LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
DEPARTMENT OF MATHEMATICS, ENGINEERING, and COMPUTER SCIENCE

MAC283 – Computer Organization and Assembly Language **(3 CREDITS/4 HOURS)**

Catalog Description:

This course is intended for students in developing a background in hardware concepts. Topics covered include number systems, data representation, binary arithmetic Boolean algebra, combinational and sequential circuits, and an introduction to assembly language programming.

Prerequisites: MAC101 or MAC 109 is required.

Instructional Objectives:
1. To enable the student to gain a working knowledge of computer hardware fundamentals with an emphasis on microprocessors.
2. To familiarize the student with logic circuits, flip-flip, memories and memory chips.
3. To introduce microprogramming for a typical computer
4. To provide the student with sample architectures.

Performance Objective:
1. To explain hardware concepts of small and large computers.
2. To describe logic circuits, flip-flops and memory-chips.
3. To write a micro-programs.
4. To understand the blueprint of the architecture of a computer.

Grading Standards:
Written Tests 45%
Class Work 20%
Final Exam 35%
Total 100%

Book:
To be determined

Course Syllabus

Week 1
- Numbers Systems, Boolean algebra and Logic Simplification

Week 2
- Logic gates circuits.

Week 3
- Complex Logic circuits, DeMorgan's Theorems, Karnaugh maps.

Week 4
- Arithmetic Circuits, Flip-Flops, Asynchronous and Synchronous Counters

Week 5
- Registers, Sequence detector, Finite states machine (Mealy model)

Week 6
- Architecture of a very simple microcomputer and introduction to assembly language.

Week 7
- Architecture of the Intel 8086, ASCII Cod and 8086 assembly language environment.

Week 8 - 12
- Microprogramming using the Intel 8086 assembly language.

Week 13
Final Exam