Birla Institute of Technology & Science, Pilani
Hyderabad Campus

Second Semester 2021-2022

(FOR THE BATCH STARTING FROM MARCH 2022)

Course Handout Part II

Date: March 11th, 2022

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. Nikumani Choudhury (nikumani@hyderabad.bits-pilani.ac.in)
Instructors	: Dr. Aritra Mukherjee, Dr. Abhijit Das, T Prathyusha, S Shashank, Kalakanda Rahul Roy Munna, Praneeta Krishnaprasad Maganti, Afrin Alam.

Scope and Objectives of the Course:

This is an introductory course to computers and programming. The language used to explain the concepts is preferably C. This course uses a bottom-up approach to teach the beginners what is the structure of a computer and how it can be programmed. It also covers adequate knowledge of Number systems. The course starts with the process of creating or developing algorithms/ flowcharts for solving different types of problems using a Computer. At a later stage, it covers programming constructs used in most languages like C, C++, etc. including data types, variables, operators, input/output, decision making, loops, arrays, functions, structures, dynamic memory allocations, file handling. Students also get hands on experience C programs in the laboratory.

The primary objectives of the course are to introduce:

- Basic representation of data and how to process this data using different types of storage representations inside a computer.
- Algorithm development for different tasks to be executed on a Computer and programming these using the high-level languages.

Text Book:

T1: J.R. Hanly and E.B. Koffman, *Problem Solving and Program Design in C*. 7th Edition. Pearson Education 2013.

Reference Books:

R1: Programming in ANSI C, E Balaguruswamy, Mc Graw Hill, 8th Edition 2019.
R2: The C Programming Language, Kernighan and Ritchie, 2nd Edition, Pearson, 2015.
R3: Let us C, Yaswanth Kanetkar, BPB Publications, 16th Edition, 2017.
R4: An Introduction to Programming through C++, Abhiram Ranade, McGraw-Hill Education, 2016

Lecture Plan:

Lecture#	Learning Objectives	Topics to be covered	Chapter in the Text Book
1-2	Introduction to Computers.	Historical perspective to computing, Basic structure of a computer, H/w and S/w, Basic operations, Programming languages, Anatomy of a computer, Classification of Computers.	T1 (1)
3-4	To understand how simple numeric data is represented inside a computer.	Number systems, Data representation, Binary arithmetic, Conversion from one base to another, Complement representations of negative numbers.	Lecture notes
5-6	To create algorithms for solving problems.	Concept of an algorithm and its design, Flowcharts.	R1 (1)
7-8		Transition of an algorithm to a program, Concept of a program.	R1 (2)
9-10	To understand the concept of problem solving using digital computer as a concrete engineering activity. The use of programming language 'C' for problem solving. To understand specific constructs in C as tools available for handling specific class of problems.	Representation and Manipulation of data (data types)	T1(2)/ R1(3)
11		Evaluation of expressions (Operations on simple data)	T1(2)/ R1(4)
12-13		Input and Output Operations including formatting.	T1(2)/ R1(5)
14-15		Sequential Evaluation and Conditional Evaluation (Sequential and conditional statements)	T1(4)/ R1(6)
16-18		Iterative/Repetitive constructs	T1(5)/ R1(7)
19-20		Programming using iterative/ repetitive constructs.	T1(5)/ R1(7)
21-23		Arrays	T1(7)/ R1(8)
24-26		Strings	T1(8)/ R1(9)
27-30		Modular programming: User defined functions.	T1(3)/ T1(10)
31-33		Pointers	T1(6)/ R1(12)
34-36		Structures & Unions	T1(10)/ R1 (11)
37-38		Dynamic memory allocation in C: malloc, calloc, realloc, free, linked lists etc.	T1(13)/ R1 (14)
39-40		File management in C.	T1(11)/ R1 (13)

Evaluation Scheme:

Component	Duration	Weightage(%)	Date & Time	Nature of Component
Mid-sem	90 mins	30%	4/05/22 (9:00-10:30)	Open Book
Continuous lab evaluations	Lab Duration	15%	Will be announced on CMS/ Google Classroom	Open Book
Lab Test (Two Tests each of 10%) -At Least one will be conducted before midterm	30 mins	20%	Will be announced on CMS/ Google Classroom	Open Book
Comprehensive	120 mins	35%	27/06/22 (Forenoon)	Closed Book

Make-up-Policy:
Make-up will be strictly granted on prior permissions and on justifiable grounds only.

Course Notices:
All notices pertaining to this course will be displayed on the CMS course page.

Chamber Consultation Hour:
Will be announced in the Classroom.

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