



Be The Difference.

COSC 6931 – Computer Systems

Fred J. Frigo, Ph.D.

Fall 2026

Course Description:

Introduction to computer organization at the CPU and memory levels with an emphasis on cyber security implications. Topics include the C programming language, combinatorial circuits, assembly language, and reverse engineering. The course is specifically suited for students lacking a strong background on computer systems from undergraduate studies.

Course Learning Outcomes:

Upon successful completion of this course, students will understand fundamental computer architecture concepts, including the von Neumann architecture, combinational logic, Boolean algebra, and base-2 and base-16 number systems. They will develop and analyze programs in C and x86 assembly, and apply reverse engineering techniques using tools such as Ghidra to interpret compiled binaries. Students will also gain practical experience working in Unix/Linux environments and understand how operating system behavior interacts with hardware, particularly in the context of cybersecurity. Homework and projects reinforce these concepts through hands-on exercises that deepen understanding of computer system behavior.

Location & Schedule:

Class meets on Mondays & Wednesdays: 3:30pm-4:45pm

In person – Cudahy Hall 208 – or live stream available via Microsoft Teams.

Grading:

Homework and Projects: 60%

Mid-term exam: 20%

Final exam: 20%

Recommended Texts:

Randall E. Bryant, David R. O'Hallaron, *Computer Systems – A Programmer's Perspective*, 3rd edition, 2016.
ISBN: 9780138105396

Other Notes:

Students are required to comply with all policies outlined in the Graduate Bulletin, including the Marquette University Honor Code and Honor Policy. Class notes and lecture recordings will be shared on D2L. Assignments will be given at least 2 weeks prior to the due date.

Office Hours:

By appointment; using Microsoft Teams or in-person Haggerty Hall – Room 235

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