

OLD SYLLABUS	REVISED SYLLABUS
SCSA1202 - PROGRAMMING WITH C AND C++	SCSA1104- PROBLEM SOLVING TECHNIQUES WITH C AND C++
SCSA1101 - PYTHON AND PROBLEM SOLVING TECHNIQUES	SCSA1204 - PYTHON PROGRAMMING

SCSA1202	PROGRAMMING WITH C AND C++	L	T	P	Credits	Total Marks
		3	*	0	3	100

COURSE OBJECTIVES

- To learn the fundamental programming concepts and methodologies which are essential to building good C/C++ program.
- To demonstrate a thorough understanding of modular programming by designing programs which require the use of programmer-defined functions.
- To impart the knowledge about pointers which is the backbone of effective memory handling
- To demonstrate adeptness of object oriented programming in developing solutions to problems demonstrating usage of data abstraction, encapsulation, and inheritance.

UNIT 1 BASICS OF C PROGRAMMING

9 Hrs.

Introduction to C: Features of C - Structure of C program-Data Types-'C' Tokens-Input/output statements-Control Statement, Functions: – Types of Functions –Recursion.

UNIT 2 ARRAYS, STRINGS AND STRUCTURES

9 Hrs.

Arrays : Single and Multidimensional Arrays— Array as Function Arguments, Strings: String Handling Functions, Structure: Nested Structures – Array of Structures – Structure as Function Argument–Function that Returns Structure, Union.

UNIT 3 POINTERS AND FILE PROCESSING

9 Hrs.

Pointers: Introduction, Arrays Using Pointers – Structures Using Pointers – Functions Using Pointer, Dynamic Memory Allocation, Storage Classes, File Handling in 'C'.

UNIT 4 OBJECT ORIENTED PROGRAMMING CONCEPTS

9 Hrs.

Introduction-Procedure vs. object oriented programming-Concepts: Classes and Objects-Operator & Function Overloading-Inheritance-Polymorphism and Virtual Functions.

UNIT 5 TEMPLATES AND EXCEPTION HANDLING

9 Hrs.

Function Templates and Class Templates – Name spaces – Standard Template Library - Casting – Exception Handling - case study.

Max.45 Hours

COURSE OUTCOMES

On completion of the course the student will be able to

- CO1: Develop simple applications in C using basic constructs.
- CO2: Design and Implement applications using arrays and strings.
- CO3: Develop and Implement applications using memory allocation and File concepts.
- CO4: Use proper class protection to provide security.
- CO5: Describe the reusability of code through Inheritance.
- CO6: Demonstrate the use of virtual functions to implement polymorphism.

TEXT / REFERENCE BOOKS

1. Deitel and Deitel, C how to Program, 7th Edition, Pearson Education, 2013.
2. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Pearson Education, 2015.
3. YashavantKanetkar, Understanding Pointers in C, 4th Revised & Updated Edition, Bbp Publications, 2008.
4. E Balagurusamy, Object Oriented Programming with C++, 3rd edition, Tata McGraw Hill, 2006.
5. Bhave, Object Oriented Programming with C++, Pearson Education, 2004.
6. John R Hubbard, "Programming with C++", Schaums Outline Series, McGraw Hill, 2nd edition, 2009.
7. BjarneStroustrup, Programming: Principles and Practice using C++, 1st Edition, Addison Wesley Publications, 2008.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

PART A : 10 Questions of 2 marks each-No choice

PART B : 2 Questions from each unit with internal choice, each carrying 16 marks

Exam Duration : 3 Hrs.

20 Marks

80 Marks

SCSA1104	PROBLEM SOLVING TECHNIQUES WITH C AND C++	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To learn the fundamentals of PST and methodologies which are essential for building good C/C++ programs.
- To demonstrate a thorough understanding of modular programming by designing programs which require the use of programmer-defined functions.
- To impart the knowledge about pointers which is the backbone of effective memory handling
- To demonstrate adeptness of object oriented programming in developing solutions to problems demonstrating usage of data abstraction, encapsulation, and inheritance.

UNIT 1 INTRODUCTION TO COMPUTER PROBLEM SOLVING

9 Hrs.

Algorithms - Building blocks of algorithms (statements, control flow, functions) -Nnotation (pseudo code, flow chart) - Algorithmic problem solving for socio economic conditions in global perspectives - Simple strategies for developing algorithms (iteration, recursion) - Efficiency of algorithms.

UNIT 2 BASICS OF C PROGRAMMING

9

Hrs.

Introduction to C: Features of C - Structure of C program-Data Types-'C' Tokens-Input/output statements-Control Statement, Functions: – Types of Functions –Recursion.

Algorithms: Reversing the digits of a number - Generation of Fibonacci sequence- Factorial Computation.

UNIT 3 ARRAYS, STRINGS AND STRUCTURES

9

Hrs.

Arrays : Single and Multidimensional Arrays— Array as Function Arguments, Strings: String Handling Functions, Structure: Nested Structures – Array of Structures – Structure as Function Argument–Function that Returns Structure, Union.

Algorithms: Sum of array elements- Removal of duplicates from an array-Finding the Kth smallest element.

UNIT 4 POINTERS AND FILE PROCESSING

9 Hrs.

Pointers: Introduction, Arrays Using Pointers – Structures Using Pointers – Functions Using Pointer, Dynamic Memory Allocation, Storage Classes, File Handling in 'C'.

Algorithms: Swap elements using Call by Reference – Sorting Arrays using pointers- Finding sum of array elements using Dynamic Memory Allocation.

UNIT 5 OBJECT ORIENTED PROGRAMMING CONCEPTS

9 Hrs.

Introduction-Procedure vs. object oriented programming-Concepts: Classes and Objects-Operator & Function Overloading-Inheritance-Polymorphism and Virtual Functions.

Max.45 Hrs.

COURSE OUTCOMES

On completion of the course the student will be able to

- CO7: Develop solutions for the given problem.
- CO8: Design and Implement applications using arrays and strings.
- CO9: Develop and Implement applications using memory allocation and File concepts.
- CO10: Use proper class protection to provide security.
- CO11: Describe the reusability of code through Inheritance.
- CO12: Demonstrate the use of virtual functions to implement polymorphism.

TEXT / REFERENCE BOOKS

8. Dromey.R.G, "How to Solve it by Computer", Prentice-Hall of India, 8th Indian Reprint, 2008.

9. Aho.A.V.,Hopcroft.J.E and Ullman.J.D, "The Design and Analysis of Computer Algorithms", Pearson education, 2004.Deitel and Deitel, C how to Program, 7th Eition, Pearson Education, 2013.
10. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Pearson Education, 2015.
11. YashavantKanetkar, Understanding Pointers in C, 4th Revised & Updated Edition, Bbp Publications, 2008.
12. E Balagurusamy, Object Oriented Programming with C++, 3rd edition, Tata McGraw Hill, 2006.
13. Bhave, Object Oriented Programming with C++, Pearson Education, 2004.
14. John R Hubbard, "Programming with C++", Schaums Outline Series, McGraw Hill, 2nd edition, 2009.
15. BjarneStroustrup, Programming: Principles and Practice using C++, 1st Edition, Addison Wesley Publications, 2008.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

PART A : 10 Questions of 2 marks each-No choice

PART B : 2 Questions from each unit with internal choice, each carrying 16 marks

Exam Duration : 3 Hrs.

20 Marks

80 Marks

SCSA1101	PYTHON AND PROBLEM SOLVING TECHNIQUES	L	T	P	Credits	Total Marks
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		3	*	0	3	100
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COURSE OBJECTIVES

- To learn fundamentals of PST & basics of python programming.
- To learn modular programming.
- To study in detailed data representation, operator, control structures, functions in python and apply it on problems.
- To learn in built functions in python & apply it on mathematical problem.
- To learn advanced algorithm by implementing lists, tuples and dictionaries.

UNIT 1 INTRODUCTION TO COMPUTER PROBLEM SOLVING

9Hrs.

Algorithms, building blocks of algorithms (statements, control flow, functions), notation (pseudo code, flow chart), algorithmic problem solving for socio economic conditions in global perspectives, simple strategies for developing algorithms (iteration, recursion), the efficiency of algorithms.

UNIT 2 DATA, EXPRESSIONS, STATEMENTS

9Hrs.

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Algorithms: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT 3 CONTROL FLOW, FUNCTIONS

9Hrs.

Conditional statements: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iterative statements: while, for, break, continue, pass, Applying for critical conditions.

Algorithms: square root, gcd, exponentiation, sum an array of numbers, factorial computation-Sine function computation-Generation of the Fibonacci sequence-Reversing the digits of an integer.

UNIT 4 FACTORING METHOD

9Hrs.

Functions: return values, parameters, local and global scope. Lambda, filter, map and reduce functions.

Algorithms: The smallest divisor of an integer-The greatest common divisor of two integers-Generating Prime Numbers-Computing the Prime Factors of an integer- Raising a Number to a Large Power

UNIT 5 LISTS, TUPLES, DICTIONARIES

9Hrs.

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing – list comprehension;

Algorithms: Removal of Duplicates -Partitioning -Finding the kth smallest Element- histogram.

Max. 45 Hours

COURSE OUTCOMES

On completion of the course the student will be able to

- CO1: Design a modular solution for a given problem.
- CO2: Choose appropriate algorithm for each module considering economic and social aspects.
- CO3: Employ multiple critical and creative thinking strategies in reasoning and problem solving.
- CO4: Evaluate and choose an appropriate problem solving strategy.
- CO5: Document the approach to be implemented in any language.
- CO6: Apply to the problem solving techniques on real world problems.

TEXT / REFERENCE BOOKS

1. Dromey.R.G, "How to Solve it by Computer", Prentice-Hall of India, 8th Indian Reprint, 2008.
2. Aho.A.V.,Hopcroft.J.E and Ullman.J.D, "The Design and Analysis of Computer Algorithms", Pearson education, 2004.
3. Martin C. Brown, " Python: The Complete Reference", McGraw Hill, 2018.
4. John M. Zelle , "Python Programming: An Introduction to Computer Science", Library of Congress.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100

Exam Duration : 3 Hrs.

PART A : 10 Questions of 2 marks each-No choice

20 Marks

PART B : 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SCSA1204	PYTHON PROGRAMMING	L	T	P	Credits	Total Marks
		3	0	0	3	100

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 build and package python programs for reusability.
- To learn how to read and write files in python.
- To learn how to use exception handling in python applications for error handling.

UNIT 1 INTRODUCTION 9 Hrs.

History of Python- Introduction to the IDLE interpreter (shell) - Data Types - Built-in function - Conditional statements - Iterative statements- Input/output functions - Compound Data Types - Nested compound statements – Introduction to Object Oriented Concepts.

UNIT 2 FILES AND EXCEPTIONS HANDLING , MODULES, PACKAGES 9 Hrs.

File Operations –Iterators - Exception handling - Regular Expressions- Creating Modules-Import Statement-Introduction to PIP-Installing Packages via PIP-Using Python Packages.

UNIT 3 GUI PROGRAMMING 9 Hrs.

GUI Programming in Python - Introduction to GUI library - Layout management - Events and bindings - Fonts – Colours - Canvas - Widgets (frame, label, button, check box, entry, listbox, message, radiobutton, text, spinbox).

UNIT 4 DATABASE AND NETWORK 9 Hrs.

Database(using NoSQL): Connector module –Cursor – Staements – Exceptions in database.
Network connectivity: Socket module – Client – Server – Email –URL Access.

UNIT 5 CASE STUDY 9 Hrs.

Web Programming using Python Image Processing – Facebook Analysis – Twitter Analysis.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1: Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in python
- CO2: Do the decision making and write functions in Python.
- CO3: Explain how to design GUI Applications in Python and evaluate different database operations.
- CO4: Design and develop Client Server network applications using Python.
- CO5: Ability to design real life situational problems and think creatively about solutions of them.
- CO6: Apply the best features of mathematics, engineering and natural sciences to program real life problems.

TEXT / REFERENCES BOOKS

1. Y. Daniel Liang, "Introduction to Programming Using Python", Pearson, 2013.
2. Paul Gries, Jennifer Campbell, Jason Montojo, "Practical Programming: An Introduction to Computer Science Using Python 3", Pragmatic Bookshelf, 2nd Edition, 2014.
3. Magnus Lie Hetland, "Beginning Python: From Novice to Professional", Apress.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100 Exam Duration: 3 Hrs.

PART A: 10 Questions of 2 marks each - No choice

PART B: 2 Questions from each unit of internal choice; each carrying 12 marks

20 Marks

80 Marks

Foot Note:

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- Content Added