

ELEC-C7420 Basic Principles in Networking

Welcome!



Aalto University
School of Electrical
Engineering

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Welcome to the course

Responsible teachers:

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Pre-Course Survey

Please go to <https://presemo.aalto.fi/networking1> and answer the questions there.

Agenda Today

- Learning outcomes
- Learning methods and study materials
- Assessment and important dates
- Q&A

Learning Outcomes

At the end of this course, you will be able to

- Describe the basic principles of TCP/IP model and the representative protocols at each layer
- Use network diagnostic tools to analyze the working mechanisms and performance of networking services
- Implement basic communications services using socket programming
- Understand basic principles of network security: public/private key encryption, signatures, hashing, Message authentication, Email Security (PGP), securing of TCP (SSL), IPsec and VPN.

Learning Methods

- Lectures and tutorials
- Reading tasks
- Case study
- Lab work (e.g. network measurement, socket programming, Arduino programming)

Lectures - networking

- 09.01.2019** TCP/IP Model and Ethernet
- 14.01.2019** Wireless LAN
- 21.01.2019** IP
- 28.01.2019** TCP, UDP
- 04.02.2019** RESTful and HTTP
- 11.02.2019** CDN and DCN
- 18.02.2019** Mid-term summary and feedback

Exercise Sessions and Deadlines

Jan 16, 2019 Tutorial on traffic measurement

Jan 23, 2019 Tutorial on traceroute

Jan 29, 2019 **Deadline for Assignment I**

Jan 30, 2019 Tutorial on socket programming

Feb 6, 2019 Q&A for Assignment III

Feb 13, 2019 **Demo sessions and deadline of Assignment II**

Feb 17, 2019 **Deadline for Assignment III**

Lectures - security

- 25.02.2019 Principles of Cryptography**
- 04.03.2019 Message Integrity and digital signatures**
- 11.03.2019 End-point authentication**
- 18.03.2019 Securing Email**
- 25.03.2019 Securing TCP**
- 01.04.2019 IPsec and VPNs**
- 08.04.2019 Summary and feedback**

Exercise Sessions and Deadlines

- 27.02.2019 Tutorial on Arduino
- 06.03.2019 Exercise and **Assignment deadline**: Cryptography
- 13.03.2019 Exercise and **Assignment deadline**: Digital signatures
- 20.03.2019 Exercise and **Assignment deadline**: Authentication
- 27.03.2019 Exercise and **Assignment deadline**: PGP
- 03.04.2019 Exercise and **Assignment deadline**: SSL
- 10.04.2019 Exercise and **Assignment deadline**: IPsec & VPN

Assignments

- 1) Wi-Fi measurement (2 students per group) 14 Points**
- 2) Socket programming (individual assignment) 18 Points**
- 3) YouTube architecture analysis (individual assignment) 18 points**

(Security-related assignment descriptions will be announced one week ahead of the deadline as pdf)

Evaluation criteria can be found from MyCourses

Study Materials

- Peter L Dordal. An Introduction to Computer Networks.
<https://intronetworks.cs.luc.edu/current/html/>
- Kurose, Ross. Computer Networking, a top-down approach.

Assessment

Course grading (scale : 1-5) is based on the results of the group and individual assignments. No late submissions will be graded.

Grade 1: 61-68

Grade 2: 69-76

Grade 3: 77-84

Grade 4: 85-92

Grade 5: 93-100

Q&A