NATIONAL UNIVERSITY
of Computer & Emerging Sciences, Lahore

Department of Computer Science

EE-2003 – Computer Organization and Assembly Language

SPRING 2024

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Office Hours: Friday 11:00 am -1:00 pm

Course Information

Program: BS **Credit Hours:** 3 **Type:** Core
Pre-requisites (if any): DLD

Program Learning Outcomes:

PLO#	PLO Name	Description
2	Knowledge for Solving Computing Problems	Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.
3	Program Analysis	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.
4	Design/Development of Solutions	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

Course Learning Outcomes:

Course Learning Outcomes (CLOs)	BT Level	PLO Mapping
1. Demonstrate the basic concepts of computer organization including CPU, memories, and input/output and explain their purposes and interactions.	C2	2
2. Describe the working of important x86 assembly primitives, including arithmetic, branching, bit manipulation, addressing modes and interrupt handling.	C2	2
3. Apply the knowledge of Intel x86 architecture to develop moderately complex and well-modularized assembly programs.	C3	4
4. Analyze the performance enhancement of a processor via cache and pipelining features.	C4	3

Course Textbook

- Assembly Language Programming Lecture Notes by Bilal Hashmi.
- Assembly Language for x86 Processors Seventh Edition Kip R. Irvine
- Computer Organization and Architecture Designing for Performance Tenth Edition by William Stallings (WS)
- David A. Patterson, John L. Hennessy, Computer Organization and Design: The hardware/software interface, 4th Edition

Tentative Lecture Plan

Week	Topics to be covered
1	Introduction to Assembly Language
2	Addressing Modes
3	Branching
4	Bit Manipulations
5	Subroutines
Midterm 1	
6	Display Memory
7	String Instructions
8	Software Interrupts
9	Real Time Interrupts and Hardware Interfacing
10	Multitasking (Optional)
Midterm 2	
11-14	Computer Architecture, Pipelining, Cache, Performance

(Tentative) Grading Criteria

1.	Quizzes	10
2.	Midterms	30
3.	Final	45
4.	Assignments/Project	15

Grading Scheme: Absolute

Course Policies

1. Quizzes may be un-announced.
2. No makeup for missed quiz or assignment.
3. 80% attendance
4. 50% passing marks

Academic Integrity

- Plagiarism and Cheating against academic integrity. Both parties involved in such cases will face strict penalty (negative marking, F grade, DC)
- CODE/ ASSIGNMENT SHARING is strictly prohibited.
- Keep in mind that by sharing your code/assignment you are not helping anyone rather hindering the learning process or the other person.
- No excuse will be entertained if your work is stolen or lost. To avoid such incidents
    - Keep backup of your code on safe online storage, such as Google Drive, Dropbox or One drive.
    - Do not leave your work on university lab computer, transfer your work to online storage and delete from the university lab computer (empty recycle bin as well)

Course Policies

1. Announcements related to different aspects of this course (e.g., lectures, quizzes, exams, etc.) may be posted on SLATE (http://slate.nu.edu.pk/portal) and google classroom. Students are expected to view the announcements section of SLATE and google classroom regularly.
2. All students are expected to attend all lectures from beginning to end. Partial or full absence from a lecture without a valid reason may hamper chances for securing good grades. University's attendance requirements must be met in order to appear in the final exam.
3. Quizzes may be announced or unannounced. A quiz will usually be about 5 – 15 minutes long and it may be given anytime during the lecture. Students missing a quiz will NOT be given a make-up quiz.
4. Students can contest their grades on quizzes and assignments ONLY within a week of the release of grades. Exams will be available for review according to university policies.
5. Students are expected to demonstrate the highest degree of moral and ethical conduct. Any student caught cheating, copying, plagiarizing, or using any other unfair means will be strictly dealt-with in accordance with university policies.