



University of Engineering and Management
Institute of Engineering & Management, Salt Lake
Campus Institute of Engineering & Management, New Town
Campus
University of Engineering & Management, Jaipur



1st Semester Syllabus for BCA Admission Batch 2025

SEMESTER 1							
Sl No.	Type	Subject Code	Subject Name	L	T	P	Credit Points
THEORY							
1	Theory	BCACC101	Introduction to C programming	4			4
2	Theory	BCACC102	Digital Electronics	4			4
3	Theory	BCACC103 / BCASAS101	Discrete Structure / Analytics Programming Fundamentals	4			4
4	Theory	BCAESP101	Essential Studies for Professionals - I		2		2
PRACTICAL							
5	Practical	BCACC191	Programming Lab with C		1	2	3
6	Practical	BCACC192	Digital Electronics Lab		1	2	3
7	Practical	BCA194	Computer System & Office Automation Tools Lab			2	1
SESSIONAL							
8	Sessional	BCASDP181	Skill Development for Professionals - I		2		2
9	Sessional	BCAIVC181	Economics, Finance and Entrepreneurship Skills - Basic		1		1
10	Sessional	BCAAE181	Soft Skills		3		2
MOOCS/MAR/IFC/INT							
11	Value Added Course	MOOCs	Massive Open Online Course				
12	Value Added Course	IFC	Industry and Foreign Certification				
13	Value Added Course	MAR	Mandatory Additional Requirements(MAR)				
14	Value Added Course	INT101	Innovative Project-I		1		1
			Total	12	11	6	27



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Syllabus and Lesson Plan for BCA Admission Batch 2025

Subject Name: **Introduction to C Programming**

Credit: 4

Lecture Hours: 40

Subject Code: **BCACC101**

Maximum: 100 marks (Internal: 50 marks; External: 50 marks)

Pre-requisite: Fundamental computer knowledge

Relevant Links:

1. Link for Study Material:

<https://drive.google.com/file/d/1KGeYtfXwmCXnoWIqud89Svt226uuBuQn/view?pli=1>

2. Link for Coursera Course:

<https://www.coursera.org/specializations/c-programming>

3. Link for LinkedIn Learning Course:

https://www.linkedin.com/learning/complete-guide-to-c-programming-foundations?upsellOrderOrigin=default_guest_learning&trk=default_guest_learning

4. Link for Infosys Springboard Course:

https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01384323703937433634517_shared/overview

COURSE OBJECTIVES:

1. To introduce students to a powerful programming language.
2. To understand the basic structure of a program.
3. To gain knowledge of various programming errors.
4. To enable the students to make flowchart and design an algorithm for a given problem.
5. To enable the students to develop logics and programs.

COURSE OUTCOMES:

CO1:Students will be able to learn how to build by the algorithms for problems and basic understanding of programming language.

CO2:Students will be able to learn how to create pictorial representations of the program and to develop an in-depth understanding of logical concepts of C Programming.

CO3:Students will be able to learn how to implement different operations on functions, pointers, structures, unions and choose best way to solve problem.

CO4:Students will be able to enhance their programming skills through implementing files concept and pre-processor.

Module number	Topic	Sub-topics	Chapter Name and Book	Mapping with Industry and International Academia	Lecture Hours
1	Introduction Constants, variables, data	History of C, Importance of C, Sample Program, Basic Structure of C Program, Programming Style, Executing C program Introduction, Character Set, C Tokens, Keywords and identifiers, Constants, Variables, Data types, Declaration of	Programming in ANSI, E. Balagurusamy- Chapter 1,2,3,4	International Academia: Practical Programming in C Industry Mapping: CLion, Eclipse(IDE), Visual Studio, CLion, Clan	14

	types. Operators and Expressions Managing Input and Output operations.	variables, Declaration of storage class, Assigning values to variables. Introduction, Arithmetic operators, Relational operators Logical operators Assignment operators Increment and decrement operators Conditional operators, Bitwise operators, Special operators, Arithmetic expression, Evaluating expression precedence of arithmetic operators, Type conversions in expression Operator precedence and associativity. Introduction, reading a Character, writing a Character Formatted Input, Formatted Output			
2	Decision making and branching Loop Functions Arrays Character Arrays and Strings	Introduction, Decision making with IF statement, IF.ELSE statement, Nesting of IF.ELSE statement, ELSE..IF ladder, Switch statement, The ? : operator, GOTO statement Introduction, The WHILE statement, The DO statement, The FOR statement, Jumps in LOOPS. What are Arrays? One dimensional Array Declaration, One dimensional array Initialization, Two-dimensional array declaration, Two-dimensional array initialization. Introduction, Declaring and initializing string variables, reading strings, writing strings, Arithmetic operations on	Programming in ANSI,E.Balagurusamy- Chapter 5,6,7,8,9	International Standards: Introduction to C MIT OpenCourseWare IndustryMapping: CLion, Eclipse(IDE), Visual Studio, CLion, Clang	12

	User-defined Functions	characters, Putting strings together, Comparison on two strings, String handling function. Introduction, need for user-defined function, A multi-function program, Elements of user-defined function, Definition of functions, return values and types, Function calls, Function declaration, Categories of function, Nesting of function, Recursion, Passing arrays to function, Passing strings to function, Scope, visibility and lifetime of variables			
3	Structures and Union Pointer	Introduction, defining structure, declaring structure variables, accessing structure members, Structure initialization, Copying and comparing structure variables, Operations on individual members Arrays of structures, Structure within structure, Structure and function, Union Understanding Pointers, accessing address of a variable, Declaring pointer variable, Initialization of pointer variable, accessing a variable through its pointer, Pointer expression, Pointer Increments and scale factor, Pointers and arrays, Pointer and character strings, Array of pointers, Pointers as function arguments, Functions returning pointers, Pointer to function, Pointer and structure	Programming in ANSI, E. Balagurusamy- Chapter 10, 11	International Academia: Lecture Notes Practical Programming in C MIT OpenCourseWare Industry Mapping: CLion, Eclipse (IDE), Visual Studio, CLion, Clang	8

4	File Management in C The Preprocessor	Introduction, Defining and opening a file Closing a file, Input/Output Operations on Files, Error handling during I/O operations, Command Line Arguments Macro substitution, File inclusion, Compiler Control Directives	Programming in ANSI, E. Balagurusamy - Chapter 12, 14	International Academia: File handling MIT OpenCourseWare Industry Mapping: CLion, Eclipse (IDE), Visual Studio, CLion, Clang	6

Module 1: Introduction, Constants, variables, data types. Operators and Expressions, Managing Input and Output operations

Working Days	Lesson Plan Description
Day 1	History of C, Importance of C
Day 2	Programming Style, Sample Program
Day 3	Structure of C Program, Executing C program
Day 4	Character Set, C Tokens, Keywords and identifiers
Day 5	Constants, Variables, Data types, Declaration of variables,
Day 6	Declaration of variables, Declaration of storage class, Assigning values to variables.
Day 7	Arithmetic operators, Relational operators
Day 8	Logical operators, Assignment operators

Day 9	Increment and decrement operators Conditional operators, Bitwise operators
Day 10	Special operators, Arithmetic expression,
Day 11	Evaluating expression precedence of arithmetic operators
Day 12	Type conversions in expression Operator precedence and associativity.
Day 13	reading a Character, writing a Character Formatted Input
Day 14	writing a Character Formatted Input, Formatted Output

Module 2: Decision making and branching Loop,Functions,Arrays,CharacterArrays and Strings,User-defined Functions

Working Days	Lesson Plan Description
Day 15	Decision making with IF statement, IF.ELSE statement,
Day 16	Nesting of IF.ELSE statement, ELSE..IF ladder
Day 17	Switch statement, The ? : operator, GOTO statement Introduction
Day 18	The WHILE statement, The DO statement, The FOR statement, Jumps in LOOPS.
Day 19	Arrays,One dimensional Array Declaration, One dimensional array Initialization
Day 20	Two-dimensional array declaration, Two-dimensional array initialization.
Day 21	Declaring and initializing string variables
Day 22	reading strings, writing strings
Day 23	Arithmetic operations on characters, Putting strings together,
Day 24	Comparison on two strings,
Day 25	String handling function.
Day 26	need for user-defined function
Day 27	A multi-function program, Elements of user-defined function, Recursion, Passing arrays to function
Day 28	Definition of functions, return values and types,
Day 29	Function calls, Function declaration, Categories of function, Nesting of function,
Day 30	Passing strings to function, Scope, visibility and lifetime of variables

Module 3: Structures and Union,Pointer

Working Days	Lesson Plan Description
Day 31	defining structure, declaring structure variables,
Day 32	accessing structure members, Structure initialization
Day 33	Copying and comparing structure variables, Operations on individual members
Day 34	Arrays of structures
Day 35	Structure within structure, Structure and function,
Day 36	Union with example
Day 37	Understanding Pointers, accessing address of a variable
Day 38	Declaring pointer variable, Initialization of pointer variable
Day 39	accessing a variable through its pointer
Day 40	Pointer expression, Pointer Increments and scale factor, Pointers and arrays,
Day 41	Pointer and character strings, Array of pointers,
Day 42	Pointers as function arguments, Functions returning pointers,
Day 43	Pointer to function, Pointer and structure

Module 4: File Management in C, The Preprocessor

Working Days	Lesson Plan Description
Day 44	Defining and opening a file Closing a file
Day 45	Input/Output Operations on Files, Error handling during I/O operations
Day 46	Command Line Arguments
Day 47	Macro substitution, File inclusion
Day 48	Compiler Control Directives

TEXTBOOK:

1. Programming in ANSI, E. Balagurusamy (8th edition)

REFERENCE BOOKS:

1. Let us C by Yashwant Kanetkar
2. Programming in ANSI C-by Raw Dawson

QUESTION PAPER PATTERN AND DATES

EXAMINATION	Dates	PART – A	PART – B	PART – C	TOTAL MARKS
Mid Term 1	August 11, 2025 to August 22, 2025	Attempt 5 out of 10 questions; Each question carries 2 marks (2×5)	Attempt 2 out of 4 questions; Each question carries 5 marks (5×2)	Attempt 1 out of 2 questions; Each question carries 10 marks (10×1)	30
Mid Term 2	October 07, 2025 to October 17, 2025	Attempt 5 out of 10 questions; Each question carries 2 marks (2×5)	Attempt 2 out of 4 questions; Each question carries 5 marks (5×2)	Attempt 1 out of 2 questions; Each question carries 10 marks (10×1)	30
End Semester Examination	November 17, 2025 to December 2, 2025	Attempt 10 out of 15 questions; Each question carries 2 marks (2×10)	Attempt 6 out of 9 questions; Each question carries 5 marks (5×6)	Attempt 5 out of 8 questions; Each question carries 10 marks (10×5)	100

Examination Rules & Regulations:

https://iemcollege-my.sharepoint.com/:b:/g/personal/iemcoe_office_iem_edu_in/EXrcoe3d6oxIogHKO074XeUBC9qm3XNaf_qUeSiVTNh5OQ?e=MMQn40



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Management, New Town Campus University of Engineering & Management, Jaipur



Syllabus for BCA Admission Batch 2025

Subject Name: **Digital Electronics**
Subject Code: **BCACC102**

Credit: 4

Lecture Hours: 48

Maximum: 100 marks (Internal: 50 marks; External: 50 marks)

Pre-requisite: Fundamental computer knowledge

Relevant Links:

1. Link for Study Material:

https://iemcollege-my.sharepoint.com/personal/pritha_banerjee_iem_edu_in/Documents/Digital%20Electrical/Digital%20Electronics-Study%20material.pdf?CT=1751014172007&OR=ItemsView

2. Link for NPTEL Course:

https://onlinecourses.nptel.ac.in/noc20_ee32/preview

3. Link for Coursera Course:

[Digital Systems: From Logic Gates to Processors | Coursera](#)

4. Link for LinkedIn Learning Course:

[Electronics Foundations: Fundamentals Online Class | LinkedIn Learning, formerly Lynda.com](#)

COURSE OBJECTIVES:

1. To gain basic knowledge of digital electronics circuits and its levels.
2. To understand and examine the structure of various number system and its conversation
3. To learn about the basic requirements for a design application
4. To enable the students to understand, analyze and design various combinational and sequential circuits
5. To understand the logic functions, circuits, truth table and Boolean algebra expression

COURSE OUTCOMES:

CO1: Convert different type of codes, Boolean algebra and number systems which are used in digital communication and computer systems. **CO2:** Employ the codes and number systems converting circuits and compare different types of logic families which are the basic unit of different types of logic gates and arithmetic circuits in the domain of performance and efficiency.

CO3: Analyze different types of combinational circuits and sequential circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.

CO4: Design different types of with and without memory element digital electronic circuits like Registers and Counters for particular operation.

Module No	Topic	Chapter Name	Sub Topic	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	Introduction	S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, fifth edition.(Chapter 1)	Overview of fundamental concepts	<i>International Academia:</i> Signals and Systems Electrical Engineering and Computer Science MIT OpenCourseWare <i>Industry Mapping: Tinker Cad,</i>	8	1 Design and verify the truth table of DeMorgans Law. 2. Design and verify the truth table of Principal of duality.

	Number System		Number System, Floating Point Representation Of Numbers, Arithmetic Operations, 1'S and 2'S Complements, 9'S Complement, 10'S Complement, Binary Coded Decimal (BCD), Codes	Breadboard, powersupply, IC		
	Boolean Algebra	S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, fifth edition.(Chapter 2)	Introduction, Development Boolean Algebra, Boolean logic operations, Basic Laws of Boolean Algebra, Demorgan's Theorem, Sum of Products and Product of Sums, Karnaugh Map			
	Logic Gates	S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, Fifth edition.(Chapter 3)	Logic Gates, Mixed Logic, Multilevel Gating Networks, Multiple Output Gate Networks	International Academia: Complex Digital Systems Electrical Engineering and Computer Science		1. Design and verify the truth table of basic logic gates (AND,OR, NOT)
	Arithmetic Circuits	S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, fifth edition.(Chapter 5)	Introduction, Procedure for the Design of Combinational Circuits, Half Adder, Full Adder, K Map Simplification, Half Subtractor, Full Subtractor, Parallel Binary Adder,4-bit Parallel Adder/Subtractor, Fast Adder, Serial Adder, 4-bit Serial Adder/Subtractor, BCD Adder	MIT OpenCourseWare IndustryMapping: Tinker Cad, Breadboard, powersupply, IC	14	2. Design and verify the truth table of Universal logic gates (NAND,NOR) 3. Design and verify the truth table of XOR and XNOR gates 4. Design basic logic gates (AND, OR, NOT) using the NAND, NOR gate. 5. Design the circuit diagram and verify the truth table for half adder using XOR and AND gate.

						6. Design the circuit diagram and verify the truth table for full adder. 7. Implement full adder using two half adders 8. Design the circuit diagram and verify the truth table for half subtractor using XOR and AND gate. 9. Design the circuit diagram and verify the truth table for full subtractor.
3	Combinational Circuits	S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, fifth edition.(Chapter 6)	Introduction, Multiplexer (Data Selectors), Applications of Multiplexer, Demultiplexer (Data Distributors), Decoders, Liquid Crystal Display, Encoders, Parity Generators/ Checkers, Parity Generation, Code Converter	<i>International Academia:</i> https://ocw.mit.edu/courses/6-006-introduction-to-algorithms-spring-2020/resources/lecture-6-binary-trees-part-1/ <i>IndustryMapping:</i> Tinker Cad, Breadboard, powersupply, IC	14	1. Design the circuit diagram for 4:1 Multiplexer. 2. Design the circuit diagram for 1:4 Demultiplexer. 3. Design the circuit diagram for Octal to binary encoder. 4. Design the circuit diagram for binary to octal decoder. 5. Design the circuit diagram for SR flip flop.
	Flip Flop	S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, fifth edition. (Chapter 7)	Introduction, Latches, Flip flop, S-R Flip flop, D Flip flop, J-K Flip flop, T Flip flop, Triggering of Flip flop, Master Slave Flip flop, Realization of one Flip-flop to another Flip flop, Application of Flip flop			

4	Counters	S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, fifth edition. (Chapter 8)	Introduction, Asynchronous Counter, Ripple Counter with decoded output, Ripple Counter with modulus, Asynchronous down counter, Up Down Counter, Propagation delay in ripple counter,	<i>International Academia:</i> <u>Microelectronic Devices and Circuits</u> <u>Electrical Engineering and Computer Science</u>	12	
			Synchronous Counter, Synchronous Counter with ripple carry, Synchronous Down Counter, Synchronous Up Down Counter, Asynchronous/Synchronous Counter, Design of Synchronous Counter	<u>MIT OpenCourseWare</u>		
	Registers	S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, fifth edition. (Chapter 9)	Introduction, Shift Register, Universal Shift Register, Shift Register counter, Shift Count	<i>IndustryMapping:</i> <i>Tinker Cad,</i> <i>Breadboard,</i> <i>powersupply, IC</i>		

Module 1: Number Systems, Codes & Boolean Algebra

Working Day	Lesson Plan Description
Day 1	Introduction to Digital Electronics: Applications and System Overview
Day 2	Number Systems: Binary, Octal, Decimal, Hexadecimal
Day 3	Binary Arithmetic: Addition, Subtraction, Multiplication, Division

Module 2: Logic Gates & Arithmetic Circuits

Day 4	1's and 2's Complement, 9's and 10's Complements
Day 5	Floating Point Representation and BCD
Day 6	Binary Coded Decimal (BCD) Codes, Gray Code, Excess-3 Code
Day 7	Boolean Algebra: Laws and Properties
Day 8	DeMorgan's Theorem, Duality Principle
Day 9	Canonical Forms: SOP and POS
Day 10	Karnaugh Map (K-map): 2- and 3-variable simplification with truth tables

Working Day	Lesson Plan Description
Day 11	Basic Logic Gates: AND, OR, NOT (Symbol, Truth Table, Realization)
Day 12	Universal Gates: NAND and NOR — Realizing other gates
Day 13	XOR and XNOR: Logic Symbol, Truth Table, Properties
Day 14	Mixed Logic and Multi-Level Gating Networks
Day 15	Half Adder: Logic Expression, Circuit and Truth Table
Day 16	Full Adder: Logic Expression, Circuit and Truth Table
Day 17	Full Adder using Two Half Adders
Day 18	Half Subtractor and Full Subtractor (Design and Verification)
Day 19	Parallel Adder/Subtractor, 4-bit Binary Adder
Day 20	Serial Adder/Subtractor, Fast Adder Design

Module 3: Combinational Circuits

Working Day	Lesson Plan Description
Day 21	Introduction to Combinational Circuits

Day 22	Multiplexer (MUX): 4:1 Design and Application
Day 23	Demultiplexer (DEMUX): 1:4 Design and Application
Day 24	Encoder: Octal to Binary
Day 25	Decoder: Binary to Octal
Day 26	Applications of Encoder and Decoder
Day 27	BCD to Seven Segment Decoder
Day 28	Parity Generator and Parity Checker
Day 29	Code Converter Design
Day 30	Real-Life Applications of Combinational Circuits (e.g., LCD control, ALU units)
Day 31	Review + Design Challenges Based on Combinational Circuits
Day 32	Hands-on Lab/Software Simulation Session (TinkerCAD/Logisim)

Module 4: Flip-Flops & Sequential Circuits

Working Day	Lesson Plan Description
Day 33	Introduction to Sequential Circuits
Day 34	Latches and SR Flip-Flop (SR FF): Construction and Truth Table
Day 35	D Flip-Flop and JK Flip-Flop
Day 36	T Flip-Flop and Master-Slave Flip-Flops
Day 37	Flip-Flop Conversion: SR to JK, JK to D, etc.
Day 38	Triggering Mechanism: Level vs Edge Triggered
Day 39	Application of Flip-Flops (Memory, Control Systems)
Day 40	Realization and Practical Implementation

Day 41	Lab: Flip-Flop-based circuit simulation (e.g., SR latch using NAND)
Day 42	Assessment/Problem Solving on Flip-Flops and Sequential Circuits

Module 5: Counters and Registers

Working Day	Lesson Plan Description
Day 43	Introduction to Counters: Asynchronous (Ripple) Counters
Day 44	Synchronous Counters and Design of Mod-n Counters
Day 45	Up-Down Counters, Applications in Clocks and Digital Instruments
Day 46	Introduction to Registers: Serial In/Out, Parallel In/Out
Day 47	Universal Shift Registers and Shift Register Counters
Day 48	Final Review and Case-based Applications: Pattern Detector, Sequence Generator

Learning Resources:

Text Books:				
Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher	
S. Salivahanan and S. Arivazhagan	Digital Circuits and Design	5 th Edition	Oxford University Press	
M. Morris Mano	Digital Design	9 th Edition	Pearson	Download eBook
Reference Books:				
Anand Kumar	Fundamentals of Digital Circuits	–	PHI	
R.P. Jain	Modern Digital Electronics	4th Edition, 2009	Tata McGraw Hill	
W.H. Gothmann	Digital Electronics – An Introduction to Theory and Practice	2nd Edition, 2006	PHI	

D.V. Hall	Digital Circuits and Systems	1989	Tata McGraw Hill	
Charles H. Roth and Lizy Kurian John	Digital System Design using VHDL	2nd Edition	Cengage Learning	

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Syllabus and Lesson Plan for BCA Admission Batch 2025

Subject Name: **Discrete Structure**

Credit: 4

Lecture Hours: 40

Subject Code: **BCACC103**

Maximum: 100 marks (Internal: 50 marks; External: 50 marks)

Pre-requisite: Number System, Basic Geometry and Trigonometry

Relevant Links:

1. Link for Study Material:

https://drive.google.com/file/d/1xJVt-c5MuWxv8cuhmLtH_WpdA2uX9fjp/view?usp=sharing

2. Link for LinkedIn Learning Course:

[Programming Foundations: Discrete Mathematics Online Class | LinkedIn Learning, formerly Lynda.com](#)

3. Link for Infosys Springboard Course:

[TOC - Introduction to Graph Theory | Infosys Springboard](#)

COURSE OBJECTIVES:

1. Use mathematically correct terminology and notation.
2. Construct correct direct and indirect proofs.
3. Use counter examples.
4. Apply logical reasoning to solve a variety of problems.

COURSE OUTCOMES:

CO1: Understand the notion of mathematical thinking, mathematical proofs and algorithmic thinking, and be able to apply them in problem solving.

CO2: Understand the basics of discrete mathematics and number theory, and be able to apply the methods from these subjects in problem solving.

CO3: Be able to use effectively algebraic techniques to analyse basic discrete structures and algorithms.

CO4: Understand some basic properties of graphs and related discrete structures, and be able to relate these to practical examples.

Module number	Topic	Chapter Name	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	Set Theory	BCA Mathematics, Volume-I, B.K.Pal, K.Das, 3 rd Edition Chapter- 1	Set Theory : Basic concepts of sets, terminology, and notation, subset, power set, operation of sets (union, intersection, symmetric difference of two sets) algebra of sets (idempotent law, associative law, commutative law, distributive law, identity law, involution law, complement law, De Morgan's law) universal Set, Venn-Euler diagram, principle of inclusion-exclusion. Functions : Definition, domain, co-domain and range, types of functions (one-one, onto, into, many-one etc.), inverse of function, composition of functions.	International Standards: https://ocw.mit.edu/courses/hst-951j-medical-decision-support-fall-2005/resources/proplogic_sets/ Industry Mapping: Neo4j, Tableau, Gephi, Microsoft Power BI, R and Python(with Pandas and NumPy)	10

2	Graph & it's fundamentals	BCA Mathematics, Volume-III, B.K.Pal, K.Das 4 th Edition Chapter- 2.1	Concept of Graph, Graph and Related Terms, Simple Graph, Regular Graph, Complete Graph, Spanning Sub-graph, Di- Graph (Directed Graph), Walk, Path, Circuit, Connected Graph, Disconnected Graph, Theorems of Graph, Euler Graph, Hamiltonian Graph	International Standards: https://ocw.mit.edu/course/s/18-217-graph-theory-and-additive-combinatorics-fall-2019/resources/lecture-2-forbidding-a-subgraph-i-mantel2019s-theorem-and-turan2019s-theorem/ Industry Mapping: NetworkX graph in Python Programming, Amazon Neptune	12
3	Trees and Fundamental Circuit	BCA Mathematics, Volume-III,, B.K.Pal,K.Das 4 th Edition Chapter-2.2	Trees and related Terms ,Binary Trees ,Theorems on Trees ,Theorems on Binary Trees ,Spanning Tree and Co-Tree ,Finding a Spanning Tree of a Connected Graph, Weight of an edge and Weighted Graph ,Minimal Spanning Tree , Kruskal's Algorithm of finding Minimal Spanning Tree ,Prim's Algorithm of finding Minimal Spanning Tree	International Standards: https://ocw.mit.edu/course/s/18-217-graph-theory-and-additive-combinatorics-fall-2019/resources/lecture-2-forbidding-a-subgraph-i-mantel2019s-theorem-and-turan2019s-theorem/ Industry Mapping: NetworkX graph in Python Programming, Amazon Neptune	10

4	Matrix Representation of a Graph	BCA Mathematics, Volume-III, B.K.Pal, K.Das 4 th Edition Chapter- 2.3	Incidence matrix of a connected graph, Incidence matrix of a connected Di-Graph, Adjacency Matrix of a connected graph, Adjacency Matrix of a Di-Graph.	International Standards: https://ocw.mit.edu/course/s/18-217-graph-theory-and-additive-combinatorics-fall-2019/resources/lecture-2-forbidding-a-subgraph-i-mantel2019s-theorem-and-turan2019s-theorem/ Industry Mapping: NetworkX graph in Python Programming, Amazon Neptune	8
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Module 1: Set Theory

Working Days	Lesson Plan Description
Day 1	Basic concepts of sets, terminology and notation
Day 2	Subset, power set
Day 3	Operation of sets (union, intersection, symmetric difference of two sets)
Day 4	Algebra of sets (idempotent law, associative law, commutative law, distributive law, identity law, involution law, complement law, De Morgan's law)
Day 5	Algebra of sets (idempotent law, associative law, commutative law, distributive law, identity law, involution law, complement law, De

	Morgan's law)
Day 6	Universal Set, Venn-Euler diagram, principle of inclusion-exclusion.
Day 7	Functions : Definition, domain, co-domain and range
Day 8	Types of functions (one-one, onto, into, many-one etc.)
Day 9	Inverse of function
Day 10	Composition of functions.

Module 2: Graph & it's fundamentals

Working Days	Lesson Plan Description
Day 11	Concept of Graph, Graph and Related Terms
Day 12	Simple Graph, Regular Graph
Day 13	Complete Graph
Day 14	Spanning Sub-graph, Di- Graph (Directed Graph)
Day 15	Walk, Path, Circuit
Day 16	Connected Graph, Disconnected Graph
Day 17	Theorems of Graph
Day 18	Theorems of Graph
Day 19	Theorems of Graph
Day 20	Euler Graph
Day 21	Hamiltonian Graph
Day 22	Hamiltonian Graph

Module 3: Trees and Fundamental Circuit

Working Days	Lesson Plan Description
Day 23	Trees and related Terms
Day 24	Binary Trees ,Theorems on Trees
Day 25	Theorems on Binary Trees
Day 36	Spanning Tree and Co-Tree
Day 27	Finding a Spanning Tree of a Connected Graph
Day 28	Weight of an edge and Weighted Graph
Day 29	Minimal Spanning Tree , Kruskal's Algorithm of finding Minimal Spanning Tree
Day 30	Kruskal's Algorithm of finding Minimal Spanning Tree
Day 31	Prim's Algorithm of finding Minimal Spanning Tree
Day 32	Prim's Algorithm of finding Minimal Spanning Tree

Module 4: Matrix Representation of a Graph

Working Days	Lesson Plan Description
Day 33	Incidence matrix of a connected graph
Day 34	Incidence matrix of a connected Di-Graph
Day 35	Incidence matrix of a connected Di-Graph
Day 36	Incidence matrix of a connected Di-Graph
Day 37	Adjacency Matrix of a connected graph
Day 38	Adjacency Matrix of a connected graph
Day 39	Adjacency Matrix of a Di-Graph.

Day 40	Adjacency Matrix of a Di-Graph.
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TEXTBOOK:

1. BCA Mathematics, Volume-I, B.K.Pal, K.Das (chapter-1)
2. BCA Mathematics, Volume-III, B.K.Pal, K.Das (chapter-2.1, 2.2, 2.3)

REFERENCEBOOKS:

1. Graph Theory, Narsingh Deo
2. Higher Algebra, S.K.Mapa

QUESTION PAPER PATTERN AND DATES

EXAMINATION	Dates	PART – A	PART – B	PART – C	TOTAL MARKS
Mid Term 1	August 11, 2025 to August 22, 2025	Attempt 5 out of 10 questions; Each question carries 2 marks (2×5)	Attempt 2 out of 4 questions; Each question carries 5 marks (5×2)	Attempt 1 out of 2 questions; Each question carries 10 marks (10×1)	30
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University of Engineering and Management
Institute of Engineering & Management, Salt Lake Campus
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur



Syllabus and Lesson Plan for BCA Admission Batch 2025

Subject Name: **Soft Skills**
Subject Code: **BCAAE181**

Credit: 2

Lecture Hours: 34

Maximum: 100 marks (Internal: 50 marks; External: 50 marks)

Pre-requisite: Spoken English, Written English

Relevant Links:

1. Link for Study Material:

<https://drive.google.com/file/d/1Zk9vSU1qAb51YxqAUgy3uX1-OBtDRXKu/view?usp=sharing>

2. Link for MIT Open Courseware:

<https://ocw.mit.edu/courses/15-289-communication-skills-for-academics-spring-2002/> , <https://ocw.mit.edu/courses/24-900-introduction-to-linguistics-spring-2022/>

3. Link for LinkedIn Learning Course:

AIM:

- Ability to read English with understanding and decipher paragraph patterns, writing techniques and conclusions.
- Skill to develop the ability to write English correctly and master the mechanics of writing the use of correct punctuation marks and capital letters.
- Ability to understand English when spoken in various contexts.

COURSE OBJECTIVES:

- To enable the learner to communicate effectively and appropriately in every situation.
- To use English effectively for study purpose across curriculum.

- To use R, W, L, S and integrate the use of four language skills, reading, writing, listening & speaking.
- To revive and reinforce structures already learnt.

COURSE OUTCOMES:

- Students will learn to handle emotions including tolerance and behavioral responses, building positive friendships and bonding with peers and classmates.
- Students will learn basics of effective communication in the professional world.
- Students will develop and maintain constructive working relationships and communicate effectively both written & spoken.
- Students will learn time and resource management, conflict resolution, teaching and mentoring others.

Module number	Topic	Sub-topics	Chapter Name and Book	Mapping with Industry and International Academia	Lecture Hours
1	Soft Skills	1.1What is soft skills & its importance 1.2 Hard Skills vs Soft Skills 1.3 Forms of Soft Skills	Chaturvedi & Chaturvedi Cengage publication	Mapping: https://ocw.mit.edu/courses/15-289-communication-skills-for-academics-spring-2002/ Industry Mapping: Situational Analysis and Role Play	5
2	Paralanguage	Paralanguage: 2.1Means of communication 2.2Same words convey different meaning 2.3Roles of paralanguage 2.4Categories of paralanguage 2.5Elements of paralanguage 2.6Voice Modulation 2.7Pauses	Study Material	International Academia Mapping: https://ocw.mit.edu/courses/24-900-introduction-to-linguistics-spring-2022/ Industry Mapping: Industry Role Play	5
3	Techniques of self-improvement	3 Self Improvement 3.1 Techniques of Self Improvement 3.2 Smart Goal Setting 3.3Teamwork 3.4 Swot Analysis	Study material	International Academia Mapping: Managerial Psychology Sloan School of Management MIT OpenCourseWare https://ocw.mit.edu/courses/15-301-	5

				managerial-psychology-fall-2006/?utm_source=chatgpt.com Industry Mapping: Role Play	
4	Self-motivation techniques	4. Self-motivation 4.1 Importance of Self-Motivation 4.2 JOHARI WINDOW MODEL 4.3 Importance of self awareness 4.4 4 Quadrants of the Johari Window	Chaturvedi & Chaturvedi Cengage publication	International Academia Mapping: Emotion & Motivation Introduction to Psychology Brain and Cognitive Sciences MIT OpenCourseWare Industry Mapping: Case study related to actual industry scenario	5
5	Time Management	5.1Time Management 5.2Benefits of time management 5.3Steps for better time management 5.4Time management matrix 5.5Case Study	Chaturvedi & Chaturvedi Cengage publication	International Academia Mapping: Communication Skills for Academics Sloan School of Management MIT OpenCourseWare Industry Mapping: Case study related to actual industry scenario	5
6	Emotional Intelligence & Empathy	6.1Emotional Intelligence and sympathy 6.2Emotional Quotient (EQ) 6.3Traits,Keyskills	Study material	International Academia Mapping: Increasing Your Physical Intelligence, Enhancing Your Social Smarts Experimental Study Group MIT OpenCourseWare Industry Mapping: Case study related to actual industry scenario	4
7	Negotiation & Conflict Resolution	7.1Negotiation and Conflict Resolution 7.2 Common causes of conflict 7.3Skills required for conflict resolution	Study material	International Academia Mapping: Negotiation and Conflict Management Sloan School of Management MIT OpenCourseWare	4

				Industry Mapping: Case study related to actual industry scenario	
8	Presentation Skills	PowerPoint Presentation	Study material	International Academia Mapping: Advanced Speaking and Critical Listening Skills (ELS) Global Studies and Languages MIT OpenCourseWare Industry Mapping: Individual Presentation	4

Module 1: Soft Skills

Working Days	Lesson Plan Description
Day 1	What is soft skills & its importance
Day 2	Verbal & Non-Verbal Communication
Day 3	Forms of Soft Skills

Module 2:

Working Days	Lesson Plan Description
Day 4	Paralanguage
Day 5	Means of communication
Day 6	Same words convey different meaning
Day 7	Roles of paralanguage
Day 8	Categories of paralanguage
Day 9	Elements of paralanguage
Day 10	Voice Modulation
Day 11	Pauses

Module 3:

Working Days	Lesson Plan Description
Day 12	Self Improvement
Day 13	Techniques of Self Improvement
Day 14	Smart Goal Setting
Day 15	Teamwork
Day 16	Swot Analysis

Module 4:

Working Days	Lesson Plan Description
Day 17	Self-motivation
Day 18	Importance of Self-Motivation
Day 19	JOHARI WINDOW MODEL
Day 20	Importance of self awareness
Day 21	Quadrants of the Johari Window

Module 5:

Working Days	Lesson Plan Description
Day 22	Time Management
Day 23	Benefits of time management
Day 24	Steps for better time management
Day 25	Time management matrix
Day 26	Case Study

Module 6:

Working Days	Lesson Plan Description
Day 27	Emotional Intelligence and sympathy
Day 28	Emotional Quotient (EQ)
Day 29	Traits, Key skills

Module 7:

Working Days	Lesson Plan Description
Day 30	Negotiation and Conflict Resolution
Day 31	Common causes of conflict
Day 32	Skills required for conflict resolution

Module 8:

Working Days	Lesson Plan Description
Day 33	Presentation
Day 34	Key requirements
Day 35	Planning Presentation
Day 36	Audience Engagement Tips
Day 37	Demonstration

TEXTBOOK:

Soft Skills for everyone, Cengage Publication

REFERENCEBOOKS:

The Art of Business Communication, Chaturvedi & Chaturvedi

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