



## **Sub Committee for Curriculum Development**

**Course Name: Computational Thinking**

**(UG/PG): UG**

**Number of Credits: 4**

**Level: 2**

### **Learning Objective(s):**

Computational thinking involves solving problems, designing systems by drawing on the concepts fundamental to computer science. This course is designed to introduce the programming concepts, program development cycle and covers various tools and techniques for problem solving such as Algorithms, Flowcharts, Pseudo code.

### **On completion of this course student will :**

- Understand computer fundamentals
- Understand the characteristics of Low level and High level programming languages.
- Understand the steps involved in development of program.
- be able to develop algorithms to solve a problem
- be able to use the tools like flow charts, pseudo code to express the algorithm.

### **Pedagogy:**

- Lectures
- Class work discussion
- Case studies
- Video sessions
- Presentations

## Course Content

Sr No.	Session Topic	Hours
1	Introduction to Computer hardware and software, I/O devices, Memory- Primary and secondary, System software, Application software.	06
2	Programming languages -High level and low level Translation - Assemblers, Interpreters and compilers, Linkers and loaders	06
2	Computational thinking- what it is? How computational thinking used? Logical and algorithmic thinking, Problem solving and Decomposing complex problem	05
3	Data Representation Number system, Arithmetic addition subtractions, computer codes, Pattern reorganization in data- find common similarities and differences; (BCD, packed/unpacked, binary, hexa.....)	08
4	Designing algorithms Study of the basic components of algorithms (action, sequence, decisions, iteration, and state). A block-based programming environment is used to develop algorithms for small-scale problems.	08
5	Use of Flowcharts with different cases	08
6	Structured programming techniques- Boolean logic – AND, OR, NOT, Sequential algorithms, decision, Iterative algorithms top and bottom tested loops, control break	08
7	File Processing Files and Streams, Creating a Sequential Access File, Reading Data from a Sequential Access File, Random Access Files-Read and Write	11
	<b>Total</b>	<b>60</b>

**Suggested Evaluation Methods:****Books Recommended****Parallel/Similar courses the existing curriculum:**

S.No.	Name of the course	Institute where it was offered
1	Logic development and programming concept	SICSR

S.No.	Name of the course	Institute where it was offered
1	Computational Thinking	Virginia Polytechnic Institute and State University, University in Blacksburg, Virginia, USA
2	Computational Thinking	University of Southampton, England

Name of Member	Priti Kulkarni	Harshad Gune			
Designation	Asst Prof	Officiating Director			
Org. / Inst.	SICSR	SICSR			
Signature					

Name of the Expert:

Signature:

Date: