



UNIVERSITY OF RAJASTHAN, JAIPUR

NATIONAL EDUCATION POLICY-2020

PROPOSED STRUCTURE OF UG- COMPUTER
APPLICATION (Basic degree)

Three/^{four}Year Under Graduate Programme in Science/Arts/Commerce

Syllabus for I to ~~VI~~^{I & II} Semesters

Examination 2023-24

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Preamble

Computer Application (CA) has been evolving as an important branch of science and technology in last three decade and it has carved out a space for itself like computer science and engineering. Computer application spans theory and more application and it requires thinking both in abstract terms and in concrete terms.

The ever -evolving discipline of computer application has strong connections to other disciplines. Many problems in science, engineering, health care, business, and other areas can be solved effectively with computers and its applications, but finding a solution requires both computer science expertise and knowledge of the particular application domain.

Computer science has a wide range of specialties. These include Computer Architecture, Software Systems, Graphics, Artificial Intelligence, Mathematical and Statistical Analysis, Data Science, Computational Science, and Software Engineering.

Universities and other HEIs introduced programmes of computer application. Information Technology is growing rapidly. Increasing applications of computers in almost all areas of human endeavour has led to vibrant industries with concurrent rapid change in technology. Unlike other basic disciplines, developing core competency in this discipline that can be reasonably stable becomes a challenge.

In India, it was initially introduced at the Master (postgraduate) level as MCA and M.Tech. Later on, engineering programmes such as B.Tech and B.E in Computer Science & Engineering and in Information Technology were introduced in various engineering College/Institutions to cater to the growing demand for trained engineering manpower in IT industries. Parallely, BCA, BSc and MSc programmes with specialisation in Computer Science were introduced to train manpower in this highly demanding area.

Computer Application is aimed at undergraduate level training facilitating multiple career paths. Students so graduated, can take up postgraduate programmes in Science/Arts/Commerce/CS or MCA as per cure courses in the under graduate program leading to research as well as R&D, can be employable at IT industries, or can pursue a teaching profession or can adopt a business management career.

All students must, therefore, have access to a computer with a modern programming language installed. The computer science framework does not prescribe a specific language. The teacher and students will decide which modern programming languages students will learn. More importantly, students will learn to adapt to changes in programming languages and learn new languages as they are developed.

The present Curriculum Framework for Computer Application core course in degrees is intended to facilitate the students to achieve the following.



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- To develop an understanding and knowledge of the basic theory of Computer Science and Information Technology with good foundation on theory, systems and applications such as algorithms, data structures, data handling, data communication and computation
- To develop the ability to use this knowledge to analyse new situations in the application domain
- To acquire necessary and state-of-the-art skills to take up industry challenges. The objectives and outcomes are carefully designed to suit to the above-mentioned purpose.
- The ability to synthesize the acquired knowledge, understanding and experience for a better and improved comprehension of the real-life problems
- To learn skills and tools like mathematics, statistics and electronics to find the solution, interpret the results and make predictions for the future developments
- To formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate

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The objectives of the Programme are:

1. The primary objective of this program is to prepare students for careers in software industry, understanding and skills, related to the use of computers and its applications.
2. The course is designed to function as an intermediate between the industry and academic institutes.
3. This course provides students with options to specialize in new and upcoming technologies.
4. To impart creativity and pursuit of excellence in computer applications.
5. To provide opportunity for the study of modern methods of information processing and its applications.
6. To develop among students the programming techniques and the problem solving skills through programming.
7. To develop the ability to use this knowledge to analyze new situations.
8. To be able to blend the acquired knowledge, understanding, and experience, for a better and improved intellectual capacity of the real-life problems.
9. To prepare students who wish to go on to further studies in computer science and related subjects.





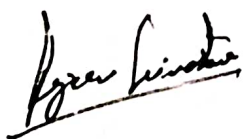




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Program Outcomes: Computer Application

1. Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity.
2. Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. Difficulty Analysis: Talent to classify, significantly evaluate and prepare complex computing problems using fundamentals of computer knowledge and request domains.
4. Design and Development of Solutions: Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.
5. Accomplish Investigations of Compound Computing Troubles: Ability to invent and ways experiments interpret data and present well up to date conclusions.
6. Application Systems Knowledge: Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.
7. Modern Tool Usage: Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.
8. Mission Administration: Skill to recognize administration and computing philosophy with computing acquaintance to supervise projects in multidisciplinary environments.
9. Communication: Must have a reasonably good communication knowledge both in oral and writing.
10. Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the integrity in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
11. Motivation to take up Higher Studies: Inspiration to continue educations towards advanced studies on Computer Science.





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Course Structure for Computer Application Course
Sem. I & II
B.Sc./B.A./B.Com. Part - I-2023-24 Onwards

Semester-wise Titles of the Papers in Computer Application						
Certificate in B.Sc./B.A./B.Com.						
Sem	Course Code	Course Title	Course Type	Theory/ Practical	Teaching Hours/ Week	Credits
I	CA-51T-101	Computer Basics & Office Management Tools	CC	Theory	4	4
	CA-51P-102	Computer Basics & Office Management Tools Lab	CC	Practical	4	2
			Total		8	6
II	CA-52T-111	Programming with C	CC	Theory	4	4
	CA-52P-112	Programming with C Lab	CC	Practical	4	2
			Total		8	6

Computer Application Course B.Sc./B.A./B.Com.
Sem. III & IV
Part - II. 2024-25 Onwards

Semester-wise Titles of the Papers in Computer Application						
Diploma in B.Sc./B.A./B.Com.						
Semester	Course Code	Course Title	Course Type	Theory/ Practical	Teaching Hours/ Week	Credits
III	CA-63T-201	Operating Systems	CC	Theory	4	4
	CA-63P-202	Operating Systems Lab	CC	Practical	4	2
			Total		8	6
IV	CA-64T-211	Database Management Systems	CC	Theory	4	4
	CA-64P-212	DBMS Lab	CC	Practical	4	2
			Total		8	6

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Computer Application Course B.Sc./B.A./B.Com.

Sem. V & VI Part - III 2025-26 Onwards

Semester-wise Titles of the Papers in Computer Application						
Degree of B.Sc./B.A./B.Com.						
Semester	Course Code	Course Title	Course Type	Theory/ Practical	Teaching Hours/ Week	Credits
V	CA-75T-301	Web Application Development	CC	Theory	4	4
	CA-75P-302	Web Application Development Lab	CC	Practical	4	2
			Total		8	6
VI	CA-76T-311	PHP Programming	CC	Theory	4	4
	CA-76P-312	PHP Lab	CC	Practical	4	2
			Total		8	6

Sem. VII & VIII

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Course Content for Computer Application Course B.Sc./B.A./B.Com.
Semesters I and II

Semester: I

Course Code: CA-51T-101	Course Title: Computer Basics & Office Management Tools
Course Credit : 04	Hours/Week: 04

Course Outcomes (COs):

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Office Activities using Word Processor Software
- Office Activities using Spreadsheets Software
- Office Activities using Presentation Software
- Office Activities involving Multimedia Editing (Images, Video, Audio ...)
- Operating System Configuration, MS Configuration.

CA-51T-101: Computer Basics & Office Management Tools

Unit-I

Evolution and generations of Computers, Characteristics of Computer, Classification of Computer, Application of Computers, Block diagram of Computer and role of each block, software & hardware, relations between software & hardware, Input and Output Devices, Software: Types of Software-System Software, Application software, and utility Software; Computer Languages: Machine, Assembly, High Level; Generations of programming languages, Features of good programming language, Translators: Assemblers, Compilers and Interpreter.

Unit-II

Number System: Introduction to number system, Binary, Octal, Decimal, Hexadecimal, Conversion between number bases, Arithmetic Operations on Binary Numbers, Alphanumeric Codes-BCD, EBCDIC, ASCII, Unicode.

Primary and Secondary Memory: Memory Hierarchy, Random Access Memory(RAM), Types of RAM, ROM, Types of ROM, Start-up Process (Booting), Classification of Secondary Storage Devices, Magnetic Tape, Magnetic Disk, Optical Disk.



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Unit-III

Internet Basics: Introduction, Features of Internet, Internet Applications, Services of Internet, Logical and Physical addresses, Internet Service Providers, Domain Name System.

MS Word: Word Processing, MS-Word features, Creating Saving and Opening Documents in Word, Toolbars, Ruler, Menus, Keyboard shortcuts, editing, previewing, Printing & Formatting a document. Find & Replace, Thesaurus, Mail Merge, Tables, Converting a Word document into various formats like-text, Rich Text Format, Word Perfect, etc.

Unit-IV

MS Excel: Worksheet Basics, Creating Worksheet, Entering data into Worksheet, Data, Text, Dates, Alphanumeric values saving & Quitting Worksheet, Opening and Moving around in an existing Worksheet, Toolbars and Menus, Keyboard shortcuts, Working with Formula & Cell Referencing, Auto Sum, Format Feature, Changing alignment, Character styles, Date Format, Border & Colors etc. Previewing & Printing a worksheet, Graphs and Charts.

Power Point: Creating and Viewing a Presentation, Managing Slide Shows, Navigating through a Presentation, Using Hyperlinks, Advanced navigation with action setting and Action buttons, Organizing formats with Master Slides, Applying and Modifying designs, Adding Graphics, Multimedia and Special Effects.

Recommended Books:

1. Sanjay Saxena; A First Course in Computers 2003 Edition; Vikas Pub.
2. Computer Fundamentals by P.K. Sinha, BPB Publication.
3. Computer Fundamentals and Programming in C, Reema Thareja, OXFORD University Press.
4. Microsoft; 2007/2010 Microsoft Office System; PHI.
5. Microsoft; Microsoft Office 2007/2010: Plain & Simple; PHI.
6. MS-Office, Dr. S.S. Shrivastava, Published by Laxmi Publication.
7. Office 2019: In Easy Steps, Michal Price, BPB Publication.

Course Code: CA-51P-102	Course Title: Office Management Tools Lab
Course Credit : 02	Hours/Week: 04

Content: Content : Recommended exercises

Exercises based on Internet, Word, Excel and Power Point.











Semester: II

Course Code: CA-52T-111

Course Credit : 04

Course Title: Programming with C

Hours/Week: 04

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts
- Read, understand and trace the execution of programs written in C language
- Write the C code for a given problem
- Perform input and output operations using programs in C
- Write programs that perform operations on arrays Course Content

CA-52T-111: Programming with C

UNIT- I

Basic concepts of Programming languages, Programming Domains, Language Evaluation criteria and language categories, Evolution of major programming languages. Describing syntax and semantics, formal methods of describing syntax, Pseudo code, Design of Algorithm & Flowchart

UNIT- II

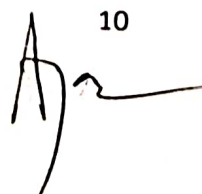
Fundamentals of C: History and importance of C, basic structure and execution of C programs, constants, variables, and data types, Various type of declarations, operators types and expressions, evaluation of expressions, operator precedence and associability. Managing input and output operations, decision making and branching. **Iteration:** while, do...while, for loop, nested loops, break & continue, goto statements.

UNIT- III

Array and String: One-dimensional array and their declaration and initialization, two-dimensional arrays and their initializations, character arrays (One and Two dimensional), reading and writing strings, string - handling functions.

Functions: Need and elements for user –defined functions, definition of functions, return values and their types, function calls and declaration, recursion, parameter passing, passing arrays and strings to functions, the scope, visibility and life time of variables.



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UNIT-IV

Understanding Pointers: Accessing the address of a variable, declaration and initialization of pointer variables, accessing a variable through its pointer, pointers and arrays, pointers and function arguments, functions returning pointers.

Structures and Unions: Defining structure, declaring structure variable and accessing structure members, initialization of structure, operation on individual members, and array of structures, union, size of structure.

Recommended Books:

1. Balagurusamy E; Programming in ANSI C; Fifth Edn; Mc Graw Hill, 2011.
2. Kanetkar Y.; LET US C; X Edition, BPB, 2010.
3. Deitel HM & Deitel JP; C How to program; 5th Edn; Pearson Pub
4. Gottfried B; Programming with C: Schaum Outlines; Mc Graw Hill Edition.

Course Code: CA-52P-112	Course Title: Programming with C Lab
Course Credit : 02	Hours/Week: 04

Content : Recommended exercises

Part A:

1. Program to read radius of a circle and to find area and circumference
2. Program to read three numbers and find the biggest of three
3. Program to demonstrate library functions in math.h
4. Program to check for prime
5. Program to generate n primes
6. Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
7. Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
8. Program to read percentage of marks and to display appropriate message (Demonstration of else-if ladder)
9. Program to find the roots of quadratic equation (demonstration of switch Case statement)
10. Program to read marks scored by n students and find the average of marks (Demonstration of single dimensional array)
11. Program to remove Duplicate Element in a single dimensional Array
12. Program to perform addition and subtraction of Matrices

Part B:

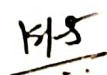
1. Program to find the length of a string without using built in function
2. Program to demonstrate string functions.
3. Program to demonstrate pointers in C
4. Program to check a number for prime by defining isprime() function











5. Program to read, display and to find the trace of a square matrix
6. Program to read, display and add two $m \times n$ matrices using functions
7. Program to read, display and multiply two $m \times n$ matrices using functions
8. Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
9. Program to Reverse a String using Pointer
10. Program to Swap Two Numbers using Pointers
11. Program to demonstrate student structure to read & display records of n students.
12. Program to demonstrate the difference between structure & union.

Note: Student has to execute a minimum of 10 programs in each part to complete the Lab course.

Pejman Lirivostan

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