ELEC-E7330 Lab Course in Internet Technologies

Startup lecture
2022-2023 (I-II)

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Welcome to one of the best courses at ELEC!

Course was 2020-2021 ranked in a TOP-10 courses' list at ELEC of high quality teaching.

This course can be your last ones at Aalto before you Master Thesis, so enjoy!
The course staff is just for you!

General

- 5 cr

- Running on periods I-II

- Lab done in groups of two students

- Almost all the labs: contact teaching

- Generally each lab work consists of pre report, lab session and final report

- Learning outcomes: Students (You) understand how communication networks function in practice

- Responsible teacher: Juha Järvinen Juha.Tapio.Jarvinen@aalto.fi

… General

- Lab room is located in 2550 (Maarintie 8/TuAS)

- Each lab work is done in a group of two students

- Both of the lab partners have to be in the lab all the time.

- Come sharp (not 15 minutes past…)

- Labs are offered between 8.00-21.00 depending on a lab and/or an assistant

Lab works

Mandatory labs

- **IPv4 Routing**
- **BGP**
- **Breaking Isolation**
- **VoIP**

Choose one

- **Network Monitoring (new)**
- **DNS**
- **VPN**
- **Security (new)**
- **Multicast (new)**
- **IPv6**

Timetable

- **BGP**
  - At the end on Nov – two days
  - The both days are mandatory.

IPv4 Routing

- **Do it in October**

Breaking Isolation & VoIP

- **Can be done in January**

Timing

- **Some lab works are more demanding than some others**
  - Demanding ~ takes more time
- **ECT ~ 27 hours, 5 ECTs ~ 135 hours, and as a group ~ 270 hours**
- **135 hours / 5 labs ~27 hours / a lab / a student**

BGP

- **The whole course does this lab at the same time as a big group.**

- **The dates for BGP labwork are**
  - 16.11.2022 at 16.00-20.00
  - 17.11.2022 at 8.00-16.00

- **The both days are mandatory.**

- **After IPv4 lab you will get a small AMD64 computer to home to prepare a "pre report"**
  - https://pcengines.ch/apu4d4.htm
  - VmWare ESXi virtualization

Breaking Isolation and VoIP

- If you are busy on the Fall term, you can move these lab to January.

- "labs" are mostly done at home.

- VoIP: APU + ESXi

- BI: Virtualbox

How to (for each lab work)

- Reserve a lab time in the reservation system

- Write the preliminary report

- Work at the lab

- Write the final report

- Return your final report into the system

How to (after the last labwork)

- **Write your personal report and return it to the MyCourses portal you'll get your credits**

Personal Report - A

When you return your final report (of each lab), please answer in Mycourses (one per group)

- Consider every assignment separately and answer to the following questions

- Mark after each topic who was your assistant while working in the laboratory (not necessarily the same assistant).

- Did you have enough preliminary knowledge to master this assignment?

- What did you learn? • Tell some of the insights that you had? • How does this assignment support your other studies? • What would you like to add to this assignment? • What would you like to remove from this ass

Personal Report - B

The Section B

- **Thinking about the course as a whole**

- **Would you like to add a new assignment? Why?**

- **Is there any assignment that you would like to remove? Why?**

Reports…

Front page - model page

- **Return preliminary report 3 days before to Mycourses portal**

- **Final report max 2 weeks after working in the lab**

- **As a PDF file**

- **Language: English in reports for English report corrector (see list in MyCourses)**

  - Otherwise you write reports in Finnish, English or Swedish. This is quite a good opportunity to practise for a thesis…

  - Finns: Do not use Finglish!! Interface on kytketty letkulla switciin (Rajapinta on kytketty johdolla kytkimeen).

… Reports

- **IPv4 Routing - use report model (ONLY for IPv4)**

- **Use several sources (not Wikipedia)**

- **Copy-Paste is not allowed**

  - In the end of your reports your should name all the references you have used. In addition, everywhere in your text you should mark somehow where you have used your references. In case of www sources you should mention the whole URL and the date when cited.

- **Reports (pre+final) one/group**

- **Personal report one/person**

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Report Format

- **Front page (model in Mycourses)**

- **Do not copy-paste any text!**

- **Do not copy-paste even images (just photos)**
    - Redraw all the images and mark a source
    - Try to use the same drawing program if possible during one report (Same style)

- **Do not include screen dumps if not asked to do**
    - Boomerang immediately

- **There must always be a reason include something in an appendix section.**
    - Source code of a program that you haven't done by yourself • Is there any need for over a 20-pages-long reports?

- **References**

References

- ## Mark your references in your text:

The Extensible Messaging and Presense Protocol (XMPP) is a middleware protocol that started out as an Extensible Markup Language (XML) based instant messaging (IM) protocol. The basic protocol was collected into four RFCs (Request for Comments) [5]–[8] by the Internet Engineering Task Force (IETF) XMPP working group in 2002. This basic definition has then been widely extended by the XMPP Extension Protocol (XEP) standards [9]. Currently there are 156 XEPs, but most implementations only use a subset of those, based on the focus of the implementation.

REFERENCES

[1] R. Yan, Jie Yang, and A. Hauptmann. Automatically labeling video data using multi-class active learning. In Proceedings Ninth IEEE International Conference on Computer Vision, Oct 2003.

[2] Tijl De Bie, Thiago Turchetti Maia, and Antonio de P ˆ adua Braga. ´ Machine learning with labeled and unlabeled data. In ESANN 2009, 17th European Symposium on Artificial Neural Networks, Bruges, Belgium, April 22-24, 2009, Proceedings, 2009.

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Report Templates

- **Use report templates at Mycourses portal**
  - Word
  - LaTex

- **Use report template also for personal report**

Report Structure

- **Apart from IPv4 Final report, just answer the questions (do not even repeat questions)**

- **IPv4 Final report: Check model IPv4 report at Mycourses portal**

Material & Sources

- There is no specific book on this course

- Lab instructions of some labs can include background material

- Otherwise, journals, peer-reviewed conference papers, books, white papers, blogs, www sites etc. are data sources on this course

Turnitin

- **This is not a problem for 99% of you at all**

- **We run Turnitin for a bunch of reports at a time**
  - If you have already got a grade, does not mean it passed Turnitin
  - This is just for your best – your Master's thesis is waiting for you.

Hints

- Do the pre report carefully, this will be your basic knowledge for the lab session

- If additional material exists, go through it.

- Once again read instructions before coming to the lab session.

- During the lab session

- Ask, if questions

- Start doing you final report immediately after your lab session, not after the 13th day.

In lab session

- Ask things, lab session is not an exam

- Both of you must understand the preliminary report: prepare well. Assistants will check whether you have prepared or not by making questions on the subject -> a short oral test

- You should have all the documents needed with you. Don't start to print them during the working in the lab.

COVID-19

- **If sick, stay at home!**

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Grading

- **Each lab will be graded separately**
  - Grade is shown in the reservation system
  - Grade can be different between group members
- **Preliminary and final reports**
- **Laboratory working**
  - including a short oral preliminary exam before every lab: grade -1 if failed)
- **Personal report has to be done (not graded)**
- **Total grade is weighted average of individual labwork grades**
  - Weight IPv4 routing = 2, the rest = 1

Assistants

- **They are for you!**

- **Every lab has two assistants (might be the same person)**

- **Grading assistant**

- **Supervising assistant**

- **If you would like to get some feedback concerning reports etc.**
  - Contact grading assistant

- **If your data obtained during lab is missing, for example**
  - Contact supervising assistant

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Cancelling a lab time

- **If you have to cancel your reservation less than 3 days (72h) before, please inform supervising assistants, too!**

- **Remember to cancel your reservation at MyCourses portal**

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Review/Feedback

- **If you are not satisfied your grade or want to ask something concerning of an individual labwork, email to a grading assistant and add as cc Juha.Tapio.Jarvinen@aalto.fi**

What to do next?

- **Check that your able to work with basic linux commands, for example:**
  - To move to another directory
  - Copy data from a remote computer to a local computer with different username
  - In which directory am I now?
  - How to kill a process
- **Check how to assign IP addresses (for IPv4 Routing labwork)**
  - What is a network (L2/L3)?
- **Check how to use Wireshark/Tcpdump tools**

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How to find a partner?

- **Here Now!**

- **Teams**
  - Check link at MyCourses portal

- **For example: Mycourses portal under topic "Pairing"**

Welcome
On Board!

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