the module.	Self - reflection	1	Activity: Hansei (Self-Reflection) Understanding themselves better in terms of Emotional Intelligence by Quick-Self Check (Situation based activity).	**CO4**

Reference Books:

1. Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Norman Whitby, Cambridge University Press, 2006, UK.
2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi.
3. Technical Communication – Principles and Practices by Meenakshi Raman &Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi.
4. Talbot, Fiona. *Improve Your Global Business English* Kogan Page, 2012.
5. Leech Geoffery. Communicative *Grammar of English.* Pearson Education Harlow, United Kingdom, 1994.
6. Sethi. J. A Course in Phonetics and Spoken English Prentice Hall India Learning Private Limited; 2 edition (1999)
7. Rebecca Corfield. *Preparing The Perfect CV*. Kogan Page Publishers, 2009.
8. Anderson, Paul V. *Technical communication*. 8th ed. Cengage Learning, 2011.
9. IELTS 11: General Training with answers. Cambridge English

Links:
Online reference e books and other reference materials:

1. http://promeng.eu/downloads/training-materials/ebooks/soft-skills/effective-communication-skills.pdf
2. http://www.infocobuild.com/education/audio-video-courses/literature/CommunicationSkills-IIT-Kanpur/lecture-09.html

Online Resources:

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

Free Apps to Practice English:

1. Memrise - https://www.memrise.com
2. Open Language - https://open-language.en.uptodown.com
3. Duolingo - https://englishtest.duolingo.com/applicants
4. Rosetta Stone - https://www.rosettastone.com/product/mobile-apps/
5. FluentU - https://www.rosettastone.com/product/mobile-apps/

Semester: 1
Branch: MCA (Integrated)

Subject Code: BMICA0104	**L- T- P** **3- 1- 0**
Subject Name: Problem Solving and Algorithmic Thinking	**Credit - 4**

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 Outcome:	
CO1 - Understand basics of programming	**K1**
CO2 - Understand the problem-solving process and apply concepts to real-life situations and data-oriented problem analysis.	**K2**
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.	**K5**

Content:

Unit	**Module**	**Topics Covered**	**Pedagogy**	**Lecture Required L=T**	**CO Mapping**
1: **Basics of Programming**	Module 1: **Introduction of Algorithm** Module 2: **Conditional Statements** Module 3: **Loops**	Introduction of an algorithm and comparison of performance of algorithms, pseudo code, flow chart, Control Statements- if, if-else and nested if-else statements, switch statements, while, for, do-while statements, Loop examples, Information and data, encoding	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding Projects, Assessments.	8T	**CO1**

2: **Problem Solving Approach**	Module 1: **Problem Solving and Algorithmic** Module 2: **Array**	Problem Solving and Algorithmic Thinking: Problem definition, Logical reasoning, Problem decomposition, Abstraction. Name binding, Modularization. Data organization: List and Arrays. Logic: Boolean logic, Data Applications of propositional logic.	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding, Projects, Assessments.	8T	**CO2**
3: **Recursion, Searching and Sorting**	Module 1: **Searching Techniques** Module 2: **Sorting Techniques**	Factoring and Recursion Techniques, Searching- Linear Search and Binary Search Sorting algorithm- Selection Sort, Insertion Sort, Bubble Sort, Merge Sort, Text processing and Pattern matching.	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding, Projects, Assessments.	8T	**CO3**

4: **Asymptotic Notations**	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.	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, Projects, Assessments.	8T	**CO4**
5: **Introduction to OOPs**	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.	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding, Projects, Assessments.	8T	**CO5**

Total No. of Lecture (40L) = 40

Reference Books:

Textbooks:

(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

Links:

https://nptel.ac.in/courses/106105171

https://www.youtube.com/watch?v=6Zc2bnwW0hQ

https://www.youtube.com/watch?v=bj911tDlrSE

https://www.youtube.com/watch?v=7dz8Iaf_weM

https://www.youtube.com/watch?v=t9WKOcRB63Q&list=PLJ5C_6qdAvBFzL9su5JFX8x80BMhkPy1

Semester: 1
Branch: MCA (Integrated)

Subject Code	**BMICA0101**	**L T P** **3 1 0**
Subject Name	**Digital Logic &Circuit Design**	**Credit-4**

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 run 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.

Pre-requisites: Basics of Electronics Engineering

Course Contents / Syllabus

UNIT-I	**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,

UNIT-II	**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

UNIT-III	**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

UNIT-IV	**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.

UNIT-V	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.

Course outcome: Upon completion of the course, the student will be able to:

CO 1	Apply concepts of Digital Binary System and implementation of Gates	K3
CO 2	Analyse and design of Combinational logic circuits	K4
CO 3	Analyse and design of Sequential logic circuits with their applications	K2,K3
CO 4	The design of finite state machine	K2
CO 5	Implementation of IoT devices with sensors	K2

Text books:

1) M. Morris Mano and M. D. Ciletti, "Digital Design", Pearson Education5th Edition.

2) David J. Comer, "Digital Logic & State Machine Design", Oxford University Press, 3rd

3) R P Jain, "Modern Digital Electronics", Tata McGraw Hill Publication, 3rd Edition.

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

Reference Books:

1) D P Kothari and J.S. Dhillon, "Digital Circuits and Design", Pearson Education.

2) A. Anand Kumar, "Fundamentals of Digital Circuits", PHI Learning Pvt. Ltd.

Links:

Unit 1	https://www.youtube.com/playlist?list=PLbRMhDVUMngfV8C6ElNAUaQQz06wEhFM5

Unit 2	https://www.youtube.com/playlist?list=PL803563859BF7ED8C
Unit 3	https://www.youtube.com/playlist?list=PLbRMhDVUMnge4gDT0vBWjCb3Lz 0HnYKkX
Unit 4	https://www.youtube.com/playlist?list=PL53575D0244F058EB
Unit 5	www.youtube.com/watch?v=urUBLmXFKl0&list=PLgMDNELGJ1CaBrefq- 0eYatfOnoncW0y-

Semester: 1
Branch: MCA (Integrated)

Subject Code: BMICA0155	**L T P**	**Credit**
Subject Name: Computer Fundamentals and Office Automation Lab	0 0 8	4

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 Outcome:

CO1 - Understand windows and its functionality	**K1**
CO2 - Understand the word processing skills	**K2**
CO3 - Understand excel work sheet and analysing the data.	**K2**
CO4 - Demonstrate power point presentation and present data in an effective manner.	**K6**
CO5 - Understand basic working of internet and email.	**K2**

Unit	**Module**	**Topics Covered**	**Pedagogy**	**Lecture Required L=T+P**	**Practical/Assignment/Lab**	**CO Mapping**
1: **Introduction to Computer System**	Module 1: **Overview of Computer System** Module 2: **Types of Memory** Module 3: **Secondary Storage Devices**	Characteristics of Computer System, Block diagram of computer system. Types of computer system and their features- Minicomputer, Micro Computer, Mainframe Computer, Supercomputer. Types of Programming Languages (Machine Language, Assembly Language, High Level Language). Data Organization, Drives, Files, . Types of Memory- (Primary	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding Projects, Assessments.	8T	Assignment	**CO1**

		and Secondary) RAM, ROM, PROM, EPROM and EEPROM. Directories Secondary Storage Devices (Floppy disk, Compact disk, Hard Disk, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display).				
2: **Windows**	Module 1: **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.	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding, Projects, Assessments.	8T+10P	Practical	**CO2**
3: **Word Processor and Spreadsheet Tool**	Module 1: **Word Processor and Spreadsheet Tool**	Salient features of Word Processing, File, Edit, View, Insert, Format, Tools, Tables, Window, help options and all their features, Options and Sub Options, Spreadsheet Tool-Excel Worksheet, Data Entry, Editing, Cell Addressing ranges, Commands, Menus, Copying & Moving Cell Content.	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding, Projects, Assessments.	8T+8P	Practical	**CO3**

4: Microsoft Power point	Module 1: **Microsoft Power point**	Starting MS-Power Point, different Bars, Different Types of Views and Exiting MS-Power Point Creating a 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.	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, Projects, Assessments.	8T+10P	Practical	**CO4**
5: MS-Access, Internet and E-mail	Module 1: **MS-Access, Internet and E-mail**	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.		8T+10P		**CO5**

Total No. of Lecture + Practical Labs (40L+38P) = 78

Course Objective:

Learn to implement linear and non-linear data structures.

Lab Course outcome:

CO1	Understand Windows Operating systems and their functionality.	K1
CO2	Demonstrate word processing skills	K2
CO3	Implement the functionalities of MS Excel.	K2
CO4	Demonstrate effective PowerPoint presentation.	K6
CO5	Create a table using MS Access.	K2

Lab No.	Unit	Topic	Programs	CO Mapping
1-1	2	WORD TASK	Create a new Word document and type some text.	**CO2**
1-2	2	WORD TASK	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”	**CO2**

			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	
1-3	2	WORD TASK	Create a Table in MS Word.	**CO2**
2-1	3	MS EXCEL	Enter some subjects' marks and find the Total Number & Average using Formula.	**CO3**
2-2	3	MS EXCEL	Using the Students Marksheet find HOW MANY SUBJECTS 1 PAPER GREATER THAN 20?	**CO3**
2-3	3	MS EXCEL	Apply the Vlookup formula in Excel.	**CO3**
2-4	3	MS EXCEL	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**
2-5	3	MS EXCEL	Create charts using the mark sheet dataset.	**CO3**
3-1	4	MS PowerPoint	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**
3-2	4	MS PowerPoint	Create a PPT with the following description - include Hyperlinks, Inserting–Images, Clip Art, Audio, Video, Objects, Tables, and Charts.	**CO4**
4-1	5	MS Access	Create a table in MS Access.	**CO5**
4-1	5	MS Access	Create a table in MS Access and also create primary key and show the relationship.	**CO5**

*Competitive coding list will be shared with the students.

Required software and Tools.

i) Paid/Unpaid: MS Office

3. **Reference Books:**

Textbooks:

(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.

Links:

https://www.youtube.com/watch?v=JVwO6ZnXVg0&list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp&index=2
https://www.youtube.com/watch?v=kRPE2T1cuOo&list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp&index=9
https://www.youtube.com/watch?v=KzS2ivdiSS8&list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp&index=26
https://www.youtube.com/watch?v=dQngpAF8pJs

1. **Any Certification/Courses for this subject**

NILL

2. Assignment Questions:

1. How many Computer Generations are there? What are the time periods they cover? What technologies were/are used?
2. What is Software?
3. What is the application software? Give examples.
4. What is the difference between RAM and ROM?
5. Define the following:
    a) Printer
    b) Floppy Disk
    c) Pen-drive

d) Scanner
e) Hard disk
f) LCD
g) Plasma Display

6. What is a computer?
7. Define cache memory?
8. What is the application software? Give examples.
9. Describe the operating system's two modes of operation
10. What are the advantages and disadvantages of using a microkernel approach?
11. Explain the main differences between a short-term and long-term scheduler.
12. What is a window?
13. Describe the components of the window.
14. List any four fonts style.
15. List any two editing features of the Word processor.
16. List any two applications of Spreadsheet.
17. List any two Statistical functions in MS-Excel
18. What do you mean by the cell in the Microsoft Excel worksheet?
19. What do you mean by the cell in the Microsoft Excel worksheet?
20. Define GUI.

Subject Code	BMICA0151	L T P	Credit
Subject Name	Digital Logic & Circuit Design Lab	0 0 4	2

List of Experiments:

Sr. No.	Name of Experiment	CO
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 d. 4-bit parallel adder using 7483 IC.	**CO2**
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	**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 e. 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 e. BCD to Binary code convertor	**CO2**
7	Design and Implementation of a. 1 bit Magnitude comparator b. 2 bit Magnitude comparator	**CO2**
8	Design and Implementation of a. 2 bit Binary Multiplier b. 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 d. 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 e- XNOR Gate	**CO2**
11	Verification of state tables of RS, JK, T and D flip-flops using a. NAND gates. b. NOR gate	**CO3**
12	Design a D flip flop using a. T flip flop b. JK flip flop	**CO3**

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	**CO3**
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	**CO3**
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.	**CO4**
16	Implement the Interfacing of Arduino with a. Ultrasonic Sensor b. Rain Sensor c. Humidity Sensor d. LDR Sensor	**CO4**
17	Implement the Interfacing of Node MCU with a. LED b. Push Buttons. c. LCD.	**CO4**
18	Implement the Interfacing of Node MCU with a. Ultrasonic Sensor b. Rain Sensor	**CO4**

19	**Mini Project List**	**CO4**
	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	

Lab Course Outcome: Upon the completion of the course, the student will be able to

CO 1	Apply concepts of Digital Binary System and implementation of Gates	K3
CO 2	Analyse and design of Combinational logic circuits	K4
CO 3	Analyse and design of Sequential logic circuits with their applications	K2,K3
CO 4	Implementation of IoT devices with sensors	K2,K3

Subject Code- BMICA0152				**L T P 0 0 4**
Subject Name- Proficiency in Workplace Communication (Lab)				**Credit - 2**
Total No. of Activities: 24				
List of Practical				
Activity	**Module**	**Topic**	**Program Logic Building**	**CO Mapping**
Anubhava Activities	1	**Getting rid of stage fright**	Participants will gain confidence in expressing themselves through dance, overcome inhibitions, and develop a sense of freedom and creativity.	**CO1**
Dumb Charades	1	**Enhancing communication skills and non-verbal expressions**	Participants will improve their ability to communicate effectively using non-verbal cues, develop teamwork and collaboration skills, and enhance their creativity in conveying messages.	**CO2**
Analysing a Case Study	2	**Case Study**	Participants will develop critical thinking skills, analyse the effectiveness of communication practices, and gain insights into real-world communication challenges and their solutions.	**CO3**
Reading Diagrams, Graphs, and Pie Charts	2	**Exercises based on charts and diagrams**	Participants will improve their ability to interpret and analyse data presented in diagrams, graphs, and pie charts, develop critical thinking skills, and make informed decisions based on visual information.	**CO2**
Reading Comprehension Exercise	2	**Exercises based on reading comprehension**	Participants will enhance their reading comprehension abilities, improve vocabulary and language skills, and develop strategies for efficient and effective reading.	**CO1**
Flip Classroom	2	**Interactive reading experience through flipped class methodology**	Participants will actively engage with reading materials, participate in discussions and activities that deepen understanding, and develop independent learning skills.	**CO3**

Filling a Form	2	**Filling forms accurately**	Participants will improve their ability to understand and follow instructions, enhance their attention to detail, and develop proficiency in accurately filling out forms.	**CO2**
Infographics	2	**Analysing information based on infographics**	Participants will improve their ability to interpret and analyse information presented in infographics, develop visual literacy skills, and effectively communicate complex concepts using visual aids.	**CO2**
Songs and decoding the lyrics	2	**Decoding song lyrics**	Participants will enhance their listening skills, improve understanding of language nuances through song lyrics, and develop appreciation for different genres of music.	**CO4**
Listening to instructions	2	**Listening based activity**	Participants will improve their listening comprehension, enhance their ability to follow instructions, and practice attention to detail.	**CO1**
Listening to directions	2	**Listening based activity**	Participants will enhance their ability to listen and comprehend verbal directions, develop spatial awareness, and improve their navigational skills.	**CO2**
Speech Analysis	2	**Speech Analysis**	Participants will develop critical thinking skills, analyse speech techniques and delivery styles, and gain insights into effective public speaking strategies.	**CO3**
Views on News	2	**News Analysis**	Participants will develop active listening skills, gain knowledge of current events, and engage in thoughtful discussions to express their views and opinions.	**CO4**
Introducing your partner	2	**Conveying information**	Participants will improve their active listening skills, develop clarity in communication, and effectively convey	**CO2**

and yourself			specific information to others.	
Podcasts	4	**Podcast listening session**	Participants will enhance their listening skills, develop the ability to extract key information from podcasts, and engage in reflective and analytical discussions based on podcast content.	**CO2**
Role Plays	4	**Role Playing Situations**	Participants will practice effective communication strategies, develop empathy and understanding, and improve their ability to handle real-life situations through role-playing exercises.	**CO3**
GD (Group Discussion)	4	**Group Discussion Sessions**	Participants will enhance their ability to express their opinions, actively listen to others, and engage in constructive discussions to develop well-rounded perspectives.	**CO5**
Presentation	4	**Presentation Delivery**	Participants will enhance their ability to deliver engaging presentations, effectively communicate their ideas, and exhibit confidence in public speaking.	**CO5**
Picture Video Prompts	4	**Visual Exercises**	Participants will enhance their ability to interpret visual stimuli, generate ideas, and communicate their thoughts effectively through storytelling.	**CO3**
Extempore	4	**Speaking Exercises**	Participants will improve their ability to speak spontaneously, organize their thoughts quickly, and effectively communicate their ideas without prior preparation.	**CO5**
Storytelling Circle	2	**Advanced Speaking Exercises**	Participants will enhance their storytelling abilities, captivate an audience with compelling narratives, and improve their overall communication effectiveness.	**CO5**

Branch- MCA INTEGRATED

Subject Code- BMICA0203	**L - T - P** **3 – 1- 0**
Subject Name- Basic Mathematics-II	**Credit - 4**

Course Objective- Objective of this course is to:

1. Enable the students to understand the basic concept of Integration.
2. Enable the students to understand the basic concept of differential equations and their solutions.
3. Enable the students to understand the basic concept ofpartial order relations and lattices.
4. Enable the students to understand the basic concept of partial differentiation and their applications.
5. Enhance the basic aptitude skills of the students.

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

CO1 -. Apply concept of integration to evaluate definite integrals.

CO2-. Apply the concept of differentiation and integration to find the solution of differential equations.

CO3- Understand the concept of partial order relations and lattices to solve various problems based on it.

CO4- Apply the concept of partial differentiation of functions of two variables to find the derivative of different type functions, and maxima and minima.

CO5- Solve the problems of Ratio, Proportion & Partnership, Problem of ages, Allegation & Mixture, Direction, Blood relation, Simple & Compound interest, Permutation & Combination.

Course Content

Unit	Module	Topics Covered	Pedagogy	Lecture Required (T=L+P)	Aligned Practical/Assignment/ Lab	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 (without proof), Basic properties of definite integral.	Classroom, PPT, M.Tutor, Smart Board	10	1.1,1.2,1.3	**CO1**
Unit 2	**DIFFERENTIAL EQUATION**	Definition, order and degree, general and particular solutions of a differential equation.	Classroom, PPT,	10	2.1,2.2,2.3	**CO2**

		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.	M.Tutor, Smart Board			
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, M.Tutor, Smart Board	8	3.1,3.2,3.3	**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, M.Tutor, Smart Board	10	4.1,4.2,4.3,4.4	**CO4**
Unit 5	**APTITUDE-II**	Ratio, Proportion & Partnership, Problem of ages, Allegation & Mixture, Direction, Blood relation, Simple & Compound interest, Permutation & Combination.	Classroom, PPT, M.Tutor, Smart Board	8	5.1,5.2,5.3,5.4	**CO5**

References-

Text Books:

1. Mathematics - Textbook for Class XI, NCERT Publication
2. Mathematics Part I - Textbook for Class XII, NCERT Publication
3. Mathematics Part II - Textbook for Class XII, NCERT Publication

Reference Books:

1. B.S. Grewal, “ElementaryEngineeringMathematics”,34thEd.,1998.
2. J.P. Chauhan, “BCA Mathematics Volume -1&2”, Krishn a Publications.
3. G.F. Simmons, “Differential Equations”
4. R.S. Aggrawal, “Quantitative Aptitude”

Links:

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
https://youtu.be/BHdXOPD4cvo
https://youtu.be/OET0qwat15o

Unit 3 •

https://www.youtube.com/watch?v=LUjb0tgE_uo
https://www.youtube.com/watch?v=DZEG3YgJbL0&list=PLEjRWorvdxL5-D6xREVQ7a-EZMJLO7N8j
https://www.youtube.com/watch?v=9edipEsWjNM
https://www.youtube.com/watch?v=XXkZC-LYJoM

Unit 4 •

https://www.youtube.com/watch?v=-LdChGbNbP4
https://www.youtube.com/watch?v=n2wyqq-K7_A
https://www.youtube.com/watch?v=79Z1SQXfE-k

Unit 5

https://www.GovernmentAdda.com

Program: MCA Integrated						
Subject Code- BMICA0204					**L - T - P** **3 – 1 - 0**	
Subject Name- Design Thinking I					**Credit - 4**	
Course Objective- 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 this course students will be able to: **CO1 -** Develop a strong understanding of the design process and apply it in a variety of business settings **CO2-**Analyze self, culture, and teamwork to work in a multidisciplinary environment and exhibit empathetic behaviour **CO3-** Formulate specific problem statements of real-time issues and generate innovative ideas using design tools **CO4-** Apply critical thinking skills in order to arrive at the root cause from a set of likely causes **CO5-** Demonstrate an enhanced ability to apply design thinking skills for the evaluation of claims and arguments						
Course Content						
Unit	**Module**	**Topics Covered**	**Pedagogy**	**Lecture Required (T=L+P)**	**Aligned Practical/Assignment/Lab**	**CO Mapping**
Unit 1	Introduction	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.	Smartboard/PPT/Text book/Reference book	**10**	Practical Approach (Discussion and Activities), Workshop at School of Future Skills Activity related to observation & team building exercise	CO 1
Unit 2		Understanding humans as a combination of I (self) and body,		**8**		

	Ethical Values and Empathy	basic physical needs up to actualization, prosperity, the gap between desires and actualization. Understanding culture in family, society, institution, startup, socialization process. Ethical behaviour: 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'	Smartboard/PPT/Text book/Reference book		Practical Approach (Discussion and Activities)/ Assignment Activity related to Empathy Map and Journey Mapping	CO 2
Unit 3	**Problem Statement and Ideation**	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	Smartboard/PPT/Text book/Reference book	**8**	Practical Approach (Discussion and Activities)/ Assignment Activity related to Brainstorming and Six Thinking Hats	

		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.				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.	Smartboard/PPT/Text book/Reference book	**6**	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/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	Smartboard/PPT/Text book/Reference book	**8**	Practical Approach (Discussion and Activities)/Assignment	CO 5

		arguments.				

References-

Text Books:

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:

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 SA
4. Roger L. Martin, Design of Business: Why Design Thinking is the Next Competitive Advantage, 2009, Harvard Business Press, Boston MA

Links:

Unit I

https://nptel.ac.in/courses/110/106/110106124/
https://nptel.ac.in/courses/109/104/109104109/
https://designthinking.ideo.com/
https://blog.hypeinnovation.com/an-introduction-to-design-thinking-for-innovation-managers
https://www.creativityatwork.com/design-thinking-strategy-for-innovation/
https://www.youtube.com/watch?v=GFffb2H-gK0

Unit II

https://aktu.ac.in/hvpe/
http://aktu.uhv.org.in/
https://nptel.ac.in/courses/110/106/110106124/
https://swayam.gov.in/nd1_noc19_mg60/preview

Unit III

https://nptel.ac.in/courses/110/106/110106124/
https://swayam.gov.in/nd1_noc19_mg60/preview

https://www.udemy.com/course/design-thinking-for-beginners/
https://www.designthinking-methods.com/en/
https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them

Unit IV

https://www.forbes.com/sites/sap/2016/08/25/innovation-with-design-thinking-demands-critical-thinking/#340511486908
https://www.criticalthinking.org/pages/defining-critical-thinking/766

Unit V

https://www.udemy.com/course/critical-thinker-academy/
https://swayam.gov.in/nd2_aic19_ma06/preview

List of Suggested projects: An indicative list of projects where you will have to be actively engaged in field work to interact with stakeholders & apply Design Tools, such as –

Institutional Projects

1. Improving canteen experience
2. Improving library usage by students
3. Facilitating interaction between students of diverse ethnic backgrounds
4. Making college campus plastic-free
5. Segregating different kind of domestic waste
6. Adopting to plastic-ban
7. How can we improve classroom experience of students?
8. How can we ensure better communication with our institution alumni?

Or

Social Projects

9. How can we ensure that clean drinking water is handled properly?
10. How might we feed everybody in the world?
11. How can we solve voters' dissatisfaction by changing the voting system?
12. How can we help the school drop-outs to continue the study?
13. How to solve issue of waste management?
14. How can we solve issue of insensitivity of peoples towards street animals?
15. How to solve the issue of gender inequality in society / college / schools?
16. How can we improve College Experiences and helping teachers?
17. How can we ensure secured financial transactions and minimize scams?
18. Facilitating Water Conservation in domestic households

19. Making the elderly adapt to mobiles/smartphones.
20. Use design thinking to use empty lot's in our neighbourhood.

Or

A project on the theme: teens, human rights, water, privacy, violence, equity, immigration, change with growth, food waste and robotics.

Or

Industrial Projects

21. Windsor Airline’s consistent flight delays are hurting the company’s bottom line. How might we ensure that Windsor Airlines flights leave on time.
22. Being part of an ever-connected society, many people in the Global North can barely fathom that still more than 1.5 billion people live off the grid. Instead of simply plugging in, they use kerosene lanterns that only illuminate spots in their home, walk miles to charge their mobile phones, or run a diesel genset for their business. How do you reinvent Solar Energy Supply for them?
23. NGO provides services and financial support to people with developmental disabilities. But for parents of children with disabilities, navigating the long and sometimes bewildering bureaucratic process required to get such services often challenges their patience and persistence. Before NGO can determine which services, if any, are best for a child, staffers conduct a thorough assessment that entails meetings with parents, home visits by social workers, and evaluations by medical professionals including speech pathologists, psychologists, and nurses. Design a process to ensure Better and faster Service.
24. A company wish to provide internet access to everyone. Design a low cost, easily applicable model.
25. Use 'design thinking' can help lose weight, stop worrying, and change life of peoples.
26. Assume you are called in to help the struggling community bank, with around 40 employees and six branches. You immediately noticed that all banks offered the same lousy experience: bland, boring, forgettable. Most banks offer the same products at basically the same rates, too. If Xling was able to come up with a great product, it would be copied by the bigger banks within days. What could you do to make the bank better?
27. Your city metro train service is facing issues of troublesome experiences of travelers. The team has notices that the queues often built up at the service counters because customers asked the same simple questions again and again. How would you improve the services.
28. Violent crime and the loss of young lives in assaults pose a frightening problem in many urban city districts. Use design thinking to find how to 'Designing Out Crime Research Center’ as solution.
29. City Hospital simply wishes improving staff hand-washing habits could prevent these needless infections. While hospitals have plenty of communal sinks and hand-sanitizing dispensers, time-strapped caregivers simply don’t use them, they noticed medical staff wiped their hands on their scrubs. Use design thinking to give solutions.
30. The Wiley produces traditionally crafted ‘Dutch Wax Print’ fabrics for Indian markets. Lately, the organization faces disrupted markets, competition, and Chinese counterfeit. Use design thinking to come up with a new vision to secure its future.

Or any of your Startup Idea as project

Semester: II
Branch: MCA (Integrated)

Subject Code- BMICA0202	**L - T - P** **3 - 0 - 0**
Subject Name- Skills for Career Enhancement	**Credit -3**

Course Objectives:

- To improve proficiency in the English language to at least Intermediate level (B1/B2) of CEFR.
- To impart business communication skills.
- To motivate the students to improve verbal communication skills for the workplace.
- To help the students acquire collaboration and critical evaluation skills.
- To train for career enhancement.

Course Outcomes:

After the completion of the course, the students will be able to

CO1 – Improve Proficiency in English to the next level of CEFR.
CO2 - Develop business communication skills.
CO3 – Improve verbal communication skills.
CO4 – Demonstrate collaboration and critical evaluation skills.
CO5 – Participate in career enhancement activities with confidence.

Course Content

Module	Topics Covered	Pedagogy	Lecture Required (T=L+P)	Aligned Practical/Assignment/Lab	CO Mapping
I - Introduction to Public Speaking	**Effective Communication** **Overview of the course** **Objective:** Developing essential skills and strategies to effectively communicate ideas and build confidence in various professional and personal settings.	Engage students in an interactive discussion about their expectations and goals for improving their communication	1	**Students will be tasked with creating a journal or digital document to record their personal communication goals for the course.**	**C01**

	Outcome: The students realize the importance and understand the course and what is expected of them.	skills.			
	Non-Verbal Communication **Objective:** To teach students the importance of nonverbal communication cues and develop their skills in various social and professional contexts. **Outcome**: The students will be able to accurately interpret and apply nonverbal communication cues, in diverse social and professional interactions.	Show video clips demonstrating various nonverbal cues, such as body language, facial expressions, and gestures, and discuss their meanings.	2	**Students will be assigned to observe and analyse nonverbal communication cues in any one real-life situation and prepare a report on the same.**	**C02**
	Overcoming Communication Barriers **Objective:** To enable students to identify and overcome barriers to effective nonverbal communication by understanding various factors that may hinder communication. **Outcome**: The Students will demonstrate improved ability to identify and overcome barriers to nonverbal communication.	Engage students in a discussion about their experiences with communication barriers and share insights on effective ways to address them.	2	**Students will be divided into groups and assigned a specific communication barrier.** **Each group will research and identify effective strategies to overcome the assigned barrier.**	**C04**
	Mastering the Art of Oral Presentations **Objective:** To equip students with the necessary skills and strategies to deliver impactful oral presentations. **Outcome**: The students will showcase enhanced proficiency in delivering impactful oral presentations.	Provide students with opportunities to practice their oral presentation skills in a supportive environment, emphasizing feedback and improvement, through guided practice.	2	**Students will be tasked with creating an elevator pitch for a hypothetical project, idea, or personal accomplishment.** **They will have to present their pitch in under two minutes, focusing on concise and compelling communication.**	**CO3**

	Online Assessment: Apply the knowledge of English LSRW Skills to give the test.	The students will be assessed through the British Council's 'English Score' app.	1		
	Hansei Session **Objective:** To develop students' cognitive skills and critical thinking. **Outcome:** The students will develop self-awareness, metacognition, and a growth mindset, empowering students to become more effective and efficient.	The students will be able to reflect on their reading experiences, evaluate their cognitive skills employed during the process, and identify strategies for improving their comprehension.	1	**Hansei activity – Experience sharing**	**CO4**
II - Effective Use of Nonverbal Communication	**The Power of Nonverbal Communication** **Objective**: To introduce the principles of nonverbal communication and its importance in effective communication. **Outcome**: Students will understand the impact of nonverbal cues on communication and its role in conveying messages.	Presentation by the students with interactive discussions.	1	**Create a collage of images representing different nonverbal cues and write a short reflection on the importance of each cue.**	**CO2**
	Mastering Body Language **Objective**: To explore various aspects of body language, including posture, gesture, eye contact, and facial expression. **Outcome:** The students will learn to use body language effectively to enhance their communication skills.	Group activities and role plays among the students to understand practical aspects of body language.	2	**Record a short video presentation using positive body language and share it with the class for feedback.**	**C02**

	Expressing Yourself: Assertiveness vs. Aggressiveness **Objective:** To understand the differences between assertive and aggressive communication styles. **Outcome**: The students will be able to recognize and employ assertive communication in various contexts.	Engaging Case Studies, Collaborative Group Discussions on different situations.	1	**Write a role play script depicting a situation where assertive communication resolves a conflict.**	**C04**
	Speak with Impact: The Power of Paralanguage **Objective:** To explore the importance of paralanguage, including intonation, voice modulation, pacing, and pausing. **Outcome**: The students will develop skills to use paralanguage effectively in their verbal communication.	Understanding Paralanguage through audiovisual resources and Video analysis	2	**Record a short audio clip delivering a speech with effective paralanguage techniques and share it for peer evaluation.**	**C03**
	Nonverbal Communication in Virtual Environments **Objective:** To explore nonverbal communication cues specific to online platforms and virtual interactions. **Outcome:** The students will understand how to adapt and effectively use nonverbal communication in virtual settings.	Virtual role plays will be conducted, and video conferencing tools will be used.	2	**Participate in a virtual group discussion on a given topic and provide constructive feedback on the nonverbal communication of peers.**	**C03**
	The Hansei – Self-reflection Activity **Objective:** To develop students' cognitive skills and critical thinking through a Hansei activity focused on reading comprehension. **Outcome:** By engaging in the Hansei activity,	The students will discuss the key take aways from the module	1	**Self-Reflection activity**	**C04**

	students will reflect on their reading experiences, evaluate their cognitive skills employed during the process.				
III – Mastering Interview Skills	**Confidence Booster** **Objective:** To build confidence and self-assurance for interviews. **Outcome:** The students will gain in confidence and overcome nervousness during interviews.	Activities like interactive discussions, and confidence-building exercises will be conducted with the students.	1	**Prepare a one-minute elevator pitch introducing yourself and your key skills.**	**C05**
	Answering Interview FAQs **Objective:** To enhance skills in answering common interview questions effectively. **Outcome:** The students will be able to provide concise and impactful responses to interview questions.	Engage students in simulated interview scenarios, where they practice answering FAQs.	1	**Create a list of frequently asked questions related to their field of interest and answer them using the STAR method.**	**C05**
	Etiquette in Interviews **Objective:** To familiarize students with professional etiquette expectations during interviews. **Outcome:** The students will be able to understand the importance of professional etiquette in creating a positive impression.	Students will be engaged in different role play scenarios to practice appropriate greetings, introductions, and body language.	2	**Create an infographic illustrating the do's and don'ts of interview etiquette, incorporating images and key points discussed during the session.**	**C05**
	Acing Interview Skills **Objective:** To provide students with essential interview skills, such as active listening, effective communication, and critical thinking. **Outcome:** Students will acquire skills to showcase their qualifications and suitability	Analyse and discuss real-life interview scenarios, identifying the application of various interview skills, through different case	2	**Create a list of challenging interview questions and prepare well-thought-out responses, showcasing your critical thinking skills.**	**C05**

	for the job during interviews.	studies.			
	Analysing Behavioural Interviews **Objective:** To familiarize students with behavioral interviews and equip them with strategies to handle behavioral questions effectively. **Outcome**: The students will develop an understanding of behavioral interviews and demonstrate the ability to provide structured and compelling responses.	Group Discussions	2	**Students will participate in a role-playing activity where they will interview each other using behavioural questions, assessing the quality of responses.**	**C05**
	The Hansei – Self-reflection Activity **Objective:** To develop students' cognitive skills and critical thinking through a Hansei activity focused on reading comprehension. **Outcome:** By engaging in the Hansei activity, students will reflect on their reading experiences, evaluate their cognitive skills employed during the process.	The students will discuss the key take aways from the module	1	**Self-Reflection activity**	**C04**
IV - Building Essential Soft Skills	**General Etiquette** **Objective**: To familiarize students with professional etiquette and social norms. **Outcome**: The students will develop an understanding of appropriate behavior in various professional settings.	Multimedia Presentation: Share audio, video, and image resources highlighting general etiquette in different contexts.	1	**Create a poster highlighting key elements of general etiquette.**	**C04**
	Discussing Important Aspects of Personality **Objective:** To explore important aspects of personality development for professional success.	Analyse real-life examples of individuals who have exhibited positive attitudes and effective time	2	**Create a personal development plan, outlining steps to cultivate a more effective personality.**	**C04**

	Outcome: The students will understand the significance of a positive attitude and effective time management in their personal and professional lives.	management, through case studies.			
	Developing a Positive Attitude **Objective:** To help students cultivate a positive attitude for personal and professional growth. **Outcome:** The students will understand the importance of a positive attitude and develop strategies to maintain it.	Guide students through self-assessment exercises to identify their current attitude and areas for improvement.	1	**Create a vision board or journal representing goals and positive affirmations.**	**C04**
	Learning Effective Time Management Techniques **Objective:** To equip students with effective time management techniques for improved productivity. **Outcome:** The students will learn strategies to manage their time efficiently and prioritize tasks effectively.	Engage students in activities like prioritization exercises and time tracking.	2	**Students will participate in a time management simulation task, where they must allocate time to different tasks and evaluate their results.**	**C04**
	Realizing Strengths and Limitations **Objective:** To help students identify and leverage their strengths while addressing their limitations. **Outcome:** The students will gain self-awareness, build confidence, and develop strategies for personal and professional growth.	Provide opportunities for students to present their strengths and limitations, fostering self-confidence.	2	**Students will create a personal SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, reflecting on their strengths, weaknesses, and potential growth areas.**	**C05**
	The Hansei – Self-reflection Activity **Objective:** To develop students' cognitive	The students will discuss the key take aways from	1	**Self-Reflection activity**	**C04**

	skills and critical thinking through a Hansei activity focused on reading comprehension. **Outcome:** By engaging in the Hansei activity, students will reflect on their reading experiences, evaluate their cognitive skills employed during the process.	the module			

Reference Books:

1. Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Norman Whitby, Cambridge University Press, 2006, UK.
2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi.
3. Technical Communication – Principles and Practices by Meenakshi Raman &Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi.
4. Talbot, Fiona. *Improve Your Global Business English* Kogan Page, 2012.
5. Leech Geoffery. Communicative *Grammar of English.* Pearson Education Harlow, United Kingdom, 1994.
6. Sethi. J. A Course in Phonetics and Spoken English Prentice Hall India Learning Private Limited; 2 edition (1999)
7. Rebecca Corfield. *Preparing The Perfect CV*. Kogan Page Publishers, 2009.
8. Anderson, Paul V. *Technical communication*. 8th ed. Cengage Learning, 2011.
9. IELTS 11: General Training with answers. Cambridge English

Links:

Online reference e books and other reference materials:

6. http://promeng.eu/downloads/training-materials/ebooks/soft-skills/effective-communication-skills.pdf
7. http://ncert.nic.in/textbook/pdf/iees101.pdf
8. http://www.infocobuild.com/education/audio-video-courses/literature/CommunicationSkills-IIT-Kanpur/lecture-09.html

Online Resources:

9. https://www.youtube.com/watch?v=JIKU_WT0Bls
10. https://www.youtube.com/watch?v=6Ql5mQdxeWk
11. https://www.youtube.com/watch?v=fE_cS75Lcvc

Free Apps to Practice English:

1. Memrise - https://www.memrise.com
2. Open Language - https://open-language.en.uptodown.com
3. Duolingo - https://englishtest.duolingo.com/applicants
4. Rosetta Stone - https://www.rosettastone.com/product/mobile-apps/
5. FluentU - https://www.rosettastone.com/product/mobile-apps/

Semester: II **Branch: MCA (Integrated)**						
Subject Name: Internet and Web Designing					**L T P**	**Credit**
Subject Code: BMICA0201					3 1 0	**4**
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 Outcome: **CO1 – Understand** the basic working scheme of the Internet and the World Wide Web and the requirements of effective web design **CO2-** Apply the web and Internet technologies. **CO3-** Demonstrate the basic concepts of network. **CO4-** Understand the security issues. **CO5-** Develop web pages using the basic HTML features with different layouts as per need of applications						**K1, K2** **K4** **K4** **K3, K4** **K3, K5, K6**
Course Content						
Unit	**Module**	**Topics Covered**	**Pedagogy**	**Lecture Required L=T+P**	**Practical/Assignment/Lab**	**CO Mapping**
1: **Introduction to Internet**	Module 1: **Overview of WWW** Module 2: **Types of Protocols**	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 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	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding Projects, Assessments.	8T+2P	Assignment	CO1

		Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts 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				
2: Working of Internet/ Websites	Module 1: **Access Network** **Module 2: Domain Names**	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	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding, Projects, Assessments.	8T	Assignment	**CO2**
3: Electronic mail & Servers	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	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, competitive coding, Projects, Assessments.	8T+4P	Assignment	**CO3**

4: Web Security	Module 1: **Security Issues**	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.	Lectures, Code Walkthroughs, Hand-on Programming, Problem Solving, Collaborative Learning, Projects, Assessments.	8T	Assignment	**CO4**
5: Basics of HTML	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, LISTING, 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.		8T+15P	Lab	**CO5**

Total No. of Lecture + Practical Labs (40L+21P) = 61

Semester: II **Branch: MCA (Integrated)**						
Subject Name: Problem solving using Python Lab						**L T P Credit**
Subject Code: BMICA0255						**0 0 8 4**
Course Objective: To provide Basic knowledge of Python programming and to implement programming skill for solving real world problems.						
Course Outcome: After completion of this course students will be able to: **CO1 –** Understanding basic programming logic. **CO2 -** Implement python programs using decision control statements. **CO3 -** Implement user defined functions and modules in python **CO4 -** Implement python data structures –lists, tuples, set, dictionaries **CO5 -** Apply programming concepts to solve real world problem.						**K2** **K3** **K3** **K3** **K3**
Course Content						
Unit	**Module**	**Topics Covered**	**Pedagogy**	**Lecture Required (T=L+P) (clearly mention the hours for theory and lab)**	**Practical/Assignment/Lab**	**CO Mapping**
1.	**Basics of python programming**	Problem Solving, Techniques, Algorithm, Building blocks of algorithms (statements, state, control flow, functions), Notation, Flow chart, Pseudo code, programming language, Categories of programming languages.	Lecture , Hands-on exercise, Demonstration, practical lab	6(4+2)	Implementation of basic Python programs.	1
		A Brief History of Python, Applications		3(1+2)	Installation of IDE and Command Prompt.	1

		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,		3(1+2)	Demonstrate the use of these in python programs.	1
		operators in python, expressions in python, strings.		3(1+2)	Develop python program to demonstrate use of Operators.	1
2	**Decision Control Statements**	Conditionals: Conditional statement in Python (if-else statement, its working and execution)	Hands-on exercise, Demonstration, lectures, practical lab	3(1+2)	Develop programs for the use of conditional statements.	2
		Nested-if statement and elif statement in Python, Expression Evaluation & Float Representation.		4(1+3)	Develop programs of different types of statements.	2
		Loops: Purpose and working of loops, while loop, For Loop, Nested Loops, Break and Continue, pass statement.		7(2+5)	Hands on practice on Loops.	2
3	**Function and Modules**	Introduction of Function, calling a function, Function arguments, built in function, scope rules	Lecture , Hands-on exercise, Demonstration, practical lab	4(1+3)	Learn about how to call or create the functions.	3
		Passing function to a function, recursion,		7(4+3)	Hands-on functions .	

		Lambda functions				
		Modules and Packages: Importing Modules, writing own modules, Standard library modules, dir( ) Function, Packages in Python		4(1+3)	Develop python programs for modules.	
4	**Basic Data structures in Python**	Strings: Basic operations, Indexing and Slicing of Strings, Comparing strings	Lecture , Hands-on exercise, Demonstration, practical lab	3(1+2)	Implement and play with strings.	4
		Regular expressions. Python Basic Data Structure: Sequence, Unpacking Sequences, Mutable Sequences,		4(1+3)	Demonstration of the regular expression.	
		Lists, Looping in lists, Tuples, Sets, Dictionaries. Map, filter, Reduce, Comprehension		7(3+4)	Implement different methods for these data structures.	
5	**File and Exception handling**	Files and Directories: Introduction to File Handling in Python, Reading and Writing files, Additional file methods, Working with Directories.	Lecture , Hands-on exercise, Demonstration, practical lab	4(1+3)	Learn Python file handling methods and python file operations	5
		Exception Handling, Errors, Run Time Errors, Handling IO Exception, Try-except statement, Raise		6(2+4)	Learn about Python exception handling methods	5

Theory: 25hrs

Practical: 43hrs

Case study: 5hrs

Project: 5hrs

Total: 78 hrs

2. List of Practical:

Lab No.	Unit	Topic	Program Logic Building	CO Mapping	Aligned with university/industry/certifications
1.1	1	Basic Python(Syntax, Variable, Type Conversion)	Python Program to Print Statement	CO1	Lab work
1.2	1	Basic Python(Syntax, Variable, Type Conversion)	Swap two variables without using a temporary variable.	CO1	Lab work
1.3	1	Basic Python(Syntax, Variable, Type Conversion)	Check if a given number is even or odd.	CO1	Lab work
1.4	1	Basic Python(Syntax, Variable, Type Conversion)	Find the largest of three numbers.	CO1	Lab work
1.5	1	Basic Python(Syntax, Variable, Type Conversion)	Convert a string to an integer.	CO1	Lab work
1.6	1	Basic Python(Syntax, Variable, Type Conversion)	Convert an integer to a string.	CO1	Home Assignment
1.7	1	Basic Python(Syntax, Variable, Type Conversion)	Convert a string to a floating-point number.	CO1	Home Assignment

1.8	1	Basic Python(Syntax, Variable, Type Conversion)	Convert a floating-point number to an integer.	CO1	Home Assignment
1.9	1	Basic Python(Syntax, Variable, Type Conversion)	WAP to demonstrate implicit and explicit type conversion.	CO1	Lab work
1.10	1	Basic Python(Syntax, Variable, Type Conversion)	Convert Employee Count to Binary	CO1	Lab work
1.11	1	Basic Python(Syntax, Variable, Type Conversion)	Convert Revenue to Currency Format	CO1	Lab work
1.12	1	Operators	Write a program to Calculate Sum of 5 Subjects and Find Percentage (Max Mark in each subject is 100).	CO1	Lab Work
1.13	1	Operators	Write a program to find gross salary.	CO1	Lab Work
1.14	1	Operators	Write a program to Calculate Area of Rectangle, Square.	CO1	Lab Work
1.15	1	Operators	Write a program to Calculate Area of Scalene Triangle and Right-angle Triangle.	CO1	Home Assignment
1.16	1	Operator	Write a program to find the perimeter of a circle, rectangle and triangle.	CO1	Home Assignment
1.17	1	Operator	Write a program to Compute Simple Interest.	CO1	Lab Work
1.18	1	Operator	Write a program to Convert Fahrenheit temperature in to Celsius.	CO1	Lab Work
1.19	1	Operator	Write a program to Find the	CO1	Home Assignment

			Gravitational Force Acting Between Two Objects.		
1.20	1	Operator	Write a program to swap the values of two variables with and without using third variable.	CO1	Lab Work
1.21	1	Operator	Write a program to perform arithmetic operations on a = 8, b = 3.	CO1	Lab Work
1.22	1	Operator	Write a program to apply relational operations on a=8, b=3.	CO1	Lab Work
1.23	1	Operator	Write a program to apply assignment operations on a=8, b=3.	CO1	Lab Work
1.24	1	Operator	Write a program to apply logical operations on a=8, b=3.	CO1	Lab Work
1.25	1	Operator	Write a program to apply bitwise operations on a=8, b=3.	CO1	Lab Work
1.26	1	Operator	Write a program to apply identity operators.	CO1	Lab Work
1.27	1	Operator	Write a program to Swap the Contents of two Numbers using Bitwise XOR Operation	CO1	Lab Work
1.28	1	Operator	WAP to find the absolute value of the given number.	CO1	Home Assignment
1.29	1	Operator	Write a program to Add two Complex Numbers.	CO1	Lab Work
1.30	1	Operator	Write a Program to find roots of a	CO1	Home Assignment

			quadratic expression.		
1.31	1	Arithmetic Operator	Program to perform basic arithmetic operations (addition, subtraction, multiplication, division) on two numbers.	CO1	Lab Work
1.32	1	Arithmetic Operator	Program to calculate the area of a rectangle using the multiplication operator.	CO1	Home Assignment
1.33	1	Arithmetic Operator	Program to calculate the average of a list of numbers using the division operator.	CO1	Home Assignment
1.34	1	Comparison Operator	Program to compare two numbers and determine if they are equal.	CO1	Lab Work
1.35	1	Comparison Operator	Program to compare two numbers and determine whether they are greater than or less than .	CO1	Lab Work
1.36	1	Comparison Operator	Program to check if a given string is equal to a specific value.	CO1	Lab Work
1.37	1	Logical Operator	Write a program to apply Logical AND operator on two operands.	CO1	Lab Work
1.38	1	Logical Operator	Write a program to apply Logical OR operator on two operands.	CO1	Lab Work
1.39	1	Logical Operator	Write a program to apply Logical	CO1	Lab Work

			NOT operator on an operand.		
1.40	1	Assignment operator	Program to increment or decrement a variable using assignment operators.	CO1	Home Assignment
1.41	1	Assignment operator	Program to calculate compound interest using compound assignment operators.	CO1	Home Assignment
1.42	1	Bitwise Operator	Program to perform bitwise AND, OR, XOR, left shift, and right shift operations.	CO1	Lab Work
1.43	1	Bitwise Operator	Program to check if a given number is odd or even using bitwise operators.	CO1	Home Assignment
2.1	2	Conditional Statements	Write a program to Accept two Integers and Check if they are Equal.	CO 2	Lab Work
2.2	2	Conditional Statements	Write a program to Check if a given Integer is Positive or Negative and Odd or Even.	CO 2	Lab Work
2.3	2	Conditional Statements	Write a program to Check if a given Integer is Divisible by 7 or not.	CO 2	Lab Work
2.4	2	Conditional Statements	Write a program to find the greatest of three numbers using else if ladder.	CO 2	Lab Work
2.5	2	Conditional Statements	Write a program to find the greatest of three numbers using Nested if.	CO 2	Lab Work
2.6	2	Conditional Statements	Write a program to convert an	CO 2	Lab Work

			Upper-case character into lower case and vice-versa.		
2.7	2	Conditional Statements	Write a program to check weather an entered year is leap year or not.	CO 2	Home Assignment
2.8	2	Conditional Statements	Write a Program to check whether an alphabet entered by the user is a vowel or a constant.	CO 2	Home Assignment
2.9	2	Conditional Statements	Write a program to print day according to the day number entered by the user.	CO 2	Lab Work
2.10	2	Conditional Statements	Write a program to print color name, if user enters the first letter of the color name.	CO 2	Lab Work
2.11	2	Conditional Statements	Write a program to Simulate Arithmetic Calculator.	CO 2	Lab Work
2.12	2	Conditional Statements	Write a menu driven program for calculating area of different geometrical figures such as circle, square, rectangle, and triangle.	CO 2	Home Assignment
2.13	2	Conditional Statements	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',	CO 2	Lab Work

			60-80% Print 'C', 50-60% Print 'D', 40-50% Print 'E', Below 40% Print 'F'.		
2.14	2	Conditional Statements	WAP to enter a character and then determine whether it is a vowel, consonants, or a digit.	CO 2	Home Assignment
2.15	2	Loops	Write a program to display all even numbers from 1 to 20	CO 2	Lab Work
2.16	2	Loops	Write a program to print all the Numbers Divisible by 7 from 1 to 100.	CO 2	Lab Work
2.17	2	Loops	Write a program to print table of any number.	CO 2	Lab Work
2.18	2	Loops	Write a program to Find the Sum of first 50 Natural Numbers using for Loop.	CO 2	Lab Work
2.19	2	Loops	Write a program to calculate factorial of a given number using for loop and also using while loop.	CO 2	Lab Work
2.20	2	Loops	Write a program to count the sum of digits in the entered number.	CO 2	Lab Work
2.21	2	Loops	Write a program to find the reverse of a given number.	CO 2	Lab Work
2.22	2	Loops	Write a program to Check whether a given Number is Perfect Number.	CO 2	Home Assignment

2.23	2	Loops	Write a program to Print Armstrong Number from 1 to 1000.	CO 2	Lab Work
2.24	2	Loops	Write a program to Compute the Value of X^n.	CO 2	Lab Work
2.25	2	Loops	Write a program to Calculate the value of ${}^nC_r$.	CO 2	Home Assignment
2.26	2	Loops	Write a program to generate the Fibonacci Series.	CO 2	Lab Work
2.27	2	Loops	Write a program to check whether a given Number is Palindrome or Not.	CO 2	Lab Work
2.28	2	Loops	Write a program to Check whether a given Number is an Armstrong Number.	CO 2	Home Assignment
2.29	2	Loops	Write a program to print all prime numbers from 1-500.	CO 2	Home Assignment
2.30	2	Loops	Write a program to find the Sum of all prime numbers from 1-1000.	CO 2	Home Assignment
2.31	2	Loops	Write a program to display the following pattern: *	CO 2	Lab Work
2.32	2	Loops		CO 2	Lab Work

			Write a program to display the following pattern: * * * * * * * * * * * * * * *		
2.33	2	Loops	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	Lab Work
2.34	2	Loops	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	Lab Work
2.35	2	Loops	Write a program to display the following pattern: * * * * *	CO 2	Lab Work

			* * * * * * * * * *		
2.36	2	Loops	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	Home Assignment
2.37	2	Loops	Write a program to display the following pattern: * * * * * * * * * * * * * * * *	CO 2	Home Assignment
2.38	2	Loops	Write a program to display the following pattern: *	CO 2	Home Assignment

2.39	2	Loops	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	Home Assignment
2.40	2	Loops	Write a program to display the following pattern: 1 2 3 4 5 6 7 8 9 10	CO 2	Home Assignment
2.41	2	Loops	Write a program to display the following pattern: A B C D E F G F E D C B A A B C D E F F E D C B A A B C D E E D C B A A B C D D C B A A B C C B A A B B A A A	CO 2	Lab Work

2.42	2	Loops	Write a program to display the following pattern: *	CO 2	Home Assignment
2.43	2	Loops	Write a program to display the following pattern: 0 0 01 10 010 010 0101 1010 0101001010	CO 2	Lab Work
2.44	2	Loops	Write a program to display the following pattern: A B C D E F	CO 2	Home Assignment

			G H I J K L M N O		
2.45	2	Loops	Write a program to display the following pattern: A BAB CBABC DCBABCD EDCBABCDE	CO 2	Home Assignment
2.46	2	Loops	Write a program to Find the Sum of A.P Series.	CO 2	Lab Work
2.47	2	Loops	Write a program to Find the Sum of G.P Series.	CO 2	Lab Work
2.48	2	Loops	Write a program to Find the Sum of H.P Series.	CO 2	Lab Work
2.49	2	Loops	Write a program to print the following sequence of integers. 1, 2, 4, 8, 16, 32	CO 2	Lab Work
2.50	2	Loops	Write a program to find the Sum of following Series: (1*1) + (2*2) + (3*3) + (4*4) + (5*5) + ... + (n*n)	CO 2	Lab Work
2.51	2	Loops	Write a program to find the Sum of	CO 2	Home Assignment

			following Series: (1^1) + (2^2) + (3^3) + (4^4) + (5^5) + ... + (n^n)		
2.52	2	Loops	Write a program to find the Sum of following Series: (1!/1) + (2!/2) + (3!/3) + (4!/4) + (5!/5) + ... + (n!/n)	CO 2	Home Assignment
2.53	2	Loops	Write a program to print the following Series: 1, 2, 3, 6, 9, 18, 27, 54, ... up to n terms	CO 2	Lab Work
2.54	2	Loops	Write a program to print the following Series: 2, 15, 41, 80, 132, 197, 275, 366, 470, 587	CO 2	Lab Work
2.55	2	Loops	Write a program to print the following Series:1, 3, 4, 8, 15, 27, 50, 92, 169, 311	CO 2	Home Assignment
2.56	2	Loops	Write a program to Convert the given Binary Number into Decimal.	CO 2	Lab Work
2.57	2	Loops	Write a program to Convert Binary to Hexadecimal.	CO 2	Lab Work
2.58	2	Loops	Write a program to find out L.C.M. of two numbers.	CO 2	Lab Work
2.59	2	Loops	Write a program to find out H.C.F.	CO 2	Home Assignment

			of two numbers.		
2.60	2	Loops	Python Program to Accept Three Digits and Print all Possible Combinations from the Digits.	CO 2	Home Assignment
2.61	2	Loops	Python Program to Print Odd Numbers within a Given Range.	CO 2	Home Assignment
2.62	2	Loops	Python Program to Find the Smallest Divisor of an Integer.	CO 2	Home Assignment
2.63	2	Loops	Python Program to Count the Number of Digits in a Number	CO 2	Home Assignment
2.64	2	Loops	Python program to find GCD between two given integer numbers.	CO 2	Lab Work
3.1	3	Functions	Write a Python function to find the Max of three numbers.	CO3	Lab Work
3.2	3	Functions	Write a Python function to sum all the numbers in a list. Sample List : (8, 2, 3, 0, 7) Expected Output : 20	CO3	Lab Work
3.3	3	Functions	Write a Python program to reverse a string. Sample String : "1234abcd" Expected Output : "dcba4321"	CO3	Lab Work
3.4	3	Functions	Write a Python function to check whether a number falls in a given range.	CO3	Home Assignment

3.5	3	Functions	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	CO3	Lab Work
3.6	3	Functions	Write a Python function that takes a number as a parameter and check the number is prime or not.	CO3	Lab Work
3.7	3	Functions	Write a Python function that checks whether a passed string is palindrome or not.	CO3	Lab Work
3.8	3	Functions	Write a Python function that prints out the first n rows of Pascal's triangle.	CO3	Lab Work
3.9	3	Functions	Write a Python function that accepts a hyphen-separated sequence of words as input and prints the words in a hyphen-separated sequence after sorting them alphabetically. *Sample Items:* green-red-yellow-black-white	CO3	Lab Work

			Expected Result: black-green-red-white-yellow		
3.10	3	Functions	Python function to convert height (in feet and inches) to centimetres	CO3	Lab Work
3.11	3	Functions	Python function to Convert Celsius to Fahrenheit.	CO3	Lab Work
3.12	3	Functions	Implement a function to check if two strings are anagrams of each other.	CO3	Lab Work
3.13	3	Functions	Python function to display all the Armstrong number from 1 to n.	CO3	Lab Work
3.14	3	Recursion	Write a program using recursion to compute factorial of a given number.	CO3	Lab Work
3.15	3	Recursion	Write a program to print Fibonacci Series using recursion.	CO3	Lab Work
3.16	3	Recursion	Write a program to calculate sum of numbers 1 to N using recursion.	CO3	Lab Work
3.17	3	Recursion	Write a program to Find Sum of Digits of the Number using Recursive Function.	CO3	Lab Work
3.18	3	Recursion	Write a program to print Tower of Hanoi using recursion.	CO3	Home Assignment
3.19	3	Recursion	Python Program to Determine How Many Times a Given Letter Occurs in a String Recursively	CO3	Home Assignment
3.20	3	Recursion	Python Program to Find the Binary	CO3	Home Assignment

			Equivalent of a Number Recursively		
3.21	3	Recursion	Python Program to Find the GCD of Two Numbers Using Recursion	CO3	Home Assignment
3.22	3	Recursion	Python Program to Find the Power of a Number Using Recursion	CO3	Home Assignment
3.23	3	Recursion	WAP to compute the sum of all the elements of the list using reduce() function.	CO3	Lab Work
3.24	3	Modules and Packages	A) Write a program to create a module and import the module in another python program.	CO3	Lab Work
3.25	3	Modules and Packages	Write a program program to import all objects from a modules, specific objects from module and provide custom import name to the imported object from the module.	CO3	Lab Work
3.26	3	Modules and Packages	Create a python package having at least two modules in it.	CO3	Lab Work
3.27	3	Modules and Packages	Create a python package having at least one subpackage in it.	CO3	Lab Work
4.1	4	String	Python program to check whether	CO 4	Lab Work

			the string is Symmetrical or Palindrome		
4.2	4	String	Ways to remove i'th character from string in Python	CO 4	Lab Work
4.3	4	String	Python program to Check if a Substring is Present in a Given String	CO 4	Lab Work
4.4	4	String	Find length of a string in python (4 ways)	CO 4	Lab Work
4.5	4	String	Python program to print even length words in a string	CO 4	Lab Work
4.6	4	String	Python program to accept the strings which contains all vowels	CO 4	Lab Work
4.7	4	String	Remove all duplicates from a given string in Python	CO 4	Lab Work
4.8	4	String	Python program to Maximum frequency character in String	CO 4	Lab Work
4.9	4	String	Python Program to Replace all Occurrences of 'a' with $ in a String	CO 4	Lab Work
4.10	4	String	Python Program to Form a New String where the First Character and the Last Character have been Exchanged	CO 4	Lab Work
4.11	4	String	Python Program to Count the Number of Vowels in a String	CO 4	Home Assignment

4.12	4	String	Python Program to Take in a String and Replace Every Blank Space with Hyphen	CO 4	Home Assignment
4.13	4	String	Python Program to Calculate the Length of a String Without Using a Library Function	CO 4	Home Assignment
4.14	4	String	Python Program to Remove the Characters of Odd Index Values in a String	CO 4	Home Assignment
4.15	4	String	Python Program to Calculate the Number of Words and the Number of Characters Present in a String	CO 4	Home Assignment
4.16	4	String	Python Program to Take in Two Strings and Display the Larger String without Using Built-in Functions	CO 4	Lab Work
4.17	4	String	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	Lab Work
4.18	4	String	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	Lab Work

4.19	4	String	Python Program to Form a New String Made of the First 2 and Last 2 characters From a Given String	CO 4	Lab Work
4.20	4	String	Python Program to Count the Occurrences of Each character in a Given String Sentence	CO 4	Lab Work
4.21	4	String	Python Program to Check if a Substring is Present in a Given String	CO 4	Lab Work
4.22	4	String	Python Program to Find the Most Repeated Word in a String.	CO 4	Lab Work
4.23	4	Regular Expression	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.	CO 4	Lab work

			vi) Maximum length of password:12.		
4.24	4	Regular Expression	Write a python program to validate mobile number.	CO 4	Lab Work
4.25	4	Regular Expression	Given an input file which contains a list of names and phone numbers separated by spaces in the following: i) Phone number contains a 3- or 2-digit area code and a hyphen followed by an 8-digit number. **ii)** Find all names having phone number with a 3digit area code using regular expression.	CO 4	Home Assignment
4.26	4	List	Program to interchange first and last elements in a list	CO 4	Lab work
4.27	4	List	WAP to find min, max and average of elements of a list having numeric data	CO 4	Lab work
4.28	4	List	Program to check if element exists in list	CO 4	Lab work
4.29	4	List	Program for Reversing a List	CO 4	Lab work
4.30	4	List	Program to Multiply all numbers in the list	CO 4	Home Assignment

4.31	4	List	Program to find smallest and largest number in a list	CO 4	Lab work
4.32	4	List	Program to find second largest number in a list	CO 4	Home assignment
4.33	4	List	Program to print all even numbers in a range	CO 4	Home assignment
4.34	4	List	Program to print all negative numbers in a range	CO 4	Lab work
4.35	4	List	Program to Remove multiple elements from a list in Python	CO 4	Lab work
4.36	4	List	Program to Cloning or Copying a list	CO 4	Lab work
4.37	4	List	Program to Count occurrences of an element in a list	CO 4	Home assignment
4.38	4	List	Program to find Cumulative sum of a list	CO 4	Home assignment
4.39	4	List	Program to Break a list into chunks of size N in Python	CO 4	Home assignment
4.40	4	List	Python Program to transpose of Matrix.	CO 4	Lab Work
4.41	4	List	Python Program to Add Two Matrices.	CO 4	Lab Work
4.42	4	List	Python Program to Multiply Two Matrices.	CO 4	Home Assignment
4.43	4	List	Program to get K^{th} Column of	CO 4	Lab Work

			Matrix		
4.44	4	List	WAP to print all even numbers of a list using list comprehension.	CO 4	Lab Work
4.45	4	List	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	Lab Work
4.46	4	List	WAP to transpose a given matrix using list comprehension.	CO 4	Lab Work
4.47	4	List	Print All the characters of a string using list Comprehension	CO 4	Lab Work
4.48	4	List	Write a program to calculate square of numbers up to n using list comprehension.	CO 4	Lab Work
4.49	4	Tuple	Python program to Find the size of a Tuple	CO 4	Lab Work
4.50	4	Tuple	Python – Maximum and Minimum K^{th} elements in Tuple	CO 4	Lab Work
4.51	4	Tuple	Create a list of tuples from given list having number and its cube in each tuple	CO 4	Lab Work
4.52	4	Tuple	Python – Flatten tuple of List to tuple	CO 4	Home Assignment
4.53	4	Set	Python Program to Count the Number of Vowels Present in a	CO 4	Lab Work

			String using Sets		
4.54	4	Set	Python Program to Check Common Letters in Two Input Strings	CO 4	Lab Work
4.55	4	Set	Python Program that Displays which Letters are in the First String but not in the Second	CO 4	Lab Work
4.56	4	Set	Python Program that Displays which Letters are Present in Both the Strings	CO 4	Lab Work
4.57	4	Set	Python Program that Displays which Letters are in the Two Strings but not in Both	CO 4	Home Assignment
4.58	4	Dictionary	Python Program to Add a Key-Value Pair to the Dictionary	CO 4	Lab Work
4.59	4	Dictionary	Python Program to Concatenate Two Dictionaries into One.	CO 4	Lab Work
4.60	4	Dictionary	Python Program to Check if a Given Key Exists in a Dictionary or Not	CO 4	Lab Work
4.61	4	Dictionary	Python Program to Generate a Dictionary that Contains Numbers (between 1 and n) in the Form (x,x*x).	CO 4	Lab Work
4.62	4	Dictionary	Python program to create an instance of an Ordered dict using a given dictionary. Sort the dictionary during	CO 4	Home Assignment

			the creation and print the members of the dictionary in reverse order.		
4.63	4	Dictionary	Python Program to Sum All the Items in a Dictionary	CO 4	Lab Work
4.64	4	Dictionary	WAP to create dictionary which has characters of given string as keys and frequency of characters as values.	CO 4	Lab Work
4.65	4	Dictionary	Python Program to Multiply All the Items in a Dictionary	CO 4	Lab Work
4.66	4	Dictionary	Python Program to Remove the Given Key from a Dictionary	CO 4	Lab Work
4.67	4	Dictionary	Python Program to Form a Dictionary from an Object of a Class	CO 4	Home Assignment
4.68	4	Dictionary	Python Program to Map Two Lists into a Dictionary	CO 4	Lab Work
4.69	4	Comprehension	Write a program Filtering even numbers from a list using tuple comprehension	CO 4	Lab Work
4.70	4	Comprehension	Creating a list of tuples from two lists using comprehension function	CO 4	Lab Work
4.71	4	Comprehension	Extracting the first character from each word in a list of strings	CO 4	Lab Work
4.72	4	Comprehension	Swapping keys and values in a dictionary	CO 4	Lab Work

4.73	4	Comprehension	Filtering even numbers from a dictionary:	CO 4	Lab Work
4.74	4	Comprehension	Write a Program to calculate square of number using dictionary comprehension	CO 4	Lab Work
5.1	5	File handling and Exceptional Handling	Python program to read file word by word	CO 5	Lab Work
5.2	5	File handling and Exceptional Handling	Python program to read character by character from a file	CO 5	Lab Work
5.3	5	File handling and Exceptional Handling	Python – Get number of characters, words, spaces and lines in a file	CO 5	Lab Work
5.4	5	File handling and Exceptional Handling	Program to Find ‘n’ Character Words in a Text File	CO 5	Lab Work
5.5	5	File handling and Exceptional Handling	Python Program to obtain the line number in which given word is present	CO 5	Lab Work
5.6	5	File handling and Exceptional Handling	Count number of lines in a text file in Python	CO 5	Lab Work
5.7	5	File handling and Exceptional Handling	Python Program to remove lines starting with any prefix	CO 5	Lab Work
5.8	5	File handling and Exceptional Handling	Python Program to Eliminate repeated lines from a file	CO 5	Home Assignment
5.9	5	File handling and Exceptional Handling	Python Program to read List of Dictionaries from File	CO 5	Home Assignment
5.10	5	File handling and Exceptional Handling	Python – Append content of one text	CO 5	Home Assignment

			file to another		
5.11	5	File handling and Exceptional Handling	Python program to copy odd lines of one file to other	CO 5	Lab Work
5.12	5	File handling and Exceptional Handling	Python Program to merge two files into a third file	CO 5	Lab Work
5.13	5	File handling and Exceptional Handling	Python program to Reverse a single line of a text file	CO 5	Lab Work
5.14	5	File handling and Exceptional Handling	Python program to reverse the content of a file and store it in another file	CO 5	Lab Work
5.15	5	File handling and Exceptional Handling	Python Program to handle divide by zero exception.	CO 5	Lab Work
5.16	5	File handling and Exceptional Handling	WAP to handle multiple exception.	CO 5	Lab Work
5.17	5	File handling and Exceptional Handling	Python program to combine each line from first file with the corresponding line in second file.	CO 5	Lab Work
5.18	5	File handling and Exceptional Handling	Write a program to copy the contents of one file to another.	CO 5	Lab Work
5.19	5	File handling and Exceptional Handling	Write a program to print First 5 line in a file	CO 5	Home assignment
5.20	5	File handling and Exceptional Handling	a) Write a program to catch the following exception: i) Value error ii) Index error iii) Name error	CO 5	Lab Work

			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.		

2. Reference Books:

(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.

(5) Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

Text Books:

(1) Magnus Lie Hetland, "Beginning Python-From Novice to Professional"—Third Edition, Apress

(2) Python Programming using Problem solving approach by Reema Thareja OXFORD Higher education

(3) Kenneth A. Lambert, ―Fundamentals of Python: First Programs, CENGAGE Learning, 2012.

Links:

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

Semester: II
Branch: MCA (Integrated)

Subject Name- Internet and Web Designing Lab	**L T P** **0 0 4**
Subject Code - BMICA0251	**Credit- 2**

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

Lab Course outcome:	
CO1 - Understand the basic working scheme of the Internet and the World Wide Web and the requirements of effective web design.	**K1**
CO2 - Understand the process of domain registration and web hosting.	**K2**
CO3 - Demonstrate the management of electronic mail using internet protocols.	**K4**
CO4 - Understand the basics of web security, HTTP and HTTPS.	**K2**
CO5 - Develop web pages using the basic HTML features with different layouts as per the requirements	**K3,K5**

Lab No.	**Unit**	**Topic**	**Programs**	**CO Mapping**
1-1	1	WWW	Search the same keywords in at least three different search engines and compare their results	CO1
1-2	2	WWW	Search the same image in at least three different search engines and compare their results	CO1
2-1	3	Email	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	CO3
2-2	3	Email	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 4. Mail recovery	CO3

			5. Add signatures	
3.1	5	HTML	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.	CO5
3.2	3	HTML	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.	CO5
3.3	3	HTML	Write HTML code to design a page containing some text in a paragraph by giving a suitable heading style.	CO5
3.4	3	HTML	Create a page to show different character formatting (B, I, U, SUB, SUP) tags. viz : log b m p = p logb m	CO5
3-5	4	HTML	Write HTML code to create a Web Page that contains an Image at its center	CO5
3-6	4	HTML	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
3.7	5	HTML	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
3.8	5	HTML	Write an HTML code to create a web page with pink color background and display a moving message in red color.	CO5

*Competitive coding list will be shared with the students.

Required software and Tools.

ii) Paid/Unpaid: Notepad

4. **Reference Books:**

Textbooks:

(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 Links:

Link:

Introduction to Internet IT Class 9 | Information & Communication Technology Skills Class 9 IT 402 - YouTube

Computer Networks and Internet Protocol - YouTube
How the Internet Works in 5 Minutes - YouTube
Introduction to Web Design - Fundamentals & Basics - YouTube

3. **Any Certification/Courses for this subject**

   NILL

4. **Assignment Questions:**
   1. Define the difference Between the World Wide Web and the Internet.
   2. Define the advantages of the internet.
   3. "Define the short notes on:
      i. Simplex and Half Duplex Channels
      ii. Applications of the Sessions layer"
   4. What is the Internet? What are its advantages and disadvantages?
   5. What are the various services of the Internet?
   6. Define the role of HTTP.
   7. Difference between HTTP and HTTPS.
   8. Explain different types of networks.
   9. Explain the following terms a) MIME b) WWW c) DNS d) HTTP with a suitable example.
   10. Define the difference between FTP and Telnet.
   11. Explain the Access Network Architecture.
   12. Difference between OSPF and BGP routing protocol.
   13. Explain the different types of access networks.
   14. Define Frame Relay.
   15. What is DNS?
   16. Explain the characteristics of the Border Gateway Protocol (BGP).
   17. What are the steps for solving Domain name disputes.

18. Explain the different types of access networks.
19. Difference between ADSL and cable modem.
20. Difference between Twisted pair cable, Co-axial cable and Optical fiber cable.
21. Explain the client-side Scripting and server-side scripting.
22. How to make an effective email.
23. What are the protocols used for sending and receiving email?
24. What is a web server?
25. Explain the HTTP methods.
26. Define the term IIS.
27. Write down the steps for sending emails to multiple people.
28. Define the steps for accessing the web server.
29. Explain the architecture of SMT
30. What are the components of a Firewall?
31. Define web security.
32. Explain Traceroute.
33. Explain the importance of a firewall.
34. What are the security threats?
35. What are the factors to be considered in Firewall design?
36. Explain SSL.
37. Name the different layers of the OSI model.
38. List out some of the common cyber-attack.
39. What is a VPN?
40. What are HTML Attributes?
41. Define the objective of using Cascading Style Sheets (CSS). Illustrate the use of style sheets with the help of a suitable example.
42. What is a Tag in HTML?
43. Differentiate between an Ordered list and an Unordered list.
44. How do you align list elements in an HTML file?
45. How to create a hyperlink in HTML?
46. What is a marquee?
47. Explain the structure of an HTML document. What steps are used to build a web page in HTML? Give an example of an HTML document in its simplest form making use of the commonly used tags. Describe the purpose of all the tags used in the document.

Subject Code- BMICA0252			**L T P 0 0 4**	
Subject Name- Skills for Career Enhancement			**Credit- 2**	
Total No. of Activities: 24				
List of Activities				
Activity	**Module**	**Topic**	**Program Logic Building**	**CO Mapping**
Interactions	1	**Getting rid of stage fright**	Students will know how to meet, greet, and strike a conversation.	**C01**
Networking and Icebreaker Activities	1	**Developing active listening and accurate communication skills**	Participants will engage in meaningful conversations, build connections, and create a positive networking atmosphere	**C02**
Elocution	1	**Developing Public Speaking Skills**	Participants will overcome stage fear and demonstrate improved delivery, articulation, and emotional expression while engaging the audience with their performance.	**C03**
Impromptu Speaking Challenge	1	**Thinking spontaneously and on the feet.**	Participants will improve their ability to think on their feet and deliver impromptu speeches confidently.	**C03**
Group Debate	1	**Learning Presentation Skills**	Participants will develop their persuasive speaking skills, critical thinking, and ability to present logical arguments in a group setting.	**C03**
Play Acting	1	**Developing communication skills and active listening**	Participants will demonstrate effective communication, active listening, and adaptability in various scenarios.	**C03**
Nonverbal Charades	2	**Developing Non-Verbal Cues**	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**

Emotional Mirror	2	**Developing Empathy**	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**
Nonverbal Gallery Walk	2	**Fostering Appreciation of Non- Verbal Communication**	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**
Expressive Art Collage	2	**Boosting creativity and self-expression**	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.	**C03**
Nonverbal Skit Performance	2	**Power of Non-Verbal Communication in story telling**	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.	**C03**
Mock Job Interviews	3	**Building Interview Skills**	Participants will demonstrate confidence, effective communication, and interview techniques necessary for successful job interviews	**C05**
Interview Question Brainstorming	3	**Increasing Interview Preparedness**	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 or desired job positions.	**C05**

Mock Interview Panel	3	**Simulated Interview Practice**	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**
Video Self-Assessment	3	**Assessing Strengths and Weaknesses**	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**
Interview Skills Workshop	3	**Skills Workshop**	Organize a workshop or guest speaker session where students can learn about the latest trends and techniques in interviews, such as behavioural interviewing or video interviews. The workshop will provide practical tips, strategies, and resources to help students excel in their future interviews.	**C05**
Values Exploration	4	**Building Core Values**	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 behaviours with their core values.	**C04**
Collaborative Problem-Solving	4	**Presenting Effective Solutions to Problems**	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.	**C04**
Sharing a Viewpoint Effectively	4	**The Discussion Circle: Group Discussion 1**	Participants will enhance their ability to express their opinions, actively listen to others, and engage in constructive discussions to develop well-rounded perspectives.	**C05**

Sharing a Viewpoint Effectively-2	4	**The Discussion Circle: Group Discussion 2**	Participants will enhance their ability to express their opinions, actively listen to others, and engage in constructive discussions to develop well-rounded perspectives.	**C05**
Interview Handling Skills	3	**Mock Interviews: Practising Behavioural and FAQs**	The students will be able to respond to behavioural interview questions efficiently.	**C05**
Presentation Skills	1	**Articulating insights: Presentations**	Participants will enhance their ability to deliver engaging presentations, effectively communicate their ideas, and exhibit confidence in public speaking.	**C03**
Final Assessment	3	**Writing Task for the Final Internal Assessment**		
Final Assessment	4	**Group Presentations for Final Internal Assessment**		