Syllabus and Course Information

Course Name:	**Computer Architecture**
Course Number:	**SDET 315-101**
Course Structure:	**2-2-3 (lecture hr/wk – lab hr/wk – course credits)**

Prerequisites: N/A

Core-Requisites: N/A

Required, Elective, Y or Selected Elective:

Instructor: Amit Patel   asp299@njit.edu

Course Materials:

Required textbook:
Computer Organization and Architecture, 11th edition
Published by Pearson (June 21, 2018) © 2019.
William Stallings, ISBN-13: 9780135205129
Reference:
Assembly Language for x86 Processors By: Kip R. Irvine Edition: 8th Publisher: Pearson
Print ISBN: 9780135381656, 0135381657
e-text ISBN: 9780135381793, 0135381797
Copyright year: 2020

Software:

The latest version of Microsoft Macro Assembler (known as MASM) should be used with this book. MASM is included with Microsoft Visual Studio. Please check our website (asmirvine.com) for the latest details about using MASM in Visual Studio

Course Description:

Assembly Language for x86 Processors focuses on programming microprocessors compatible with Intel and AMD processors running under current versions of Microsoft Windows.

History of Computer Architecture:

Assembly language is the oldest programming language, and of all languages, bears the closest resemblance to native machine language. It provides direct access to computer hardware, requiring you to understand much about your computer's architecture and operating system utilizing data representation, debugging, programming, and hardware manipulation.

Course Outcomes:

- Basic principles of computer architecture as applied to x86 processors.

- Basic Boolean logic and how it applies to programming and computer hardware.

- How x86 processors manage memory, using protected mode and virtual mode

- How do high-level language compilers (such as C++) translate statements from their language into assembly language and native machine code.

- How do high-level languages implement arithmetic expressions, loops, and logical structures at the machine level.

- Data representation, including signed and unsigned integers, real numbers, and character data.

- How to debug programs at the machine level. The need for this skill is vital when you work in languages such as C and C++, which generate native machine code.

- How application programs communicate with the computer's operating system via interrupt handlers and system calls

- How to interface assembly language code to C++ programs

- How to create assembly language application programs

Academic Integrity: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:
http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action.

This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course Outline.

Student use of artificial intelligence (AI) is permitted in this course for certain assignments and activities. You are not permitted to use AI for your responses to other student's posts in discussion forums and/or for any of assignments except your initial post to discussion forum, doing so would undermine student learning and achievement of course learning outcomes: Additionally, if and when students use AI in this course, the AI must be cited as is shown within the *NJIT Library AI citation page* for AI. If you have any questions or concerns about AI technology use in this class, please reach out to your instructor prior to submitting any assignments.

Weekly Schedule

Days: Tuesday

Times: 6:00 PM to 10:05 PM

Location: Central King Building Room: 315
Please note that all weekly assignments are due by Monday.

WEEK 1	Basic Concepts and Computer Evolution	CHAPTER 1 READING	QUIZ/LAB/DISCUSSION
WEEK 2	Performance Concepts	CHAPTER 2 READING	QUIZ/LAB/DISCUSSION
WEEK 3	Computer Function and Interconnection	CHAPTER 3 READING	QUIZ/LAB/DISCUSSION
WEEK 4	The Memory Hierarchy: Cache/Internal/External	CHAPTER 4-7 READING	QUIZ/LAB/DISCUSSION
WEEK 5	Input/Output	CHAPTER 8 READING	QUIZ/LAB/DISCUSSION
WEEK 6	Operating System Support	CHAPTER9 READING	QUIZ/LAB/DISCUSSION

WEEK 7	Number Systems	CHAPTER 10 READING	QUIZ/LAB/DISCUSSION
WEEK 8	MID-TERM		
MID-TERM	TDB		
WEEK 9	Computer Arithmetic	CHAPTER 11 READING	QUIZ/LAB/DISCUSSION
WEEK 10	Digital Logic	CHAPTER 12 READING	QUIZ/LAB/DISCUSSION
WEEK 11	Instruction Sets: Characteristics and Functions	CHAPTER 13 READING	QUIZ/LAB/DISCUSSION
WEEK 12	Instruction Sets: Addressing Modes and Formats	CHAPTER 14 READING	QUIZ/LAB/DISCUSSION
WEEK 13	Assembly Language and Related Topics	CHAPTER 15 READING	QUIZ/LAB/DISCUSSION
WEEK 14	Processor Structure and Function	CHAPTER 16 READING	QUIZ/LAB/DISCUSSION
WEEK 15	Reduced Instruction Set Computers	CHAPTER 17 READING	QUIZ/LAB/DISCUSSION
FINAL EXAM	TBD		

Grade:

QUIZ: 10%
LAB: 10%
DISCUSSION: 25%
MID-TERM: 25%
FINAL: 30%

Grading Policy

Final Grade   Range
A   100% - 92%
B+   91% - 88%
B   87% - 82%
C+   81% - 77%
C   76% - 70%
D   69% - 60%
F   59% - 0%