



Tararani Vidyapeeth's

KAMALA COLLEGE, KOLHAPUR
Autonomous

Affiliated to
SHIVAJI UNIVERSITY, KOLHAPUR

Accredited By NAAC with 'A' Grade

Faculty of Interdisciplinary Studies

Structure, Scheme and Curriculum For

Bachelor of Computer Application

Part – I

Semester I and II

Syllabus to be implemented from June, 2022 onwards



KAMALA COLLEGE, KOLHAPUR
Autonomous

REVISED SYLLABUS /CURRICULUM (CBCS, SEMESTER PATTERN) FOR B.C.A. I

1. TITLE: B.C.A. Part I
2. YEAR OF IMPLEMENTATION: New Syllabus (CBCS Pattern) (Semester Pattern) will be implemented from June 2022 onwards
3. DURATION: B.C.A.I – Two Semester (One Year)
4. PATTERN OF EXAMINATION: Semester (CBCS Pattern)
70+30 per semester
70 Marks for theory
and 30 marks for Internal Evaluation
5. MEDIUM OF INSTRUCTION: English
6. STRUCTURE OF COURSE: B.C.A. I- Two Semester(Two Courses)



Choice Based Credit System Proposed Course Structure for Bachelor of Computer Application

Three Years (6 Semester) Programme

**Course Structure of new Curriculum
2022-2023**

B.C.A. I

Sr. No.	Class	Semester	Name of the Course
1	B.C.A. I	I	A1CC Fundamentals of Computer
2	B.C.A. I	I	A2CC Introduction to Programming Using C
3	B.C.A. I	I	A3AEC Principles of Management
4	B.C.A. I	I	A4AEC Business Communication
5	B.C.A. I	I	A5AEC Office Automation
6	B.C.A. I	I	A6CCL Lab Course-I Based on A2CC
7	B.C.A. I	I	A7CCL Lab course-II Based on A5AEC

Sr. No.	Class	Semester	Name of the Course
1	B.C.A. I	II	B1CC DBMS
2	B.C.A. I	II	B2CC Operating System
3	B.C.A. I	II	B3AEC Object Oriented Programming Using C++
4	B.C.A. I	II	B4AEC Financial Accounting with Tally
5	B.C.A. I	II	B5AEC Mathematical Foundations for Computer Applications
6	B.C.A. I	II	B6CCL Lab Course-III Based on B1CCand B4AEC
7	B.C.A. I	II	B7CCL Lab course-IV Based on B3CC

B.C.A. II

Sr. No.	Class	Semester	Name of the Course
1	B.C.A. II	III	C1CC Web Technology
2	B.C.A. II	III	C2CC Computer Network and Internet
3	B.C.A. II	III	C3 AEC Data Structure using C
4	B.C.A. II	III	C4AEC Elements of Statistics
5	B.C.A. II	III	C5AEC Human Resource Management and Materials Management
6	B.C.A. II	III	C6CCL Lab Course-V Based on C1 CC
7	B.C.A. II	III	C7CCL Lab Course VI based on C3CC&C4 AEC

S. No.	Class	Semester	Name of the Course
1	B.C.A. II	IV	D1CC RDBMS
2	B.C.A. II	IV	D2CC Software Engineering
3	B.C.A. II	IV	D3AEC DOT NET Technology
4	B.C.A. II	IV	D4AEC Entrepreneurship Development
5	B.C.A. II	IV	D5AEC PHP
6	B.C.A. II	IV	D6CCL Lab Course-VII Based on D1CC
7	B.C.A. II	IV	D7CCL Lab Course-VIII Based on D3CC
8	B.C.A. II	IV	Mini Project

Sr. No.	Class	Semester	Name of the Course
1	B.C.A. III	V	E1 CC Java Programming
2	B.C.A. III	V	E2CC Data Warehousing and Data Mining
3	B.C.A. III	V	E3AEC IT Security
4	B.C.A. III	V	E4AEC Elective-I 1. Python Programming 2. C# Dot Net 3. Ethical Hacking
5	B.C.A. III	V	E5AEC Elective-II 1.Digital Marketing 2. Management Information System 3. Knowledge Management
6	B.C.A. III	V	E6CCL Lab Course-IX Based on E1CC
7	B.C.A. III	V	E7CCL Lab Course-X Based on E4DSE

Sr. No.	Class	Semester	Name of the Course
1	B.C.A. III	VI	F1CC Cloud Computing
2	B.C.A. III	VI	F2CC Elective-I 1. Internet of Things (IoT) 2. Android Programming 3. R Programming
3	B.C.A. III	VI	F3AEC Elective-II 1. IT Management 2. ERP 3. M – Commerce
4	B.C.A. III	VI	F4AEC Soft Skills & Personality Development
5	B.C.A. III	VI	F5AEC Industrial Visit
6	B.C.A. III	VI	F6CCL Lab Course XI Based on F2DSE
7	B.C.A. III	VI	F7CCL Major Project

DSC - Discipline Specific Course
DSE - Discipline Specific Elective
SEC - Skill Enhancement Course

Credit System and Workload

B.C.A. I Sem - I

Sr. No .	Course name	Title	Theory /Practical /Project	Marks(Total)	Distribution of Marks		
					Theory	CCP	Practical
1	I	Fundamentals of Computer	Theory	100	70	30	-
2	II	Introduction to Programming Using C	Theory/ Practical	100	70	30	-
3	III	Principles of Management	Theory	100	70	30	-
4	IV	Business Communication	Theory	100	70	30	-
5	V	Office Automation	Theory/ Practical	100	70	30	-
6	VI	Lab Course-I Based on A2 CC	Practical	50	-	-	50
7	VII	Lab course-II Based on A5 AEC	Practical	50	-	-	50

B.C.A. I Sem – II

Sr. No .	Course name	Title	Theory/ Practical/ Project	Marks(Total)	Distribution of Marks		
					Theory	CCP	Practical
1	I	DBMS	Theory/ Practical	100	70	30	-
2	II	Operating System	Theory	100	70	30	-
3	III	Object Oriented Programming Using C++	Theory/ Practical	100	70	30	-
4	IV	Financial Accounting with Tally	Theory	100	70	30	-
5	V	Mathematical Foundations for Computer Applications	Theory	100	70	30	-

6	VI	Lab Course-III Based on B1 CC and B4 AEC	Practical	50	-	-	50
7	VII	Lab course-IV Based on B3 CC	Practical	50	-	-	50

Scheme of Teaching: B.C.A–Part-I Semester–I

Sr. No.	Course name	Title	Distribution of Workload(Per Week)		
			Theory	Practical	Total
1	I	Fundamentals of Computer	4	2	6
2	II	Introduction to Programming Using C	4	2	6
3	III	Principles of Management	4	-	4
4	IV	Business Communication	4	-	4
5	V	Office Automation	4	-	4
6	VI	Lab Course-I Based on B2 CC	-	4	4
7	VII	Lab course-II Based on B5 AEC	-	4	4
		Total--	20	16	36

Scheme of Teaching: B.C.A–Part-I Semester–II

Sr. No.	Course name	Title	Distribution of Workload(Per Week)		
			Theory	Practical	Total
1	I	DBMS	4	2	6
2	II	Operating System	4	2	6
3	III	Object Oriented Programming Using C++	4	-	4
4	IV	Financial Accounting with Tally	4	-	4
5	V	Mathematical Foundations for Computer Applications	4	-	4
6	VI	Lab Course-III Based on B2 CC and B4 AEC	-	4	4
7	VII	Lab course-IV Based on B3 CC	-	4	4
		Total--	20	16	36

B.C.A. II Sem - III

Sr. No .	Course name	Title	Theory/ Practical/ Project	Marks(Total)	Distribution of Marks		
					Theory	CCP	Practical
1	I	Web Technology	Theory/ Practical	100	70	30	-
2	II	Computer Network and Internet	Theory	100	70	30	-
3	III	Data Structure using C	Theory/ Practical	100	70	30	-
4	IV	Elements of Statistics	Theory	100	70	30	-
5	V	Human Resource Management and Materials Management	Theory	100	70	30	-
6	VI	Lab Course-V Based on C1 CC	Practical	50	-	-	50
7	VII	Lab Course VI based on C3 CC&C4 AEC	Practical	50	-	-	50

B.C.A. II Sem - IV

Sr. No .	Course name	Title	Theory/ Practical/ Project	Marks(Total)	Distribution of Marks		
					Theory	CCP	Practical
1	I	RDBMS	Theory/ Practical	100	70	30	-
2	II	Software Engineering	Theory	100	70	30	-
3	III	DOT NET Technology	Theory/ Practical	100	70	30	-
4	IV	Entrepreneurship Development	Theory	100	70	30	-
5	V	PHP	Theory	50	-	50	-
6	VI	Lab Course-VII Based on D1 CC	Practical	50	-	-	50
7	VII	Lab Course-VIII Based on D3 CC	Practical	50	-	-	50
8	VIII	Mini Project	-	50	-	-	50

Scheme of Teaching: B.C.A–Part-II Semester–III

Sr. No.	Course name	Title	Distribution of Workload(Per Week)		
			Theory	Practical	Total
1	I	Web Technology	4	2	6
2	II	Computer Network and Internet	4	2	6
3	III	Data Structure using C	4	-	4
4	IV	Elements of Statistics	4	-	4
5	V	Human Resource Management and Materials Management	4	-	4
6	VI	Lab Course-V Based on C1 CC	-	4	4
7	VII	Lab Course VI based on C3 CC&C4 AEC	-	4	4
		Total--	20	16	36

Scheme of Teaching: B.C.A–Part-II Semester–IV

Sr. No.	Course name	Title	Distribution of Workload(Per Week)		
			Theory	Practical	Total
1	I	RDBMS	4	2	6
2	II	Software Engineering	4	2	6
3	III	DOT NET Technology	4	-	4
4	IV	Entrepreneurship Development	4	-	4
5	V	PHP	4	-	4
6	VI	Lab Course-VII Based on D1 CC	-	4	4
7	VII	Lab Course-VIII Based on D3 CC	-	4	4
8	VIII	Mini Project	-	-	-
		Total--	20	16	36

B.C.A. III Sem - V

Sr. No .	Course name	Title	Theory/ Practical/ Project	Marks(Total)	Distribution of Marks		
					Theory	CCP	Practical
1	I	Java Programming	Theory/ Practical	100	70	30	-
2	II	Data Warehousing and Data Mining	Theory	100	70	30	-
3	III	IT Security	Theory	100	70	30	-
4	IV	Elective-I 1. Python Programming 2. C# Dot Net 3. Ethical Hacking	Theory/ Practical	100	70	30	-
5	V	Elective-II 1.Digital Marketing 2. Management Information System 3. Knowledge Management	Theory	100	70	30	-
6	VI	Lab Course-IX Based on E1 CC	Practical	50	-	-	50
7	VII	Lab Course-X Based on E4 DSE	Practical	50	-	-	50

Sr. No .	Course name	Title	Theory/ Practical/ Project	Marks(Total)	Distribution of Marks		
					Theory	CCP	Practical
1	I	Cloud Computing	Theory	100	70	30	-
2	II	Elective-I 1. Internet of Things (IoT) 2. Android Programming 3. R Programming	Theory/ Practical	100	70	30	-

3	III	Elective-II 1. IT Management 2. ERP 3. M - Commerce	Theory	100	70	30	-
4	IV	Soft Skills & Personality Development	Theory	50	-	50	-
5	V	Industrial Visit	Theory	25	-	25	-
6	VI	Lab Course XI Based on F2 DSE	Practical	100	-	-	100
7	VII	Major Project	-	125	-	-	125

B.C.A. III Sem - VI

Scheme of Teaching: B.C.A–Part-III Semester–V

Sr. No.	Course name	Title	Distribution of Workload(Per Week)		
			Theory	Practical	Total
1	I	Java Programming	4	2	6
2	II	Data Warehousing and Data Mining	4	2	6
3	III	IT Security	4	-	4
4	IV	Elective-I 1. Python Programming 2. C# Dot Net 3. Ethical Hacking	4	-	4
5	V	Elective-II 1.Digital Marketing 2. Management Information System 3. Knowledge Management	4	-	4
6	VI	Lab Course-IX Based on F1 CC	-	4	4
7	VII	Lab Course-X Based on F4 DSE	-	4	4
		Total--	20	16	36

Scheme of Teaching: B.C.A–Part-III Semester–VI

Sr. No.	Course name	Title	Distribution of Workload(Per Week)		
			Theory	Practical	Total
1	I	Cloud Computing	4	2	6
2	II	Elective-I 1. Internet of Things (IoT) 2. Android Programming 3. R Programming	4	2	6
3	III	Elective-II 1. IT Management 2. ERP 3. M – Commerce	4	-	4
4	IV	Soft Skills & Personality Development	4	-	4
5	V	Industrial Visit	4	-	4
6	VI	Lab Course XI Based on F2 DSE	-	4	4
7	VII	Major Project	-	4	4
		Total--	20	16	36

SCHEME OF EXAMINATION:

- The examination shall be at the end of each semester.
- All papers shall carry 70 marks for Theory and 30 marks for **practical/sessional work/internal examination (CCE)**.
- The evaluation of the performance of the students in theory shall be based on semester examination as mentioned above.
- Question paper will be set in the view of the entire syllabus preferably covering each module of the syllabus.

• Nature of question paper (Theory)

- Duration: 3 Hours

Total Marks – 70

- Instructions:

- 1) Que.1 and Que. 6 are compulsory questions
- 2) Attempt any three Questions from Que. No.2 to Que. No. 5.
- 3) Figures to the right indicate total marks.

- Qu.1) A. Multiple Choice Questions (10 questions for 1 mark each) 10
- B. Give Reasons or Short answer question (Any two out of three) 10
- Qu.2) Broad answer question 10
- Qu.3) Broad answer question 10
- Qu.4) Broad answer question 10
- Qu.5) Broad answer question 10
- Qu.6) Write notes on (Any Four out of Six) 20

The evaluation of the performance of the students in practical shall be based on internal evaluation at the end of **first, Second, Third, Fourth and fifth** semester and external examination at the end of **sixth** semester.

- **Nature of Practical Question Paper:**

There will be three questions of 15 Marks each, out of which student have to attempt any two Questions and 10 marks for journal and 10 marks for oral for 2-credit lab course and time duration is two hours.

For four-credit lab course there will be four questions of 25 Marks each, out of which student have to attempt three questions and 10 marks for journal and 15 marks for oral and time duration is three hours.

Practical Examination conducted by the University appointed examiner panel of two members. The panel members have more than five years' experience as full time teacher.

- **Medium of Instruction:** The medium of instructions shall be in English.

EQUIVALENCE OF COURSE:**B.C.A. I**

Sr. No.	Class	Semester	Title of the Course (Old)	Course	Title of the Course (New)
1	B.C.A. I	I	Fundamentals of Computer	1	Fundamentals of Computer
2	B.C.A. I	I	Introduction to Programming Using C	2	Introduction to Programming Using C
3	B.C.A. I	I	Principles of Management	3	Principles of Management
4	B.C.A. I	I	Business Communication	4	Business Communication
5	B.C.A. I	I	Office Automation	5	Office Automation
6	B.C.A. I	I	Lab Course-I Based on A2CC	6	Lab Course-I Based on A2CC
7	B.C.A. I	I	Lab course-II Based on A5AEC	7	Lab course-II Based on A5AEC

Sr. No.	Class	Semester	Title of the Course (Old)	Course	Title of the Course (New)
1	B.C.A. I	II	DBMS	1	DBMS
2	B.C.A. I	II	Operating System	2	Operating System
3	B.C.A. I	II	Object Oriented Programming Using C++	3	Object Oriented Programming Using C++
4	B.C.A. I	II	Financial Accounting with Tally	4	Financial Accounting with Tally
5	B.C.A. I	II	Mathematical Foundations for Computer Applications	5	Mathematical Foundations for Computer Applications
6	B.C.A. I	II	Lab Course-III Based on B1CC and B4AEC	6	Lab Course-III Based on B1CC and B4AEC
7	B.C.A. I	II	Lab course-IV Based on B3CC	7	Lab course-IV Based on B3CC

B.C.A.II

Sr. No.	Class	Semester	Title of the Course (Old)	Course	Title of the Course (New)
1	B.C.A. II	III	Web Technology	1	Web Technology
2	B.C.A. II	III	Computer Network and Internet	2	Computer Network and Internet
3	B.C.A. II	III	Data Structure using C	3	Data Structure using C
4	B.C.A. II	III	Elements of Statistics	4	Elements of Statistics
5	B.C.A. II	III	Human Resource Management and Materials Management	5	Human Resource Management and Materials Management
6	B.C.A. II	III	Lab Course-V Based on C1CC	6	Lab Course-V Based on C CC301
7	B.C.A. II	III	Lab Course VI based on C3CC&C4AEC	7	Lab Course VI based on C3CC&C4AEC

Sr. No.	Class	Semester	Title of the Course (Old)	Course	Title of the Course (New)
1	B.C.A. II	IV	RDBMS	1	RDBMS
2	B.C.A. II	IV	Software Engineering	2	Software Engineering
3	B.C.A. II	IV	DOT NET Technology	3	DOT NET Technology
4	B.C.A. II	IV	Entrepreneurship Development	4	Entrepreneurship Development
5	B.C.A. II	IV	PHP	5	PHP
6	B.C.A. II	IV	Lab Course-VII Based on D1CC	6	Lab Course-VII Based on D1CC
7	B.C.A. II	IV	Lab Course-VIII Based on D3CC	7	Lab Course-VIII Based on D3CC

B.C.A.III

Sr. No.	Class	Semester	Title of the Course (Old)	Course	Title of the Course (New)
1	B.C.A. III	V	Java Programming	1	Java Programming
2	B.C.A. III	V	Data Warehousing and Data Mining	2	Data Warehousing and Data Mining
3	B.C.A. III	V	IT Security	3	IT Security
4	B.C.A. III	V	Elective-I 1. Python Programming 2. C# Dot Net 3. Ethical Hacking	4	Elective-I 1. Python Programming 2. C# Dot Net 3. Ethical Hacking
5	B.C.A. III	V	Elective-II 1.Digital Marketing 2. Management Information System 3. Knowledge Management	5	Elective-II 1.Digital Marketing 2. Management Information System 3. Knowledge Management
6	B.C.A. III	V	Lab Course-IX Based on E1CC	6	Lab Course-IX Based on E1CC
7	B.C.A. III	V	Lab Course-X Based on E4DSE	7	Lab Course-X Based on E4DSE

Sr. No.	Class	Semester	Title of the Course (Old)	Course	Title of the Course (New)
1	B.C.A. III	VI	Cloud Computing	1	Cloud Computing
2	B.C.A. III	VI	Elective-I 1. Internet of Things (IoT) 2. Android Programming 3. R Programming	2	Elective-I 1. Internet of Things (IoT) 2. Android Programming 3. R Programming
3	B.C.A. III	VI	Elective-II 1. IT Management 2. ERP	3	Elective-II 1. IT Management 2. ERP

			3. M - Commerce		3. M – Commerce
4	B.C.A. III	VI	Soft Skills & Personality Development	4	Soft Skills & Personality Development
5	B.C.A. III	VI	Industrial Visit	5	Industrial Visit
6	B.C.A. III	VI	Lab Course XI Based on F2DSE	6	Lab Course XI Based on F2DSE
7	B.C.A. III	VI	Major Project	7	Major Project

Programme Outcomes: B.C.A.

After completion of program, Students / graduates will be able to:

PO1: Apply knowledge of ICT in solving business problems.

PO2: Learn various programming languages and custom software.

PO3: Design component, or processes to meet the needs within realistic constraints.

PO4: Identify, formulate, and solve problems using computational temperaments.

PO5: Comprehend professional and ethical responsibility in computing profession.

PO6: Express effective communication skills.

PO7: Recognize the need for interdisciplinary, and an ability to engage in life-long learning.

PO8: Knowledge of contemporary issues and emerging developments in computing profession.

PO9: Utilize the techniques, skills and modern tools, for actual development process.

Programme Specific Outcomes:

On the completion of the programme student able to:

1. Equip themselves to potentially rich & employable field of computer applications.
2. Pursue higher studies in the area of Computer Science/Applications.
3. Take up self-employment in Indian & global software market.
4. Meet the requirements of the Industrial standards.

B.C.A. Part-I
Semester I-Paper No. I
Course Code –A1CC
Fundamentals of Computer

WorkLoad-6
Theory-4 Lectures/Week

TotalMarks-100
Theory-70Marks
CCP-30Marks

Course Outcomes -

After completion of this course students will be able to –

1. Understand basic concepts of computer.
2. Describe peripheral devices and number systems.
3. Understand operating environment
4. Demonstrate the use of Linux Operating system commands

Course content:

Module I - Introduction to Computer System

- Introduction, Characteristics of Computers, Block diagram of computer
- Types of computers and features- Mini Computers, Micro Computers, Mainframe Computers, Super Computers, Laptops and Tablets
- Types of Programming Languages- Machine Languages, Assembly Languages, High Level
- Languages
- Portals - Social Networking sites- Blogs - viewing a webpage, downloading and uploading the website;
- Translators- Assembler, Compiler, Interpreter
- Data Organization- Drives, Files, Directories

Module II - Introduction to Computer Peripherals

- Primary And Secondary storage devices
- I/O Devices- Scanners, Digitizers, Plotters, LCD, Plasma Display

- Pointing Devices –Mouse, Joystick, Touch Screen
- Number Systems
- Introduction to Binary, Octal, Hexadecimal system
- Conversion, Simple Addition, Subtraction, Multiplication, Division

Module III

- **Concepts of Software**
- Definition: software, Types of software: System Software, Application Software. System Software: Operating System. Types of O.S.
- Introduction to DOS and its limitations.
- MS Windows: Desktop, Icons, File and Directory, Structure, Menu Items, Control Panel, File and Directory Search, Notepad, Paintbrush, Utility programs: Anti-virus,
- Disk Cleaning, Defragmentation, and Compression/Decompression of files.
- Application software: Examples of commercial software with brief introduction.

Module IV

- **PC Hardware and Linux**
- Introduction of Hardware.
- Type and Working of Hardware parts – Ports, Motherboard, CPU.
- Basic Input and Output Setting(BIOS), Network Interface
- Card (NIC), Graphics card.
- Linux
- Introduction Linux, Features, Structure of Linux, File system,
- Commands , Permission and inodes, I/O redirection, Pipes ,VI Editor
- Open Office-Impress - Introduction – Creating Presentation, Saving

Reference:

1. Computers Today by S. Basandra Galgotia Pub.
2. Microsoft Office 2000 by Vipra Computers, Vipra Printers Pvt. Ltd.
3. Advanced Microsoft Office 2000 by Meredith Flynnin, Nita Rutkosky, BPB Pub using Microsoft office 2007 by Ed Bott ,Woody Leonhard , Pearson publication\PC/HARDWARE BY-Join Josh O`Reilly Publication

B.C.A. Part-I
Semester I-Paper No. II
Course Code A2CC

Introduction to Programming using 'C'

WorkLoad-6

TotalMarks-100

Theory-4 Lectures/Week

Theory-70Marks

CCP-30Marks

Preamble

1. The subject is designed in such a way that, it will able to implement the algorithms and drawing algorithms for solving problems.
2. The students will able to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.
3. The C Programming language will be used in simple data processing applications also he/she must be able to use the concept of array of structures and file Handling.
4. Develop confidence for self education and ability for life-long learning needed for computer language.

Objective

The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C. Also by learning the basic programming constructs they can easily switch over to any other language in future.

Course content:

Module I

- **Basic of Programming**
- Problem definition, problem analysis, Algorithms, flow chart, Debugging, Types of errors in programming, Documentation.
- Basics of '_C' programming language
- Data Types, Variable Declaration, Input/output Statement, Built-in Standard Library, C Program Structure, writing the First '_c' Program, Compilation and Execution of C Program, Format Specifies and Escape Sequences.
- Branching Statements -Introduction, if statement, if-else statement, Nested If-else, Switch case statement.

Module II

- **Control Statements and Array**
- Definition of Loop.
- Types of looping statement
- Difference between while loop and do—while Loop,
- Loop control Statement (break, continue),
- Infinite Loop,
- Definition and declaration of array,
- features of Array,
- Initialization of array,
- Memory representation of array,
- Single Dimensional Array,
- Two Dimensional Array,
- Predefined String functions

Module –III

- **User Defined Functions and Pointer**
- Definition, declaration, prototype of function
- Local and global variable,
- User defined functions
- Recursion, Storage classes.
- Pointer Definition and Declaration,
- Pointer Initialization,
- Pointer arithmetic.
- Arrays of Pointers,
- Pointers and One and two dimensional Arrays
- Call by value and call by reference
- Dynamic Memory Allocation

Module–IV

- **Structures and File Handling**
- Definition and declaration of structure
- Nested Structure, Array of structures, structure pointer,
- passing structure to function, self- referential structure,
- Definition and declaration of union

- Difference between Structure and Union
- Concept of File ,Text and binary mode files, Opening and closing files- fopen() and fclose(),
- File opening mode- read, write, append ,reading and writing string function gets(),puts()), Formatted input- scanf(), sscanf(), fscanf(), fread(), Formatted output- printf(), sprintf(), fprintf(), fwrite().
- Functions-fseek(), ftell(), fflush(), fclose(), rewind().

Reference:

1. The C Programming Language- By Brian W Kernighan and Dennis Ritchie
2. C Programming by E. Balgurusamy.
3. The GNU C Programming Tutorial -By Mark Burgess
4. Let us C- By Yashwant Kanetkar

B.C.A. Part-I
Semester I-Paper No. III
Course Code – A3AEC
Principles of Management

WorkLoad-6

Theory-4 Lectures/Week

TotalMarks-100

Theory-70Marks

CCP-30Marks

Course Outcomes -

After completion of this course students will be able to –

1. Understand the influence of historical forces on current practice of management.
2. Understand frameworks in the four functions of management.
3. Understand leadership styles to anticipate the consequences of each leadership style
4. Be able to identify and apply appropriate management techniques for organizations; and
5. Understand social responsibility involved in business situations

Course content:

Module I - Introduction to Management

- Definition of Management
- nature and importance of management
- Functions of Management
- Levels of management
- Role of Manager in Organization
- Contribution of F.W. Taylor, Henry Fayol and Max Weber.

Module II - Functions of Management

- Planning: Meaning, Definition & Nature, Steps in Planning.
- Organising: Meaning,
- Definition & Classification. (Formal & Informal organization, Virtual organization.)
- Staffing: Meaning Definition & Functions.

- Directing: Meaning and importance of Directing
- Controlling: Meaning, Steps and Types of Control.

Module –III - Leadership and Motivation

- Leadership: Meaning & Definition of leadership
- Theories of Leadership
- Qualities of Leadership & Types of Leaders
- Motivation: Meaning, definition & importance of motivation
- Theories of motivation – Maslow’s Hierarchy Theory, Herzberg’s theory & Theory X & Y.ERG Theory.

-

Module–IV - Trends in Management

- Management Information System: Meaning, Definition & Types of Information, careers in MIS
- Management of Change: Meaning Definition & Forms or Types of Changes
- Corporate Social Responsibilities.

Reference:

- 1) Principles of Management : T. Ramasamy
- 2) Management Concepts and Practices: Dr. Manmohan Prasad
- 3) Principles of Management- P. Subba Rao
- 4) Management –L.M.Prasad
- 5) Essential of Management by Kncotz & O’ Donnel.

BCA Part -I

Semester I-Paper No. IV

Course Code A4 AEC

Business Communication I

Work Load - 4

Total Marks – 50

Theory – 4 Lectures / Week

Theory - 40 Marks

Practical – 2 Lectures/Week/Batch

Practical – 10 Marks

Course Outcomes - After completion of this course students will able to demonstrate a good understanding of

–

1. Effective business writing
2. Effective business communication
3. Developing and delivering effective presentation
4. Effective interpersonal communication

Course Content:

Module I - Communication Skills

- Concept, Objectives, Process of communication
- Types of communication – Verbal, Non verbal
- Barriers to effective communication, Overcoming the barriers
- Forms of Communication in an organization – Formal and informal

Module II - Listening Skills

- Importance of listening in business communication
- Difference between hearing and listening
- Concept of the listening process – Active listening and passive listening
- Barriers to effective listening, Guidelines for effective listening

Module III - Writing Skills

- Business letters, Essentials of a business letters,
- Types of business letters – Tenders, quotations, orders, sales, complaint
- Email correspondence
- Preparing Notice, Agenda and Minutes
- Report writing

Module IV - Presentation Skills

- Business presentations, Seminar presentations

- Strategies for effective presentation
- Audio visual aids in presentation, Delivery methods for presentation

References :

- 1) Essential Communication Skills, Shalini Agarwal
- 2) Business Communication, R. K. Madhukar
- 3) E-mail : A Write It Well Guide: How to write and Manage E-mail in the workplace-Janis Fisher Chan
- 4) The AMA Handbook of Business Letters – Jeffrey L. Seglin; Edward Coleman
- 5) On the Education of a man of Business – Arthur Helps
- 6) Effective Writing : Improving Scientific, Technical and Business Communication, Christopher Turk; Kirkman

Scheme of Internal Practical Evaluation 10 marks

- | | | |
|----|-------------------------------|---------|
| 1) | Submission of Home Assignment | 5 marks |
| 2) | Viva – Voce | 5 marks |

B.C.A. Part-I
Semester I-Paper No.V
Course Code A5 AEC

Office Automation

WorkLoad-6

Theory-4 Lectures/Week

TotalMarks-100

Theory-70Marks
CCP-30Marks

Preamble

1. The Office Automation tool – Microsoft's Word & Open Office's Writer will be used to create word documents.
2. With the help Microsoft's Power Point & Open Office's Impress students will be able to design presentations.
3. The Office Automation tools will be used in simple data processing applications also he/she must be able to use the concept of array of structures and file Handling.
4. Develop confidence for self education and ability for life-long learning needed for computer language.

Objective

Office Automation course would enable students in crafting professional word documents, power point presentations using the Microsoft suite of office tools. To familiarize the students in preparation of documents and presentations with office automation tools. Also this subject enables students to use Open Office Applications and prepare documents using Open Office Writer and presentations using Open Office Impress. This course also helps students for using browsers, surfing, searching and creating, using emails.

Course content:

Module I - INTERNET & ADVANCED COMMUNICATION

- Internet and Web Browsers: Definition & History of Internet - Uses of Internet
- Different types of Internet Connections;
- Dial up connection, Broad band (ISDN, DSL, Cable), Wireless (Wi-Fi, WiMax, Satellite, Mobile), browsers and its types,

internet browsing, searching - Search Engines

- Portals - Social Networking sites- Blogs - viewing a webpage, downloading and uploading the website;
- Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc.

Module II

- **INTRODUCTION TO MS WORD**
- Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents,
- Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection-style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab,
- Presentation Files, Master Templates & Re-usability, Slide Transition, Making Presentation CDs,
- Printing Handouts
- Operating with MS Power Point files /slides
- Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, Creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page. Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Inserting ClipArt, Pictures/Files etc.,
- Tools – Word Completion, Spell Checks, Mail merge

Module –III

- **INTRODUCTION TO MS-Excel**
- Introduction, applications of Spread sheet, Menus, Tool bars and icons, Spreadsheet Opening, saving, closing, printing file, setting margins, Converting file to different formats,
- Entering And Editing Data- Copy, cut, paste, undo, redo, find, search, replace,
- filling continuous rows and columns, inserting data into cells, columns, rows and sheet, Computation Data- Setting formula, finding total in rows and columns,
- Functions Types- Mathematical, Group, string, date and time,
- Formatting Spread Sheet- Alignment, font, border, hiding, locking, cells, highlighting values, background color, bordering and shading,

- Working With Sheet Sorting, filtering, validation, consolidation, subtotals,
- Charts-Selecting, formatting, labelling, scaling,
- Tools- Error checking, spell check, formula auditing, tracking changes.

Module –IV

- INTRODUCTION TO POWER POINT

- Introduction to presentation
- Opening new presentation, Different presentation templates, setting backgrounds, selecting presentation layouts.
- Creating a presentation – Setting Presentation style, Adding text to the Presentation.
- Formatting a Presentation -Adding style, Colour, gradient fills, Arranging objects, Adding Header &Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation
- Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.

Reference:

- 1) Microsoft Office 2007 Bible - John
- 2) Walkenbach, HerbTyson, FaitheWempen, caryN.Prague, MichaelR.groh, PeterG.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.
- 3) Introduction to Information Technology - Alexis Leon, Mathews Leon, and Leena Leon, Vijay Nicole Imprints Pvt. Ltd., 2013.
- 4) A Conceptual Guide to OpenOffice
- 5) Computer & Internet Basics Step-by-Step - Etc-end the Clutter - Infinity Publishing
- 6) Open Office Basic: An Introduction3.

Websites:

- 1) <http://windows.microsoft.com/en-in/windows/msoffice-basics-all-29-topics>
- 2) <https://wiki.openoffice.org/wiki/Documentation> 15.
<https://documentation.libreoffice.org/assets/Uploads/Documentation/en/GS6.0/GS60-GettingStartedLO.pdf>

B.C.A. Part-I
Semester I-Paper No.VI
Course Code – A6CCL
Lab Course –I Based on A2 CC

WorkLoad-4

TotalMarks-70

Practical-4 Lectures/Week/Batch

Course Outcomes

After completion of this course students will be able to –

1. Understand and trace the execution of programs written in C language.
2. Write the C code for a given algorithm
3. Implement Programs with pointers and arrays, perform pointer arithmetic and file handling.

List of Practical's:

1. Write a program to accept 5 subject marks and calculate total marks, percentage and grade of student.
2. Write a program to input a number and find the given number is Odd or Even.
3. Write a program to input the day number and display day of week.
4. Write a program to find the sum of first n natural numbers.
5. Write a program which display following output
A B C D E
A B C D
A B C
A B
A
6. Write a program to accept the range and generate Fibonacci Series.
7. Write a program to find given number is Armstrong or not.
8. Write a program to find prime numbers between given range
9. Write a program to sort the numbers in ascending and descending order using array.
10. Write a program to add two Matrices; Use two Dimensional arrays
11. Write a program to find the product of given two matrices.
12. Write a function which adds three number and display output on the screen.
13. Write a function which calculate cube of given number.
14. Write a program which swap two number using a) call by value and b) call by reference.

15. Write a program which create student structure which accept stud roll no, student name, address, subject marks, percentage and display same on screen.
16. Write a program to separate even and odd numbers available in file.
17. Write a program to count the no. of words in a given text file.
18. Write a program to remove blank lines from a file.
19. Write a program to copy content of one file into another file.
20. Write a file handling program which accept student information store it into disk file using binary mode.

Scheme of practical evaluation

Internal Practical Evaluation

50 marks

- | | | |
|------|-----------------------|---------|
| i) | Practical | 30marks |
| ii) | Submission of Journal | 10marks |
| iii) | Viva | 10marks |

B.C.A. Part-I
Semester I-Paper No.VII
Course Code – A7CCL
Lab Course –II Based on A5AEC

WorkLoad-4

TotalMarks-70

Practical-4 Lectures/Week/Batch

Course Outcome

After completion of this course students will be able to -

1. Understand the components of office automation
2. Perform operations using MS Word and PowerPoint
3. Surf details through Internet
4. Understand and discuss about the use of Office Package and internet in daily life

List of Practical's:

1. Searching for a web site / application / text documents viewing and downloading.
2. Create an E-mail account, Retrieving messages from inbox, replying, attaching files filtering and forwarding
3. Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.
4. Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.
5. Preparing a newsletter: To prepare a newsletter with borders, two columns text, header and footer and inserting a graphic image and page layout.
6. Creating and using styles and templates To create a style and apply that style in a document To create a template for the styles created and assemble the styles for the template.
7. Creating and editing the table .Create a table using table menu .To create a monthly calendar using cell editing operations like inserting, joining, deleting, splitting and merging cells .To create a simple statement for math calculations viz. Totaling the column.

8. Creating numbered lists and bulleted lists. To create numbered list with different formats (with numbers, alphabets, roman letters) . To create a bulleted list with different bullet characters.
9. Printing envelopes and mail merge. To print envelopes with from addresses and to addresses To use mail merge facility for sending a circular letter to many persons To use mail merge facility for printing mailing labels.
10. Using the special features of word To find and replace the text To spell check and correct. To generate table of contents for a document To prepare index for a document.
11. Create an advertisement Prepare a resume.
12. Creating a new Presentation based on a template – using Auto content wizard, design template and Plain blank presentation.
13. Creating a Presentation with Slide Transition – Automatic and Manual with different effects.
14. Creating a Presentation applying Custom Animation effects – Applying multiple effects to the same object and changing to a different effect and removing effects.
15. Creating and Printing handouts.

Scheme of practical evaluation

Internal practical evaluation		50marks
i)	Practical	30marks
ii)	Submission of Journal	10marks
iii)	Viva	10marks

B.C.A. Part-I
Semester II-Paper No. I
Course Code B1CC
Database Management System

WorkLoad-4

TotalMarks-70

Theory-4 Lectures/Week

Preamble

- 1) Describe the basic concepts of DBMS and various databases used in real applications
- 2) Demonstrate the principles behind systematic database design approaches.
- 3) Design the database structure by applying the concepts of Entity-relational model and Normalization.
- 4) Learn MS-Access for database creation and handling transactions.

Objective -

The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

Course content:

Module I

- **Introduction of DBMS**
- Basic Concept (Data Vs. Information, Database)
- Definition of DBMS, Needs and Features of DBMS,
- Comparison of file processing system with DBMS
- Functions of DBMS
- Advantages and disadvantages of DBMS
- Structure of DBMS
- Architecture of database system
- Schema, Subschema Data abstraction, data independence, data dictionary, users of database.

Module II

- Data Models

- Introduction, definition, features of data models
- DFD
- Object based data models- Entity Relationship Model, Cardinality
Record based models- Hierarchical Model, Network Model,
Relational Model and Physical Data Models.
- Keys: Primary key, foreign key, candidate key, super key, unique
key.
- Normalization: Concept of normalization, advantages, First NF,
Second NF, Third NF, examples of normalizations.

Module III

- Database Management through Ms-Access

- Introduction of MS Access, features, database creation, table
creation, insert records, queries, forms and report creation.
- Case Study: Normalized database design system for- Library
management system, Inventory management system etc.
- SQL: Introduction of SQL, features, SQL data types, DDL
commands- create table, describe table, alter table, drop table
commands etc., DML-insert, delete, update commands etc, DQL
commands- All select commands, aggregate functions, order by
clause.

Module IV

- Organization of Database System

- Introduction of file, file types, organization of file- heap file
organization, serial file organization, sequential, index sequential
file, random access file (direct access file)
- Types of Database System: centralized database system, client
server system, distributed database system.

Books Recommended:

- 1) Database System Concept – Henry korth and A. Silberschatz
- 2) Fundamentals of Database System- Ramez Elmasri, Shamkant B. Navathe(Pearson)
- 3) Database Management System- Raghu Ramkrishnan, Gehrke (McGraw Hill)
- 4) SQL, PL/SQL The Programming Language Oracle :- Ivan Bayross, BPB Publication
- 5) Introduction to SQL by Reck F. van der Lans by Pearson
- 6) Database Management System- R. Panneerselvam

7) Ms-Office Complete reference

Web References:

1) <https://www.oreilly.com/library/view/relational-theory->

2) <https://en.wikipedia.org/wiki/Database>

3) <https://hackr.io/blog/dbms-normalization>

4) https://en.wikipedia.org/wiki/Database_normalization

B.C.A. Part-I
Semester II-Paper No.II
Course Code –B2 CC
Operating System

WorkLoad-4

TotalMarks–70

Theory–4 Lectures/Week

Preamble:

- 1) Understand basic concepts of Operating System and there types.
- 2) Apply the concept of a process and scheduling algorithms.
- 3) Realize the concept of deadlock and different ways to handle it.
- 4) Understand various memory management techniques and file system.

Objectives:

- To study operating system, types of operating system. Process creation and termination.
- To understand the process management and Inter-process communication.
- To learn critical-section problems and classical process-synchronization problems.
- To know the concept of deadlock, different methods for preventing or avoiding deadlocks and techniques for memory management.
- To learn and understand file system, directory structure, file allocation methods...

Course content:

- | | |
|------------------|---|
| Module I | <ul style="list-style-type: none">- Introduction of Operating System- Definition, Objectives, Functions.- Generations of OS.- Types of OS (Batch, Multiprogramming, Time Sharing, Real time, Distributed, Personal, Mobile).- OS Structure (Monolithic, Layered, Microkernel, Exokernel, Client-Server). |
| Module II | <ul style="list-style-type: none">- Process Management- Process Management- Introduction to Processes.- Process Model, Process creation, Process termination.- Process hierarchy |

- Process states.
- Interprocess Communication – Shared memory system, Message passing systems.

Module III - Memory Management

- Memory Management- Introduction to memory management Requirements (Relocation, Protection, Sharing, Logical organization, Physical organization).
- Memory partitioning- Fixed partitioning, Dynamic partitioning, Paging, Segmentation.
- Concept of Virtual memory.

Module IV - File System

- Files & File system, File structure.
- File types, File access, File attributes, Basic file operations.
- Directories- Single-level & Hierarchical directory systems, Path names & Directory operations.
- Differentiate between Windows and Linux OS.

Reference:

- 1) Modern Operating Systems, Andrew S Tanenbaum, 3rd Edition, PHI, 2010.
- 2) Operating Systems, Achyut S Godbole, 2nd Edition, McGraw Hill Publications.
- 3) Operating Systems, Internals & Design Principles, William Stalling, 6th Edition, .Pearson Publication,
- 4) Operating System, Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne, 2008
- 5) Operating System, Abraham Silberschatz, Peter Baer Galvin, and
 - a. Greg Gagne, 7th Edition, 2004

B.C.A. Part-I
Semester II-Paper No. III
Course Code –B3 CC

Object Oriented Programming Using C++

WorkLoad-4

Theory-4 Lectures/Week

TotalMarks-100

Theory-70Marks

CCP-30Marks

Preamble:

After completion of this course students will able to –

- 1) Understand object-oriented programming and advanced C++ concept.
- 2) C++ is an object-oriented programming language which gives a clear structure to programs
- 3) Students can design programs based on object, class, inheritance, abstraction, encapsulation, dynamic binding and polymorphism.
- 4) Language is developed as an enhancement of the C language to include object-oriented paradigm

Objective:

The objective of course is to develop programming skills of students, using object oriented programming concepts, learn the concept of class and object using C++ and develop classes for simple applications.

Course content:

Module I - INTRODUCTION TO OOP

- Difference between POP & OOP
- Structure of C++ Program
- Basic Concepts of OOP – Objects, Classes, Data Abstraction and Data Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing
- Benefits & Features of OOP
- Data types, Keywords and Operators
- Control Structure – Conditional and Looping

Module II - OBJECT, CLASSES & CONSTRUCTOR

- Class Definition, Function Definition and Declaration
- Arguments to a Function - Passing Arguments to a Function,

- Default Arguments
- Calling Functions, Inline Functions
- Scope Rules of Functions and Variables
- Member Function Definition – Inside class and Outside the class using scope Resolution Operator
- Accessing Members from Object(S)
- Static Class Members - Static Data Member, Static Member Function
- Array, Array of objects, Array of class members, Advantages and disadvantages of array
- Friend Function and Friend Classes
- Declaration and Definition of a Constructor & Destructor

Module III

- **INHERITANCE**
- Concept of Inheritance
- Base Class & Derived Class
- Types of Inheritance – Single, Multiple, Hierarchical, Multilevel, Hybrid Inheritance
- Dynamic Memory Allocation / Deallocation using New and Delete Operator

Module IV

- **POLYMORPHISM**
- Concept of Polymorphism
- Static Polymorphism and Dynamic (Compile time) Polymorphism
- this pointer
- Pointers to Derived Classes
- Virtual Functions
- Pure Virtual Function

Reference:

- 1) The C++ Programming Language, 4th Edition by Bjarne Stroustrup
- 2) Object Oriented Programming with C++ by E. Balagurusamy
- 3) Let Us C++ by Yashavant P. Kanetkar
- 4) C++: The Complete Reference by Herbert Schildt

B.C.A. Part-I
Semester II-Paper No. IV
Course Code – B4AEC

Financial Accounting with Tally

WorkLoad-4

Theory-4 Lectures/Week

TotalMarks-100

Theory-70Marks

CCP-30Marks

Course Outcomes -

After completion of this course students will able to –

1. Use basic accounting terminology, procedures and systems of maintaining accounting records.
2. Understand financial statements
3. Learn to create company, enter accounting voucher entries and also print financial statements, etc. in Tally.
4. Demonstrate MIS reports in Tally ERP.

Course content:

- Module I - Introduction to Financial Accounting**
- Meaning and Definition of Financial Accounting
 - Objectives of Accounting
 - Various users of Accounting Information
 - Accounting Terminologies
 - Accounting Concepts and Conventions
 - Double entry system
 - Types of Accounts and Golden rules of accounting
 - Books of Prime Entry, Subsidiary Books and Ledger Creation
- Module II - Preparation of Financial Statements**
- Trial Balance – Meaning, Definition, purpose and features, preparation of Trial Balance.
 - Final Accounts – Introduction, Objectives of Final Accounts, Adjustments before Preparing Final Accounts, Preparation of Trading Account, Profit and Loss Account, Balance Sheet.

Module III - Introduction to Tally

- Tally History and Journey, Difference between manual accounting v/s computerised accounting, Tally features,
- Tally Fundamentals - Company Data – Gateway of Tally, Creating and Maintaining a Company, Loading a Company, F11: Company Features, F12: Configuration.
- Voucher Entry
- Inventory - Stock Groups, Stock Categories, Stock Items
- Units of Measurement, Bills of Materials, Batches & Expiry Dates
- Tally on mobile

Module IV - Report Generation in Tally

- Printing – Printing Configuration for vouchers
- Printing reports – Profit and Loss A/C, Balance Sheet, Inventory, Interest Calculations, Day Book etc
- Data Management – Backup & restore, Split a Company, Import Data, Export of Data, E-Capabilities
- Tally ODBC
- Introduction to GST, Objectives of GST, GST Billing – GST Invoice, Issuing of GST, Mandatory Fields in GST, Personalizing GST Invoices, Types of invoices.

Reference:

1. Anthony, RN. and Reece. J.S.: Accounting Principles: Richard Irwin Inc.
2. Gupta. R.L. and Radhaswamy. M: Financial Accounting; Sultan Chand and Sons, New Delhi.
3. Shukla. M.C., Grewal T.S., and Gupta, S.C.: Advanced Accounts: S. Chand & Co. New Delhi.
4. Advance Accountancy:- Maheshwari
5. Advance Accountancy:- R.L. Gupta
6. Computerized Financial Accounting Using Tally - Rajan Chougale.

Web References:

- 1) www.accountingcoach.com
- 2) www.futureaccountant.com

B.C.A. Part-I
Semester II-Paper No. IV
Course Code – B5 AEC

Mathematical Foundations for Computer Applications

WorkLoad–4

TotalMarks–70

Theory–4 Lectures/Week

Preamble :

- 1) Basic knowledge of set theory, functions and relations concepts, matrix needed for designing and solving problems.
- 2) Construct simple mathematical proofs and possess the ability to verify them.
- 3) We can write an argument using logical notation and determine if the argument is valid or is not valid.
- 4) By graph algorithm we can solve problems.

Objectives

- 1) The primary objective of this course is to provide mathematical background and sufficient experience on various topics of discrete mathematics like matrix algebra, logic and proofs, combinatory, graphs, algebraic structures, formal languages and finite state automata.
- 2) This course will extend student's Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

Course content:

- Module I - SETS**
- Introduction.
 - Methods of describing of a set: Tabular form, Set builder form.
 - Finite set, Infinite set, Empty set, Subset, Universal set, Equal sets, disjoint sets, and Complementary set.
 - Operation on Sets: Union of sets, Intersection of sets, Difference of sets, Examples.
 - De Morgan's Laws (without proof).
 - Venn diagram, Examples.

- Cartesian product of two sets, Examples.
Idempotent laws, Identity laws, Commutative Laws, Associative laws, Distributive laws, Inverse laws, Involution laws.
- Duality.
- Computer Representation of sets and its operations.
- Relations and Functions: Introduction, Operations on Functions, Injective, surjective and bijective functions

Module II

- **Logic**
- Definition: Statement (Proposition).
- Types of Statements: Simple and compound statements.
- Truth values of a statement.
- Truth Tables and construction of truth tables.
- Logical Operations: Negation, Conjunction, Disjunction, Implication, Double Implication.
- Equivalence of Logical statements.
- Converse, Inverse and Contra positive.
- Statement forms: Tautology, Contradiction, and Contingency
- Duality, Laws of logic: Idempotent laws, Commutative laws, Associative laws, Identity laws, Involution laws, Distributive laws, Complement laws, De Morgan's laws.
- Argument: Valid and Invalid arguments.
- Examples based on above.

Module III

- **Matrices**
- Introduction.
- Types of matrices: Row matrix, Column matrix, Null matrix, Unit matrix, Square Matrix, Diagonal matrix, Scalar matrix, Symmetric matrix, Skew - symmetric matrix, Transpose of a matrix,
- Definition of Determinants of order 2nd & 3rd and their expansions
3.4 Singular and Non-Singular Matrices
- Algebra of Matrices: Equality of matrices, Scalar Multiplication of matrix, Addition of matrices, Subtraction of matrices, Multiplication of matrices.
- Elementary Row & Column Transformations
- Inverse of Matrix (Using Elementary Transformations)

Module IV

- Examples based on above. Delete Operator
- **Graphs**
- Introduction
- Simple graph, Multi graph, Pseudo Graph
- Digraph 4.4 Weighted Graph
- Degree of Vertex, Isolated Vertex, Pendant Vertex.
- Walk, Path, Cycle.
- Types of Graph: Complete, Regular, Bi-Partite, Complete Bi-partite. 4.8 Matrix Representation of Graph: Adjacency and Incidence Matrix. 4.9 Operation on Graph: Union, Intersection, Complement.
- Examples based on above.

Reference:

1. Discrete Mathematics & Structures by Satinder Bal Gupta, University Science Press
2. Fundamental Approach to Discrete Mathematics by D. P. Acharjya, Sreekumar, New Age International Publishers
3. Discrete Mathematical Structures by Kolman, Busby, Ross, Pearson Education Asia
4. Matrices by Shantinarayan, S. Chand & Co. New Delhi
5. Discrete Mathematics by Schaum Series
6. Discrete Mathematics by K D Joshi
7. David Makinson, -Sets, Logic and Maths for Computing, Springer Indian Reprint, 2011.
8. Kenneth H. Rosen, -Discrete Mathematics and Its Applications, Tata McGraw Hill, 4th Edition, 2002.
9. Trembley, J.P. and Manohar, R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw Hill, New Delhi, 20

B.C.A. Part–I
Semester II-Paper No. V
Course Code – B6 CCL
Lab Course-III Based on B1 CC

WorkLoad-4

TotalMarks–50

Practical–4 Lectures/Week/Batch

Course Outcomes

After completion of this course students will be able to –

- 1) Use MS-Access DBMS and design database
- 2) Perform operations on data using MS access features
- 3) Create company using Tally ERP
- 4) Perform accounting using Tally ERP

List of Practicals:

1. Write procedure for creating database in Ms-Access.
2. Establish relationship between tables and write steps for it.
3. Generate form in Ms-Access and write steps in detail.
4. Create reports using different queries based on multiple tables and write steps in detail for it.
5. Lab assignment based on Case Studies
 - a) Library system:
 - b) HR Management System
 - c) Inventory Management System

Design normalized data structures with appropriate constraints. (at least 5 tables for each system), Design forms, Create different query using query wizard, Create at least 3 reports using report wizard (at least 5 records)
6. Practical's based on Tally ERP
 - a) Company creation, features and configuration
 - b) Ledger creation ,group creation
 - c) Creating masters and recording day to day transactions
 - d) Allocation of tracking expenses and income
 - e) Management of purchase, sales and taxes
 - f) Reports

Scheme of practical evaluation

Internal practical evaluation

50marks

- | | | |
|------|-----------------------|---------|
| i) | Practical | 30marks |
| ii) | Submission of Journal | 10marks |
| iii) | Viva | 10marks |

B.C.A. Part-I
Semester II-Paper No.VI
Course Code – B6 CCL
Lab Course-IV Based on B3 CC

WorkLoad-4

TotalMarks–50

Practical–4 Lectures/Week/Batch

Course Outcomes

After completion of this course students will be able to –

- 1) Understand the difference between the top-down and bottom-up approach
- 2) Describe the object-oriented programming approach in connection with C++
- 3) Apply the concepts of object-oriented programming
- 4) Illustrate the process of data file manipulations using C++

List of Practicals:

1. Write a simple program (without Class) to use of operators in C++.
2. Illustrating Control Structures.
3. Write a program to create a class and creating an object.
4. Illustrating different Access Specifiers.
5. Write a oop program to demonstrate static data member.
6. Demonstrate arguments to the function.
7. Illustrating inline function.
8. Define Member function-outside the class using Scope Resolution Operator.
9. Illustrating friend class and friend function.
10. Create constructors – default, parameterized, copy.
11. Destructor.
12. Dynamic Initialization of Object.
13. Illustrating Inheritance – single, multiple and multilevel.
14. Perform static and dynamic polymorphism.
15. Demonstrate virtual & pure virtual function

Scheme of practical evaluation

Internal practical examination

50marks

i)	Practical	30marks
ii)	Submission of Journal	10marks
iii)	Viva	10marks