Semester Lecture Plan

Name of the college: Government College of Arts, Science and Commerce, Sanquelim Goa.

Name of Faculty: Pooja Bhanudas Naik	**Subject:** Computer Science	
Paper code and Paper name: CSA100-Problem Solving and Programming	**Program/Course: FYBSc**	**Division:**
Academic year: 2024 - 2025	**Semester: II**	**Total Lectures: 45**

Course Objectives:

1. To understand the concepts and techniques of problems solving.
2. To analyses , understand and build logic to solve basic problems.
3. To design Algorithms and flowcharts for better understanding and documentation for accurate implementation of the problem.
4. To code and implement a well-structured, robust programming logic using a suitable programming language.

Course Learning Outcome:

- **Understand the ways and stages of Problem Solving.**
- **Understand basic computing concepts , algorithm design , flowchart design , programming constructs and debugging.**
- **Apply the problem solving and programming concepts in designing solution to simpler problems.**
- **Code and implement a well-structured programming logic using a suitable programming language.**

Month	Lectures From:	Lectures To:	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/Assignment	ICT Tools	Reference books
December	09/12/2024	14/12/2024	3	Introduction to Problem Solving Problem Solving Life Cycle- Understanding the Problem Statement, Analyzing the problem, Planning Program design using Hierarchy charts, Expressing Program logic using flowcharts/ Pseudocode. Structured Programming concept	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.

December	16/12/2024	21/12/2024	3	Modular Programming-Top-Down design, Bottom-up design, Stepwise Refinement. Understanding basic problem Solving Tools			
January	02/01/2025	04/01/2025	01	Algorithms: Definition & its attributes, algorithm constructs, Statements: Input-Output, Decision-Making, &Looping, Examples Flowchart: Definition & its attributes, symbols, Statements: Input-Output, Decision-Making & Looping.	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
January	06/01/2025	11/01/2025	3	Module representation, Drawing conventions and standards, Examples. Pseudo-code: Definition & its attributes, constructs ,and Examples, Basic Program Structures	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
January	13/01/2025	18/01/2025	3	Data & its types (Integer, Floating-point, Character, String). Constants & Variables, scope, Instructions & its type ,how computer stores data, Operators (Arithmetic, Assignment, Relational, Logical, etc).	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
January	20/01/2025	25/01/2025	3	Expressions and Equations, Evaluation of expressions, Keywords. Local and Global Variables, Parameters, Return Values, naming conventions & standards, Understanding literals, syntax and semantics, functions and modules. Basic sequential Instructions	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.

January	27/01/2025	01/02/2025	3	Sequential statements using operators, constants , variables	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
February	03/02/2025	08/02/2025	3	Operands , expressions and equations. Problem Solving with Decision	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
February	10/02/2025	15/02/2025	3	The Decision logic Structure , Multiple If/then/Else Instructions	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
February	17/02/2025	22/02/2025	3	Using Straight-Through Logic, Using Positive & Negative Logic Logic Conversion, Decision Tables, Case Logic Structure	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
February	24/02/2025	01/03/2025	3	Problem Solving with Loops The Loop Logic Structure, Incrementing, Accumulating , While/While End	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
March	03/03/2025	08/03/2025	3	Repeat/Until, Automatic-Counter Loop. Nested Loops, Indicators (flags)	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
March	10/03/2025	15/03/2025	3	Understanding functions, Functions: Definition and its need & constructs designing simpler functions, function communication using arguments & return statements, scope of functions, function declaration and prototype	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.

March	17/03/2025	22/03/2025	3	Call by Value and Call by reference. Concept of Recursive functions: why, when and how. Designing recursive functions and recursive call. Base case and recursive case	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
March	24/03/2025	29/03/2025	3	Problem Solving with Arrays, Arrays Concepts: One dimensional Arrays, Creating. iterating, accessing and modifying array elements. Concept of Strings, String as array of characters.	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
March	31/03/2025	05/04/2025	3	Debugging & Documentation Definition, Types, Need and how to do it.	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.
April	07/04/2025	11/04/2025	3	Revision	Practice problems at home and during practicals.	Smart Board LCD Projector	Maureen Sprankle and Jim Hubbard, Problem Solving and Programming Concepts, Pearson Education India 9th edition.

***Assessment Rubrics**

Component	**Max Marks**
ISA 1	7.5
ISA 2	7.5
Practical	25
Project	-
Semester End Examination	60