GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT
COURSE CURRICULUM

Course Title: Computer Programming
(Code: 3310701)

Diploma Programmes in which this course is offered	Semester in which offered
Computer Engineering, Information Technology,	**First Semester**

1. RATIONALE

This Course intends to develop programming skills in the students, using a popular structured programming language `C'. The students will learn step by step procedure (i.e. flowcharting & Algorithm) of any program development process. The programming skills thus acquired using `C' language can be used for acquiring necessary programming skill to work with advance level programming languages which in turn will be helping in developing programs for the scientific, research and business purposes.

2. LIST OF COMPETENCIES

The course content should be taught and implemented with the aim to develop the following competencies.

i. **Develop Simple Programs using 'C' Language**

3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**ESE**	**PA**	**ESE**	**PA**	**200**
3	0	4	7	70	30	40	60	

Legends: L-Lecture; **T** – Tutorial/Teacher Guided Theory Practice; **P** - Practical; **C** – Credit;
ESE - End Semester Examination; **PA** - Progressive Assessment.

4. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit – 1: Flowchart and Algorithm	1.1. Draw flow chart to solve given problem logically. 1.2. Develop Algorithm to solve given program.	**Flowchart and Algorithm** ➢ Flowchart • Definition and Importance of flowchart. • Symbols of Flowchart. • Flow lines, Terminals, Input/Output ,Processing Decision, Connection off-page connectors • Guidelines for preparing Flowchart. • Flowchart structure o Sequence, selection, repetition. • Limitation of flowchart ➢ Algorithm • Developing and writing algorithm using pseudo codes
Unit– 2: Basics of 'C'	2.1. Comprehend general structure of 'C' program 2.2. Declare and define variables 2.3. Write and execute simple program in 'C'	➢ **Basics of 'C'** • General structure of 'C' program and standard directories • Advantages of C language. • Character set, 'C' tokens • Keywords and Identifiers , Constants and Variables • Data Types in 'C' • Rules for defining variables • Declaration and Initialization • Dynamic initialization • Type modifiers and type conversion • Constant and volatile variable • Input and Output statements in 'C' • Write, compile, execute a simple 'C' program
Unit– 3: Operators and Expression	**3.1.** Use arithmetic, relational and logical operators for forming expressions. **3.2.** Format input and output using 'C' statements.	**Operators and Expression** • Introduction of different types of operators and their symbolic representation • Properties of operator • Priority of operator and their clubbing • Comma and conditional operator • Arithmetic operators • Relational operators • Assignment operators and expressions • Logical operators • Bitwise operators • Formatted input and output in 'C'
Unit–4: Decision Statements	4.1. Develop programs using decision making statements in 'C' language.	**Decision Statements** • Unconditional branching: goto statement • Conditional branching statements: If statement • If-else statement • Nested If-else statement • If-else-if Ladder statement • break, continue and goto statements • switch statements
Unit–5: Loop Control	5.1. Develop programs using	**Loop Control Statements**

Unit	Major Learning Outcomes	Topics and Sub-topics
Statements	structured loop control statements in 'C' language.	• for loop • Nested for loop • While loop • Do-while loop
Unit– 6: Introduction of Array (one dimensional)	6.1. Declare and define array. 6.2. Develop programs using array in 'C' language.	**Introduction of Array (one dimensional)** • Array Terminology • A characteristics of an array • Array Declaration • Array initialization • Accessing an array • Storing value in an array (Bubble Sort)

5. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total
1.	Flowchart and Algorithm	6	3	5	4	12
2.	Basics of 'C'	6	3	3	4	10
3.	Operators and Expression	8	4	4	3	11
4.	Decision Statements	8	3	5	5	13
5.	Loop Control Statements	8	4	5	5	14
6.	Introduction of Array (one dimensional)	6	2	3	5	10
	Total	**42**	**19**	**25**	**26**	**70**

Legends: R = Remembrance; U = Understanding; A = Application and above levels (Revised Bloom's Taxonomy)

6. SUGGESTED LIST OF EXERCISES/PRACTICAL/EXPERIMENTS

The exercises/practical/experiments should be properly designed and implemented with an attempt to develop different types of skills leading to the achievement of the competency. Following is the list of exercises/practical/experiments for guidance.

S. No.	Unit No.	Practical Exercises
1	1	Draw Flow Chart and write algorithm for at least four problems.
2	2	Write minimum 5 programs using Constants, Variables & arithmetic expression.
3	2	Write programs to understand Data types, Type modifiers and Type conversion.
4	2	Write programs providing insight to formatted and unformatted input and output in C.
5	3	Write minimum 5 programs providing understanding of Relational operators.
6	3	Write programs using logical and bitwise operators.
7	4	Make programs using If, If-else, If-else-if and Nested If statements.
8	4	Make programs using break, continue, goto and switch statements.
9	5	Write programs to understand simple For loop and nested loops.

10	5	Write programs using While Loop and Do-while loop.
11	6	Write programs on arrays. (Sorting, merging, finding particular value etc.)

7. SUGGESTED LIST OF PROPOSED STUDENT ACTIVITIES

Following is the list of proposed student activities:

- Search and Identify areas where C programming is widely used as sole programming language.
- Development of charts explaining various flow chart features.

8. SUGGESTED LEARNING RESOURCES

A. List of Books

Sr.No.	Author	Title of Books	Publication
1	Kamthane Ashok N.	Programming with ANSI And Turbo C	Pearson publication, Latest Edition
2	Balaguruswami E.	Programming in ANSI C	Tata McGraw-Hills publication, Latest Edition
3	Kanetkar Yashavant	Let us 'C'	BPB publications, Latest Edition

B. List of Major Equipment/ Instrument

Computer System with latest configuration and memory

C. List of Software/Learning Websites

- Introduction to C Programming Language, http://www.learnconline.com/2010/03/introduction.html
- Comp.lang.C Frequently Asked Questions, http://www.c-faq.com
- C Tutorial, http://www.cprogramming.com/tutorial/c-tutorial.html

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. P.P.Kotak**, Head, Dept. of Computer Engg., AVPTI Polytechnic, Rajkot
- **Prof. R. M Shaik**, Head, Dept. of Computer Engg., KD Polytechnic, Patan.
- **Prof. K. N. Raval**, Head, Dept. of Computer Engg., RCTI Polytechnic,Ahmedabad
- **Shri Sachin. D. Shah** Lecturer in Computer Engg., RCTI Polytechnic, Ahmedabad

Coordinator and Faculty Members from NITTTR Bhopal

- **Dr. K. James Mathai**, Associate Professor, Dept. of Computer Engg. & Application, NITTTR, Bhopal
- **Prof.R. K .Kapoor**, Associate Professor, Dept. of Computer Engg. & Application, NITTTR, Bhopal

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