COSC 4300 – Network Design & Security

Fred J. Frigo, Ph.D.

Fall 2025

Course Description:

Focuses on the design and protocols of the upper layers of the Internet architecture, including the TCP/IP protocol suite, packet switching and routing, network programming and applications. Emphasizes related security attacks and defenses, including DNSSEC, TSL, IPsec and the BGP PKI protections.

Course Learning Outcomes:

We will explore fundamental networking principles, protocols, and architectures with emphasis on cybersecurity requirements to protect computer networks and systems from harm, theft, and unauthorized use. The goal of homework and projects will be to gain a deeper understanding of the ideas and concepts of this course through actual implementation in such areas as: network configuration, TCP/IP, firewalls, encryption, certificates, SYSLOG, OpenSSL, TLS, SPLUNK, Wireshark, etc.

Location & Schedule:

Class meets on Tuesdays & Thursdays: 3:30pm-4:45pm
In person – Cudahy Hall 417 – or live stream available via Microsoft Teams.

Grading:

Homework and Projects: 60%
Mid-term exam: 20%
Final exam: 20%

Recommended Texts:

William Stallings, Lawrie Brown, *Computer Security - Principles and Practice*, 4th edition, 2018.
ISBN: 9780134794105

Douglas E. Comer, *Internetworking with TCP/IP Volume One*, 6th edition, 2013.
ISBN: 9780136085300

Other Notes:

Students are required to comply with all policies outlined in the Undergraduate Bulletin, including the Marquette University Honor Code and Honor Policy. Attendance is required. Excessive unexcused absences may result in grade of 'WA' or 'WF'. 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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