UNIVERSITY OF KOTA, KOTA
BACHELOR OF COMPUTER APPLICATION (BCA) Exam.- 2022-23
(Applicable for students admitted in Session 2022-23)

1. **Eligibility:** The basic eligibility for admission to the course is 10+2 in any discipline with minimum 45% marks, 4% relaxation in marks will be given to the SC /ST/OBC (except creamy layer) / SOBC / PH candidates. The admission in the course is based on merit of XII class. Reservation policy will be applicable as per the state government rules.
2. **Selection** : Based on merit in qualifying examination.

1. Scheme of Instruction:

Each year shall be of ten months (150 working days) duration. Details of lecture hours per week shall be as follows:

Theory: Three hours/week for each Paper

Practical: Students are required to work in the Laboratory for 4 hours per week for each practical under faculty guidance.

2. Examination Scheme:

1. University shall conduct examinations only after completion of 150 working days of instruction in a year.
2. Each theory paper shall be of 100 marks (75 marks for written examination of 3 hrs duration and 25 marks for internal assessment).
3. Each practical paper shall be of 100 marks.
4. The internal marks will be awarded by committee consisting of Head of the Department & the faculty concerned.
5. The student have to pass internal and external exam separately theory as well as practical papers.

Theory:

1. **Assignments:** 40% of the internal assessment marks for each theory paper will be awarded on the basis of performance in the assignments regularly given to the students, and its records.
2. **Internal Examination:** 40% of the total Internal Assessment marks for each theory paper will be awarded on the basis of performance in written examination conducted by the faculty, one at the end of fourth month and another at the end of eighth month.
3. **Seminar/Oral examination:** 10% of the total internal assessment marks for each paper will be awarded on the basis of performance either in a seminar or internal viva-voce.
4. **Overall performance:** 10% of the total internal assessment marks will be awarded for each paper on the basis of performance and conduct in the classroom.

Practical :

1. **Project**: 80% of the total Internal Assessment Marks for each practical paper during I & II year will be awarded on the basis of project, its presentation and project report submitted by the students. This activity can be held in the team of maximum two students. There should be a project co-ordinator (faculty member of computer science department).
2. **Internal examination:** 10 % of the total Internal Assessment marks for each practical paper during I & II year will be awarded on the basis of performance in practical examination conducted by the faculty, once during the session. In III year it will be 80%.
3. **Overall performance:** 10 % of the total internal assessment marks will be awarded during I & II year for each practical paper on the basis of performance and conduct of the student in the practical lab. In III year it will be 20%.

BCA -103: Problem Solving through C Programming

Time: 3 Hrs.   **Max. Marks: 100**

UNIT- I

Algorithm and algorithm development: Definition and properties of algorithm, flow chart symbols, example of simple algorithms. Program design, errors: syntax error and semantic error, debugging, program verification, testing, documentation and maintenance.

Variable names, data type and sizes, constants, declarations, arithmetic operators, relational and logical operators, type conversions, increment and decrement operators, bitwise operators, assignment operators and expressions, precedence and order of evaluation, standard input and output statements.

UNIT- II

Control Flow: Statements and blocks, if-else, nested if, switch, looping statement: while, for, do-while, break and continue, go-to and labels.

Arrays : declarations, integer and character array, reading and writing an array, one and two dimensional array, operations on arrays.

UNIT – III

Functions and Program Structure: Basics of function, function definition and declaration, external variables, scope rules, header files, static variables, register variables, block structure, initialization, recursion, the C preprocessor.

Pointer : Pointers and addresses, pointers and function arguments, address arithmetic. Character pointers, pointers to pointers, Pointers to functions.

UNIT - IV

Structures: Basics of structures, structures and functions, arrays of structures, pointers to structures, self-referential structures, typedef, unions.

UNIT - V

File Handling: access methods, different file operations and functions, concept of text & Binary files, file I/O, command line argument, formatted file input and output.

Text / Reference Books

1. Computer science Volume I and II, Deendayalu R., Second Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Fundamentals of computers, Rajaraman V., Second Edition, Prentice Hall of India Private Limited, New Delhi.
3. The C Programming Language, Kernighan B.W. and Ritchie D.M., Prentice Hall of India Private Limited, New Delhi.
4. How to solve it by computers. Dromey R., Prentice Hall of India Private Limited, New Delhi.
5. Programming with C, E. Balaguruswamy, PHI

BCA-105 PC Software Packages

Time: 3 Hrs.   **Max. Marks: 100**

UNIT – I

DOS: Introduction, history & versions of DOS, DOS basics- Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files, DOS commands: internal & external.

UNIT – II

GUI Based OS: Concepts, Features, Structure, Desktop, Taskbar, Start Menu, My Computer, Recycle Bin, Accessories- Calculator, Notepad, Paint, Word-pad, Character Map, Explorer, Entertainment, Managing Hardware & Software- Installation of Hardware & Software, Using Scanner, System Tools, Communication, Sharing Information between programs.

UNIT – III

Word Processing: Features, Creating, Saving and Opening Documents in Word, Interface, Toolbars, Ruler, Menus, Keyboard Shortcut, Editing, Previewing, Printing & Formatting a Document, Advanced Features of MS Word, Find & Replace, Using Thesaurus, Using Auto- Multiple Functions, Mail Merge, Handling Graphics, Tables & Charts, Converting a word document into various formats like- Text, Rich Text format, Word perfect, HTML etc.

UNIT – IV

Worksheet: Worksheet basics, creating worksheet, entering into worksheet, heading information, data, text, dates, alphanumeric values, saving & quitting worksheet, Opening and moving around in an existing worksheet, Toolbars and Menus, Keyboard shortcuts, Working with single and multiple workbook, working with formulae & cell referencing, Auto sum, Copying formulae, Absolute & relative addressing, Worksheet with ranges, formatting of worksheet, Previewing & Printing worksheet, Graphs and charts, Database, Creating and Using macros, Multiple worksheets- concepts, creating and using.

UNIT – V

Introduction to Power Point: Creating slide show with animations, Designing Presentations.
Case Study of web editing tool and DBMS tool such as: Front Page, Ms-Access Creating & using databases in Access.

Text / Reference Books

1. Introduction to computers by P.K. Sinha & Priti Sinha, BPB Publication, 1992.
2. Microsoft 2000, 8 in 1 by Joe Habraken, PHI
3. Window XP Computer Reference , BPB Publication.
4. IT Tools and Applications by A. Mansoor, Pragya Publications, Mathura.
5. DOS Quick Reference by Rajeev Mathur, Galgotia Publications.
6. Ms Office XP Computer, BPB Publications.

BCA 202: Database Management System

Time: 3 Hrs.   **Max. Marks: 100**

Unit –I

Introduction : Purpose of the data base system, data abstraction, data model, data independence, data definition language, data manipulation language, data base administrator, data base users, overall structure.

Unit –II

ER Model : entities, mapping constrains, keys, E-R diagram, reducing E-R diagrams to tables, generation, aggregation, design of an E-R database scheme.

Unit –III

Relational Model : The catalog, base tables and views. Relational Data Objects **-** Domains and Relations: Domains, relations, kinds of relations, relations and predicates, relational databases.
Relational Data Integrity - Candidate keys and related matters: Candidate keys. Primary and alternate keys. Foreign keys, foreign key rules, nulls. Candidate keys and nulls, foreign key and nulls.

Unit –IV

The SQL Language: Data definition, retrieval and update operations. Table expressions, conditional expressions, embedded SQL.
Views: Introduction, what are views for, data definition, data manipulation, SQL support.

Unit –V

File and system structure : overall system structure, file organisation, logical and physical file organization, sequential and random, hierarchical, inverted, multi list, indexing and hashing, B-tree index files.

Text / Reference Books

1. Date C.J., Database Systems, Addision Wesley.
2. Korth, Database Systems Concepts, McGraw Hill.
3. Database Management System, Ramakrishna, Gehkre, McGraw – Hill
6. Database management systems, Leon alexis, leon Mathews, "Vikash publication
7. Database system, Rob, coronel, 7th edition, Cengage Learning.

BCA 204: Data Structures

Time: 3 Hrs   Max. Marks: 100

Unit I

Introduction: structure and problem solving, algorithmic notation, Data Structure, Algorithms and sub algorithms, introduction to algorithm analysis for time and space

Unit II

Primitive and non primitive data structure concept, representation and manipulation of strings, concept and terminology for non primitive data structure, concept of arrays, stacks, queues. Basic operations on arrays, stacks & queues.

Unit III

Linear data structures and their linked storage representation: pointers and linked allocation, linked linear list, singly linked list, application of linked linear lists.

Unit IV

Non Linear data structure: Trees, types of trees, Graphs and their representations, applications of graph.

Unit V

Sorting and searching: concept of sorting and searching, selection sort, bubble sort, merge sort, binary search

Text / Reference Books

1. An Introduction to Data Structures with Applications, Tremblay & Sorensons, Tata Mcgraw hills publications.
2. Data structure and algorithms, Aho., Alfred V., Pearson Education.
3. Fundamentals of Data structure in C, Horowitz, Ellis, Galgotia publication.
4. Introduction to Data Structure and algorithms with C++ , Rowe, Glenn W., Prentice , Hall
5. Data structures using C and C++ , Langsun , Augenstein , Tenenbaum Aaron M, Prentice Hall
6. Data structure and Algorithm using C, R.S. Salaria.

BCA 302: Visual Programming

Time: 3 Hrs.   **Max. Marks: 100**

UNIT – I

Client Server Basics: Discover Client-Server and Other Computing Architectures, Understand File Server Versus Client-Server Database Deployment, Learn About the Two Tier Versus Three Tier Client-Server Model, Visual Basic Building Blocks and Default Controls: Forms, Using Controls, Exploring Properties, Methods and Events, Introduction To Intrinsic Controls, Working With Text, Working With Choices, Special Purpose Controls, VB Advance Controls: Events, Menu bar, Popup Menus, Tool bar, Message Box, Input Box, Built-in Dialog Boxes, Creating MDI, Working with Menus

UNIT – II

VB Programming Fundamentals and Variables: Introduction to Variables, Variable Declaration, Arrays, Introduction to Constants and Option Explicit Statement, Assignment Statements, Math Operations, Strings, Formatting Functions, Controlling and Managing Program: Control Statements, Loops, Error Trapping, Procedures, Functions, Controlling How Your Program Starts, Introduction to common controls- Tree view, list view, tab strip, Creating and working with control arrays.

UNIT – III

Visual Basic and databases: Understanding the Data Controls and Bound Controls, Introduction to Data Form Wizard, Introducing DAO, Working with Record sets, Record Pointer, Filters, Indexes, Sorts and Manipulation of Records. Remote and ActiveX Data Objects: Working With ODBC, Remote Data Objects and Remote data Control, Introducing ADO, ADO Data Control.

UNIT – IV

Using Data Grid Control and ActiveX Data Objects. ActiveX Controls, Extending ActiveX Controls And Classes: Creating, Testing, Compiling, Enhancing and User Drawn ActiveX Controls, Using ActiveX Control Interface Wizard and Property Pages Wizard, Introducing Ambient, Extender Objects, Creating Property Pages, Building Class Modules, ActiveX DLL.

UNIT V

Client-Server Development Tools: COM, Services Models, Development Tools Included with VB 6, SourceSafe Projects. Reports and Packaging: Data Reports and Crystal Reports, Packaging A Standard EXE Project, VB and Internet: Introduction to VBScript, Tools used with VBScript and VBScript Languages, Introduction to Active Server Pages, ASP Objects.

Text / Reference Books

1. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
2. Noel Jerke - Visual Basic 6 the Complete Reference, Tata McGraw Hill - 1999.

BCA 304: Web Technology

Time: 3 Hrs.   **Max. Marks: 75**

Unit I

Introduction to Basics of Internet: Concepts of Internet: Domain, IP Addressing, Resolving Domain Names, Overview of TCP/IP and its Services, WWW.

Unit II

Introduction to HTML, Designing Pages with HTML, Essential Tags, Deprecated Tags, Tags and Attributes, Text Styles and Text Arrangements, Text, Effects, Exposure to Various Tags (DIV, MARQUEE, NOBR, DFN, HR, LISTING, Comment, IMG), Color and Background of Web Pages, Lists and their Types, Attributes of Image Tag.

Unit III

Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, concept of navigation, Different Section of a Page and Graphics, Footnote and e-Mailing, Creating Table, Frame, Form and Style Sheet.

Unit IV

DHTML: Dynamic HTML, Document Object Model, Features of DHTML, CSSP (Cascading Style Sheet Positioning) and JSSS (JavaScript assisted Style Sheet), Layers of Netscape, The ID Attribute, DHTML Events.

Unit V

Web Designing Tools: Front Page Basics , Web Terminologies, Phases of Planning and Building Web Sites, The FTP, HTTP and WAP, Features, Front Page Views, Adding Pictures, Backgrounds, Links, Relating Front Page to DHTML.

Text / Reference Books

1. HTML Black Book – Steven Holzner – Dreamtech Press.
2. HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB.
3. http:www.W3schools.com/html/
4. Dynamic HTML webMagic/ jet douyer-hayden Development group
5. The DHTML Company only Robert mudrey, PHI.

Time: 3 Hrs.   **Max. Marks: 75**

Unit I

An overview of Java: Object oriented programming, Two paradigms, abstraction, the, OOP principles, Java class libraries, variables, arrays, Data types and casting, Operators, operator precedence, Control statements.

Unit II

Classes & Objects: Class fundamentals, declaring object reference variable, Introducing methods, constructors, the key word, garbage collection, Overloading methods. Inheritance and polymorphism: super class and subclass, protected members, Relationship between super and sub class. Inheritance hierarchy, abstract classes and methods, final methods and classes, nested classes, Type wrappers.

Unit-III

String handling: The string constructor, string length, special string operator character extraction, string comparison, searching string, modifying string, data conversion, changing the case of characters, string buffer.

Unit IV

Multithreaded Programming: The Java thread model, the main thread, creating thread, creating multiple thread, using is alive () and join (). Thread priorities, synchronization, Inter thread communications, suspending resuming and stopping thread using multithreading.

Exception handling: Exception handling fundamentals

Unit-V

Introduction to Applets : Applet Fundamentals, using paint method, basic of AWT

Recommended Books:

1. Herbert Schildt: JAVA 2 The Complete Reference, TMH, Delhi
2. Deitel: How to Program JAVA, PHI
3. U.K. Chakraborty and D.G. Dastidar: Software and Systems An Introduction, Wheeler Publishing, Delhi.
4. Joseph O'Neil and Herb Schildt: Teach Yourself JAVA, TMH, Delhi

Practical

BCA 306
Practicals: Experiments based on the paper BCA – 302 & 304 and Project development for Internal Assessment.

BCA 307
Practical II: Experiments based on the paper BCA-305.

Innovations and Employability in the area of Computer Science

Innovations

Computer Science is the most creative and diverse field of all the technology fields. If you can imagine an outcome, this major will provide you the tools to create it. In addition to providing a solid grounding in all the most significant areas of computer science, The syllabus is designed for students considering their individual needs, who want to study a broad computer science curriculum with an emphasis on combining both the theory and practice of computer science. Then the syllabus will be able to develop computer professionals with a good grasp of how to design and build high quality systems for industry that are usable in real world socio-technical contexts.

The overall aim to develop this syllabus of Computer Science course is to deliver a broad but rigorous Computer Science education coupled with direct exposure to cutting edge research. Graduates and Post Graduate of this programme are intended to continue directly into careers involving innovative thinking and problem solving, as part of an advanced research, development or other applied field of computer science.

Employability

Selection to study the Computer Science opens up many avenues for future career prospects.
Almost every major challenge in the world turns to the use of computer science to solve problems; from medical research, education, supporting aid work in disaster areas, helping to create a sustainable environment, the logistics of moving products around the world, to the world of business and securing and managing the vast levels of data through visualisation, security and transmission; not to mention the world of media.

Being a successful Computer professional is not just about solving technical problems, but also collaboration, leadership, and teamwork; which is why our degree courses encourage you to gain these interdisciplinary and interpersonal skills in addition too.

☐   Computers and computing technology lies at the heart of organisations across all industrial sectors; and our graduates are equipped to support and develop these systems.