Birla Institute of Technology & Science, Pilani
Hyderabad Campus

FISRT SEMESTER 2019-2020
Course Handout Part II

01/08/2019

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

CourseNumber   : CSF111
CourseTitle   : ComputerProgramming
Instructor-In-Charge : Dr. Lov Kumar
Team Members: Dr. Odelu Vanga, Dr. Sudeepta Mishra, Mr. Sanket Mishra,Mr. Gourish Goudar, K Sai Anirudh, Mr. Madan Naresh,Mr. Rajesh Kumar,Mrs. Sanghamitra Samanta, Mrs. Rashmi Sahay, Mrs. T. Sahithi.

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 andFiles.
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, the objective is to develop the problem solving skill and capability.

The primary goals of the course are to introduce:
 Basic representation of data and how to process data using the representation insidea computer.
 Techniques for specifying data, operations on data, and problem solving usingC.
 Systematic techniques and approaches for constructingprograms.

Text and Reference:
T1. *Problem Solving and Program Design in C* by J.R. Hanly and E.B. Koffman. 7th Edition, Pearson Education.
Reference Books:
R1. *Programming with C* by Bryon Gottfried, Jitendra Chhabra. 3rd Edition, TMH.
R2. *The C Programming Language* by Brian W. Kernighan, Dennis Ritchie. 2nd Edition, Prentice Hall.
R3. *Introduction to Computing Systems: From bits & gates to C & beyond* byYale Patt, Sanjay Patel. 2nd Edition, McGraw Hill.

Course Plan

Lecture No.	Learning objectives	Topics to be covered	Chapter in Text Book
1	To list computer hardware and computer software.	Introduction to computers, programming, high level languages, compiling programs, integrated development environments	T1 (Chap1) R1 (Chap1)
2-4	To solve problems and formulate solutions to computingproblems. To be able to apply and use correct symbols for flowcharting given aproblem.	Problem statement, input/output description, the notion of an algorithm, algorithm development, flow charts	T1 (Chap1) R1(Chap1)
5-7	Number systems and Data Representation used in programming. To be able to represent data in different number systems and perform conversions.	decimal to binary, decimal to octal, decimal to hex, binary to decimal, binary to hex, hex to decimal, hex to binary, octal to decimal 1's Complement, 2's Complement	Lecture Notes
8-12	To be able to demonstrate the use of operators and data types in writing C expressions.	Number systems and Data Representation. 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 (Chap2) R3(Chap2)
13-14	To be able to demonstrate and apply the formatted input output statements.	How printf(), scanf() works and field widths and precisions ?	T1 (Chap2) R1(Chap4) R2(Chap7)
15-16	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(Chap4) R1(Chap6)
17-19		while, do-while, for, break and continue, goto and labels	T1(Chap5) R1(Chap6) R2(Chap3)
20-21	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(Chap6) R1(Chap7) R2(Chap4)
22-24	To be able to write recursive programs.	Recursion	T1 (Chap 9) R1(Chap7)

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(Chap7) R1(Chap9) R2(Chap5)
28-31	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, Dynamic memory	T1(Chap 6) R1(Chap 11) R2(Chap 5)
32-34	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)
35-37	To be able to use and write programs using structures, unions, Linked List 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(Chap10) R1(Chap12) R2(Chap 6)
38-39	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)
40	To understand bit-level manipulations.	Bitwise operators, bit-fields, shift function, rotating bits	R1(Chap 14) R2(Chap 2)
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(Chap11) R1(Chap13) R2(Chap 7)

Evaluation Scheme:

Component	Duration	Weightage(%)	Date & Time	Nature of Component
Mid-Sem Test	1.5 hrs	20%	1/10, 1.30 -- 3.00 PM	Closed Book
Quiz+		10%	-	Open Book
Lab Evaluation*		30%	-	Open Book
Comprehensive Examination	3 hrs.	40%	7/12 FN	Closed Book

+Quiz [10%]
     3 quizzes will be conducted each of 5%weightage (est 2 out of 3)
     Nature - Open Book: CMS, Text Book, LabSheets

*Lab Evaluation [30%]
        Continuous Lab Evaluation –5%
        Online Test-1 –12.5%
        Online Test-2 –12.5%
        Online Test-3 –12.5%
        est 2 out of 3
        Nature - Open Book: CMS, Text Book, LabSheets

Chamber (H134) Consultation Hours: To be announced

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 labevaluations.

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 betaken.

Prior Permission of FIC, Timetable and Exams is required to get make-up for the comprehensiveexam.

Instructor-in-charge's / Dean's decision in the matter of granting Make-up would befinal.

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.

Instructor-In-Charge, CS F111