

DEPARTMENT OF COMPUTER APPLCIATIONS

| COURSE PLAN – PART I | | | |
|---|---|---------------------------------|------------|
| Name of the programme and specialization | B.Tech. / ICE | | |
| Course Title | Introduction to Computer Programming (Theory and Lab) | | |
| Course Code | CSIR11 | No. of Credits | 3 |
| Course Code of Pre-requisite subject(s) | Nil | Semester | I |
| Session | July 2022 | Section (if, applicable) | A |
| Name of Faculty | Dr. Saroja.S | Department | CA |
| Official Email | saroja@nitt.edu | Telephone No. | 8903482613 |
| Name of Course Coordinator(s) (if, applicable) | NIL | | |
| Official E-mail | NIL | Telephone No. | NIL |
| Course Type | GIR (Core Course) | | |
| Syllabus (approved in BoS) | | | |
| <p>Introduction to computers - Types of programming languages- Developing a program - Algorithms- Characteristics- Flow Charts- Principles of structured programming- Sequential selecting structures- Repetitive Structures-Bounded, Unbounded and Infinite iterations.</p> <p>Introduction to C- C character set- Identifiers and Keywords- Data types- Constants- Variables- Declarations- Expressions- Statements- Symbolic Constants- Operators- Library Functions- Data input and output: Single character input and output- Entering input data- Writing output data- gets and puts functions - Control Statements- Branching: if-else-looping: while- do-while- for; Nested control Structures- switch statements- Break statements- Continue Statements- Comma operator-goto statements.</p> <p>Modular Programming- Functions and Procedures - Examples- Parameters passing methods - Arrays- Defining an array- Processing an array- Multi dimensional arrays- Pointers- Variables definitions and initializations- Pointer operators- Pointer expressions and arithmetic- Pointers and one-dimensional arrays - String operations.</p> <p>Functions- Defining function- Accessing a function- Function prototypes- Passing arguments to a function- Passing arrays to a function- Passing Pointers to function- Recursion – Dynamic memory allocation - malloc, calloc, realloc – Structures – Declaration – Structures and Functions – Arrays of Structures – Pointers to structures – Typedef - Unions – Bit-fields.</p> <p>Files – Input / Output using files – fread, fwrite, fprintf, fscanf – Formatted input – File access - argc, argv.</p> | | | |



REFERENCE BOOKS

1. Byron Gottfried, Programming with C, 3rd Edition, Tata McGraw Hill Education, 2010.
2. R.G. Dromey, How to solve it by Computers? Prentice Hall, 2011.
3. Brian W Kernighan and Dennis Ritchie, The C Programming language, 2nd Edition, Prentice Hall, 1988.
4. J.R.Hanly and E.B. Koffmann, Problem Solving and Program design in C, 6th Edition, Pearson Education, 2009.
5. Paul Deital and Harvey Deital, C How to Program? 7th Edition, Prentice Hall, 2012.
6. Yashvant Kanetkar, Let Us C, 12th Edition, BPB Publications, 2012.

COURSE OBJECTIVES

1. To learn the fundamentals of computers.
2. To learn the problem-solving techniques writing algorithms & procedures.
3. To learn the syntax and semantics for C programming language.
4. To develop the C code for simple logic.
5. To understand the construct of structure program including conditionals and iterations

MAPPING OF COs with POs

| Course Outcomes | Programme Outcomes (PO) (Enter Numbers only) |
|--|---|
| 1. Ability to write algorithms for problems | 1, 4 |
| 2. Knowledge of the syntax and semantics of C programming language | 1, 3, 4, 5 |
| 3. Ability to code a given logic in C language | 1, 3, 4 |
| 4. Knowledge in using C language for solving problems | 1, 3, 4 |

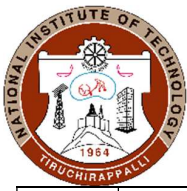
COURSE PLAN – PART II

COURSE OVERVIEW

This lab integrated course covers basics of C programming. It provides insights on problem solving aspects by discussing several examples using algorithms, flowcharts and progressively writing programs. Students are introduced to programming constructs like character set, instructions, functions, structures, and files. Comprehensive hands on exercises are integrated throughout the course to inculcate the programming practice to solve any real-world problems.

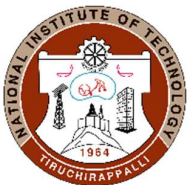
COURSE TEACHING AND LEARNING ACTIVITIES

| S.No. | Week/Contact Hours | Topic | Mode of Delivery |
|-------|---------------------------------------|--|---|
| 1 | 14/11/2022 to 18/11/2022 – 1 hours | Introduction to computers, Programming languages types, Structured programming languages | Lecture <i>Power point presentation</i> |
| 2 | 21/11/2022 to 25/08/2022 – 3 hours | Types of programming languages | Practical |



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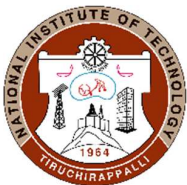
| | | | |
|----|---------------------------------------|---|--|
| 3 | 21/11/2022 to 25/11/2022 – 2 hours | Algorithm- algorithm characteristics, algorithm as pseudo code – need and sample. Flow chart – sample flow chart for some problems, Developing a program, Input and output statements in C, character sets, keywords, variables, constants, identifiers | Lecture <i>Chalk and Talk</i> <i>Power point presentation</i> |
| 4 | 28/11/2022 to 02/12/2022 – 3 hours | Basic program as discussed | Practical |
| 5 | 28/11/2022 to 02/12/2022 – 2 hours | Operators, Control statements- if, if-else, if-else-if, library functions | Lecture <i>Chalk and Talk</i> <i>PPT, Coding</i> |
| 6 | 05/12/2022 to 09/12/2022 – 3 hours | Simple programs using Sequential Programming | Practical |
| 7 | 05/12/2022 to 09/12/2022 – 2 hours | More on control statements-while, do-while, for, more on input and output – gets(), puts(), expressions | Lecture <i>Chalk and Talk</i> <i>PPT, Coding</i> |
| 8 | 12/12/2022 to 16/12/2022 – 3 hours | Sample programs using control statements, expressions | Practical |
| 9 | 12/12/2022 to 16/12/2022 – 2 hours | More on control statements- nested for, for-while combinations, go-to, break, continue statements. Use of operators in nested control structures | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 10 | 19/12/2022 to 23/12/2022 – 1 hour | More on Control Statement | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 11 | 19/12/2022 to 23/12/2022 – 1 hour | Cycle Test I | Written Test |
| 12 | 26/12/2022 to 30/12/2022 – 3 hours | Sample programs based on Repetitive Structure | Practical |
| 13 | 26/12/2022 to 30/12/2022 – 2 hours | Functions and procedures – theory, parameter passing methods, examples, recursion-its advantages, disadvantages, examples | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 14 | 02/01/2023 to 06/01/2023 – 3 hours | Programming Test 1 | Practical Test |
| 15 | 02/01/2023 to 06/01/2023 – 2 hours | Arrays and Sample programs – single dimensional and multi-dimensional arrays for integers | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 16 | 09/01/2023 to 13/01/2023 – 2 hours | Arrays of strings, examples | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 17 | 09/01/2023 to 13/01/2023 – 3 hours | Programs based on functions-parameter passing methods, recursions | Practical |
| 18 | 16/01/2023 to 20/01/2023 – 2 hours | Pointers, pointer operators, pointer arithmetic | Lecture <i>Chalk and Talk</i> <i>Coding</i> |



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|----|---------------------------------------|---|--|
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| 19 | 16/01/2023 to 20/01/2023 – 3 hours | Sample programs based on arrays – single dimensional and multi-dimensional | Practical |
| 20 | 16/01/2023 to 20/01/2023 – 1 hour | Cycle Test 2 | Written Test |
| 21 | 23/01/2023 to 27/01/2023 – 2 hours | Pointers and arrays – relationship, programs, pointers and functions, Passing arguments to functions, pointers as arguments | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 22 | 23/01/2023 to 27/02/2023 – 3 hours | Sample programs - Arrays for strings, Pointers, pointer operators, pointer arithmetic | Practical |
| 23 | 30/01/2023 to 03/02/2023 – 3 hours | Sample programs based on Pointers and arrays – relationship, pointers and functions, passing pointer arguments in functions | Practical |
| 24 | 30/01/2023 to 03/02/2023 – 2 hours | Memory allocation- malloc, calloc, realloc, Structure declarations, structures and functions | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 25 | 06/02/2023 to 10/02/2023 – 3 hours | Sample programs based on memory allocation and structure functions | Practical |
| 26 | 06/02/2023 to 10/02/2023 – 2 hours | Arrays of structures, pointer to structures, Typedef, Unions | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 27 | 13/02/2023 to 17/02/2023 – 3 hours | Sample programs using structure array, structure pointers, files | Practical |
| 28 | 13/02/2023 to 17/02/2023 – 2 hours | Files- input/output using files, file access methods, argc, argv | Lecture <i>Chalk and Talk</i> <i>Coding</i> |
| 29 | 13/02/2023 to 17/02/2023 – 3 hours | Programming Test 2 | Practical Test |

COURSE ASSESSMENT METHODS

The assessment in this course has two components, viz., Theory and Practical. The assessment in Theory component has cycle test and final assessment whose details are given in the below table. The assessment in Theory will be done for a total of 70 marks. The assessment in Practical component has periodical record / observation evaluation and final assessment whose details are given in the below table. The assessment in Practical will be done for a total of 30 marks. The total marks for this course is 100.



| COURSE ASSESSMENT METHODS-THEORY | | | | |
|---|---------------------------------------|--|-----------------|--------------------|
| S.No. | Mode of Assessment | Week/Date | Duration | % Weightage |
| 1 | Cycle Test 1 | As per schedule | 1 hour | 15 |
| 2 | Cycle Test 2 | | 1 hour | 15 |
| CPA | Compensation Assessment | | 1 hour | 15 |
| 3 | Final Assessment | | 3 hours | 40 |
| TOTAL THEORY MARKS | | | | 70% |
| COURSE ASSESSMENT METHODS-PRACTICAL | | | | |
| 4 | Continuous Assessment (Weekly lab) | -- | -- | 10 |
| 5 | Programming Assessment 1 | 02/01/2023 to 06/01/2023 – 3 hours | 3 hours | 10 |
| CPA | Compensation Assessment Lab* | As per academic schedule | 1 hour | 10 |
| 6 | Programming Assessment 2 | 13/02/2023 to 17/02/2023 – 3 hours | 3 hours | 10 |
| TOTAL PRACTICAL MARKS | | | | 30% |
| TOTAL MARKS (70%+30%) | | | | 100% |
| COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed) | | | | |
| <ol style="list-style-type: none"> 1. Students' feedback through class committee meetings 2. Feedbacks are collected before final examination through MIS or any other standard format followed by the institute 3. Students, through their Class Representatives, may give their feedback at any time to the course faculty which will be duly addressed. | | | | |
| COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified) | | | | |
| <u>MODE OF CORRESPONDENCE</u> : Email/ Phone, in-person | | | | |



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COMPENSATION ASSESSMENT POLICY

1. One compensation assessment will be given after completion of Cycle Test 1 and 2 for the students those who are absent for any assessment due to genuine reason.
2. Compensatory assessments would cover the syllabus of Cycle tests 1 & 2.
3. The prior permission and required documents must be submitted for absence.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

1. The Course Coordinator is available for consultation during the time intimated to the students then and there.
2. Relative grading adhering to the instructions from the office of the Dean (Academic) will be adopted for the course.

FOR APPROVAL

Course Faculty *S. Sar* CC- Chairperson *V. Sridhar* HOD *S. Sridhar*
(Dr V Sridhar)