Siddharth University, Kapilvastu, Siddharthnagar

SYLLABUS
of
Computer Application
as
MINOR
for
B.Sc./B.A. Programme

(According to CBCS & NEP 2020)

[With effect from the Academic Year 2025-26 onwards Approved in Board of Studies (BOS) meeting on dated 21/11/2025]

Year wise structure of B.Sc./B.A. Computer Application (MINOR) Syllabus

The Computer Application programme shall be offered as a Minor subject under the 4-Year Undergraduate Programme (FYUGP) in B.Sc./B.A. as per the guidelines of the State Higher Education Council. Students may opt for the Minor subject in I, II, III and IV Semester under the Choice Based Credit System (CBCS) in combination with another two Major subject, as approved by the University/College.

Year	Semester	Course Code	Paper Title	Theory/ Practical	Credits
First	I	BMCCA101T	Computer Fundamentals and IT Tools	Theory	4
Second	III	BMCCA301T	Python and R Programming	Theory	4

Syllabus Developed by:

S.No.	Name	Designation	Department	College/ University
1	Dr. Ashwini Kumar Srivastava	Asst. Professor & Head	Dept. of Computer Application	Shivharsh Kisan P.G. College, Basti

DETAIL SYLLABUS FOR B.Sc. /B.A. -I Year/ I-Semester (Computer Application)

(Minor)

Course Title: Computer Fundamentals and IT Tools (UG 4 Year Course)

Course Code: BMCCA101T

Credit Units: 4

Level: UG

Credit Distribution of the course		
Lecture (L)	**Tutorial (T)**	**Practical (P)**
04	**-**	**-**

Course Objectives:

- Develops basic understanding of computers and its applications.
- Develops the ability to work with computers using various networks/Internet.
- Makes proficient in using various application software to solve real-world problems.
- Introduces the more advanced features of the IT.

Prerequisites: Basic knowledge of Computer.

Course Contents/Syllabus:

Unit	Topic	No. of Lectures
I	Computer and its characteristics, applications of computer, types of computer, Types: Mainframe computer, Super computer, Mini Computer. Memory: memory hierarchy, memory types, Hard disk drives, Floppy disk, Magnetic Tapes, Optical Disks: CD, DVD, input and output devices: Keyboard, Mouse, Joystick, scanner, OCR, OMR, web camera, monitor, printer and its types.	**8**
II	Software and its types (System Software, Application Software, firmware Software's) Computer Languages and its types, Translators: Compiler, Linker, Interpreter, Loader	**7**
III	Number System: Decimal, Binary, Octal, Hexadecimal, Conversion of one number system to another, Arithmetic Operations: Addition, Subtraction, Multiplication. Complement methods: r's and (r - l)'s complement.	**8**
IV	Introduction to Computer Network, Data Communication, Components of Data Communication, Data Transmission Mode, LAN, MAN, WAN , LAN Topologies: Ring, Bus, Star, Mesh and Tree Topologies, Internet, IP Address, DNS, Web page, Website, Browsers, URL, e-mail, Applications of Internet.	**7**
V	Operating System and its types, Functions of Operating System, Windows Operating System and its features, Desktop elements: Icons, My Computer, Recycle Bin, Taskbar, Network Places, Documents, Anatomy of window: title bar, menu bar, tool bar, control buttons, scroll bars, document area and stat us bar. Control panel, disk formatting, defragmentation, Disk Clean-Up, magnifier, Narrator, On-Screen Keyboard	**7**
VI	Introduction to Word Processing, Microsoft word screen, file menu, edit menu, view menu, insert menu, format menu, tools menu table menu, alignment of text, applying fonts, working with wizards, size of text, font of the text, color of the text, autocorrect, auto format, working with tables, mail-merge feature, header footers and page numbers, using bulleted and number lists, inserting a picture file.	**8**

VII	Understanding Microsoft Excel for windows, understanding spreadsheets, file menu, edit menu, view menu, insert menu, format menu, tools menu, data menu, creating a Worksheet in Excel for windows, copying formula, formulas that make decisions, functions in Excel, sum function, average function, function wizard, functions in Excel, Date and time functions, logical functions, creating charts in Excel, creating graphs, modifying chart, adding data to a chart	**8**
VIII	Introduction of PowerPoint for windows, file menu, edit menu, view menu, insert menu, format menu, tools menu, slide show menu, creating presentation by AutoContent Wizard, creating a new presentation entering the text, moving the text, reordering slides, duplicating slides, deleting slides, making slide shows, adding effects, adding animation.	**7**

Suggested Readings:

1. P. K. Sinha & Priti Sinha , "Computer Fundamentals", BPB Publications, 2007.
2. Dr. Anita Goel, Computer Fundamentals, Pearson Education, 2010.
3. Peter Norton, " Introduction to computers", Sixth Edition Tata McGraw Hill , 2007.
4. Joyce Coax, Joan Preppernau, Steve Lambert and Curtis Frye, "2007 Microsoft® Office System step by step", Microsoft Press, 2008.
5. R. K. Taxali, "PC Software for Windows", Tata McGraw Hill Publishers Pvt. Ltd.
6. V. Rajaraman, "Fundamentals of Computers", PHI.
7. Introduction to Information Technology, ITL Education Solution Ltd., Pearson Education India , 2012

Suggestive digital platforms web links:

1. https://www.pearsoned.co.in/prc/book/anita-goel-computer-fundamentals-1e-1/9788131733097
2. http://fmis.ap.gov.in/fileBkp2/13/computer_fundamentals%20by%20sinha%20&%20sinha.pdf

DETAIL SYLLABUS FOR B.Sc. /B.A. -II Year/ III-Semester (Computer Application)

(Minor)

Course Title: Python and R Programming (UG 4 Year Course)

Course Code: BMCCA301T

Credit Units: 4

Level: UG

Credit Distribution of the course		
Lecture (L)	**Tutorial (T)**	**Practical (P)**
04	**-**	**-**

Course Objectives:

- Develops the use of the Python and R Programming language to implement various algorithms, and develops the basic concepts and terminology of programming in general.
- Make familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
- Able to apply the problem solving skills for creating, debugging and testing a software application using the Python and R Programming language.
- Introduces the more advanced features of the Python and R Language.

Prerequisites: Basic knowledge of Computer.

Course Contents/Syllabus:

Unit	Topic	No. of Lectures
I	Introduction to Python Programming: History, features, Installing Python, working with Python, The Difference Between Brackets, Braces and Parentheses, Python Interpreter, Python shell, Indentation. Character Set, Identifiers , Data Types.	**8**
II	Variables and Expressions: Values and Types, Variables, Variable Names and Keywords, Type conversion, Operators and its types, Expressions, Interactive Mode and Script Mode.	**8**
III	Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.	**7**
IV	Functions, Built in functions, User Defined Functions, Anonymous Functions: lambda in Python, Recursion, Stack diagrams for recursive functions, Functions defined in modules.	**7**
V	Introduction to R, Features of R, Applications of R, keywords, variables, and data types in R.	**7**
VI	Operators (Arithmetic operator, Relational operator, Logical, Assignment etc.), Control constructs: if command, if else command, for loop, repeat loop, while loop, Introduction to function in R	**8**
VII	Vector matrix operations: matrix operations such as addition, subtraction, multiplication, matrix inverse, solution of linear equation.	**7**

VIII	Graphics in R: the plot command, simple mathematical function plots, histogram, bar-plot, points, lines, segments, arrows, pie diagram, graphical parameters, adding a legend, Insertion sorting.	**8**

Suggested Readings:

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Allen Downey, Jeffrey Elkner, Chris Meyers. How to think like a computer scientist: learning with Python / 1st Edition, 2012.
3. Ch Satynarayana, M Radhika Mani, ands B N Jagadeesh, Python Programming, Universities Press, 2018
4. Ashwini Kr Srivastava & Vijay Kumar "A Text Book of Python Programming Essentials: From Basics to Advanced", Discount Group of Publication, 2024
5. Albert, J. & Rizzo, M.: R by Example, Springer, 2012
6. Michael J. Crawley: The R Book, 2nd Edition, Wiley, 2012
7. Ashwini Kr Srivastava & Vijay Kumar "A Text Book of R Programming Essentials: From Basics to Advanced", Plaksha Prakashan.

Suggestive digital platforms web links:

1. http://docs.python.org/3/tutorial/index.html
2. http://interactivepython.org/courselib/static/pythonds
3. https://www.r-project.org