

S-72.1130 Telecommunication Systems

Welcome to course workspace. For help and discussions use [S-72.1130 discussion forum](#).

NOTE: If you experience missing figures, you can [download this page in pdf](#)

Results

Course final results including both Dec 2009 and Jan 2010 exams [here](#)

Note that we have made grading more loose such that both exam and tutorial/drills difficulty would be better counted for

Exam requirements

Exam area covers lecture handouts, tutorials & drills (solutions below) with the respective Ebrary materials (as referred in tutorial sheets) and materials in [lecture notice section](#). Exam is based on true/false or multiple choice questions only.

Tutorial solutions: [t1](#), [t2](#), [t3](#), [t4](#) and [t5](#)

[Drill solutions](#) (use password **telemeta** to open drill solutions)

Overview

Objective of the course is to give basic knowledge of telecommunication networks and have a deeper look on some of the various functionalities. Networks discussed include Public Switched Telephone Network PSTN, wireless local area networks (WLAN), digital subscriber lines (xDSL), public land mobile networks (PLMN) and Internet that is in great deal based on TCP/IP protocol suite. We will also familiarize us with the standardization work of International Telecommunications Union (ITU), European Telecommunications Standards Institute (ETSI) and Internet Engineering Task Force (IETF). Lecture and tutorial materials will be available in this homepage.

Course discusses the following topics:

[1 Overview \(ppt\) pdf](#)

[2 Public Switched Telephone Network \(PSTN\) pdf](#)

[3 Wireless Local Area networks \(WLAN\) pdf](#)

[4 Asynchronous Digital Subscriber Line \(ADSL\) pdf](#)

[5 The Internet pdf](#)

Special topics popped up in lectures and extra materials will be discussed / illustrated in [lecture notice - section](#)

Personnel

- Timo Korhonen (lecturer)

- Shekar Nethi (lecture assistant)
- Muhammad Farhan Khan (lecture assistant)

Passing the Course and Materials

Course materials include lecture handouts, voluntary drill and tutorial assignments that all are accessed and submitted in this page.

In addition, there will be web-materials that are referred in lectures and in tutorials. The following books might also prove to be useful:

- W. Stallings: Data and Computer Communications, 7th/8th ed. (easy to follow, covers most course topics fairly well)
- J. F. Kurose, Keith W. Ross: Computer Networking, 2nd ed. (extensive, covers mainly Internet)
- A. Leon-Garcia, I. Widjaja: Communication Networks, 2nd ed. (extensive, covers Internet, also some S-72.1140 materials)
- M. Duck, R. Read: Data Communications and Computer Networks, 2nd ed. (very simple to follow)

Also, [Ebrary](#) provides much material relating to this course. You can access Ebrary in TKK campus. Out

of campus: You can use VPN (SSH) or go to <http://libproxy.tkk.fi/> and select Ebrary from row 29.

Following Ebrary references are useful (number in parenthesis refers to some of the relevant chapter):

1. Essentials of Modern Telecommunications Systems: DSL(6), PSTN(3), SDH(7), PCM(2), PLMN(4) - [link](#)
2. Principles of Digital Communication Systems and Computer Networks: PSTN(11), Internet(16) - [link](#)
3. Data Communication Principles for Fixed and Wireless Networks: SDH (7), HDLC(6), Overview(1) - [link](#)
4. Introduction to Telecommunications Network Engineering 2nd ed: PSTN and Traffic eng. (2) - [link](#)
5. OFDM for Wireless Communications Systems: WLAN(2) - [link](#)
6. Telecommunications: A beginners guide: PSTN(1), Internet(2-9), SDH(10) - [link](#)

Grading

Final grade is determined by the formula:

$$\text{Final_Grade} = \text{Exam_Grade} + 0.1 * \text{Tutorial_Grade} + 0.05 * \text{Drill_Grade}$$

$$\text{Max}\{\text{Exam_Grade}\} = \text{Max}\{\text{Tutorial_Grade}\} = \text{Max}\{\text{Drill_Grade}\} = 5$$

Timetables

In the table 1 below yellow indicates lectures and blue tutorials. Light brown indicates release and deadline of drills. Generally tutorials take place on Mondays 10-12 hours in S4 and lectures on Wednesdays 14-16 hours in S4

except on 11.12.09 tutorials will be in B-hall, main building, at 12-14 hours.

Course first exam will take place at 22.12.09, 13-16 hours in halls S1, S3 and S4.

| NOV 09 | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|--------|-----|-----|-----|-----|-----|-----|-----|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | | | | | | |
| | | | | | | | |
| DEC 09 | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | 28 | 29 | 30 | 31 | | | |

Table 2 below shows timetable of tutorials and drills.
Tutorials need to be returned on Mondays at 10 AM.

| tutorial /drill timetable | | |
|---------------------------|----------|----------|
| topic | released | deadline |
| overview | 9.11 | 16.11 |
| PSTN | 16.11 | 23.11 |
| WLAN | 23.11 | 30.11 |
| ADSL | 30.11 | 7.11 |
| Internet | 7.11 | 11.11 |
| Drills | 27.11 | 18.12 |

Tutorials and Drill

Instructions:

- (i) Download respective tutorial/drill in pdf,
- (ii) Read advised references and have a look on lecture slides
- decide alternatives based on downloaded pdf
- (iii) Fill your reply to web-form (note: you can access the form only once)
- correct alternatives are discussed in the tutorial lecture
- (iv) Answering a tutorial/drill question yields for correct answer +3 points, for false answer -3 points, and for unselected answer 0 points. Note that **you can fill the web form only once**. Tutorial session will discuss also some solved examples.

NOTE 1: Don't select true or false if you don't know the answer - this yields zero points.

NOTE 2: Optima form-systems is not compatible with Internet Explorer 8. We know that it is compatible at least with Mozilla Firefox.

Tutorial 1. 1st tutorial is based on Ebrary materials [4, Chapters 2-2.5] and [3, Chapters 1-2.1.1] above and 1st lecture slides.

1st tutorial deadline (from table I above) is **16.11.09 at 10 AM**.

Tutorial 1: [PDF](#) WEB - [FORM](#) (Can be accessed only once. Access when you know the answers.)

Tutorial 2. Answer the following questions based on lecture slides #1 and #2:

[PDF](#), WEB - [FORM](#) (before clicking the FORM please check the instructions (i)-(iv) above)

Tutorial 3 is based on Ebrary materials [5, Chapter 2] and [3, pages 164-167] and 3rd lectures slides:

[PDF](#), WEB-[FORM](#) (before clicking the FORM please check the instructions (i)-(iv) above, use Mozilla Firefox browser)

Tutorial 4 is based on Ebrary material [1, Chapter 7]:

[PDF](#), WEB-[FORM](#), return by 7.12 at 10 AM (same rules as in the earlier tutorials)

Tutorial 5 is based on Ebrary materials [2, Chapter 16], [6, Chapters 3-5 and 19] and Internet lecture slides:

[PDF](#), WEB-[FORM](#), return by 11.12 at 12 hours. NOTE: 11.12.09 tutorials will be in B-hall, main building, at 12-14 hours.

Drill is divided into DSL questions 1-10 and Internet questions 11-21: Drill questions on ADSL are based on Ebrary materials [1, Chapters 6.1-6.4], [6, Chapter 20] and ADSL lecture slides. Drill questions on Internet are based on Ebrary materials [2, Chapter 16], [4, Chapter 6.3 and Pages (312-315)], [6, Chapters 3, 19 and Pages (110-123)] and Internet lecture slides. Drill deadline is **18.12.2009 at 23:59**.

[PDF](#), WEB-[FORM](#) ((before clicking the FORM please check the instructions (i)-(iv) above, use Mozilla Firefox browser) NOTE: Due to Optima grading system bugs your grade in observed feedback might not reflect your actual points - the respective final points will be informed later.