COURSE: CMPS 250 – Machine Organization and Assembly Language Programming
Department of Computing Sciences, University of Scranton

DATE: Spring 2026 *(January 28, 2026 – May 22, 2026)*

INSTRUCTOR: P. M. Jackowitz
OFFICE: LSC 192
OFFICE HOURS: As posted (online and office door), and by appointment.
(Additionally, "Microsoft Teams" can be used for remote meetings.)
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Course Description:
(Prerequisite: CMPS 144) An introductory study of the organization and architecture of computers through an exploration of various virtual machines. Programming at the assembly-language level and interfacing with software components (primarily written in C). Topics include representation of data and instructions, computer arithmetic, memory hierarchies, instruction sets, addressing modes, digital logic, microprogramming, pipelining, and parallel processing. (Undergraduate Catalog 2025-2026)

STUDENT LEARNING OUTCOMES: Upon completion of the course, a successful student will have the ability to do each of the following:

1. Explain the functional components and operation of a computer system in detail, with focus on the processor, memory and the system interconnect.
2. Explain the generic design of the processor's Control Unit and the Instruction Execution Cycle in detail.
3. Explain the processor's Arithmetic Logic Unit and in particular the integer operations of addition, subtraction, multiplication and division.
4. Explain and use common representations of data and instructions.
5. Read, understand and modify existing program components written in Intel Assembly Language, and develop additional ones.
6. Understand the syntax and semantics of any assembly language; in particular, have the ability, with appropriate reference materials, to fully understand and develop program components in any assembly language.
7. Read, understand and modify existing program components written in the C Programming Language, and develop additional ones.
8. Explain dynamic memory management in general and be experienced in the use of pointers in C, and memory addresses in assembly language.
9. Identify, explain and know the significance and use of common circuits used in computer systems; decoders, multiplexers, adders, flip-flops, etc.

TEXTS: Computer Systems – Fifth Edition by J. Stanley Warford, Jones and Bartlett Publishers, 2017. See: https://computersystemsbook.com/

Dive into Systems, Suzanne J. Matthews, Tia Newhall, Kevin C. Webb, Dive into Systems LLC, 2020. See: https://diveintosystems.org/

Course Materials: The corresponding Brightspace "course" will provide students access to course materials, with "drop boxes" configured for the submission of work for the instructor to evaluate.

GRADING:	Worth
Tests *(approximate date) and Quizzes (as announced)*	
Week of March 9th	20%
Final Exam: *(comprehensive, as per Final Exam Schedule)*	40%
Assignments: Submission and Assessment	40%

Attendance: *Your attendance at all class meetings is expected. Your participation during class, as evidenced in part by your attentiveness, speaking in class to ask and answer questions and participate in discussions, will be considered in the determination of the final course grade.*

PROCEDURES:

Lectures:

- please sit in the same seat for every class meeting
- feel free to ask and answer questions, and to contribute to discussions
- classroom use of all electronic devices/gadgets (including computers) is at the full discretion of the instructor. *(Distracting others or yourself will not be tolerated.)*

Tests and Quizzes:

- always announced in advance, and **no make-ups will be given**
- notice must be given if a test must be missed due to serious illness or emergency

Assignments:

- assignments are activities accomplished outside of class meetings that require the development and submission of specified items (typically source programs) that may be tested, evaluated and graded
- each student is required to submit the results they have accomplished for each assignment
- discussions and mutually beneficial collaboration among students is encouraged, but must not be to the point of representing someone else's effort and understanding as one's own, as this would be considered to be **academic dishonesty**
- although learning how to make effective use of online and AI resources has merit, overusing these to provide results instead of the student developing them themselves hinders understanding and would likewise be considered to be **academic dishonesty**
- academic dishonesty will be dealt with **severely;** see Academic Code of Honesty in the Student Handbook at: https://www.scranton.edu/academics/cte/acad-integ/acad-code-honesty.shtml
- each assignment will have a specified **due date** and results submitted **after the due date are considered to be "late"**, and may be assessed a late penalty.
- assignments typically have a corresponding specified **subsequent submission deadline**, after which results may not be submitted, and are considered to be **"too late"**
- incomplete results generally will receive a grade much higher than zero, while not submitting will result in a grade of zero

Other:

- See "Syllabi Language" regarding "My Reporting Obligations as a Required Reporter" at: https://www.scranton.edu/equity-diversity/faculty-resources.shtml