FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Bachelor of Arts / Bachelor of Science (Computer Science)

(Semester I-IV)

(Under Continuous Evaluation System)
(12+3 System of Education)

Session: 2019-20

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Scheme of Studies and Examination
Session 2019-20
Bachelor of Arts / Bachelor of Science (Computer Science)

Semester I								
Course Name	**Program Name**	**Course Code**	**Course Type**	**Marks**				**Examination time (in Hours)**
				Total	**Ext.**		**CA**	
					L	**P**		
Computer Science (Computer Fundamentals & PC Software)	B.A-Sem I B.Sc(CS).- Sem I B.Sc(Eco.)-Sem I	BARM-1134 BCSM-1134 BECM-1134	E C E	100	50	30	20	3+3

Semester II								
Course Name	**Program Name**	**Course Code**	**Course Type**	**Marks**				**Examination time (in Hours)**
				Total	**Ext.**		**CA**	
					L	**P**		
Computer Science (Programming in C)	B.A Sem II B.Sc.- Sem II B.Sc(Eco.)-Sem I	BARM-2134 BCSM-2134 BECM-2134	E C E	100	50	30	20	3+3

Semester - III								
Course Name	**Program Name**	**Course Code**	**Course Type**	**Marks**				**Examination time (in Hours)**
				Total	**Ext.**		**CA**	
					L	**P**		
Computer Science (Computer Oriented Numerical And Statistical Methods)	B.A-Sem III B.Sc(CS).- Sem III B.Sc(Eco.)-Sem III	BARM-3134 BCSM-3134 BECM-3134	E C E	100	50	30	20	3+3

Semester - IV								
Course Name	**Program Name**	**Course Code**	**Course Type**	**Marks**				**Examination time (in Hours)**
				Total	**Ext.**		**CA**	
					L	**P**		
Computer Science (Data Structures & Programming Language Using C++)	B.A Sem IV B.Sc.- Sem IV B.Sc(Eco.)-Sem IV	BARM-4134 BCSM-4134 BECM-4134	E C E	100	50	30	20	3+3

Bachelor of Arts / Bachelor of Science (Computer Science)

Session 2019-20

SEMESTER- I
Course Code: BARM-1134
BCSM-1134
BECM-1134

COMPUTER FUNDAMENTALS & PC SOFTWARE
(THEORY)

Course Outcomes:
After passing this course the student will be able to:

CO1: have knowledge of Computer components - hardware and software.
CO2: use computer system for general tasks at user level, including operative systems and programming environments.
CO3: learn the basics of Operating System and Programming environment.
CO4: gain knowledge on office automation software and recognise when to use a particular office program to create professional and academic documents.
CO5: analyse, design and implement solutions to various problems using algorithms, flowcharts, decision tables and psuedocodes.

Bachelor of Arts / Bachelor of Science (Computer Science)

Session 2019-20

SEMESTER- I
Course Code: BARM-1134
BCSM-1134
BECM-1134

COMPUTER FUNDAMENTALS & PC SOFTWARE
(THEORY)

Time: 3+3 Hrs

Max Marks : 100
Theory : 50
Practical : 30
CA : 20

Instructions for Paper Setter -
Eight questions of equal marks are to 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

1. Introduction to computer and its uses: milestones in hardware and software. Batch oriented/Online/real time application.
2. Computer as a system: basic concepts: stored programs, functional units and their inter–relation: communication with the computer.
3. Data storage devices and media: primary storage: storage addressed, and capacity, type of memory: secondary storage; magnetic tape – data representation and R/W: magnetic disc, fixed & removable, data representation and R/W, floppy disc drives, Winchester disc drive, conventional disc drives, Data organization, Compact Disc.

UNIT -II

1. Input/Output devices: Key–tape/diskette devices, light pen mouse and joystick, source data automation (MICR, OMR, and OCR), screen assisted data entry; portable/hand held terminals for data collection, vision input system.
2. Printed output: Serial, line, page, printers; plotters, visual output; voice response units.

UNIT–III

Introduction to Windows based operating system and Desktop icons

UNIT–IV

MS–Word:

Introduction to Word, Introduction to Parts of Word Window (Title Bar, Menu Bar, Tool Bar, The Ruler, Status Area), Page Setup, Creating New Documents, Saving Documents, Opening an Existing documents, insert a second document into an open document, Editing and formatting in document, Headers and Footers, Spell Checking, Printing document, Creating a Table Using the Table Menu and table formatting, Borders and Shading, Templates and Wizards, Mail Merge

MS Power Point:

Introduction to MS Power point, Power point elements, Templates, Wizards, Views, Exploring Power Point Menu, Working with Dialog Boxes, Adding Text, Adding Title, Moving Text Area, Resizing Text Boxes, Adding Art, Starting a New Slide, Starting Slide Show, Saving presentation; Printing Slides, Views (View slide sorter view, notes view, outlines view) Formatting and enhancing text formatting, Creating Graphs (Displaying slide show and adding multi–media).

References:

1. R.K. Taxali: Introduction to Software Packages, GalgotiaPublicaions.
2. MS–Office Compiled by SYBIX
3. MS–Office BPB Publications.
4. Introduction to Computer by P.K. Sinha
5. Windows Based Computer Courses by Gurvinder Singh &Rachpal Singh, Kalyani Publishers.

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SEMESTER- I
Course Code: BARM-1134
BCSM-1134
BECM-1134

COMPUTER FUNDAMENTALS & PC SOFTWARE (PRACTICAL)

Practical based on Computer Fundamental & PC Software
Windows, MS Word, Power Point

Bachelor of Arts / Bachelor of Science (Computer Science)

Session 2019-20

SEMESTER- II

Course Code: BARM-2134
BCSM-2134
BECM-2134

PROGRAMMING IN C
(THEORY)

Course Outcomes:
After passing this course the student will be able to:

CO1:Understand problem solving techniques.
CO2:Write different algorithms to solve programming problems.
CO3:Write C Code for given problem.
CO4:Read, Understand, Trace the execution of C Programs.
CO5:Understand different programming elements like Functions, Arrays, Pointers, Structures and File handling

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Session 2019-20

SEMESTER- II

Course Code: BARM-2134
BCSM-2134
BECM-2134

PROGRAMMING IN C
(THEORY)

Time: 3+3 Hrs

Max Marks : 100
Theory : 50
Practical : 30
CA : 20

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Instructions for Paper Setter -
Eight questions of equal marks are to 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

Data Representation, Introduction to Number Systems and Character Codes, Flow Charts, Problem Analysis, decision tables, pseudo codes and, algorithms.

UNIT–II

Programming Languages C:

Basics of C: Introduction to C, Applications and Advantages of C, Tokens, Types of Errors
Data Types: Basic & Derived Data Types, User Defined Data Types, Declaring and initializingvariables.

Operators and Expressions: Types of operators (Unary, Binary, Ternary), Precedence andAssociativity
Data I/O Functions: Types of I/O function, Formatted & Unformatted console I/O Functions

UNIT–III

Control Statements: Jumping, Branching and Looping–Entry controlled and exit controlled, Advantages/Disadvantages of loops, difference between for, while and do–while.

Arrays: Types of Arrays, One Dimensional and Two Dimensional Arrays.

Strings: Introduction to Strings and String functions, array of strings.

UNIT-IV

Functions: User Defined & Library Function, Function (Prototype, Declaration, Definition),Methods of passing arguments, local and global functions, Recursion.

Storage Classes: Introduction to various storage classes, scope and lifetime of a variable, Storage class specifiers (auto, register, static, extern), advantages and disadvantages.

Structure and Union: Introduction to structure and union, pointers with structure.

Books Suggested:

(i) Programming with C Languages C. Schaum Series.
(ii) YashwantKanitkar – Let Us C
(iii) C Programming by Stephen G Kochan
(iv) Balaguruswamy: “Programming in ANSIC”.

Bachelor of Arts / Bachelor of Science (Computer Science)

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SEMESTER- II

Course Code: BARM-2134
BSEM-2134
BECM-2134

PROGRAMMING IN C
(PRACTICAL)

Practical based on Programming in C

Bachelor of Arts / Bachelor of Science (Computer Science) - SEMESTER–III

(Session 2019-20)

COURSE CODE: BARM-3134
BCSM-3134
BECM-3134

COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS (THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand numerical methods, non linear equations, interpolation methods and Simultaneous Solution of Equations.

CO2: Learn about Interpolation and Curve Fitting and Numerical differentiation.

CO3: Learn Correlation, Regression, Bivariate & Multivariate distribution and Interpretation of Trend Analysis.

Bachelor of Arts / Bachelor of Science (Computer Science) - SEMESTER–III

(Session 2019-20)

COURSE CODE: BARM-3134
BCSM-3134
BECM-3134

COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS (THEORY)

Time: 3+3 Hrs

Max Marks : 100
Theory : 50
Practical : 30
CA : 20

Instructions for Paper Setter -

Eight questions of equal marks are to 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:

1 Numerical methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.

2 Non-linear Equations, Iterative Solutions, Multiple roots and other difficulties, Interpolation methods, Methods of bisection, False position Method, Newton Raphson-method.

3 Simultaneous Solution of Equations, Gauss Elimination Method Gauss Jordan method. Gauss Siedel Method, Matrix Inversion Method.

UNIT–II

4 Interpolation and Curve Fitting, Lagrangian Polynomials, Newton's Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.

5 Numerical Integration and Different Tryaperzoidal Rule, Simpson's 1/3 Rule Simpson's 3/8 Rule. Numerical differentiation by Polynomial Fit Statistical Techniques

UNIT-III

1 Measure of Central Tendency, Preparing frequency distribution table, Mean Arithmetic, Mean geometric, Mean harmonic, Mean median Mode.

2 Measure of dispersion, Skewness and Kurtosis Range, Mean deviation, Standard deviation, co-efficient of variation, Moments Skewness Kurtosis.

UNIT–IV

1. Correlation Bivariate Distribution Multivariate distribution.
2. Regression B.C., Linear Regression, Multiple Regression.
3. Trend Analysis least square fit linear trend, Non-linear trend

Y=axb

Y=abx

Y=acx

Polynomial fit: Y=a+alX+ea^2x2+a^nxn+n

References

1 B.S. Grewal: Numerical Methods for Engineering, Sultan Chand Publications.
2 V. Rajaraman: Computer Oriented Numerical Methods, Prentice Hall of India Private Ltd., New Delhi.

Bachelor of Arts / Bachelor of Science (Computer Science) - SEMESTER–III

(Session 2019-20)

COURSE CODE: BARM-3134
BCSM-3134
BECM-3134

COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS LAB (PRACTICAL)

Practical based on Computer Oriented Numerical and Statistical Methods

Bachelor of Arts / Bachelor of Science (Computer Science) - SEMESTER–IV

(Session 2019-20)

COURSE CODE: BARM-4134
BCSM-4134
BECM-4134

DATA STRUCTURES & PROGRAMMING LANGUAGE USING C++ (THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Get familiarize with basic data structures and Analyze algorithms to determine their efficiency.

CO2: Handle operations on various data structures.

CO3: Choose appropriate data structures according to real world problems.

CO4: Learn basics of Object oriented Programming Paradigm.

Bachelor of Arts / Bachelor of Science (Computer Science) - SEMESTER–IV

(Session 2019-20)

COURSE CODE: BARM-4134
BCSM-4134
BECM-4134

DATA STRUCTURES & PROGRAMMING LANGUAGE USING C++ (THEORY)

Time: 3+3 Hrs

Max Marks : 100
Theory : 50
Practical : 30
CA : 20

Instructions for Paper Setter -

Eight questions of equal marks are to 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

Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time-Space Trade off between Algorithm.

Arrays: Array Defined, Representing Arrays in memory, various operations on linear arrays, Multi Dimensional arrays.

Linked Lists: Types of Linked Lists, representing linked list in memory, advantages of using linked lists over arrays, various operations of linked lists.

UNIT–II

Stacks: Description of STACK structure, Implementation of stack, using arrays and linked lists, application of stack-converting Arithmetic expression from infix notational to polish and their subsequent evaluation, quicksort technique to sort an array.

Queues: Description of queue structure, Implementation of queue using arrays and linked lists, description or priorities of queues, deques.

Sorting and Searching: Sorting Algorithms, bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort, searching Algorithms, linear search and binary search.

UNIT–III

Object Oriented Programming: Objects & Classes, Constructor & Destructor, Operator Overloading, Overloading unary operators, Overloading binary operators, Data conversion, Pitfalls of operator overloading and conversion.

UNIT-IV

Inheritance, Derived class and base class, Derived class constructor. Overloading member functions, Inheritance in the English distance class, class hierarchies, Public & Private inheritance, Level of inheritance, Polymorphism, problems with single inheritance, multiple inheritance

References:

1. Seymour Lischutz, Theory and Problems of Data Structures.
2. Schaum's Outline Series, McGraw Hill Company.
3. Tanenbaum, Data Structure Using C++

Bachelor of Arts / Bachelor of Science (Computer Science) - SEMESTER–IV

(Session 2019-20)

COURSE CODE: BARM-4134
BCSM-4134
BECM-4134

DATA STRUCTURES & PROGRAMMING LANGUAGE USING C++ LAB (PRACTICAL)

Practical based on Data Structures & Programming Language Using C++