

CSE 4232 Computer Network Programming (3 credits)

Primary instructor: Marius Silaghi

Textbooks and references:

D. Comer and D. Stevens, Internetworking with TCP/IP Vol I, III, 5th edition. Prentice-Hall, 2006. (T)

E. Rescoria, SSL and TLS: Designing and Building Secure Systems. Addison-Wesley, 2001. (R)

Course information:

2014–2015 Catalog description: CSE 4232 Computer Network Programming (3 credits). Covers design and implementation of programs that communicate with other programs across a computer network. Includes common protocols, network management and debugging tools, server-side networking, client-side networking, presentation layer (ASN1, XML), secure socket layer, multithreading, exceptions and remote procedure call. Prerequisites: CSE 2010 or CSE 2050 or ECE 2552

Prerequisites by topic: Programming skills in C or Java, basic data structures

Place in program: Advanced elective

Course outcomes & related student outcomes: The student will be able to

1. Explain a global picture of how Internet communication works. (1: Fundamental knowledge)
2. Locate standards defining Internet protocols: read, implement, and explain such standards. (1: Knowledge of history and present issues)
3. Write simple scripts to test the status of the Internet connection and configuration. (1: Skillful use of tools)
4. Write simple scripts that can communicate over the Internet using standard protocols. (1: Skillful use of tools)
5. Write programs that can communicate over the Internet using standardized binary formats. (1: Scientific, computing, and engineering problem solving)
6. Design and implement multi-threaded servers, clients, and peer-to-peer systems. (1: Skillful software construction)

Topics covered:

1. History and evolution of the Internet and its physical layer (3 hours)
2. Standardization in Internet (RFC), and basic protocols: IP, TCP, UDP, RTP, URLs (3 hours)
3. Debugging tools, scripting servers, and clients (3 hours)
4. Presentation layer (ASN1, XDR) (3 hours)

5. Main Internet protocols: HTTP, SMTP, POP3, IMAP, and FTP (3 hours)
6. Basic socket programming in C in Java (3 hours)
7. Advanced socket options in C and Java (5 hours)
8. Threads, daemons, and single thread servers (3 hours)
9. Basic encryption and SSL (3 hours)
10. Programming with secure socket libraries: OpenSSL, and TLS (3 hours)

Approved by: Marius Silaghi, Associate Professor

Signature: _____

Date: 01/30/2015