



Department of Computer Applications National Institute of Technology Tiruchirappalli

1. Course Outline			
Course Title	PROBLEM SOLVING AND PROGRAMMING		
Course Code	CA711		
Department	Computer Applications	No. of Credits	3
Pre-requisites Course Code	-	Faculty Name	Dr.Michael Arock Dr.S.Sangeetha
E-mail	michael@nitt.edu sangeetha@nitt.edu		
Course Type	Theory		

2. Course Overview
<p>This course introduces the concepts of Problem solving and programming to students using procedural programming paradigm. The students learn to build complete solutions to simple and complex problems by writing pseudocode and converting it into programming language syntax. This course uses C programming language exclusively and establishes a foundation for learning problem solving aspects.</p>
3. Course Objective
To learn problem solving methodologies and aspects of C programming.
4. Course Outcomes (CO)
<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Write structured pseudo codes for a given problem. 2. Write C programs for solving problems. 3. Design programs for complex problems applying the concepts of Arrays and pointers. 4. Design programs for complex problems applying the concepts of structures and files

Course Outcomes	Aligned Programme Outcomes (PO)
1. Write structured pseudo codes for a given problem.	1,2,3,7
2. Write C programs for solving problems.	1,2,3,5,7
3. Design programs for complex problems applying the concepts of Arrays and pointers.	1,2,3,5,7,8
4. Design programs for complex problems applying the concepts of structures and files	1,2,3,5,7,8

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
1	1	Hardware and Software components, Programming paradigms, Program Development Cycle, Evolution of Programming languages. Principles of Structured programming	chalk and Talk (2h) Problem solving - 1hr
2	2	Modular Programming - Functions and Procedures- Parameter passing methods,C Language Fundamentals, Sequential, selective and repetitive structures	-do-
3	3	Functions: Definition - call - prototypes - block structure - Storage Classes	-do-
4	4	Arrays - 1D character and numeric arrays- Declaration, initialization and accessing array elements - Passing array elements and arrays as arguments	-do-
5	5	Arrays - 2D character and numeric arrays- Declaration, initialization and accessing array elements - Passing array elements and arrays as arguments	-do-
6	6	Pointers - Address and indirection operators, Pointer type declaration, assignment, initialization - Pointer arithmetic - Functions and pointers - Arrays and pointers -Strings and pointers	-do-
7	7	Multi-dimensional arrays using pointers - Pointer to arrays - Pointers to functions - Dynamic memory management	-do-
8	8	Structures - Variables, Accessing members, Assignment and nesting - Pointers to Structures -	-do-
9	9	Structures and functions - Array of Structures - Structures with pointers - Unions	-do-
10	10	Files : operations - Formatted input/output - character input/output - File positioning and Error handling	-do-
11	11	Pre-processor directives- Command line arguments	-do-

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	Week 4	1 Hr	20
2	Test 2	Week 8	1 Hr	20
3	Assignment	Week 8	1 week	10
4	Semester	At the end of course	3 hrs	50

ESSENTIAL READINGS :

1. J.R. Hanly and E.B. Koffman, "Problem Solving and Program Design in C", 6th Edition, Pearson Education, 2009.
2. M.A. Vine, "C programming for the absolute beginner", 2nd Edition, Thomson Course Technology, 2008.
3. B.A. Forouzan and R.F. Gilberg, "Computer Science: A Structured Programming Approach Using C", 3rd Edition, Thomson Course Technology, 2005
4. B. Gottfried, "Schaum's Outline of Programming with C", 3rd Edition, Tata McGraw Hill, 2010.
5. B.W. Kernighan, D.M. Ritchie, "The C Programming Language", 2nd Edition, PHI, 1995

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

- The students through the class representative may give their feedback at any time to the course faculty which will be duly addressed.
- The students may also give their feedback during Class Committee meeting.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

- **Plagiarism**
The students are expected to come out with their original solution for problems given as assignment, and tests/examinations.
- **Attendance**
100% is a must. However, relaxation upto 25% will be given for leave on emergency requirements (medical, death, etc.) and representing institute events.

FOR SENATE'S CONSIDERATION

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2. 





Course Faculty _____

CC-Chairperson _____

HOD _____