



**3(e)Course / Teaching Plan with detail of
number of lectures on each unit of
curriculum for the AS 2025-26**

Annexure IV-H



Lecture Plan

Program : Bachelor of Computer Applications (BCA)
Subject Name : Data Structures & Algorithms using C

Paper Code : BCA 106
Semester : 2nd
Academic Session : 2025-26

Unit	Lecture No	Topic to be discussed	BTL
1	1	Introduction to Data Structures, Importance of DSA	2
1	2	Data Structures, Classification and Operations of Data Structures.	1
1	3	Introduction to Algorithms- Attributes, Design Techniques, Time Space Trade Off	2
	4	Growth of functions, Masters Theorem	2
1	5	Arrays: Single Dimension, declaration and basic operations	2
1	6	Two-Dimension Array	2
	7	Introduction to Multi Dimensions	2
1	8	Memory Representation, Address Calculation	2
1	9	Sparse Matrices- Types, Representation.	2
1	10	Dynamic memory allocation, Dynamic Memory versus Static Memory Allocation.	3
1	11	Linked List: Concept and importance	1
1	12	Singly Linked List, Operations: Creation, Insertion	3
1	13	Singly Linked List, Operations: Creation, Insertion	3
1	14	Singly Linked List, Operations: Deletion, Modification	3
1	15	Singly Linked List, Operations: Searching, Sorting, Reversing, and Merging	3
1	16	Doubly Linked List	2
1	17	Header Linked List, Circular Linked List	2
2	18	Searching: Linear and Binary Search	3
2	19	Sorting: Selection Sort, Bubble Sort	3
2	20	Insertion Sort, Merge Sort,	3
2	21	Quick Sort, Elementary Comparison of Searching and Sorting Algorithms.	3
2	22	Elementary Comparison of Searching and Sorting Algorithms	4
2	23	Stacks: Introduction and practical applications	2
2	24	Static Implementation, Basic Operations	3
2	25	Dynamic Implementation, Basic Operations	3



2	26	Applications- Evaluation and Conversion between Polish and Reverse Polish Notations	3
2	27	Queues: Introduction and practical applications	3
2	28	Static Implementation, Operations on linear Queue	3
2	29	Dynamic Implementation, Operations on linear Queue	3
2	30	Circular Queue with basic operations	3
2	31	Doubly Ended Queue, Priority Queue.	3
2	32	Hashing: Hash Table, Hash Functions	2
2	33	Collision Resolution using chaining and double hashing	2
3	34	Trees: Concept, Notations & Terminologies, application areas	2
3	35	Memory Representation, Binary Trees Concept	3
3	36	Binary Tree Types- Complete, Full, Strict, Expression Binary Tree, Evaluation of arithmetic expressions using expression binary trees.	3
3	37	Tree Traversals (Recursive and non-recursive)	3
3	38	Binary Search Tree, Creation, traversal	3
3	39	AVL Tree, creation, rotations	2
3	40	M-Way trees	2
3	41	B-Trees.	2
4	42	Graph Concept, terminology, application areas	2
4	43	Graph representation- Adjacency Matrix, Incidence Matrix and Linked Representation	3
4	44	Graph representation using linked list	3
4	45	Graph Traversal (Breadth First and Depth First)	2
4	46	Spanning Tree- Prim's Algorithm	2
	47	Kruskal's algorithm	2
4	48	Shortest Path- Dijkstra's Algorithm	2
4	49	Bellman-Ford algorithm	2
4	50	Warshall's Algorithm	2



Lesson Plan

Program : Bachelor of Computer Applications (BCA)
 Subject Name : Data Structures & Algorithms using C
 Paper Code : BCA 106
 Semester : 2nd
 Academic Session : 2025-26

Teaching Pedagogy and Delivery Mechanism:

An approach of classes room lectures, writing algorithms for appropriate data structures and practical implementation using C programming language.

COURSE OUTCOMES (COs):

After completion of this course, the learners will be able to:

CO #	Detailed Statement of the CO	Mapping to PO #
CO1	Familiarize the basics of data structures and algorithms	PO1, PO3, PO11, PO12
CO2	Understand and apply linear and nonlinear data structures and their operations	PO1, PO3, PO4, PO12
CO3	Compare and implement searching, sorting and hashing techniques	PO1, PO3, PO4, PO12
CO4	Appraise and determine the correct data structure for any given real world problem.	PO1, PO3, PO4, PO8, PO11, PO12

Unit	CO Covered	BTL Level(s)
Unit 1	CO 1, 2	BTL 1,2,3
Unit 2	CO 1,2,3	BTL 1,2,3,4
Unit 3	CO 1,2,4	BTL 1,2,3,4
Unit 4	CO 1,2,4	BTL 1,2,3,4

Lesson Plan

<u>Unit</u>	<u>Topics</u>	<u>Text / Ref Book</u>	<u>Objective</u>	<u>Target CO</u>	<u>Outcome</u>
1	Linear Data Structures- Static: Introduction to Algorithms- Attributes, Design Techniques, Time Space Trade Off, Data Structures, Classification and Operations of Data Structures. Growth of functions, Masters Theorem Arrays: Single Dimension, Two-Dimension and Introduction to Multi Dimensions, Memory Representation, Address Calculation, Sparse Matrices- Types, Representation. Introduction: Dynamic Memory Allocation, Dynamic Memory versus Static Memory Allocation. Linked List Types: Singly Linked List, Doubly Linked List, Header Linked List, Circular Linked List. Operations: Creation, Insertion, Deletion, Modification, Searching, Sorting, Reversing, and Merging.	TB1 [Chapters 1,4], RB1 [Chapters 1,2,4,5]	To introduce the concept of data structures. To revise static memory allocation using an array and its operations. To introduce dynamic memory allocation, concept of linked list and its types with operations.	CO 1, CO 2	Students are well aware of data structures and algorithms and their importance in real life. Students Develop an understanding of linear data structures implemented with static and dynamic memory.
2	Searching and Sorting: Linear and Binary Search, Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, quicksort, Elementary Comparison of Searching and Sorting Algorithms. Stacks: Introduction, Static and Dynamic Implementation, Operations, Applications- Evaluation and Conversion between Polish and Reverse Polish Notations. Queues: Introduction, Static and Dynamic Implementation,	TB1 [Chapter 2,3,4,6,7], RB1 [Chapter 6,9]	To understand various searching and sorting procedures. To introduce linear data structures like stacks and queues and their basic operations and applications.	CO 1, CO2, CO3	Students are aware of importance of sorting data and various techniques used in sorting and searching. Students will understand the importance of organising

	Operations, Types- Linear Queue, Circular Queue, Doubly Ended Queue, Priority Queue. Hashing: Hash Table, Hash Functions, and Collision Resolution by chaining and double hashing.				data in Stacks and Queues and their practical applications.
3	Trees: Notations & Terminologies, Memory Representation, Binary Trees Types- Complete, Full, Strict, Expression Binary Tree, Evaluation of arithmetic expressions using expression binary trees. Tree Traversals (Recursive and non-recursive), Binary Search Tree, AVL Tree. M-Way trees, B-Trees.	TB1 [Chapter 5], RB1 [Chapters 7]	To introduce non- linear data structures. To introduce different trees along with their real life usage and basic operations.	CO 1, CO2, CO4	Students will be aware of non-linear data structures like trees and graphs and their practical application areas.
4	Introduction to Graphs: Notations & Terminologies, Representation of Graphs- Adjacency Matrix, Incidence Matrix and Linked Representation. Graph Traversal (Breadth First and Depth First), Prim's Algorithm, Kruskal's algorithm, Dijkstra's Algorithm, Bellman-Ford algorithm, Warshall's Algorithm.	TB1 [Chapters 8], RB1 [Chapters 8]	To introduce graph theory to students and its representations. To introduce various algorithms for graph traversal and spanning trees.	CO1, CO2, CO4	Students will be familiar with various algorithms for Graph traversal, path matrix and spanning trees.

Recommended Readings:

TEXT BOOKS:

TB1. Y. Langsam, M. J. Augenstein and A.M. Tanenebaum, "Data Structures using C and C++", Pearson Education India, Second Edition, 2015.

TB2. E. Horowitz and S. Sahni, "Fundamentals of Data Structures in C". Universities Press, Second edition, 2008.

REFERENCE BOOKS:

RB1. Schaum's Outline Series, "Data Structures", TMH, Special Indian Ed., Seventeenth Reprint, 2014.

RB2. Ashok N kamthane "Introduction to Data Structures in C", Pearson, Third Edition, 2009.

RB3. D. Samanta, "Classic Data Structures", PHI, Second Edition, 2009.

RB4. D. Malhotra and N. Malhotra, "Data Structures and Program Design using C", Laxmi Publications,



Indian adapted edition from Mercury Learning and Information-USA, First edition, 2018.

RB5. Y. Kanetkar “ Data Structures through C”, BPB Publication, Third Edition, 2019.

RB6. R.F Gilberg, and B A Frouzan- “Data Structures: A Pseudocode Approach with C”, Thomson Learning, Second Edition, 2004.

RB7. A. K. Rath, and A.K. Jagadev, “Data Structures and Program Design Using C”, Scitech Publications, Second Edition, 2011.

RB8. Reema Thareja, “ Data Structures using C”, Third Edition, Oxford press



Lecture Plan

Program : BA(Economics)(Hons.)
Subject Name : Business Economics
Paper Code : 107
Semester : 1st
Academic Session : 2025-26

UNIT I: Introduction to Business Economics and Fundamental concepts, Consumer Behavior		CO	Learning Outcome	BTL
1	Nature, Scope, Definitions of Business Economics	1	Understand the scope and relevance of Business Economics, explain fundamental economic concepts, and evaluate consumer decision-making theories	BTL 1-4
2	Difference between Business Economics and Economics	1		
3	Contribution and Application of Business Economics to Business	1		
4	Micro vs. Macro Economics	1		
5	Opportunity Costs, Marginalism, Incrementalism	1		
6	Market Forces and Equilibrium	1		
7	Concept of Behavioural Economics	1		
8	Cardinal Utility Approach: Diminishing Marginal Utility	1		
9	Law of Equi-Marginal Utility	1		
10	Ordinal Utility Approach: Indifference Curves	1		
11	Marginal Rate of Substitution, Budget Line	1		
12	Consumer Equilibrium	1		
UNIT II: Demand Analysis, Theory of Production, Cost Analysis				
13	Theory of Demand, Law of Demand	2	Analyze demand and production theories, interpret cost structures, and apply forecasting techniques in business decisions	BTL 2-5
14	Movement along vs. Shift in Demand Curve	2		
15	Concept of Measurement of Elasticity of Demand	2		
16	Factors Affecting Elasticity of Demand, Income Elasticity of Demand	2		
17	Cross Elasticity of Demand, Advertising Elasticity of Demand	2		
18	Demand Forecasting: Need, Objectives	2		
19	Demand Forecasting: Methods	2		
20	Theory of Production: Meaning and Concept of Production	2		
21	Factors of Production and Production function. Fixed and Variable Factors	2		



22	Law of Variable Proportion (Short Run Production Analysis)	2		
23	Law of Returns to a Scale (Long Run Production Analysis)	2		
24	ISO QUANTS	2		
25	Concept of Cost, Cost Function	2		
26	Short Run Cost, Long Run Cost, Economies and Diseconomies of Scale	2		
UNIT -III: Price Output Decisions under various market conditions				
27	Pricing under Perfect Competition (features, short run, long run equilibrium of firm/industry)	3	Compare pricing strategies across market structures and evaluate strategic outcomes under various competitive conditions	BTL 2-5
28	Pricing under Perfect Competition (features, short run, long run equilibrium of firm/industry)	3		
29	Pricing Under Monopoly (features, short run and long run equilibrium)	3		
30	Pricing Under Monopoly (features, short run and long run equilibrium)	3		
31	Control of Monopoly	3		
32	Price Discrimination	3		
33	Price Discrimination	3		
34	Pricing Under Monopolistic Competition (features, short run and long run equilibrium, demand and cost, excess capacity)	3		
35	Pricing Under Monopolistic Competition (features, short run and long run equilibrium, demand and cost, excess capacity)	3		
36	Pricing Under Monopolistic Competition (features, short run and long run equilibrium, demand and cost, excess capacity)	3		
37	Pricing Under Oligopoly (Cournot Model, kinked demand curve model)	3		
38	Pricing Under Oligopoly (Cournot Model, kinked demand curve model)	3		
39	Pricing Under Oligopoly (Cournot Model, kinked demand curve model)	3		
40	Pricing Under Oligopoly (Cournot Model, kinked demand curve model)	3		
UNIT IV: Concepts of Macro Economics				
41	Definitions, Importance, Macro-economic variables	4	Examine macroeconomic indicators, analyze national	BTL 2-4
42	Circular flow model	4		
43	Indian Foreign Policy	4		
44	Inflation, Unemployment, GDP	4		



45	National Income: Concepts, Definition,	4	income	
46	Methods of Measurement	4	concepts and	
47	National Income in India, Problems in Measurement of National Income	4	measurement methods, and	
48	Precautions in Estimation of National Income	4	evaluate macro policy implications	

Suggested Readings: (All latest editions)

1. Samuelson, P & Nordhaus, W., Economics, McGraw Hill Education
2. Dwivedi, D.N., Managerial Economics, Vikas Publishing House.
3. Thomas C.R. Managerial Economics, McGraw Hill Education.
4. Mankiw, NG, Principles of Economics, Cengage Learning.
5. Peterson, L. and Jain. Managerial Economics, Pearson Education.
6. Kreps, D., Microeconomics for Managers, Viva Books Pvt. Ltd



LECTURE PLAN

Program : Bachelor of Business Administration (BBA)
Subject Name : Business Communication
Paper Code : BBA 110
Semester : 2nd
Academic Session : 2025-26

Lecture Number	Unit	Topic	Session Outcome	Pedagogy	ICT Tools	Mapping with CO
1	Unit I	Introduction to Communication	Understand the meaning, significance, and types of communication.	Lecture, discussion	PPT slides	CO1
2	Unit I	Process of Communication	Explain the communication process and its elements.	Lecture	Videos, animations	CO1
3-4	Unit I	Principles of Effective Communication	Learn the 7Cs of communication and their applications.	Interactive session	PPT slides	CO1
5	Unit I	Spoken and Written English	Improve skills in spoken and written communication.	Group activity, practice	Vocabulary Practice	CO3
6	Unit I	Effective Listening	Develop active listening skills for better communication.	Listening exercises	Audio clips	CO1, CO3
7	Unit II	Globalization and Communication	Understand the impact of globalization on business communication.	Lecture, discussion	Presentation	CO2, CO4
8-9	Unit II	Cultural Dimensions in Communication	Explore Etic and Emic approaches to culture; address cross-cultural communication barriers.	Lecture, discussion	Cultural videos	CO2, CO4
10	Unit II	Technology in Communication	Learn the role of technology in	Lecture, discussion	Videos	CO2, CO3



			global communication.			
11	Unit II	Ethical & Legal Issues	Analyse ethical and legal issues in business communication.	Real time Examples	Articles	CO4
12-13	Unit III	Business Letters Basics	Understand the need, functions, and layout of business letters.	Practice session	Templates	CO3
14-15	Unit III	Writing Persuasive & Sales Letters	Draft effective persuasive and sales letters.	Writing Practice	Word processors	CO3
16	Unit III	Employment Letters	Write interview, promotion, and resignation letters.	Practice exercises	Online samples	CO3
17-18	Unit IV	Departmental Communication Basics	Recognize barriers and types of departmental communication.	Role-play, group discussion	Ppt.	CO1, CO4
19-20	Unit IV	Report Writing and Presentation Tools	Develop skills for report writing and creating presentations.	Workshop, demonstration	Presentation tools	CO3, CO4
21	Unit IV	Guidelines for Effective Presentation	Learn and apply strategies for impactful presentations.	Practice session	Videos, feedback tools	CO3
22	Unit IV	Review and Assessment	Summarize learning and evaluate student understanding.	Quiz, discussion	Interactive quizzes	CO1, CO2, CO3, CO4



Lecture Plan

Program : Master of Computer Applications
Subject Name : Operating System with Linux
Paper Code : MCA 105
Semester : 1st semester
Academic Session : 2025-26

S.No	Topics	No. of Sessions (1hr)	CO Mapping	Objective / Outcome	Learning Aids / Tools	BTL
1	Operating System: Concept, Components of Operating System, Operating System Operations	1	CO1	Understand OS basics, components and operations	PPT Slides, Whiteboard, Real-world Examples	BTL2
2	Protection and Security. Computing Environment	1	CO1	Learn OS protection/security and computing environments	PPT Slides, Security Scenario Videos	BTL2
3	Abstract View of OS: User view, System View, Operating System Services	1	CO1	Differentiate user and system views of OS	PPT Slides, Diagrams	BTL2
4	System Calls: Concept, types of System Calls. Computer System Architecture	1	CO1	Understand system calls and architecture basics	PPT, Terminal Demo, Code Snippets	BTL2
5	Types of Operating systems: Batch Operating System, Multi-Programmed Operating System	1	CO1	Identify and compare types of OS	Charts, PPT Slides	BTL2
6	Time-Shared Operating System, Real Time Operating System	1	CO1	Understand time-shared and real-time OS features	PPT, Case Studies	BTL2
7	Distributed Operating Systems, Desktop systems	1	CO1	Learn about distributed and desktop OS	PPT, Video Demonstrations	BTL2
8	Process Management:	1	CO4	Explain processes and	Diagrams,	BTL3



S.No	Topics	No. of Sessions (1hr)	CO Mapping	Objective / Outcome	Learning Aids / Tools	BTL
	Process Concept, Operation on Processes			their operations	Whiteboard	
9	Cooperating Processes, Inter-Process Communication	1	CO4	Understand cooperating processes and IPC mechanisms	PPT, Code Snippets, IPC Demo	BTL3
10	Threads	1	CO4	Understand threading concepts and usage	PPT, Terminal, Code Examples	BTL3
11	Process Synchronization: Introduction, The Critical-Section Problem with solution	1	CO3	Learn synchronization challenges and solutions	PPT, Flowcharts, Example Algorithms	BTL3
12	Bakery Algorithm	1	CO3	Understand Bakery algorithm for synchronization	PPT, Whiteboard, Pseudocode	BTL2
13	Synchronization hardware, Semaphores	1	CO3	Learn hardware synchronization and semaphore usage	Hardware Diagrams, Code Snippets	BTL3
14	Semaphores Implementation	1	CO3	Implement semaphore mechanisms	PPT, Code Examples	BTL3
15	Classical Problems of Synchronization with algorithms	1	CO3	Analyze classical synchronization problems	PPT, Problem Statements	BTL3
16	Critical Regions, Monitors	1	CO3	Understand critical regions and monitor constructs	PPT, Diagrams	BTL2
17	CPU Scheduling: Basic Concepts, Scheduling Criteria	1	CO3	Understand CPU scheduling basics and criteria	PPT, Charts	BTL2
18	Scheduling algorithms	1	CO3	Learn different scheduling algorithms	PPT, Gantt Charts, Simulation Tools	BTL2
19	Multilevel Queue	1	CO3	Understand advanced	PPT, Visual	BTL3



S.No	Topics	No. of Sessions (1hr)	CO Mapping	Objective / Outcome	Learning Aids / Tools	BTL
	Scheduling, Multilevel Feedback Queue Scheduling			scheduling techniques	Diagrams	
20	Deadlock: System Models, Deadlock Characterization	1	CO3	Explain deadlock models and characteristics	PPT, Resource Allocation Graphs	BTL3
21	Resource Allocation Graph, Deadlock Prevention	1	CO3	Use resource graphs for deadlock prevention	PPT, Graph Visuals	BTL3
22	Deadlock Avoidance	1	CO3	Understand deadlock avoidance algorithms	PPT, Algorithms	BTL4
23	Deadlock Detection and Recovery	1	CO3	Learn deadlock detection and recovery methods	PPT, Flowcharts	BTL4
24	Banker's algorithm	1	CO3	Apply Banker's algorithm for resource allocation	PPT, Sample Problems	BTL4
25	Memory Management: Main Memory: Contiguous Memory Allocation	1	CO2	Understand contiguous memory allocation	PPT, Visuals	BTL3
26	Fragmentation and types	1	CO2	Learn internal and external fragmentation	PPT, Charts	BTL3
27	Paging	1	CO2	Understand paging memory management	PPT, Visual Diagrams	BTL3
28	Segmentation	1	CO2	Learn segmentation memory management	PPT, Memory Map Diagrams	BTL3
29	Virtual Memory: Demand Paging	1	CO2	Understand demand paging concepts	PPT, Simulation Software	BTL4
30	Page Replacement, Page replacement algorithm	1	CO2	Understand page replacement policies	PPT, Code Examples	BTL4
31	Allocation of frames	1	CO2	Learn frame allocation methods	PPT, Visuals	BTL3
32	Thrashing	1	CO2	Identify causes and effects of thrashing	PPT, Real-World	BTL3



S.No	Topics	No. of Sessions (1hr)	CO Mapping	Objective / Outcome	Learning Aids / Tools	BTL
					Examples	
33	File-System Interface: Concepts	1	CO2	Understand file system interface and access methods	PPT, Diagrams	BTL3
34	Access Methods, Directory and Disk Structure	1	CO2	Learn directory and disk structure	PPT, Diagrams	BTL2
35	File-System Structure, File-System Implementation	1	CO2	Understand file system internals	PPT, Code Snippets	BTL2
36	Directory Implementation, Allocation Methods	1	CO2	Learn directory and allocation methods	PPT, Visuals	BTL2
37	Allocation Methods, Free-Space Management	1	CO2	Understand allocation and free-space management	PPT, Charts	BTL2
38	Devices: Types of devices, Channels and Control Unit, Multiple Paths, Block Multiplexing	1	CO2	Learn device types and control mechanisms	PPT, Device Diagrams	BTL2
39	Secondary Storage	1	CO2	Overview of secondary storage devices and structure	PPT, Charts	BTL2
40	Mass-Storage Structure, Disk Structure	1	CO4	Understand mass storage and disk architecture	PPT, Visuals	BTL2
41	Disk Scheduling Algorithms	2	CO4	Learn disk scheduling algorithms and policies	PPT, Simulation Tools	BTL4
42	Disk Management	1	CO4	Understand disk management techniques	PPT, Examples	BTL4
43	RAID structure of disk	1	CO4	Learn RAID levels and benefits	PPT, Diagrams	BTL4



Lesson Plan

Program : Bachelor of Business Administration (BBA)
Subject Name : Business Communication
Paper Code : BBA 110
Semester : 2nd
Academic Session : 2025-26

Objectives

At the end of this course the student will:

- Proficient in formal written communication.
- Be able to make well-articulated presentations.
- Learn the importance of good listening
- Learn about multicultural communication.

Pedagogy

The sessions will be a blend of lectures and practical exercises with special focus on the business communication skills.

Lesson Plan

Unit No.	Topic	Online Links	Pedagogy	Objectives	Target CO	Outcome
1	Fundamentals of Communication	<u>Meaning and Significance of Communication</u> <u>Process of Communication</u>	Lectures, Extempore, practical exercises	To understand communication basics, the process, and principles for effective business communication.	CO1: Knowledge of business communication concepts and their relevance in	Students will gain foundational knowledge of communication, enhancing spoken and written communic



					organiza- tions.	ation abilities.
2	Communicating in a Multicultural World	https://executive.berkeley.edu/thought-leadership/blog/cross-cultural-communication	Case studies, Presentation different countries culture and barriers faced by them in communication	To learn about global communication, multicultural dynamics, and overcoming cultural communication barriers.	CO2: Ability to meet corporate challenges and communicate effectively in multicultural teams.	Students will develop skills for effective communication in global and multicultural settings.
3	Business Letter Writing and Presentation Tools	https://edu.gcfglobal.org/en/business-communication/how-to-write-a-formal-business-letter/1/	Guided practice	To master business correspondence and presentation techniques.	CO3: Enhanced written and oral communication skills, including global communication perspectives.	Students will acquire practical expertise in crafting professional business letters and delivering presentations.
4	Departmental Communication	https://www.teachinglearninghq.com/2021/02/writing-memos-emails-letters-notices.html	Practice of writing Memo, Notice / Circular	To understand internal communication, manage barriers, and	CO4: Awareness of social, cultural, ethical, and	Students will demonstrate proficiency in managing internal



				effectively use tools like newsletters, reports, and presentations.	legal communication issues, with the ability to communicate effectively in a multicultural business environment.	and external communication efficiently while considering ethical and cultural dimensions.
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Suggested Readings:

1. Lesikar, Business Communication: Making Connections in a Digital World, McGraw Hill Education.
2. Boove, C.L., Thill, J.V. & Chaturvedi, M., Business Communication Today, Pearson.
3. Krizan et al., Effective Business Communication, Cengage Learning.
4. Chaney & Martin, Intercultural Business Communication, Pearson Education.



Lesson Plan

Program : BA(Economics)(Hons.)
Subject Name : Business Economics
Paper Code : 107
Semester : 1st
Academic Session : 2025-26

Course Objective:

The objective of this subject is to give understanding of the basic concepts and issues in business economics and their application in business decisions.

Course Outcomes

CO 1: Ability to solve the problems of economics

CO 2: Proficiency in solving the problems of Market and demand fluctuations

CO 3: Ability to solve the problems of capacity utilization

CO 4: Capability to take decision on pricing in different market forms

UNIT	CONTENT	OUTCOME	LECTURES	CO
I	Introduction to Business Economics and Fundamental concepts • Introduction • Application of Business Economics to Business • Consumer Behavior • Cardinal Utility Approach • Ordinal Utility Approach	Understand the scope and relevance of Business Economics, explain fundamental economic concepts, and evaluate consumer decision-making theories	12	1
II	Demand Analysis • Law of Demand • Measurement of Elasticity of Demand • Demand Forecasting • Theory of Production • Concept of Cost • Future of International Organizations	Analyze demand and production theories, interpret cost structures, and apply forecasting techniques in business decisions	14	2
III	Price Output Decisions • Perfect Competition • Monopoly • Monopolistic Competition • Oligopoly	Compare pricing strategies across market structures and evaluate strategic outcomes under various competitive conditions	14	3
IV	Concepts of Macro Economics • Circular flow model • National Income	Examine macroeconomic indicators, analyze national income concepts and measurement methods, and evaluate macro policy implications	8	4



LESSON PLAN

Program : Master of Computer Applications
Subject Name : Operating System with Linux
Paper Code : MCA 105
Semester : 1st semester
Academic Session : 2025-26

UNIT-I

No. of Hours: 11

Chapter/Book References: TB1 [Ch 1, 2, 3]; TB2 [Ch 2, 3]; TB4 [Ch 1]

Objective:

To learn about different types of Operating Systems and Process Management by Operating System.

Expected Outcome:

Explain the structure and functions of Operating Systems, including components, types, and their working.

Syllabus:

- Operating System: Concept, Components, Operations, Protection and Security
- Computing Environment
- Abstract View of OS: User view, System View, OS Services, System Calls (concept & types)
- Computer System Architecture: Single Processor Systems, Multiprocessor Systems
- Types of Operating Systems: Batch, Multi-Programmed, Time-Shared, Real-Time, Distributed
- Process Management: Process Concept, Operations on Processes, Cooperating Processes, IPC, Threads
- Linux OS: Introduction and Basic Commands



Teaching Plan:

Week	Topics Covered	Activities / Methods	Tools/Resources	In class Assessment
1	OS Concepts, Components, Operations	Lecture, Discussion	Textbooks, Slides	Quiz on OS concepts
2	Protection, Security, Computing Environment	Q&A	Examples	---
3	Abstract View, System Calls	Interactive Lecture, Examples	Code snippets	-----
4	System Architecture (Single & Multiprocessor)	Diagram drawing, group activity	Whiteboard	Diagram submission
5	Types of Operating Systems	Comparative analysis, Group work	Charts, Videos	MCQ test on OS types
6	Process Management & Linux Basic Commands	Lab session: Linux commands practice	Linux OS environment	Practical task on process commands

Mapping: CO1, CO4

BTL 2

UNIT-II

No. of Hours: 11

Chapter/Book References: TB1 [Ch 5, 6]; TB2 [Ch 9]; TB3 [Ch 7, 15]

Objective:

Learn scheduling algorithms and process synchronization with algorithm implementations.

Expected Outcome:

Analyze performance of scheduling algorithms and concurrency management.

Syllabus:

- Process Synchronization: Critical Section Problem, Bakery Algorithm, Synchronization hardware, Semaphores and their Implementation
- Classical Synchronization Problems, Critical Regions, Monitors
- CPU Scheduling: Concepts, Criteria, Algorithms, Multilevel Queue & Feedback Scheduling



- Linux OS: Process management commands and system calls

Teaching Plan:

Week	Topics Covered	Activities / Methods	Tools/Resources	In class Assessment
1	Introduction to Process Synchronization	Lecture + Algorithm walkthrough	Pseudocode examples	Quiz on critical section problem
2	Bakery Algorithm and Hardware Synchronization	Group discussion and code demo	Code snippets	Assignment: Write Bakery algo
3	Semaphores & Classical Problems	Lab practice with semaphore code	Linux lab	Practical on semaphore implementation
4	CPU Scheduling Concepts & Criteria	Theory + Gantt charts exercises	Textbooks	-----
5	Scheduling Algorithms & Multilevel Scheduling	Case studies and comparison charts	Slides, Charts	Test on scheduling algorithms
6	Linux Process Management Commands	Hands-on Linux commands	Linux OS	Practical test on Linux commands

Mapping: CO3, CO4 and BTL 2, 4

UNIT-III

No. of Hours: 12

Chapter/Book References: TB1 [Ch 7, 8, 9]; TB3 [Ch 15]

Objective:

Learn deadlock management and memory management techniques including page replacement.

Expected Outcome:

Understand deadlock, memory, and virtual memory management. Apply Linux memory management commands.

Syllabus:

- Deadlock: Models, Characterization, Resource Allocation Graph, Prevention, Avoidance, Detection, Recovery, Banker's Algorithm



- Memory Management: Contiguous allocation, Fragmentation, Paging, Segmentation
- Virtual Memory: Demand Paging, Page Replacement algorithms, Allocation of frames, Thrashing
- Linux OS: Memory management commands and system calls

Teaching Plan:

Week	Topics Covered	Activities / Methods	Tools/Resources	In class Assessment
1	Deadlock Concepts and Models	Lecture + resource graph drawing	Diagrams, slides	Assignment on deadlock detection
2	Deadlock Prevention, Avoidance, Banker's Algorithm	Algorithm walkthrough + examples	Textbooks, codes	Numerical on Banker's algorithm
3	Memory Management Techniques	Lecture + fragmentation examples	Charts, case studies	-----
4	Virtual Memory, Demand Paging, Page Replacement	Algorithm explanation + demo	Pseudocode, slides	Assignment: Compare page replacement algorithms
5	Thrashing and Frame Allocation	Case study discussion	Research papers	-----
6	Linux Memory Commands & System Calls	Linux lab practical	Linux OS	Practical test on memory commands

Mapping: CO3, CO2

BTL 2, BTL 3

UNIT-IV

No. of Hours: 10

Chapter/Book References: TB1 [Ch 9, 10, 11, 12]; TB2 [Ch 5, 11]; TB3 [Ch 3, 7]

Objective:

Manage files, directories, devices and secondary storage.

Expected Outcome:

Understand disk scheduling, file systems and practice Linux file/directory commands.

Syllabus:



- File System Interface: Concepts, Access Methods, Directory & Disk Structure
- File System Structure & Implementation, Directory Implementation, Allocation, Free Space Management
- Devices: Types, Channels, Control Units, Multiple Paths, Block Multiplexing
- Secondary Storage: Disk Structure, Disk Scheduling Algorithms, Disk Management, RAID
- Linux OS: File management commands and system calls

Teaching Plan:

Week	Topics Covered	Activities / Methods	Tools/Resources	In class Assessment
1	File System Interface and Access Methods	Lecture + diagram drawing	Slides, diagrams	Quiz on file system basics
2	File & Directory Implementation	Case study + coding examples	Code snippets	-----
3	Device Types and Control Units	Explanation and device demos	Videos, hardware lab	-----
4	Disk Scheduling & RAID	Algorithm walkthrough + RAID study	Charts, research	Quiz on disk scheduling algorithms
5	Linux File & Directory Commands	Practical session	Linux OS	Practical file management test

Mapping: CO2, CO4

BTL 4, BTL 5

TEXT BOOKS:

Silberschatz, Galvin, Greg, "Operating System Concepts", Wiley and Sons, 9th Edition, 2015.

Sumitabha Das, "Unix concept and Programming", McGraw Hill education, 4th Edition, 2015.

TB3. W. Richard Stevens Stephen A. Rago" Advanced Programming in the Environment", Addison-Wesley, 3rd Edition, 2013.

TB4. Milan Milenkovic, "Operating Systems Concepts and Design", Tata McGraw-Hill, 1st Edition, 1995.

REFERENCE BOOKS:

RB1. Godbole, Achyut, "Operating System", McGraw-Hill Education, 2nd Edition, 2018.

RB2. William Stallings, "Operating System: Internals and Design Principles", Pearson Education, 2018.

RB3. A. S. Tanenbaum, "Modern Operating Systems ", Pearson, 3rd Edition, 2007.

RB4. Kenneth H. Rosenet al, "UNIX: The Complete Reference", McGraw-Hill/Osbor



- RB5. Dhanjay M. Dhamdhere, "Operating System A concept based approach", Tata McGraw-Hill, 2nd Edition, 2006.
- RB6. Madnick E. and Donovan J., "Operating Systems", Tata McGraw Hill, 2001.