

**Rajiv Gandhi Govt. College Saha (AMBALA)**  
**(Affiliated to Kurukshetra University, Kurukshetra)**  
**(‘B+’ Grade, NAAC Accrediated)**

॥ तमसो मा ज्योतिर्गमय ॥  
"अंधरे से मुझे प्रकाश की ओर ले चलो"  
"From darkness, Lead me to Light"



**Course File (Scheme, Syllabus and Lesson Plan)**

**Programming Methodologies (CC-M)**  
**(B23-CSE-203)**

According to  
Curriculum Framework for Under-Graduate  
Programmes

As per NEP-2020 (Multiple Entry-Exit, Internships and  
Choice Based Credit System)

DEPARTMENT OF COMPUTER SCIENCE &  
APPLICATIONS

(For the Batches Admitted from 2023-2024)

**Jan-May 2026**  
**Programming Methodologies**

**Name of the Teacher:** Dr. Rajeev Goel

**Class:** BSc.-II

**Session:** July-Nov 2025

**Internal Marks:** 30 (20(T)+10(P))

**Subject:** Operating Systems

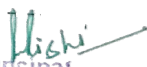
**Semester:** 3<sup>rd</sup> Sem

**External Marks:** 70(50(T)+20(P))

<b>Part A Introduction</b>			
<b>Subject</b>	COMPUTER SCIENCE		
<b>Semester</b>	I		
<b>Name of the Course</b>	<b>Programming Methodologies</b>		
<b>Course Code</b>	B23-CSE-203		
<b>Course Type:(CC/MCC/MDC/CC M/DSEC/VOC/DSE/PC/AE C/VAC)</b>	CC –M (Minor)		
<b>Level of the course (As per Annexure-I)</b>	100-199		
<b>Pre-requisite for the course (if any)</b>	NA		
<b>Course Objectives</b>	<p>The course will aim to:</p> <ol style="list-style-type: none"> <li>1. Understand the problem solving algorithms and flowcharts.</li> <li>2. understand the concept of program and debugging.</li> <li>3. learn the basic programming constructs.</li> <li>4. understand various programming methodologies.</li> <li>5. understand the various programming methodologies by implementing these practically.</li> </ol>		
<b>Course Learning Outcomes(CLO)</b>	<p><b>CLO1:</b> To analyze problems and design appropriate solutions using algorithms and flowcharts..</p> <p><b>CLO2:</b> To explain the concepts of programs and debugging, and identify common programming errors. .</p> <p><b>CLO3:</b> To apply basic programming constructs such as variables, data types, operators, control structures, and loops to develop simple programs.</p> <p><b>CLO4:</b> To differentiate between various programming methodologies and understand their use cases.</p> <p><b>CLO5:</b> To implement different programming methodologies practically to develop, test, and debug programs for real-world problem scenarios.</p>		
<b>Credits</b>	Theory	Practical	Total
	1	1	2
<b>Contact Hours</b>	1	2	3
<b>Max. Marks: 50(30(T)+20(P))</b>			<b>Time: 3Hrs.(T), 3Hrs.(P)</b>
<b>Internal Assessment Marks: 15(10(T)+5(P))</b>			
<b>End Term Exam Marks: 35(20(T)+15(P))</b>			

**Part B-Contents of the Course**

  
**Dr. Rajeev Goel**

  
Principal  
Rajiv Gandhi College  
Saha(Ambala)

## Jan-May 2026 Programming Methodologies

### Instructions for Paper-Setter

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory. Practicum will be evaluated by an external and an internal examiner. Examination will be of three- hour duration.

Unit	Topics	Contact Hours
I	Problem Solving: Understanding the problem, Analyzing the problem, and Identifying the solution. Tools for Problem-Solving: Flowcharts and its Symbols. Algorithm designing. Examples of Algorithms with flow chart. Decision Table.	4
II	Program: Concept of a program, Need for writing programs, Characteristics of a good program, Programming style, Documentation, and Program Maintenance. Debugging Programs: Syntax Errors, Run-Time Errors, Logical Errors. Process of conceptualizing a solution to a problem and moving from algorithm to programming	4
III	General Concepts: Clarity and Simplicity of Expressions, Use of proper names for Identifiers, Comments, Indentation; and Documentation. Programming Constructs: Sequence, Selection, and Iteration; Simulation (dry run) of the program for better understanding of algorithm; Comparison and Analysis of Algorithms through simulations.	4
IV	Methodologies: Structured programming, Top-down approach, Bottom-up approach, Functional programming, Modular programming, and Object-oriented programming.	3
V*	Practicum: Students are advised to do laboratory/practical practice not limited to, but including the following types of problems: <ul style="list-style-type: none"> <li>• Draw a flowchart and design an algorithm that calculates simple interest using principle, rate, and time.</li> <li>• Draw a flowchart and write an algorithm to swap the values of two variables.</li> <li>• Draw a flowchart and design an algorithm to check whether the given number is even or odd.</li> <li>• Draw a flowchart and design an algorithm that inputs three numbers and displays the largest number.</li> <li>• Draw a flowchart and design an algorithm to find the smallest from n numbers.</li> <li>• Draw a flowchart and design an algorithm to find the greatest from n numbers.</li> <li>• Draw a flowchart and design an algorithm to find the sum and average of n input numbers.</li> <li>• Draw a flowchart and design an algorithm to find the sum of the digits of the input number.</li> <li>• Identify the requirements for a college system computerization.</li> <li>• Identify the various modules in a banking system.</li> <li>• Identify the complete design of a general grocery store.</li> <li>• Draw the decision table for finding the greatest of three numbers.</li> <li>• Draw to decision table for checking eligibility for admission to college in an undergraduate programme taking your assumptions.</li> </ul>	30

### **Suggested Evaluation Methods**

<b>Theory:</b>	<b>End Term Examination:</b>
<ul style="list-style-type: none"> <li>• Class Participation: 4</li> <li>• Seminar/presentation/assignment/quiz/class test etc.: NA</li> <li>• Mid-Term Exam: 6</li> </ul>	A three hour exam for both theory and practicum. End Term Exam Marks: 35(20(T)+15 (P))
<b>Practicum:</b> <ul style="list-style-type: none"> <li>• Class Participation: NA</li> <li>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5</li> <li>• Mid-Term Exam: NA</li> </ul>	

**Jan-May 2026**  
**Programming Methodologies**

**Part C Learning Resources**

**Recommended Books /e-resources/LMS:**

- Sinha, P.K. & Sinha, Priti, Computer Fundamentals, BPB.
- Dromey, R.G., How to Solve it By Computer, PHI.
- Norton, Peter, Introduction to Computer, McGraw-Hill.
- Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World.
- Rajaraman, V., Fundamentals of Computers, PHI.

**Lesson Plan**  
**Programming Methodologies**

Month	Week	Topic	Remarks
Jan 2026	1	Problem Solving: Understanding the problem, Analyzing the problem, and Identifying the solution.	
	2	Tools for Problem-Solving: Flowcharts and its Symbols	
	3	Algorithm designing. Examples of Algorithms with flow chart. Decision Table.	
	4	Program: Concept of a program, Need for writing programs, Characteristics of a good program.	<b>Class Test</b>
Feb 2026	1	Programming style, Documentation, and Program Maintenance.	
	2	Debugging Programs: Syntax Errors, Run-Time Errors, and Logical Errors.	
	3	Process of conceptualizing a solution to a problem and moving from algorithm to programming.	
	4	General Concepts: Clarity and Simplicity of Expressions, Use of proper names for Identifiers, Comments.	<b>Class Test</b>
March 2026	1	<b>Holi Vacations</b>	
	2	Programming Constructs: Sequence, Selection, and Iteration; Simulation (dry run) of the program for better understanding of algorithm.	
	3	Indentation; and Documentation. Programming	
	4	Comparison and Analysis of Algorithms through simulations.	
April 2026	1	Methodologies: Structured programming	<b>Mid-Term Exams</b>
	2	Top-down approach, Bottom-up approach	
	3	Modular programming, Object-oriented programming.	<b>Class Test</b>
	4	<b>University Exams</b>	

**Assignment-I**

- Q1. What is a flowchart? Write any four flowchart symbols and their uses. Draw a flowchart and write an algorithm to calculate simple interest using principle, rate, and time.
- Q2. What is an algorithm? Explain the characteristics of a good algorithm. Draw a flowchart and write an algorithm to swap the values of two variables.
- Q3. Explain the concept of problem solving and the steps involved in problem solving. Draw a flowchart and write an algorithm to check whether a given number is even or odd.
- Q4. What is a computer program? Explain the need for writing programs. Draw a flowchart and write an algorithm to find the sum of the digits of a given number.

**Assignment-II**

- Q1. What is meant by good programming style? Write any four rules for writing a good program
- Q2. Explain programming constructs: Sequence, Selection, and Iteration.
- Q3. What is structured programming? Explain the top-down and bottom-up approaches.
- Q4. What is a decision table? Draw a decision table to find the greatest of three numbers..