

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

**MAC295 – Computer Architecture**

**4 credits; 5 hours (3 lecture, 2 lab)**

**Prerequisites: MAC265, MAC292**

**Catalog Description:**

This course will introduce the students to integrated circuit technologies including data storage and digital signal processing on a computer system, and programming with microcontrollers and embedded systems. This course will emphasize the laboratory construction and troubleshooting of these circuits. The student should expect to pay for additional materials for this course.

**Instructional Objectives:**

1. Familiarize students with semiconductor memory and data storage
2. Enable students to explain signal processing and digital signal processors
3. Introduce students to analog-to-digital conversion and digital-to-analog conversion
4. Introduce students to data modulation in transmission process
5. Enable students to describe multiplexing and demultiplexing in data transmission
6. Introduce students to parallel buses, serial buses, and bus interfacing
7. Enable students to interpret the function of a processor in the computer system
8. Familiarize students with embedded systems and integrated circuit technologies

**Performance Objectives:**

1. Describe semiconductor memory and data storage
2. Explain signal processing and digital signal processor
3. Explain analog-to-digital conversion and digital-to-analog conversion
4. Describe data modulation in transmission process
5. Describe multiplexing and demultiplexing in data transmission
6. Explain parallel buses, serial buses, and bus interfacing
7. Interpret the function of a processor in the computer system
8. Describe embedded systems and integrated circuit technologies

**Textbook:**

Floyd, Thomas L., Digital Fundamentals, 11th Edition, Pearson, ISBN: 10-0-13-273796-5.

**Evaluation:**

Written Tests (2 total at 25% each)	50%
Class Work	20%
Final exam	35%
Total	100%

**Academic Integrity:**

This class will be conducted in compliance with LaGuardia Community College's academic integrity policy.

**Attendance:**

The maximum number of unexcused absences allowed is 15% of the total class meetings. Unexcused absences beyond this maximum will result in a grade of WU or F.

**Comments:**

The grading standards listed above and the contents listed in the course outline are both subject to modification by the instructor.

**COURSE OUTLINE**

Week	Topic
1	Overview of logic circuits and programmable logic
2	Data storage, semiconductor memory, programmable memory, flash memory
3	Memory expansion, magnetic and optical storage, cloud storage
4	Signal conversion and processing, analog-to-digital conversion
5	Digital-to-analog conversion, digital signal processing, the digital signal processor (DSP)
6	Data transmission, modulation of analog signals with digital data
7	modulation of digital signals with analog data, multiplexing and demultiplexing
8	Bus basics, parallel buses, serial buses, bus interfacing
9	The computer system, the processor: basic operation, addressing modes and special operations
10	Operating systems and hardware, programming, microcontrollers and embedded systems
11	Integrated circuit technologies, CMOS circuits, TTL circuits
12	Comparison of CMOS and TTL performance, ECL circuits
13	Review on computer system and integrated circuit technologies, Final Exam