Course Code	Course Name	ECTS Credit
CSC107	Digital and Logical Design	7.5

Pre-Requisite	Course Type	Language of Instruction
	Compulsory	English

Year of Study	Level of Course	Mode of Delivery
1st /2nd	BSc/1st Cycle	On Campus

Course Objectives:

The course provides basic knowledge and understanding of Boolean Algebra and Digital Logic principles, with emphasis on design and analysis of combinational and sequential digital logic. In addition, it provides the basis for advanced study in the organization of computer systems, computer architecture.

Learning Outcomes:

After successful completion of the course, the students will have:

- Basic knowledge of Boolean logic principles and its implementation in digital planning
- In-depth understanding of combinational and sequential digital / logic circuits and hierarchical design principles
- Ability to analyze and logically synthesize digital circuits

Teaching Methodology:

Lectures 42 hours

Labs 30 hours

Course Content

Digital numerical systems and representation of information. Numeric functions (operations), decimal and alphanumeric codes.

Binary logic, Boolean algebra (identities, actions, equations, manipulation), regular forms, simplifications.

Logic gates, switch logic, CMOS logic implementation, integrated circuits.

Combined logic design: Circuits (gate level). Design hierarchy and processes, computer-aided design (CAD).

Implementation of combinational logic, of two and more levels. Numerical operations (addition, subtraction, multiplication) and other widespread operations (multiplexers, coders, decoders). Programmable logic design (ROMs, PLAs, PALs, FPGAs).

Sequential logic design: locks, flip-flops, finite state machines and minimization problems (Mealy and Moore models).

Registrars, registrar transfer and counters

Assessment Methods:

Final Exam

Mid-Term/Lab Exam

Assignments

Required Textbooks/Reading:

Title	Author(s)	Publisher	Year
Logic and Computer Design Fundamentals,	M.M. Mano and C.R. Kime	Pearson	2016
Digital Design Principles and Practice	J.F. Wakerly	Pearson	2017