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# Second Semester 2023-2024

# Course Handout Part II

Date:January 9th, 2024

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. Apurba Das, Prof. Chittaranjan Hota, Dr. Jay Dave, Dr. Aneesh Chivukula.

PhD T.A. :S RasagnaVakkalanka, PraneetaKrishnaprasad, Chavali Lalitha, Mekala Kiran

**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*. 8thEdition. Pearson Education 2015.

**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:**

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| --- | --- | --- | --- |
| **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:**

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| --- | --- | --- | --- | --- |
| **Component** | **Duration** | **Weightage(%)** | **Date & Time** | **Nature of Component** |
| Mid-sem | 90 mins | 30% | 15/03 - 2.00 - 3.30PM | Closed Book |
| Continuous Lab Quiz | Lab Duration | 10% | In Lab (best 10/13) | Open Book |
| Class Interaction/Quiz | In class | 10% | In class (best 10/15) | Open Book |
| Lab Exam | 60 mins | 10% | TBA | Open Book |
| Comprehensive | 180 mins | 40% | 17/05 FN | Closed Book |

**\***40% of the Evaluation will be completed by Mid Semester Grading.

**Make-up-Policy:**

Make-up will be strictly granted on prior permissions and on justifiable grounds only. There is no make-up for Lab evaluation/quiz and Class interaction/quiz.

**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**