

**Anekant Education Society's
Tuljaram Chaturchand College of Arts, Science and
Commerce, Baramati
Autonomous**

**Certificate Courses
Department of Statistics**

Sr. No.	Certificate Course	To be Run for	No. of Credits	Course Coordinator
1	Advance Python	PG	2	Ms. N. A. Jagtap nilambarijagtap22@gmail.com
2	C-Programming	UG	2	Ms. S. D. Wadkar sarita.wadkar25@gmail.com

Anekant Education Society's
Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati
(Autonomous Institution)

Statistics Department

Course Title: Certificate Course in Advance Python

Course Syllabus

Course Objectives:

- To understand why Python is a useful scripting language for developers.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To learn how to identify Python object types.
- To learn how to use indexing and slicing to access data in Python programs.
- To define the structure and components of a Python program.
- To learn how to write loops and decision statements in Python.
- To learn how to write functions and pass arguments in Python.
- To learn how to build and package Python modules for reusability.
- To learn how to read and write files in Python.

Learning Outcomes:

- Problem solving and programming capability.

Unit 1: [2 L]

Introduction: History, Features, Setting up path, Working with Python, Basic Syntax

Unit 2: [10 L]

Variable and Data Types: Variable Declaration, Declaration rules.

Operators: Assignment Operation, Logical operators, Comparison Operators, Membership operators.

String Manipulation: Accessing Strings, Basic Operations, String slices, Function and Methods

Number: Integer, Float, Complex.

Lists: Introduction, Accessing list, Operations, Working with lists, Function and Methods.

Tuple: Introduction, Accessing tuples, Operations, Working, Functions and Methods.

Unit 3:**[10 L]**

Dictionaries: Introduction, Accessing values in dictionaries, Working with dictionaries, Properties, Functions.

Set: Introduction, Accessing values in dictionaries, Working with dictionaries, Properties, Functions.

Conditional Statements: If, If- else, Nested if-else.

Looping: For, While, Nested loops.

Control Statements: Break, Continue, Pass.

Functions: User define Function, Lambda Function, Map function, Filter Function, Defining a function, Calling a function, Function Arguments, Global and local variables.

Unit 4:**[10 L]**

Library: Introduction, Installation, Uses.

Numpy Library and Operations: Introduction to Numpy, Array Creation, Array Indexing, Array Slicing, Array Manipulation.

Random Numbers: Normal distribution Random numbers, Binomial random Numbers.

Descriptive Statistics: Mean, Mode, Median, Variance, Range.

Five number Summary: Minimum, Quartile-1, Quarile-2, Quartile-3, Maximum, Numpy.

Pandas Library and Operations: Introduction to Pandas, Series, Groupby, DataFrames, Merging, Joining, and Concatenating, Missing Data, Operations, Pandas.

Potting Using Pandas and Interpretation: plot.barh, pot.area, plot.density, plot.hist, plot.line, plot.scatter, plot.bar, plot.box, plot.hexbin

Dr. Avinash Jagtap
Department of Statistics

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Course Title: C-Programming
Course Syllabus**

A) Learning Objectives:

Students successfully completing this course will be able:

1. The course realizes and design algorithm for problem solving.
2. The objective of the course is to develop problem solving abilities using computers.
3. The student will develop skills for writing programs using C.

B) Learning Outcome:

1. Student will be solved to problems using programming capability.
2. Student will be exploring their algorithmic approaches to problem solving.
3. Student will be developed modular programs using control structures, pointers, arrays, strings and functions.

TOPIC CONTENT

Unit 1: C Fundamental

[8 L]

- 1.1 History of 'C' language, Application areas, Structure of a 'C' program, 'C' Program development life cycle, Function as building blocks,
- 1.2 'C' tokens: Character set, Keywords, Identifiers, Variables, Constants (character, integer, float, string, escape sequences, enumeration constant),
- 1.3 Data Types: Numeric and character data types, Numeric and character constants, string constants, symbolic constants.
- 1.4 Operators, Types of operators: arithmetic, relational, logical, assignment, bitwise, conditional. Expressions, types of operators, Operator precedence and Order of evaluation.
- 1.5 Character input and output, String input and output, Formatted input and output.

Unit 2: Control Structure**[8 L]**

Decision making structures: - if, if-else, switch and conditional operator, Loop control structures: - while, do while, for, use of break and continue, Nested structures, Unconditional branching (goto statement)

Unit 3: Array**[6 L]**

Concept, declaration, definition, initialization of array, problem using arrays, passing to function.

Unit 4: String**[4 L]**

String Literals, string variables, declaration, definition, initialization, Syntax and string operations, use of predefined string functions, string functions like strcpy(), strcat(), strlen(), strcmp(), strrev(). Array of strings.

Unit 5: Function**[6 L]**

Concept of function, Standard library functions, User defined functions: - declaration, definition, function call, parameter passing (by value), calling a function by reference and by value, return statement. Recursive functions, Scope of variables. local and global variables. List of writing functions:

1. To find factorial of integer number (both recursive and non-recursive)
2. To find the value of X^n where n is integer. (both recursive and non-recursive)
3. To find GCD of two integer numbers (both recursive and non-recursive)
4. To find maximum/minimum of n numbers. (non-recursive)

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