

Gujarat University
K. S. School of Business Management and Information Technology
[Five Years' (Full – Time) M.Sc. (CA&IT) Integrated Degree Course]
First Year M.Sc. (CA&IT) (Semester - I)

Course Name: Fundamentals of Computer Architecture and Electronics - Practicals

Course Code: IDC-IMSCIT-114P

Course Credit: 2

Course Outcomes:

- To instil foundational knowledge of electronics, emphasizing the design and analysis of simple circuits and understanding of digital logic.
- To introduce students to the intricacies of assembly language programming, shedding light on low-level program representation and its transition from high-level languages.
- To develop practical skills in circuit construction, logic gate operations, and assembly programming.
- To ensure students can set up and operate in an assembly programming environment, developing an understanding of control structures and operations at the assembly level

Contents:

Unit No.	Course Content	Hours	Credits
1	Assembly Language Programming <ul style="list-style-type: none">• Setup and Environment Initialization<ul style="list-style-type: none">• Setting up an Assembly Programming Environment using tools like MASM or NASM.• Writing and executing a simple "Hello World" program in assembly.• Basic Operations<ul style="list-style-type: none">• Implement arithmetic and logical operations using assembly instructions.• Manipulate data in registers and memory• Control Structures Implementation<ul style="list-style-type: none">• Design simple programs demonstrating loops and conditional structures in assembly.• Develop procedures and function calls for modular code design	30	1
2	Digital Logic Circuits <ul style="list-style-type: none">• Building Simple Circuits<ul style="list-style-type: none">• Recognize components like resistors, capacitors, diodes, and transistors.• Construct basic series and parallel circuits using breadboards.	30	1

Gujarat University
K. S. School of Business Management and Information Technology
[Five Years' (Full – Time) M.Sc. (CA&IT) Integrated Degree Course]
First Year M.Sc. (CA&IT) (Semester - I)

	<ul style="list-style-type: none">• Measure and analyze voltage, current, and resistance using multimeters• Introduction to Digital Electronics<ul style="list-style-type: none">• Understand the concept of binary logic: 0s and 1s, high and low voltages.• Explore and test the operations of fundamental logic gates: AND, OR, NOT, NAND, NOR, and XOR.• Design basic combinational circuits, such as half adders, full adders, and multiplexers, using the provided logic gates		
--	--	--	--

Reference Books:

1. Computer System Architecture –
By M. Morris Mano – PHI/Pearson Education
2. Digital Computer Fundamentals –
By Thomas C. Bartee – Tata McGraw- Hill

Accomplishments after Completing the Course:

Upon successful completion of the "Fundamental of Computer Organization and Electronics- Practicals" course, students will be able to:

- Be proficient in setting up an assembly language programming environment using popular tools like MASM or NASM.
- Demonstrate competence in writing, assembling, and executing assembly language programs.
- Implement and test arithmetic and logical operations at the assembly level.
- Manipulate data storage in both registers and memory, understanding the nuances of each.
- Design and execute assembly programs with control structures, such as loops and conditionals.
- Have hands-on experience with basic electronic components like resistors, capacitors, diodes, and transistors.
- Possess the ability to construct, test, and troubleshoot simple series and parallel circuits.
- Understand the fundamental concepts of binary logic, representing data in high and low voltage signals.
- Have practical experience with essential digital logic gates like AND, OR, NOT, NAND, NOR, and XOR.
- Design, implement, and test basic digital circuits, including combinational circuits like half adders and full adders.