



Birla Institute of Technology & Science, Pilani

Hyderabad Campus

Academic—Undergraduate Studies Division

INSTRUCTION DIVISION

SECOND SEMESTER 2018-2019

Course Handout Part II

Date: 2207-10701-20189

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 : MD Dr. Sudeepa Abhishek Mishra Thakur Subhrakanta Panda
Team Members : Dr. Lev Kumar Odelu Vanga, Dr. Mr. Jabez Surender Singh Samant, Ms. B. S. A. S. Rajita, Mr. Sanket Mishra, Mr. Rajesh Kumar Srivastav, Ms. Sahithi T. deepa Mishra, J. Christopher

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 goals-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 Chhabra TMH 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:

Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book
1	<u>To understand the evolution of Programming Paradigms, and fundamentals of programming.</u> <u>To list computer hardware and computer software.</u>	Introduction to computers, number systems and data representation , programming, high level languages, compiling programs , integrated development environments	T1 (Chap 1) R1 (Chap 1)
<u>2-3</u>	<u>To identify basic data, data types and data representation for a given problem.</u> <u>To be able to covert data given in number system to the other</u>	<u>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.</u>	<u>R3(Chap 2)</u>
<u>24-6</u>	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)
<u>37-121</u>	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)
<u>1312-143</u>	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)
<u>14-15</u>	<u>To understand bit-level manipulations.</u>	<u>Operators in C, Bitwise operators, bit-fields, shift function, rotating bits.</u>	<u>R1(Chap 14)</u> <u>R2(Chap 2)</u>
<u>16-17</u>	<u>To be able to demonstrate and apply the C programming language constructs and solve problems.</u>	<u>C statements and blocks, Making decisions: if-else, else-if, switch construct</u>	<u>T1(Chap 4)</u> <u>R1(Chap 6)</u>
<u>18-20</u>	<u>To understand and be able apply looping constructs to solve problems.</u>	<u>while, do-while, for, break and continue.</u>	<u>T1(Chap 5)</u> <u>R1(Chap 6)</u> <u>R2(Chap 3)</u>
<u>20-24</u> <u>21-22</u>	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)
<u>22</u> <u>23-24</u>	To be able to write <u>apply recursion in solving recursive problems.</u> program <u>programss.</u>	Recursion	T1 (Chap 9) R1(Chap 7)
<u>23-26</u> <u>5-27</u>	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	T1(Chap 7) R1(Chap 9) R2(Chap 5)

		to functions, Searching and Sorting	
27-28 <u>28-30</u>	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)
29-30 <u>31-32</u>	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)
31-33 <u>33-35</u>	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)
<u>36-38</u>	<u>To implement linked list in C.</u>	<u>Creation, traversal, search, deletion in the linked list</u>	<u>T1(Chap 13)</u> <u>Lectures</u> <u>Notes</u>
34 <u>39-40</u>	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)
36-37	To understand bit-level manipulations.	Bitwise operators, bit-fields, shift function, rotating bits	R1(Chap 14) R2(Chap 2)
38-40	To implement linked list in C.	Creation, traversal, search, deletion in the linked list	T1(Chap 13) Lectures Notes
41-42 <u>42-44</u>	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)

Component	Duration	Weightage(%)	Date & Time	Nature of Component
Mid-sem	1.5 Hrs	20%	16/3 9.00 - 10.30AM	Closed Book
Quiz+Continuous Lab Evaluation*		1020%		Open Book
Lab Examination+valuation*		3020%		Open Book
Comprehensive	3 Hrs	40%	13/05 FN	Closed Book

+Quiz [10%]

2 quizzes will be conducted each of 5% weightage.

Nature - Open Book: CMSNotebook, Text Book, Lab Sheets

***Continuous Lab Evaluation [3020%]**

- 4 lab evaluations will be conducted. **Best 3 will be considered each of 10% weightage.** 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): CMS, Text Book, Lab Sheets Only text book and one note book will be allowed. No photocopies or any other printed materials, cheats will be allowed.

+*Lab Examination 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 (B203TBD) 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 quizzes and lLab 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