Learner's Guide

Computer Networks
Distance course

Spring 2006

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1. About the course

1.1. Description of the course

The intent of the course is to provide a basic theoretical and practical knowledge in the area of computer networks with emphasis on Internet technology. Its objectives are to familiarize the student with network terminology and to introduce him/her to different network architectures, transmission media, network topologies and access methods, network types and components, the basics of addressing and routing and simple methods for network troubleshooting.

1.2. Course aims

After the completion of this course the student will be able to:

- Categorize the common network protocols with respect to the layers in the OSI and TCP/IP protocol suites,

- Understand and explain the functioning of various network components,

- Describe different addressing techniques and their relation to each other,

- Perform simple calculations of trunk's capacity and other parameters measuring network performance

- Distinguish among different network topologies and architectures and be aware of their advantages and disadvantages

- Implement simple tools for network troubleshooting.

1.3. Prerequisite knowledge

To be able to follow this course the student should fulfill the following:

- Be able to use a computer, some text processing program, and Internet services, such as browsing and searching the Web, use FTP and E-mail.

- Have general upper secondary school knowledge.

- Have good knowledge of technical English language.

1.4. Text book and other course material

The book to be used with this course is Data Communications and Networking, Berhouz A. Forouzan, Mc Graw Hill, 3rd revised edition, ISBN: 0-0712-3241-9. The following list shows pages of the book to be read with this course. You will find review questions, multiple choice questions and exercises after each chapter. As there are too many of them, this table contains the most important ones. By doing them you will apprehend better the topics studied. You do not need to send the answers for these questions. However, you can find the solutions to the odd numbered problems at the book web site .

Chapter	Pages to read	Review questions	Multiple Choice Questions	Exercises
Chapter 1	3 to 20	1, 3, 4, 8, 9, 12, 11, 13	15, 17, 18, 22, 24, 26	28, 29, 33, 40
Chapter 2	27 to 41	3, 6, 7, 13, 14	17, 20, 22, 23, 26	29, 30, 31
Chapter 3	49 to 73	3, 6, 9, 12, 16	23, 25, 27, 32, 35	53, 61, 63, 71, 74, 78, 79, 84
Chapter 4	85 to 93 and 98 to 107	2, 4, 15, 16	22, 36, 37, 38	49, 50, 58
Chapter 5	115 to 138	4, 6, 9, 10, 11, 13	24, 27, 31, 33, 50	54, 56, 64
Chapter 6	149 to 155 and 157 to161	4, 7	16, 19	
Chapter 7	173 to 190	4, 8, 11, 17	33, 34, 33, 42	47
Chapter 8	197 to 205	14, 15, 16	32, 39, 40	
Chapter 9	219 to 232 without going in details	1, 3, 6	22, 26, 37, 41	
Chapter 10	243 to 256	1, 2, 5, 10, 11	22, 25, 31, 36, 37	45, 48, 49, 50, 51
Chapter 11	267 to 285 (with understanding the concepts only, not memorizing all the fields of HDLC) and 288 to 290 (Data transparency)	1, 2, 5, 10, 15	17, 19, 21, 22, 23	36, 39, 40, 41, 42, 43, 44
Chapter 12	295			
Chapter 13	311 to 320	1, 5, 6, 10, 14	26, 27, 30	
Chapter 14	333 to 354	2, 3, 4, 5, 6	16, 19, 22	32, 33, 35
Chapter 16	387 to 396	1, 2, 3, 4, 5	15, 18, 19, 20, 22	
Chapter 18	435 to 442 and 446 to 453	1, 4, 6, 7		
Chapter 19	471 to 502	1, 6, 7, 8, 9	23, 29, 34, 35	50, 57, 61, 63, 64
Chapter 20	513 to 528	2, 3, 4, 10	16, 17, 20, 22	
Chapter 21	543 to 557	3, 4, 7, 9	14, 15, 16, 32, 33	66, 68, 69,
Chapter 22	593 to 612	1, 2, 3, 4, 5	15, 17, 20, 25, 27	
Chapter 24	671 to 675	1, 2	11, 12, 13, 14	30,
Chapter 25	685 to 698	1, 2, 3, 4, 8	12, 14, 16, 27	30, 31, 35, 32
Chapter 26	705 to 725	1, 6, 8, 9, 10	17, 18, 23, 29, 36	
Chapter 27	731 to 753	4, 8, 10, 11	23, 27, 28, 32, 35	60, 61, 63

In addition to the book, you can use the lecture slides and other course material supplied on the course web page. Minor revision to the course material may occur one week before the recommended dates given on the Calendar and in the Time-line. Announcement about any changes will be announced on the discussion forum.

The course material is written in English. However you are free to communicate with the supervisors and answer assignments in Swedish as well as English.

1.5. Course requirements and assessment

Students are expected to be online and ready to work continuously, just as in a regular course. You can acquire knowledge through reading the on-line material and the book, working through the questions and problems given in the book, doing the assignments and quizzes. The discussion forum, chat and private mail are to be used for communication. Visit the WebCT discussion forum at least once a week, since important messages may be published there.

In order to successfully finish the course the student is required to earn 5 points (7.5 ECTS credits).

- Two points (3 ECTS credits) are obtained by finishing successfully all the assignments and quizzes.

- Three points (4.5 ECTS credits) can be earned by passing the written exam.

There are three assignments, two of which include laboratory exercises and review questions and one project type of assignment where you are required to write a short essay on a topic related to computer networks. The assignments are submitted on-line through the WebCT tool for assignments. They are graded by the instructor and there are two available grades (Pass and Fail). In case you fail the assignment, you will need to do it again.

There is a quiz for each section in the Course materials. You can take each quiz unlimited number of times or until you finish it successfully (have 60% of the total points).

1.6 Written Exam

The course is concluded by a written exam. Exams are normally offered every year in the end of March, beginning of June, end of August, end of October and mid-January. See the short-term exam schedule for Mid Sweden University, or the long-term 2005/06 exam schedule for ITM department in Sundsvall.

The exam can be taken in Sundsvall or at another place. In the later case the arrangements should be done four weeks in advance according to the instructions given in the registration form.

The exam lasts four hours and you can only use a pocket calculator. The use of other materials is not allowed during the exam. The written exam consists of two sections. The first one is a theory part where you need to show understanding of the network concepts, protocols and technologies. You should be able to define and understand the key terms given in terminology list published under the icon Exam. The second part of the exam consists of exercises similar to those you have encountered in the book, the assignments and the quizzes. You will pass the exam if you earn more than 50% of the points available. The following table will be used for assigning the grades.

Scale	% of total points	Grade
Swedish	0 – 49	U
Scale	50 – 74	G
(U, G, VG)	75 – 100	VG

Swedish	0 – 49	U
Scale	50 – 66	3
(3, 4, 5)	67 – 83	4
	84 – 100	5

ECTS (European Credit Transfer System) scale	0 – 49	F
	50– 59	E
	60 – 69	D
	70 – 79	C
	80 – 89	B
	90 – 100	A

2. Studying on distance

2.1. Using the WebCT platform

If you have never used the WebCT platform, try to be patient at the beginning and don't get upset about the difficulties that may occur. It always takes time to familiarize oneself with something completely new. In addition to the contents you also need to learn how to utilize the learning environment. There are thus two learning processes going on at the same time. Take plenty of time to familiarize yourself with both the learning environment and the contents of the studies you are beginning with.

Besides this guide the home page for the course contains the following icons:

Communication tools: Under this icon you will find Discussions, Mail, Chat and Homepages. In Discussions you can post a question or comment that can be read and answered by everyone in the class. You can also read and answer to the messages posted by others. The topics under this tool are named according to the different aspects in the course. Therefore before you post a message, choose a topic corresponding to the subject.

Mail functions in the same way as ordinary e-mail. The only difference is that you can communicate with the members of the class only.

NB! If you are used to check regularly your ordinary mail, configure the WebCT mail to forward messages to the e-mail address that you read on the daily bases. Click on "Communication", "Private mail" and "Message settings", check "forwarding my e-mail to", enter your address and click "Update".

To participate in Chat you need to be logged on the course at the same time as the other participants and "enter" the same chat room.

Homepages tool provide you with possibility to present yourself to the other students and to find out who are your classmates. You can place there your photo and write something about you. If you already have a homepage place a link to it.

Exam issues: This icon contains the terminology list you need to master before coming to the exam and some old exams. The solutions are not posted immediately and will be available later in the course.

Course material: You will find there lectures (Power Point slides) associated with a single or two chapters from the book. The lectures should help you when revising the material read from the book.

Assignments: The assignment will appear later in the course according to the schedule given at the end of this document. Before doing the assignment read carefully the instructions provided. The submission of the assignments should be done via the tool provided for this purpose on the Assignment page. You will first upload file(s) and then submit the assignment. You are not supposed to send the assignments via private mail.

Quizzes: Do the quiz associated with each lecture immediately after you have read the pages from the book for a particular chapter(s) and have revised the lecture given in the course materials.

Book web site: This is a link to the book web page where you can find the solutions to the odd numbered problems and other resources helpful for your study.

Grades: Here you can see the grades you have obtained for different parts of the course, as well as your final grade when you finish the course.

Calendar: This tool contains recommended dates for studying through the course and the due dates for submission of the assignments.

The links for almost all aspects of the course are available on the Course menu (the left side bar of the course web page).

If you face any problems do not hesitate to ask the instructors or the other students for help. All technical problems can be solved as long as you remember to be patient. The e-mail address of your instructor is given in section 2.4 of this guide.

2.2. Regularity

Regularity is very important for you to follow the course. It is important to read and comment on the comments and thoughts of others regularly to keep up the discussion. Silence and irregularity will not serve you well.

Regularity is also important because discussions concerning topics under study often take place at a certain limited time. As the topic changes new subjects will be in the focal point and discussion concerning previous topics ceases.

Read carefully the calendar for the course and the deadlines for the assignments in advance and do your best to follow the schedule. In case of any extenuating circumstances that can keep you away from the course, notify the instructor.

2.3. Cooperation

Co-operation can be carried out on-line even though you have never seen each other. What you have to constantly bear in mind though, is that an on-line discussion never includes the information conveyed by tones of voice, facial expressions and other body language as in a face-to-face situation, which greatly affects the way a message is understood. With these tones and expressions misunderstandings, which easily occur in on- line discussions, could be avoided. When writing messages you can use signs (smiles), which will shortly but effectively convey feelings and thoughts behind your messages.

2.4. Your instructors

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The preferred communication is via discussion forum within the course, next come WebCT private mail or ordinary Internet e-mail. Your questions sent using this kind of communication will be normally answered within 24 hours and always within one week. Use the phone only in emergencies.

3. Course details

3. 1 Recommended time plan

The course starts January 23rd 2006 and ends June 11th 2006. This is a 25% study rate course. This means that you will need to spend approximately 10 hours each week working on this course. The total number of weeks for the course is 20.

However, you may also choose to study the course in shorter time, for example 10 weeks, and write the exam in March. Please inform the supervisor if that is your intention. All the assignment and quizzes should be concluded before the exam, unless you get respite from the supervisor.

The following table includes the recommended time schedule for studying the course during 20 weeks. The Calendar icon on the course contains the dates recommended for doing each part of the course, too.

Course Week	Reading from the book	Assignments	Quizzes
1	Chapter 1		Finish quiz 1
2	Chapter 2		Finish quiz 2
3	Chapter 3		Finish quiz 3
4	Chapter 4		Finish quiz 4
5	Chapter 5		Finish quiz 5
6	Chapter 6 and 7		Finish quiz 6
7	Chapter 8 and 9		Finish quiz 7
8	Review of Chapters 1-9	Due date for Assignment 1	Finish quiz 8&9
9	Chapter 10		Finish quiz 10
10	Chapter 11 and 12		Finish quiz 11&12
11	Chapter 13 and 14		Finish quiz 13&14
12	Chapter 16 and 18		Finish quiz 16
13	Review of Chapters 10-18		Finish quiz 18
14	Chapter 19	Due date for Assignment 2	Finish quiz 19
15	Chapter 20 and 21		Finish quiz 20&21
16	Chapter 22		Finish quiz 22
17	Chapter 24 and 25		Finish quiz 24&25
18	Chapter 26 and 27		Finish quiz 26&27
19	Review of Chapters 19-27	Due date for Assignment 3 (the project) Due date for all the quizzes	Review old exams
20	Prepare for the exam		

3.2 Optional lectures

It is not required that you attend any physical meetings on the distance except for the exam. However, those of you who are in Sundsvall or its vicinity are welcome to join the lectures of the campus course, which is taught at 50% study rate from March until May. See the course schedule for the exact time and place of the lectures.