

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Bachelor of Arts /Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

(Semester I- IV)

(Under Continuous Evaluation System)

(12+3 System of Education)

Session: 2025-26

Batch: 2023-26



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

DSCs - FOUR YEAR DEGREE PROGRAMME

Bachelor of Arts Honours / Bachelor of Science (Economics) Hons.

COMPUTER APPLICATIONS (VOCATIONAL)

Session 2025-26

Bachelor of Arts Honours / Bachelor of Science (Economics) Hons. Semester-I											
Program Name	Course Code	Course Title	Course Type	Hours per week	Credit		Marks			Examination Time (in Hours)	
				L-T-P	L-T-P	Total	Total	Ext.			C A
								L	P		
Bachelor of Arts Sem- I	BARM-1124	Computer Applications (Vocational)	DSC	3-0-2	3-0-1	4	100	40	30	30	3+3
Bachelor of Science (Economics)- Sem I	BECM-1124	(Computer Fundamentals and PC Software)	DSC								

Bachelor of Arts Honours/ Bachelor of Science (Economics) Hons. Semester-II											
Program Name	Course Code	Course Title	Course Type	Hours per week	Credit		Marks			Examination Time (in Hours)	
				L-T-P	L-T-P	Total	Total	Ext.			CA
								L	P		
Bachelor of Arts Sem- II	BARM-2124	Computer Applications (Vocational)	DSC	3-0-2	3-0-1	4	100	40	30	30	3+3
Bachelor of Science (Economics)- Sem II	BECM-2124	(Introduction to Programming using Python)	DSC								

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

Session 2025-26

Bachelor of Arts / Bachelor of Science (Economics) Semester-III											
Program Name	Course Code	Course Title	Course Type	Hours per week	Credit		Marks			Examination Time (in Hours)	
				L-T-P	L-T-P	Total	Total	Ext.			CA
								L	P		
Bachelor of Arts Sem- III	BARM-3124	Computer Applications (Vocational)	E	3-0-2	3-0-1	4	100	40	30	30	3+3
Bachelor of Science (Economics)- Sem III	BECM-3124	(Operating System)	E								

Bachelor of Arts / Bachelor of Science (Economics) Semester-IV											
Program Name	Course Code	Course Title	Course Type	Hours per week	Credit		Marks			Examination Time (in Hours)	
				L-T-P	L-T-P	Total	Total	Ext.			CA
								L	P		
Bachelor of Arts Sem- IV	BARM-4124	Computer Applications (Vocational)	E	3-0-2	3-0-1	4	100	40	30	30	3+3
Bachelor of Science (Economics)- Sem IV	BECM-4124	(Relational Database Management Systems)	E								

Bachelor of Arts / Bachelor of Science(Economics) Semester I

Session 2025-26

COURSE CODE: BARM-1124

BECM-1124

**COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)**

Course Outcomes:

After passing this course the student will be able to:

CO1: comprehend about computer hardware, operating system concepts and various system software.

CO2: Identify various input, output and memory devices.

CO3: Apply office automation software to create professional and academic documents.

CO4: Apply skills to make effective presentations using associated application software.

Bachelor of Arts / Bachelor of Science(Economics) Semester I

Session 2025-26

COURSE CODE: BARM-1124

BECM-1124

**COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)
(THEORY)**

Examination Time: 3 Hrs.

Max. Marks: 100

L-T-P: 3-0-1

Theory: 40

Credits: 4

Practical: 30

CA: 30

Instructions for Paper Setter -

Eight questions of equal marks (08 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), type of Software, Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input and Output Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader), Monitor, Printers (laser printer, dotmatrix printer, ink jet printer).

Memories: Primary Memory-RAM and ROM. **Secondary Memory** - Hard Disk, CD, DVD. Introduction to Windows based operating system and Desktop icons.

UNIT III

Word Processing: Introduction to word, Parts of window of word (Title bar, menu bar, status bar, and ruler), Understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns in table. Adding picture, page colors and Watermarks, Borders and shading, Templates, wizards, Mail Merge.

UNIT IV

PowerPoint: Introduction to PowerPoint, Exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds. Using a pick look Wizards to change format.

References:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
4. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
5. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.

Note: The latest editions of the books should be followed.

Bachelor of Arts / Bachelor of Science(Economics) Semester I

Session 2025-26

COURSE CODE: BARM-1124

BECM-1124

**COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)
(PRACTICAL)**

Examination Time: 3 Hrs.

Max. Marks: 100

L-T-P: 3-0-1

Theory: 40

Credits: 4

Practical: 30

CA: 30

Instructions for the examiners: - Two questions of equal marks strictly as per the syllabus and based on the practical exercises covered in the semester. Questions may be subdivided into parts (not exceeding four). Candidates will attempt ONE question, explain their answer by writing on the answer sheet, and then implement the same on the computer. Examiner will evaluate both the answers (theory as well as practical). The viva should also be conducted alongside, and the student is asked viva questions related to the question and the solution he/she is working on during the exam.

Students will prepare a report after analyzing print and social media advertisements along with the local market survey to understand the desktop/laptop vendors and prices. Arrange the options available as per price/performance preferences.

Lab exercises based on:

- Practice the Windows Operating System command line and the GUI for user interaction, personalization, and file management
- Document preparation with Word using the features mentioned in the syllabus
- Presentation preparation with PowerPoint using the features mentioned in the syllabus

Bachelor of Arts / Bachelor of Science (Economics) Semester II

(Session 2025-26)

COURSE CODE: BARM-2124

BECM-2124

**COMPUTER APPLICATIONS (VOCATIONAL)
(INTRODUCTION TO PROGRAMMING USING PYTHON)**

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the working of various programming constructs involved in Python Programming.

CO2: Apply various operators and control sequence of program using various control statements.

CO3: Apply programming concepts such as list, tuples, dictionaries, functions and strings to provide solution in different problem domains.

CO4: Perform debugging and exception handling.

Bachelor of Arts / Bachelor of Science(Economics) Semester II

Session 2025-26

COURSE CODE: BARM-2124

BECM-2124

**COMPUTER APPLICATIONS (VOCATIONAL)
(INTRODUCTION TO PROGRAMMING USING PYTHON)**

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 40

L-T-P: 3-0-1

Practical: 30

Credits: 4

CA: 30

Instructions for Paper Setter -

Eight questions of equal marks (08 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Problem Solving, Problem Analysis, Concept of writing an algorithm, drawing a flowchart, developing a program.

Introduction to Python: Python's features, Story behind the name, Python versions, Execution environments: the Python Interpreter and IDEs (e.g. PyCharm or VSCode), Getting and Setting up Python.

Python program structure: Writing your first "Hello World" program; creating, saving and executing a program; comments, Indentation.

UNIT II

Data and Expressions: Literal Constants, numbers, strings – immutable strings, quotes, the escape sequence, the format methods. Variables and Identifiers, data-types, object,

Operators & Expressions: shortcuts, evaluation order, Boolean Expressions (Conditions), Logical Operators. User Input/output.

Control Flow: Selection Control, Nested conditions, Loops, break and Continue Statements, Data Structures: list, tuple, dictionary and set; basic operations e.g. creating, indexing, slicing, membership

UNIT III

Functions: defining and calling functions, passing and returning values, local and global variables, recursive functions, Iteration vs. Recursion.

Modules: purpose and usage, the import statement, from – import statement, the `__main__` attribute, creating a module and importing, the `dir()` function.

Handling Exceptions: try..catch and with statements, errors, debugging.

UNIT IV

Files and Strings: Opening Files, Using Text Files, Reading files, Writing files, Understanding read functions, Understanding write functions.

Introduction to numpy and pandas for data processing.

References:

1. Yashavant Kanetkar, Aditya Kanetkar, Let Us Python-6th Edition, BPB Publications.
2. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, Wiley Publications.
3. Martin C. Brown, Python: The Complete Reference, Indian Edition, McGraw Hill Education (India) Private Limited
4. Mark J. Guzdial, Introduction to Computing and Programming in Python, Pearson Education.

Note: The latest editions of the books should be followed.

Bachelor of Arts / Bachelor of Science(Economics) Semester II

Session 2025-26

COURSE CODE: BARM-2124

BECM-2124

**COMPUTER APPLICATIONS (VOCATIONAL)
(INTRODUCTION TO PROGRAMMING USING PYTHON) (PRACTICAL)**

Examination Time: 3 Hrs.

Max. Marks: 100

L-T-P: 3-0-1

Theory: 40

Credits: 4

Practical: 30

CA: 30

Instructions for the examiners: - Two questions of equal marks strictly as per the syllabus and based on the practical exercises covered in the semester. Questions may be subdivided into parts (not exceeding four). Candidates will attempt ONE question, explain their answer by writing on the answer sheet, and then implement the same on the computer. Examiner will evaluate both the answers (theory as well as practical). The viva should also be conducted alongside, and the student is asked viva questions related to the question and the solution he/she is working on during the exam.

Programming exercises based on:

- Use the Python interactive interpreter
- Getting familiar with a Python IDE
- Python fundamentals, data types, operators
- Operators, flow control using if, else and elif, While statement, loops using For, Loop Patterns
- Implementation of different collections like list, tuple and dictionary and their various functions
- Demonstrating creation of functions, passing parameters and return values
- Working with modules
- Handling Exceptions
- Implementation of reading, writing and organizing files
- Basic numpy and pandas functions

Bachelor of Arts / Bachelor of Science(Economics) Semester III

Session 2025-26

COURSE CODE: BARM-3124
BECM-3124

**COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM)**

Course Outcomes:

After passing this course the student will be able to:

CO1: Describe, contrast and compare different types of Operating System.

CO2: Analyze CPU scheduling and memory management policies.

CO3: Comprehend about deadlock along with its prevention and detection.

CO4: Apply commands to perform various tasks in Linux operating system.

Bachelor of Arts / Bachelor of Science(Economics) Semester III

Session 2025-26

COURSE CODE: BARM-3124

BECM-3124

**COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM)
(THEORY)**

Examination Time: 3 +3 Hrs.

Max. Marks: 100

L-T-P: 3-0-1

Theory: 40

Credits: 4

Practical:30

CA: 30

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to Operating System, Types of Operating systems: Multiuser, Multitasking and Multiprogramming, Functions of Operating System, Booting a System, Language Processors: Compiler, Assembler, Interpreter, Linker and Loader.

UNIT-II

CPU Scheduling: Basic concepts, Scheduling Algorithms, Evaluation: Turnaround Time, Waiting Time.

Memory Management: Logical address space and physical address space, schemes.

Introduction to File Management, I/O Device Management, Data Management.

UNIT-III

Deadlocks: System Model, Deadlock characterization, Methods for handling deadlocks, Deadlocks Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Approach to Deadlock handling.

UNIT-IV

Linux: Introduction, Features, Architecture of linux (Kernel, Shell)

Linux Commands: cat, cd, chmod, chown,cp, ls, mkdir, mv, rmdir, rm,mv, sort, ln,df, echo, exit, find, free, whoami, grep ,cal, who, pwd.

Introduction to Vi Editor, **commands:** opening, inserting, modifying, deleting and saving files.

References:

1. AviSilberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, Wiley, 2013.
2. Charles Crowley, Operating Systems: A Design-Oriented Approach, Tata McGraw Hill, 2001.
3. Deitel, An Introduction to Operating Systems, Second Edition, Addison Wesley, 1990.
4. William Stallings, Operating Systems: Internals and Design Principles, Pearson Education Limited, 2014.
5. Anshuman Sharma, Fundamentals of Operating System, Lakhanpal Publishers, 2nd Edition.

Note: The latest editions of the books should be followed.

Bachelor of Arts / Bachelor of Science(Economics) Semester III

Session 2025-26

**COURSE CODE: BARM-3124
BECM-3124**

**COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM)
(PRACTICAL)**

Examination Time: 3 +3 Hrs.

Max. Marks: 100

L-T-P: 3-0-1

Theory: 40

Credits: 4

Practical: 30

CA: 30

Practical based on Operating System.

Bachelor of Arts / Bachelor of Science(Economics) Semester IV

(Session 2025-26)

COURSE CODE: BARM-4124

BECM-4124

**COMPUTER APPLICATIONS (VOCATIONAL)
(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)**

Course Outcomes:

After passing this course the student will be able to:

CO1: Illustrate the concept of data models, database normalization along with its various forms.

CO2: Apply SQL to design basic to intermediate level of databases.

CO3: Apply various built-in functions for formatting of data.

CO4: Comprehend the concept of PL/SQL and its relationship with SQL.

Bachelor of Arts / Bachelor of Science(Economics) Semester IV

(Session 2025-26)

COURSE CODE: BARM-4124

BECM-4124

**COMPUTER APPLICATIONS (VOCATIONAL)
(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)**

(THEORY)

Examination Time: 3 +3 Hrs.

Max. Marks: 100

Theory: 40

L-T-P: 3-0-1

Practical:30

Credits: 4

CA: 30

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Basic Concepts: An overview of Database Management, (database, database system, why database). An architecture for a database system (levels of the architecture, mapping, data independence), DBA, Definition of CODD's Rules.

Normalization of Data: First, Second and Third Normal form, **Database Models:** Hierarchical, Network, Relational, Introduction to Relational database systems.

UNIT II

ORACLE: Introduction to Oracle, **Data Types:** Char, numbers, varchar, varchar2, date, long.

DDL Commands of SQL: Create Tables, Constraints, Alter Table, Drop Table, Rename.

Data Manipulation Language: Insert Into, Update Statement, Delete Statement, Select statement (Select distinct, Select from where, Select from where order by, Select group by clause, Select Group by having clause).

Transaction Control Language: Rollback, Savepoint, Commit.

UNIT III

Built in Functions- Aggregate Functions (Sum, Avg, max, min, count), Character Functions (Lower, Upper, Length, Substr, RPAD, LPAD), Arithmetic Functions (Round, Trunc, Sqrt, Mod, Abs, Sine) Date and Time Functions and Other Miscellaneous Functions (Add-months, Month-between, NVL, NVL2, decode) & Conversion Functions (to-char,to-number, to-date).

Join methods and Sub query, Union, Intersection, Minus, Views.

UNIT IV

PL/SQL: Introduction to PL/SQL, Relationship between SQL & PL/SQL, Advantages, block structure, Valuable and Constant declaration, Declaration using variable attributes - %type, %rowtype, control statements.

References:

1. Silberschatz, Korth&Sudarshan, Database Systems Concepts, McGraw-Hill Inc.(2020), 7th edition.
2. C.J. Date, An Introduction of Database System, Addison-Wesley Publishing co. (2003), 8th edition.
3. Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publishers (2016), 4th edition.
4. Ivan Bayross, SQL/PL/SQL. The Programming Language of Oracle, BPB Publications(2010), 4th edition.
5. RamezElmasri and ShamkantNavathe, Fundamentals of Database Systems, Pearson Education (2015), 7th edition.
6. P.S. Gill, Database Management Systems, Dreamtech Press (2019), 2th edition.

Bachelor of Arts / Bachelor of Science(Economics) Semester IV

(Session 2025-26)

COURSE CODE: BARM-4124

BECM-4124

COMPUTER APPLICATIONS (VOCATIONAL)

(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)

(PRACTICAL)

Examination Time: 3 +3 Hrs.

Max. Marks: 100

Theory: 40

L-T-P: 3-0-1

Practical:30

Credits: 4

CA: 30

Practical on Relational Data Base Management System.