Institute of Computer Science
Samrat Vikramaditya Vishwavidyalaya, Ujjain (MP)

SCHEME OF

BCA (HONS.)

(Under the Faculty of Engineering Science)

FOUR YEARS (8 SEMESTERS) CBCS

(FOR UTD)

(UNDER NEW EDUCATION POLICY-2021-22)

CHOICE BASED CREDIT SYSTEM (CBCS)

2025-2026 ONWARDS

Institute of Computer Science

Samrat Vikramaditya Vishwavidyalaya Ujjain

BCA (Hon's)

Programme Objectives:

BCA (Hon's) course is a full time Four years (Eight semesters) Bachelor's degree in Computer Application that aims to develop skills to analyze, design and implement computerized solutions. The programme provides key concepts in computer fundamentals, applications, software design & development and web design. The course aims to develop technical skills through exposure to programming, data structure, database management system and web development. The focus is on improving critical thinking, communication skills, managerial skills and ethical values. If the student wants to pursue higher studies abroad, he/she can obtain BCA (Hons) 4 years degree after successful completion of six semesters.

PROGRAMME OUTCOMES:

- **Employability**: Ability to get employment opportunities in corporate/government/private sectors or to be a successful entrepreneur.
- **Environment and sustainability**: Understand the impact of sciences and computers' to craft solutions in a global, economic, environmental, and societal context.
- **Modern tool usage**: Ability to use the modern programming languages, tools, techniques and skills necessary for design, develop and deploy software based applications.
- **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of upcoming information technology changes.
- **Domain Knowledge**: Ability to apply exploration to study and analyze problems in different areas of information technology.
- **Knowledge enhancement**: Comprehend the fundamentals, principles, applications and importance of computational concepts.
- **Higher Education**: Capability to move on to higher level learning based on computer science fundamentals.
- **Secure Digital Solutions**: Design and develop secure web centric solutions to boost digital transformation.
- Ability to analyze, interpret and present findings effectively using mathematical and communication skills.
- Understand the fundamentals and applications of programming, data structures, databases, networking, data mining, network security and software engineering.
- Amalgamate knowledge of information technology and software tools for programming.
- Ability to effectively apply the computer science concepts to analyze, design and develop cost effective, efficient and secure solutions to the societal problems.

SAMRAT VIKRAMADITYA VISHWAVIDYALAYA, UJJAIN MP

(Session -2025-2026 onwards)

BCA (Hon's) FOUR YEARS (EIGHT SEMESTERS), CBCS SCHEME (NEP)

S.No.	Paper code	Course Component and Name of Course	Credits			Marks		Total
			T	P	Total	Max Marks CCE Internals	Max Marks Theory Externals	
1.	BCAH 101 Major-1	Programming in C	4	0	4	20	50	100
	BCAH P	Programming in C	0	2	2	10	20	
2.	BCAH 102 Minor -I	Operating System	4	0	4	30	70	100
3	BCAH-103 Multidisciplinary-I	Discrete Mathematical Structure	3	0	3	30	70	100
3.	BCAH 104 AEC-I	Hindi	2	0	2	30	70	100
4.	BCAH-105 SEC (VOC-I)	Office Automation	3	0	3	30	70	100
5.	BCAH -106 Project Work	Web Designing	2	0	2	30	70	100
Total Credits and marks			18	2	20	180	420	600

PART A: Introduction				
Programme:Certificate	Class: I SEM		Year: I Year	Session: 2025-26
Subject: Computer Application				
1.	Course Code	BCAH 101		
2.	Course Title	**Programming in C**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Major-I**		
4.	Pre-Requisite (if any)	Basic fundamentals of computer		
5.	Course Learning Outcomes(CLO)	• Identify situations where computational methods and computers would be useful. • Given a computational problem, identify and abstract the programming task involved. • Approach the programming tasks using techniques learned and write pseudo-code. • Choose the right data representation formats based on the requirements of the problem. • Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand.		
6.	Credit Value	4 Credit		
7.	Total Marks	Max. Marks : 70	Min. Passing Marks: 25	

PART B: Content of the Course		
Total No. of Lectures (in hours per week): 01 Hour per day		
Total Lectures: 60 Hours		
Unit	Topics	No. of Lectures
I	**Indian Knowledge System:** Ancient Indian Contribution: Brahmagupta "Chakravala method", Aryabhata Algorithm. The Panini Grammar System (Ashtadhyayi). Modern Contribution: Origin of Julia Programming Language, Indian Scientist who designed new programming languages and open source languages. Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance, algorithms & flowcharts, Characteristics of a good program – accuracy, simplicity, robustness, portability, minimum resource & time requirement, modularization; Rules/conventions of coding, documentation, naming variables; Top down design; Bottom-up design.	12
II	History of C, Structure of a C program, Data types, Constant & Variable, Operators & expressions, Control Constructs – if-else, for, while, do-while, Case statement, Arrays, Formatted & unformatted I/O, Type modifiers &	12

	Storage classes, Ternary operator, Type conversion & type casting, Priority & associativity of operators.	
III	Functions, Arguments, return value, Parameter passing – call by value, call by reference, return statement, Scope, visibility and life time rules for various types of variable, static variable, calling a function, Recursion – basics, comparison with iteration, tail recursion, when to avoid recursion examples.	12
IV	Special constructs – break, continue, exit(), goto& labels; Pointers - &and * operators, pointer expression, pointer arithmetic, dynamic memory management functions like malloc(), calloc(), free(), String, Pointer to function, Function to parameter, Structure – basic, declaration, membership operator, pointer to structure, referential operator, self-referential structures, structure within structure, array in structure, array of structures, Union – basic, declaration; Enumerated data type, Typedef, Command line arguments.	12
V	File handling and related functions: printf&scanf family, C preprocessor – basics, # Include, # define, # undef, conditional compilation directive like #if, #else, #endif, #ifdef and #ifndef, Variable argument list functions.	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

1. Kerninghan& Richie: The C Programming language, PHI
2. Cooper Mullish: The Spirit of C, Jaico Publishing House, Delhi
3. Kanetkar Y: Let us C
4. Kanetkar Y: Pointers in C.

Suggestive digital platform web links:

https://beginnersbook.com/2014/01/c-pointers/
https://www.programiz.com/c-programming/c-if-else-statement
https://javatutoring.com/control-statements-in-c/
https://www.programiz.com/c-programming/c-arrays
https://tutorialspoint.com/cprogramming/c_structures.htm
https://beginnersbook.com/2014/01/c-functions-examples/
https://www.javapoint.com/data-types-in-c

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: **50** Continuous Comprehensive Evaluation (CCE): **20** Marks University Exam (UE): Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	10 10 **Total Marks: 20**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	$04 \times 05 = 20$ $06 \times 05 = 30$ **Total Marks: 50**

PART A: Introduction				
Program: **Certificate**		Class: **I Sem**	Year: **I Year**	Session: **2025-26**
Subject: **Computer Applications**				
1.	Course Code	BCAH P		
2.	Course Title	**Programming in C**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Core Course**		
4.	Pre-Requisite (if any)	To study this course, a student must have basic logical and analytical skills.		
5.	Course Learning Outcomes(CLO)	**After the completion of this course, a successful student will be able to do the following**: 1. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles. 2. Writing efficient and well-structured computer algorithms/programs. 3. Learn to formulate iterative solutions and array processing algorithms for problems.		
6.	Credit Value	**Practical – 2 Credits**		
7.	Total Marks	Max. Marks : **20+10**	Min. Passing Marks: **15**	

PART B: Content of the Course		
No. of Lab Practicals (in hours per week): **2 hours per week**		
Total No. of Lab.: **60 Hrs.**		
	Suggestive list of Practicals	**No. of Labs.**
	Given the problem statement, students are required to formulate problem, develop flowchart/algorithm, write code in C, execute and test it. Students should be given assignments on following : 1. Write a program to input N numbers and find their average. 2. Write a program to calculate area and circumference of circle for given radius. 3. Write a program to covert the temperature from Fahrenheit to Celsius. 4. Write a program to swap the contents of two variables with the help of third variable. 5. Write a program to swap the contents of two variables without third variable. 6. Write a program to find area of a circle, rectangle, square using switch case. 7. Write a program to print table of any number. 8. Write a program to print Fibonacci series. 9. Write a program to find factorial of a given number. 10. Write a program to print digits of entered number in reverse	60

order.

11. Write a program to generate even/odd series from 1 to 100.
12. Write a program whether a given number is prime or not.
13. Write a program for call by value and call by reference.
14. Write a program to create a pyramid structure

    1
    12
    123
    1234
15. Write a program to print sum of two matrices.
16. Write a program to print multiplication of two matrices.
17. Write a program to calculate the length of a given string.
18. Write a program to illustrates the concept of Dynamic Memory Allocation.
19. Write a program to illustrates the concept of Structure.
20. Write a program to illustrates the use of Command Line Argument.

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

1. Kerninghan& Richie: The C Programming language, PHI
2. Cooper Mullish: The Spirit of C, Jaico Publishing House, Delhi
3. Kanetkar Y: Let us C
4. Kanetkar Y: Pointers in C.
5. Programming in ANSI-C:E Balagurusami, TMH.

Reference Books:

Suggestive digital platform web links

https://beginnersbook.com/2014/01/c-pointers/
https://www.programiz.com/c-programming/c-if-else-statement
https://javatutoring.com/control-statements-in-c/
https://www.programiz.com/c-programming/c-arrays
https://tutorialspoint.com/cprogramming/c_structures.htm
https://beginnersbook.com/2014/01/c-functions-examples/
https://www.javapoint.com/data-types-in-c

PART D: Assessment and Evaluation			
Internal Assessment : Continuous Comprehensive Evaluation (CCE) : **10Marks**		**External Assessment**: University Exam (UE) : **20 Marks** Time : **02.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	2 Marks	Practical record file	5 Marks
Viva	3 Marks	Viva voce practical	5 Marks
Lab Test from practical list	2 Marks	Table works/ Exercise Assigned (02) in practical exam	5 Marks
Assignments (Charts/ Model)/ Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	3 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	5 Marks
Total ***Excursion/ Lab visits/ Industrial Training is compulsory***	**10 Marks**	**Total**	**20 Marks**

<table>
<tr><th colspan="5">PART A: Introduction</th></tr>
<tr><td colspan="2">Program: Certificate</td><td>Class: I SEM</td><td>Year: I Year</td><td>Session: 2025-26</td></tr>
<tr><td colspan="5">Subject: Computer Application</td></tr>
<tr><td>1.</td><td>Course Code</td><td colspan="3">BCAH-102</td></tr>
<tr><td>2.</td><td>Course Title</td><td colspan="3">Operating Systems</td></tr>
<tr><td>3.</td><td>Course Type (Core Course/Elective/Generic Elective/ Vocational</td><td colspan="3">Minor-I</td></tr>
<tr><td>4.</td><td>Pre-Requisite (if any)</td><td colspan="3">Students must have the basic knowledge of Computer basics.</td></tr>
<tr><td>5.</td><td>Course Learning Outcomes(CLO)</td><td colspan="3">Upon successful completion of this course, students will be able to:
Identify and describe the Services Provided by Operating Systems.
Understand and Solve Problems Involving Process Control, Mutual Exclusion, Synchronization and Deadlock.
Apply Various Approaches of Memory Management Techniques
Understand the Structure and Organization of the File System.
Implement Processor Scheduling, Synchronization and Disk Allocation Algorithms for a Given Scenario.</td></tr>
<tr><td>6.</td><td>Credit Value</td><td colspan="3">4 Credit</td></tr>
<tr><td>7.</td><td>Total Marks</td><td>Max. Marks : 100</td><td colspan="2">Min. Passing Marks: 35</td></tr>
</table>

PART B: Content of the Course		
Total No. of Lectures (in hours per week): 01 Hours per day		
Total Lectures: 60 Hours		
Unit	Topics	No. of Lectures
I	**Indian Knowledge System:** The BOSS operating system, open source softwares, growth of LINUX, Aryabhatt Linux, contributions of innovators – Rajen Sheth, Sunder Pichai etc. **Introduction to Operating Systems:** Operating system services, multiprogramming, time-sharing system, storage structures, system calls, multiprocessor system. Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling, I/O devices organization, I/O devices organization, 1/0 devices organization, I/O buffering.	12
II	**Process concept:** process scheduling, operations on processes, threads, inter-process communication, precedence graphs, critical section problem, semaphores, problems of synchronization, Deadlock problem: deadlock characterization, deadlock prevention. deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.	12
III	**Concepts of memory management:** logical and physical address space, swapping, contiguous and Non- contiguous allocation, paging, segmentation, and paging combined with segmentation.	12
IV	Concepts of virtual memory, demand paging, page replacement algorithms. allocation of frames, thrashing, demand segmentation, Security threads protection, Intruders- Viruses-trusted system,	12
V	Disk scheduling, file concepts, file access methods, allocation methods, directory systems, file protection, introduction to distributed systems and parallel processing case study.	12

PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Reading: 1. Operating System by Silberschatz. 2. Operating System by Deitel 3. Modern operating system by Tanneubacem. 4. Donovan, J.J. : System programming, Mcgraw Hill,1972

Suggestive digital platform web links: https://web.iitd.ac.in/~minati/MTL458.html https://www.cse.iitb.ac.in/~mythili/os/ https://www.youtube.com/watch?v=aCJ3YgoolHQ
Suggested equivalent online courses: https://nptel.ac.in/courses/106/102/106102132/

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks : 70 Marks Continuous Comprehensive Evaluation (CCE): **30** Marks University Exam (UE): 70 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	15 15 **Total Marks: 30**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	05 × 05 = 25 09 × 05 = 45 **Total Marks: 70**

PART A: Introduction				
Program: Certificate		Class: I SEM	Year: I Year	Session: 2025-26
Subject: Computer Application				
1.	Course Code	BCAH 103		
2.	Course Title	**Discrete Mathematical Structure**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Multidisciplinary - I**		
4.	Pre-Requisite (if any)	To study this course, a student must have the basic knowledge of Maths.		
5.	Course Learning Outcomes(CLO)	• Students will learn the basic concepts of sets, permutations, relations, graphs, trees. • Students will represent discrete objects and relationships using abstract mathematical structures. • Apply the Operations of Sets and use Venn Diagrams to Solve Applied Problems; • Understand, Explain and Apply the Basic Principles of Sets and Operations in Sets to Solve the Problems • Analyze Modern Problems in Computer Science and solve them Using Graphs and Trees.		
6.	Credit Value	3 Credit		
7.	Total Marks	Max. Marks : 100	Min. Passing Marks: 35	

PART B: Content of the Course		
Total No. of Lectures (in hours per week): 01 Hours per day		
Total Lectures: 60 Hours		
Unit	Topics	No. of Lectures
I	Indian Knowledge System: Basic concepts of Mathematical Logic in ancient India: Panini's Logical Structure, Avaktavtakta, Navya-Nyaya Logic. Indian Contributions in Statistics: P. C. Mahalanobis, C. Radhakrishna Rao, Samanta Chandra Sekhar Harichandan, J. K. Ghose, P. Maiti. Set Theory: Introduction, Sets and Elements, Universal Set and Empty Set, Subsets, Venn Diagrams. Relations: Introduction, Product Sets, Relations, Pictorial Representation of Relations, Composition of Relations, Types of Relations, Partial Ordering Relations.	12
II	Functions: Introduction, One-to-One, Onto, and Invertible Functions, Cardinality. Logic and Propositional Calculus: Introduction, Propositions and Compound Propositions, Basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions.	12

III	Counting: Introduction, Basic Counting Principles, Factorial Notation, Binomial Coefficients, Permutations and Combinations. Pigeon hole Principle.	12
IV	Graph Theory: Introduction, Graphs and Multigraphs, Subgraphs, Paths, Connectivity, Weighted Graphs, Complete, Regular and Bipartite Graphs. Directed Graphs: Introduction, Graph Algorithms: Depth first and Breadth-First Searches.	12
V	TREES AND CUT - SETS : Paths and Circuits, Shortest Paths, Eulerian Paths and Circuits, Hamiltonian Paths and Circuits. Rooted Trees, Path Lengths in Rooted Trees, Binary Search Trees. Spanning Trees, Minimum Spanning Trees.	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

1. Elements of Discrete Mathematics, C.L.Liu, Second Edition, TMH
2. Discrete Mathematics and its applications, Kenneth H. Rosen, (Fifth Edition), Tata McGraw Hill Publishing Company.
3. Theory and Problems of Discrete Mathematics, Semmour Lipschutz, Marc Lipson, Second Edition, Schaum's Outline, T.M.H.

Suggestive digital platform web links:

https://www.mbacrystalball.com/blog/2015/10/09/set-theory-tutorial/
https://plato.stanford.edu/entries/set-theory/basic-set-theory.html

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks : 70 Marks
Continuous Comprehensive Evaluation (CCE): **30** Marks
University Exam (UE): 70 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	15 15 **Total Marks: 30**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	05 × 05 = 25 09 × 05 = 45 **Total Marks: 70**

PART A: Introduction				
Program: Certificate		Class: I SEM	Year: I Year	Session: 2025-26
Subject: Computer Application				
1.	Course Code	BCAH 105		
2.	Course Title	**Office Automation**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Skill Enhancement Course (Voc)**		
4.	Pre-Requisite (if any)	To study this course, a student must have the basic knowledge of Computer.		
5.	Course Learning Outcomes(CLO)	• Gain hands-on skills in MS Windows, MS Word, MS Excel, MS Access, and MS PowerPoint. • Automate routine office tasks using spreadsheets and macros. • Design well-structured documents with advanced formatting techniques. • Develop professional presentations with animations and transitions. • Integrate traditional Indian knowledge systems into office automation workflows.		
6.	Credit Value	3 Credit		
7.	Total Marks	Max. Marks : 100	Min. Passing Marks: 35	

PART B: Content of the Course		
Total No. of Lectures (in hours per week): 01 Hours per day		
Total Lectures: 60 Hours		
Unit	Topics	No. of Lectures
I	**Indian Knowledge System (IKS) and its Relevance to MS Office:** Ancient Indian knowledge traditions in documentation, recordkeeping, and manuscript writing; Evolution of structured writing systems from palm leaf manuscripts to modern digital documentation; Role of Vedic and post-Vedic literature in structured data storage and information retrieval; Traditional methods of calculation and tabulation in ancient India and their relevance to modern spreadsheet applications; Ethical aspects of Indian knowledge systems and their application in professional documentation and communication; Indian logic systems (Nyaya, Mimansa) and their structured approach to problem-solving in database and spreadsheet management; Use of Sanskrit grammatical rules as an analogy to modern data structuring principles; Lessons from ancient Indian education systems (Nalanda, Takshashila) on effective presentation and communication skills; Adaptation of Indian knowledge preservation techniques in modern document management using MS Office tools.	12

II	**MS Windows:** Introduction to MS Windows; Features of Windows; Various versions of Windows & their use; Working with Windows; My Computer & Recycle Bin; Desktop, Icons, and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars; Working with Files & Folders; Shortcuts & Autostarts; Accessories and Windows Settings using Control Panel; Start button & Program lists; Installing new Hardware & Software.	12
III	**Basics of MS Word:** Creating Word documents; The Word Window, Entering Texts, Editing Document texts; Selecting Texts, Copying and Moving Texts; Applying Text Enhancements; Applying Fonts and Font Styles in Word, Highlighting Text for a Distinctive Look. Aligning and Formatting; Aligning Text using identification options, Setting Line Spacing Options using Tabs. Creating Lists, Numbers, and Symbols; Numbering and Bullets, Creating Special Characters. Replacing and checking Text; Creating and Applying Frequently used Texts, Finding and Replacing Texts, More about Spelling and Grammar using the Thesaurus Command. Getting Print using Print Preview, Changing Page Orientation and Paper Size, Aligning Text Vertically, Setting Margins, Printing Options. **Advanced Formatting Techniques in Word:** Formatting Pages; Formatting Sections, Creating and Modifying Page Numbers, Creating Headers and Footers, Taking Care of Loose Ends, Working With Columns; Working With Newspaper Columns, Revising Column Structure. Constructing High-Quality Tables; Creating and Revising Tables, Modifying Table Structure, Formatting Table, Creating Outlines in Word using Templates, Use of Mail Merge in Microsoft Word	12
IV	**Creating Excel Worksheets:** Entering and Editing Cell Entries: Excel Application Window, Workbooks and Worksheets, Moving the Cell Pointer, Entering Text and Numbers, Revising Text and Numbers. **Working with Numbers:** Creating Formulae, Formatting numbers. Changing Worksheet Layout; Adjusting Column Width and Row Height, Inserting and Deleting Rows and Columns, Inserting and Deleting Cells, Moving and Copying Cell Contents, Naming Worksheets, Selecting Worksheets, Copying and Moving Worksheets, Inserting and Deleting Worksheets. **Other Formatting Options:** Aligning Text, Border and Color. **Printing in Excel:** Print Preview, Changing Page Setup, Checking Worksheet Spelling. **Advanced Techniques in Excel:** Using Functions and References; Use of Functions, Entering Functions, Relative and Absolute Cell References. Creating Named Ranges, Creating Easy-to-Understand Charts; Pie Charts, Series Charts, Creating Charts, Moving, Sizing and Printing Chart Objects. **Editing and Formatting Charts:** Adding a Data Series, Deleting a Data Series, Modifying and Formatting Charts.	12

V	**Creating PowerPoint Presentations:** Creating a Basic Presentation, Building Presentations, Modifying Visual Elements, Formatting and Checking Text, Adding Objects, Applying Transitions, Animation Effects and Linking, Preparing Handouts.	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

1. Microsoft Office 97: Will Train, Gini Courter, Annette Marquis (BPB Publication).
2. Microsoft Office 2000: Gini Courter & Annette Marquis (BPB Publication).
3. MS Office 2000 for Everyone: Saxena Sanjay, sschnd.
4. Writer's Guide to Microsoft Word: Kari Holloway.
5. Access 2016 Bible: Michael Alexander, Richard Kusleika.
6. Excel 2019: Greg Harvey / Microsoft PowerPoint Made Easy: Chris Smith..

Suggestive digital platform web links:

https://www.webucator.com/how-to/how-use-mail-merge-microsoft-word.cfm – How to Use Mail Merge in Microsoft Word.
https://support.microsoft.com/en-us/office/create-pivottable-or-pivotchart-views-in-anaccess-desktop-database-83e524df-dfbd-456d-9dd0-0a48claa6752 – Create PivotTable or PivotChart Views in an Access Database
https://support.microsoft.com/en-us/office/create-a-pivottable-to-analyze-worksheet-dataa9a84538-bfe9-40a9-a8e9-f99134456576 – Create a PivotTable to Analyze Worksheet Data.
https://www.youtube.com/watch?v=Zv3XI/IBb3V6A – YouTube Tutorial on MS Office.
http://www.digimat.in/nptel/courses/video/l21106007/L12.html – NPTEL MS Office Course Video.

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks : 70 Marks
Continuous Comprehensive Evaluation (CCE): **30** Marks
University Exam (UE): 70 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	15 15 **Total Marks: 30**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	05 × 05 = 25 09 × 05 = 45 **Total Marks: 70**