

**SECOND SEMESTER 2018-2019**

# Course Handout Part II

Date: 07-101-2019

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course Number : CS F111

Course Title : Computer Programming

Instructor-In-Charge : Dr. *Subhrakanta Panda*

Team Members : Dr. Odelu Vanga, Mr. Surender Singh Samant, Ms. B. S. A. S. Rajita, Mr. Sanket Mishra, Mr. Rajesh Kumar Srivastav, Ms. Sahithi T.

**Scope and Objective of the Course:**

The course covers the following topics: Basic Model of a Computer; Problem Solving – Basic Computing Steps and Flow Charting (Assignment, Sequencing, Conditionals, Iteration). Programming Constructs – Expressions, Statements, Conditionals, Iterators/Loops, Functions/Procedures; Data Types – Primitive Types, Tuples, Choices (Unions or Enumerations), Lists/Arrays, Pointers and Dynamically Allocated Data. Input output and Files.

While the topics are taught using a specific language, the intent of the course is to teach a programming methodology, and not a programming language. There is also a laboratory component that involves development and testing of iterative and procedural programs using bounded and unbounded iterations, function composition, random access lists, sequential access lists, dynamically allocated lists, and file access. Finally, sincerely putting effort will reward you making you a good problem solver which is very much required in every sphere of life and course.

The primary objectives of the course are to introduce:

* Basic representation of data and how to process data using the representation inside a computer.
* Techniques for specifying data, operations on data, and problem solving using C.
* Systematic techniques and approaches for constructing programs.

**Text and Reference:**

**T1.** J.R. Hanly and E.B. Koffman, *Problem Solving and Program Design in C*. 7th Edition. Pearson Education

**Reference Books:**

**R1.** Programming with C Bryon Gottfried, Jitendra ChhabraTMH 3rd Edition.

**R2.** Brian W. Kernighan, Dennis Ritchie. *The C Programming Language*. Prentice Hall. 2nd Edition.

**R3.** Yale Patt, Sanjay Patel. *Introduction to Computing Systems: From bits & gates to C & beyond*, Second edition, McGraw Hill.

**Course Plan:**

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| **Lecture No.** | **Learning objectives** | **Topics to be covered** | **Chapter in the Text Book** |
| 1 | To understand the evolution of Programming Paradigms, and fundamentals of programming. | Introduction to computers, programming,  high level languages. | T1 (Chap 1)  R1 (Chap 1) |
| 2-3 | To identify basic data, data types and data representation for a given problem.  To be able to covert data given in number system to the other | Binary number system, Data representation: Unsigned Integers, Signed Integers: Signed Magnitude, One’s complement, two’s complement, floating point data representation, octal, hexadecimal and octal number systems and conversions. | R3(Chap 2) |
| 4-6 | To solve problems and formulate solutions to computing problems.  To be able to apply and use correct symbols for flowcharting given a problem | Problem statement, input/output description, the notion of an algorithm, algorithm development, flow charts | T1 (Chap 1)  R1(Chap 1) |
| 7-11 | To be able to demonstrate the  use of operators and data types  in writing C expressions.  To be able to represent data in  different number systems and  perform conversions. | C language elements: variables, data types  and sizes, operators, expressions,  precedence and associativity, general form  of a C program | T1 (Chap 2)  R1 (Chap 2, 3)  R2 (Chap 2)  R3(Chap 2) |
| 12-13 | To be able to demonstrate and  apply the formatted input output  statements. | How printf(), scanf() works and field widths and precisions ? | T1 (Chap 2)  R1(Chap 4)  R2(Chap 7) |
| 14-15 | To understand bit-level  manipulations. | Operators in C, Bitwise operators, bit-fields, shift function, rotating bits. | R1(Chap 14)  R2(Chap 2) |
| 16-17 | To be able to demonstrate and apply the C programming language constructs and solve problems. | C statements and blocks, Making decisions: if-else, else-if, switch construct | T1(Chap 4)  R1(Chap 6) |
| 18-20 | To understand and be able apply looping constructs to solve problems. | while, do-while, for, break and continue. | T1(Chap 5)  R1(Chap 6)  R2(Chap 3) |
| 21-22 | To be able to write programs  using functions and  comprehend the various types  of parameter passing and also  passing different data types. | Functions and program structure, arguments  and local variables, function prototype,  function definition, calling functions,  returning function results, call by value. | T1(Chap 6)  R1(Chap 7)  R2(Chap 4) |
| 23-24 | To be able to apply recursion in solving recursive problems.rogramss. | Recursion | T1 (Chap 9)  R1(Chap 7) |
| 25-27 | To be able to write programs  using arrays and apply them for  searching and sorting. | Declaring and referencing arrays, using  array elements as counters, initializing  arrays, 1-D and 2-D arrays, passing arrays  to functions, Searching and Sorting | T1(Chap 7)  R1(Chap 9)  R2(Chap 5) |
| 28-30 | To be able to use and write  programs using pointers  efficiently. | Pointer variable declaration and  initialization, pointer operators, pointers  and addresses, pointer arithmetic, pointer  arrays, pointer to a function, call by  reference | T1(Chap 7)  R1(Chap 9)  R2(Chap 5) |
| 31-32 | To be able to use and write  programs using strings and its  library functions efficiently. | String basics, string library functions, string  comparison, null string | T1(Chap 8)  R1(Chap 10) |
| 33-35 | To be able to use and write  programs using structures,  unions and enums efficiently | Basics of structures, unions and enums,  structure type data as input and output, array  of structures, structure containing structures,  pointers to structures, Self-referential  structures. Difference between structures  and unions | T1(Chap 10)  R1(Chap 12)  R2(Chap 6) |
| 36-38 | To implement linked list in C. | Creation, traversal, search, deletion in the linked list | T1(Chap 13)  Lectures Notes |
| 39-40 | To be able to distinguish  between different storage  classes.  To be able to use the right  storage classes while writing  programs. | Memory segment of a C program in RAM  and Different storage classes: auto, register  static and external. | T1(Chap 12)  R1(Chap 8,14)  R2(Chap 4) |
| 41-42 | To be able to implement file  processing for persistent data  storage. | Files and streams, creating and accessing sequential files, random access files, read, write operations, binary files | T1(Chap 11)  R1(Chap 13)  R2(Chap 7) |

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| **Component** | **Duration** | **Weightage(%)** | **Date & Time** | **Nature of Component** |
| Mid-sem | 1.5 Hrs | 20% | 16/3  9.00 - 10.30AM | Closed Book |
| Continuous Lab Evaluation\* |  | 20% |  | Open Book |
| Lab Examination**+** |  | 20% |  | Open Book |
| Comprehensive | 3 Hrs | 40% | 13/05 FN | Closed Book |

**\*Continuous Lab Evaluation [20%]**

* Every Alternate LAB, a test will be conducted. Average of all the test scores will be considered for the final evaluation.
* Nature - Open Book (in Lab): Only text book and one note book will be allowed. No photocopies or any other printed materials, cheats will be allowed.

**+Lab Examination [20%]**

* Two Lab Examinations will be conducted. The average score will be considered for final evaluation.
* Nature - Open Book (in Lab): Only text book and one note book will be allowed. No photocopies or any other printed materials, cheats will be allowed.

**Chamber (TBD) Consultation Hours:** To be announced by individual instructors.

**Course Notices:** All notices pertaining to this course will be displayed on the CS&IS Dept. Notice Board and/or CMS.

**MAKE UP POLICY**

* **No Make-ups** for Lab evaluations.
* Prior Permission of the Instructor-in-Charge is required to get make-up for the Mid-Sem. Only on producing documentary proof of possible absence, which proves that student would be physically unable to appear for the exam, the decision of granting the make-up will be taken.
* Prior Permission of Dean, Instruction Division is required to get make-up for the comprehensive exam.
* Instructor-in-charge’s / Dean’s decision in the matter of granting Make-up would be final.

**ACADEMIC HONESTY AND INTEGRITY POLICY:**

Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

**Mobile phones or any other communication equipment is not allowed during the examination.**

**Instructor-In-Charge**