

BCA (1st Semester)
030010114: Fundamentals of Programming

Lesson Plan

Objectives: To introduce the fundamentals of programming concepts, methodology and enforce logical thinking to design and develop algorithm along with problem solving techniques.

Course Outcomes:

- C01: Describe the basic concepts of programming.
 C02: Solve problems through program development life cycle.
 C03: Design and develop programs using conditional and loop control statements.
 C04: Get knowledge about array and able to use for problem solving.
 C05: Design and develop programs using methods.
 C06: Design and develop derived data type and use in problem solving.

Unit	Sub Unit	No. of Lecture (s)	Topics	Reference Chapter/ Additional Reading	Teaching Methodology to be used	Evaluation Parameters
1	Introduction of Computer Programming					
	1.1.	1	Computer Languages, Programming Paradigm and Classification	VR#1-Page No. 1-10	Chalk & Talk	
	1.2.	1	Programming Process: Problem Understanding, Planning, Coding, Translation, and Testing	JF#1-Page No.- 8-15	Chalk & Talk	
	1.3.	1	Pseudo Code Statements and Flowchart	JF#1-Page No.- 15-18	Chalk & Talk	
	1.4.	1	Program Structure, Data Types, Constants, Variables	JF#1-Page No.- 41-48	Chalk & Talk	
	1.5.	1	Operators, Precedence and Associativity: Assignment, Arithmetic	JF#1-Page No.- 48-52	Chalk & Talk	
	1.6.	1	Expressions and their Evaluation, Type Conversion	VR#2-Page No. 45-49,62	Chalk & Talk	
	1.7.	1	Escape Sequence, Input/output: Streams and Formatting I/O	VR#2-Page No. 35-40	Chalk & Talk	
2	Making Decisions					
	2.1.	1	Local and Global Variables		Chalk & Talk	
	2.2.	1	Operators: Relational and Logical	JF#4-Page No. 134-141	Chalk & Talk	
	2.3.	1	Boolean Expressions	JF#4-Page No. 134-141	Chalk & Talk	
	2.4.	3	Selection Statement: if, if..else.. and Nested if statement	JF#4-Page No. 137-169	Chalk & Talk	Theory Quiz
	2.5.	3	Multiway Selection Statement: switch case, elseif , and break statement	JF#4-Page No. 137-169	Chalk & Talk	Practical Unit Test1

3	Repetitions					
	3.1.	2	Control and Nested Loops	JF#5-Page No. 184-216	Chalk & Talk	
	3.2.	2	Common Mistakes and Advantages of Looping	JF#5-Page No. 184-216	Chalk & Talk	
	3.3.	4	For, Do While and Do Until Loops	JF#5-Page No. 184-216	Chalk & Talk	
	3.4.	2	Single-Level Break and Multiple-Level Control Break	JF#5-Page No. 184-216	Chalk & Talk	Theory Unit Test-1
4	Arrays					
	4.1.	1	Array Declaration	JF#5-Page No. 229-261	Chalk & Talk	
	4.2.	1	Array Initialization	JF#5-Page No. 229-261	Chalk & Talk	
	4.3.	1	Constant Arrays and Parallel Arrays	JF#5-Page No. 229-261	Chalk & Talk	
	4.4.	2	Multidimensional Arrays	JF#5-Page No. 229-261	Chalk & Talk	
	4.5.	2	Sorting and Searching from Array	JF#5-Page No. 229-261	Chalk & Talk	
	4.6.	2	String Manipulation	VR#6-Page No. 182-188	Chalk & Talk	
5	Functions					
	5.1.	1	Function Creation with single parameter and Return a Value	JF#9 Page No. 370-410	Chalk & Talk	
	5.2.	1	Function Invocation: Call by Value, Call by Reference	JF#9 Page No. 370-410	Chalk & Talk	
	5.3.	2	Function Creation with Multiple Parameters	JF#9 Page No. 370-410	Chalk & Talk	
	5.4.	1	Passing Arrays into Functions	JF#9 Page No. 370-410	Chalk & Talk	
	5.5.	1	Recursion	JF#9 Page No. 370-410	Chalk & Talk	
	5.6.	1	Default Value Parameters	VR#2 Page No. 57- 59	Chalk & Talk	Practical & Theory Unit Test-2
6	Derived Types					
	6.1.	1	Enumerated Types	JF#10 Page No. 426-447	Chalk & Talk	
	6.2.	1	Abstract Type: Class	JF#10 Page No. 426-447	Chalk & Talk	
	6.3.	1	Access Specifiers	JF#10 Page No. 426-447	Chalk & Talk	
	6.4.	2	Class Members: Variables and Methods	JF#10 Page No. 426-447	Chalk & Talk	
	6.5.	1	Accessing the Method	JF#10 Page No. 426-447	Chalk & Talk	Theory and Practical Section Test

Text Book:

1. Joyce Farrel- Programming Logic and Design -Cengage Learning - JF

Reference Books:

1. Venugopal, Rajkumar, Ravishankar. Mastering C++, Tata McGraw Hill. - VR
2. Forouzan B. Gilberg R. Computer Science – A Structured Approach Using C++, Cengage Learning. - FB
3. Sachin Malhotra, Saurabh Choudhary – Programming in Java – Oxford University Press - SM
4. Sharman Shah, Vaishali Shah – Core Java for Beginners– SPD - SS

Course Objectives and Course Outcomes Mapping:

Understand the fundamentals of programming concepts and methodology: C01, C02, C03, C04, C05, C06

To develop algorithm, enforces logical thinking: C01, C02, C03

To become familiar with problem solving techniques: C03, C04, C05, C06

Course Units and Course Outcomes Mapping

Unit No.	Unit	Course Outcomes					
		C01	C02	C03	C04	C05	C06
1	Introduction to Computer Programming	✓	✓				
2	Making Decisions	✓	✓	✓			
3	Repetitions		✓	✓			
4	Arrays		✓	✓	✓		
5	Functions		✓	✓	✓	✓	
6	Derived Types		✓	✓	✓	✓	✓

Programme Outcomes:

P01: Ability to understand the concepts of key areas in computer science.

P02: Ability to design and develop system, component or process as well as test and maintain it so as to provide promising solutions to industry and society.

P03: Effective communication and presentation skill.

P04: Ability to understand professional and ethical responsibility.

P05: Recognition of the need for life-long learning.

Course outcomes and Programme outcomes mapping:

Programme outcomes	Course Outcomes					
	C01	C02	C03	C04	C05	C06
P01	✓	✓	✓	✓	✓	✓
P02	✓	✓	✓	✓	✓	✓
P03	✓	✓				
P04	✓	✓	✓	✓	✓	✓
P05	✓	✓	✓	✓	✓	✓

Computing Environment:

A student must have the following computing environment in laboratory and or on his/her laptop and.

- ❖ GNU g++ or Java compiler in Linux platform.

Activities/Practicum:

The following activities shall be carried out by the students.

- ❖ Historical study of the Programming languages.
- ❖ Study of standard header files in C or C++ and Packages in Java.
- ❖ To prepare a list of syntax errors with solutions.

The following activities shall be carried out by the teacher.

- ❖ Demonstrate programming Environment and Program Testing and debugging.
- ❖ Discussion of Compilation, Linking and Loading and Program execution process.

Number of Practical Problems in Journal: 20

Total sets to be developed for each division: 2

Unit Number	Number of Questions	Time required to implement and debug the question (in hours)	Minimum required of Journal Certification
Unit-1	2	3	2
Unit-2	3	8	3
Unit-3	4	10	4
Unit-4	4	10	4
Unit-5	4	10	3
Unit-6	3	9	2
Total	20	50	18

Concept linkage:

Unit/Sub-Unit	Prior concept linkage	Post concept linkage
6.2 to 6.4	-	030010213: Unit 1