

Syllabus for “Course 1-02-327 and 1-01-051: Introduction to
Computer Networks”
Kinneret College on the Sea of Galilee
School of Engineering

Instructor: Michael J. May

Semester 2 of 5770

1 Course Details

The course meets **1:00pm – 4:00pm** on Sundays. The Targil for the course is **4:00pm – 5:00pm** on Sundays.

The course has **3** hours of lecture and **1** hour of Targil. The room for the course is Caravan 510. The room for the Targil is Computer Room 202 in the Sciences Building.

The course is cross-listed between the Information Systems Engineering (ISE) track as 1-02-327 and Electrical and Electronic Engineering (EEE) track as 1-01-051 in Kinneret, so the course is divided into two parts to fulfill the requirements for both tracks. The course meets for **3** hours of lecture and **1** hour of Targil per week.

ISE students will be responsible for the first 9 lectures of the course to fulfill their requirement for 2 hours of lecture per week ($2 \times 14 = 28$). To make up the missing hour ($9 \times 3 = 27$) we will arrange for a one hour tutorial on network programming in C# sometime during the course of the semester.

To make up the missing Targil hours (4) for the ISE students, two or three review sessions will be arranged in the two weeks before the final exam. The scheduling for the extra review sessions will be discussed later in the semester.

EEE students will be responsible for all 14 weeks of lecture for the course to fulfill their requirement for 3 hours of lecture per week. EEE students will not be required to attend the extra review sessions before the final exam.

2 Prerequisites

For ISE students, the prerequisites for this course are “Course 1-02-114: Computer Design and Operating Systems”, “Course 1-02-285: Probability” , “Course 1-02-218: Algorithms”.

For EEE students, the prerequisites for this course are “Course 1-01-254: Statistic Methods in Engineering” and “Course 1-00-101: Introduction to Computer Science”.

3 Overview

The course covers the basics of modern networking technologies, focussing on the link and transport layers. The course assumes no prior knowledge of networks or communications protocols.

ISE and EEE The shared ISE and EEE material includes basics of computer networks, ARQ protocols, MAC layer fundamentals, Local Area Networks (LANs) using Ethernet, LAN bridging, and an introductory study of IP, TCP, and UDP.

EEE Only In addition, the EEE material includes a more in depth study of TCP including congestion control, routing and switching protocols (internal and external), Token Ring and FDDI LAN architectures, a more in depth study of wireless communication protocols, and an introduction to cellular network communication.

The schedule for the course is as shown in the following table. The ISE and EEE columns in the table indicate which lectures are required for ISE and EEE students with a ✓ symbol. Lecture contents are correlated with the books for the course, Tannenbaum (T) [3], Kurose and Ross (KR) [1], and Peterson and Davie (PD) [2] by showing the chapter or section number in the respective book for each lecture.

4 Lecture Schedule

#	Date	Subject	ISE	EEE	T	KR	PD
1	7 March	Overview, Links, OSI Model, Bandwidth/Latency	✓	✓	1.3–1.4, 2.1	1	1.1–1.5
2	14 March	Data Link Layer: Error Correction, Framing, HDLC	✓	✓	3.1–3.3, 3.6	5.1–5.3	2.1–2.4
3	21 March	ARQ Protocols	✓	✓	3.4	3.4	2.4–2.5
4	11 April	Ethernet	✓	✓	4.3	5.4–5.6	2.6
5	18 April	Fast Ethernet, Wireless, Switching Algorithms	✓	✓	4.3–4.3, 5.1	4.2.1–4.2.2, 6.3	2.8, 3.1
6	25 April	Switches, Bridges, IP	✓	✓	4.7, 5.6	5.6, 4.4	3.1–3.2, 4.1
7	2 May	IP, Subnetting	✓	✓	5.6	4.4, 4.4.2	4.1–4.1.4, 4.3.1
8	9 May	RIP, UDP, TCP I	✓	✓	5.2.4, 6.4–6.5	4.6.1, 3.3, 3.5	4.2.1–4.2.2, 5.1–5.2
9	16 May	TCP II	✓	✓	6.5–6.6	3.5	5.2, 6.3
10	23 May	Congestion Control, Queuing Protocols		✓	5.2–5.3	3.6–3.7	6.1–6.4
11	30 May	Queuing Token Ring Networks		✓		5.3	6.2, 2.7
12	6 June	Token Ring, FDDI		✓	5.6, 7.1	4.6, 2.5	2.7
13	13 June	CIDR, 802.11 Wireless		✓	4.4	6.1–6.3	4.3.2, 2.8
14	22 June	Mobility, NAT		✓	2.6	6.2–6.4	4.3

Since this is an advanced course, students **are expected to come to class having read the material listed above in the lecture schedule**. Students who do not come prepared will find themselves at a significant disadvantage.

5 Quizzes

There will be (a maximum of) four in class short quizzes at the beginning of lectures during the course of the semester. The quizzes will take place from 1:00-1:10pm. There will be (a maximum of) one quiz during weeks 1–4, one between weeks 5–7, one between weeks 8–10, and one between weeks 11–14. The quiz material will come from the readings assigned for the lecture on which the quiz is given. Students will be told of the upcoming quiz **in class the week before the quiz**.

All students may skip or drop the grade of one of the quizzes without penalty. ISE students will only be required to take the first three (3) quizzes.

Students who arrive in class after 1:10pm will not be given the opportunity to take the quiz.

Quizzes are tentatively scheduled to take place on the following dates and on the following material:

#	Date	Topic	Source
1	11 April	Reliable Transmissions	PD 2.4-2.5, T 3.3.2-3.4, KR 3.4
2	9 May	Bridges, IP	PD 3.2, 4.1, T 4.7.1-4.7.5
3	16 May	RIP and Subnetting	PD 4.2.1-4.2.2, 4.3.1
4	6 June	Queuing	PD 6.2
5	22 June	802.11 Wireless	KR 6.1-6.3

6 Assignments

There will be four assignments during the course of the semester. They will involve a fair amount of work, either by hand or using the OPNet IT Guru Academic Edition mentioned below in Section 8

Each assignment can be done in groups of three (3) students.

More details of the assignments will be distributed during the course of the semester.

7 Recitation and Laboratory Assignments

Exercise sessions are a combination of recitation and hands on experimentation sessions. Students may ask questions during the session and the instructor will answer all questions and issues posed.

Some exercise sessions will include a laboratory assignment due at the end of the session. Some will include a laboratory assignment due at the beginning of the following lecture period. Any laboratory assignment will be based on material covered in previous lecture or readings, not new material. They will not be taken into consideration in the final grade.

8 Networking Tool

We will use the OPNet IT Guru Academic Edition network simulator for laboratory experiments during the course of the semester. The simulator is installed on all of the computers in Rooms 202 and 214 in the Sciences Building. It is also freely available for students to download and use from the site: www.opnet.com/university_program/itguru_academic_edition/. Since it is available online, students are expected to install and use it on their personal computers in case they have difficulty accessing Rooms 202 or 214 or need to work off campus.

9 Attendance

Students are responsible for all material presented in class, recitation, and laboratory sessions, all assigned readings, and all material provided for additional reading out of class.

Attendance of lectures and targil sessions is expected and required for this course. As per College policy, a student who misses 20% or more of the lectures of targil sessions may not be permitted to take the final exam. Attendance will be taken from time to time, but will not be taken directly into consideration in the calculation of the course grade. Students who miss lectures do so at their own risk and expense and will be expected to make up missed material on their own.

Students who know they will be missing two or more lectures due to circumstances beyond their control should inform the instructor as soon as possible before or after the fact to prevent misunderstandings or problems at the end of the semester.

Students who miss a lecture or targil are recommended to contact their classmates to get notes or find out what material was covered. The course syllabus and web page will also indicate the material covered and have the slide sets presented at all lectures.

9.1 Decorum

Students who attend lecture are expected to give their full attention to the material. Talking on cellular phones, text messaging, or other disturbing behavior will not be tolerated. Students who need to speak on the phone during lecture time or are expecting urgent messages *must* leave the classroom quietly, conduct their business, and return when they can participate fully in the class.

Students must arrive to lectures **on time, within the first 5 minutes of class**. As per college policy, the instructor reserves the right to expel from the classroom any student who enters more than 5 minutes late for lecture or who is disturbing others.

10 Submissions

10.1 How to Submit Work

To ensure timely submission of projects and work, students may only submit work via one of the following mechanisms:

- the Telem system
- in person
- via email to the course address: `ise327@gmail`

Materials sent via email to any other address risk being ignored or ungraded without consideration of their merits. Technical issues with the Telem software should be directed to the information technology support staff in Kinneret College who will address them in a timely manner.

10.2 Late Submission Policy

Students are expected to be on time with their project submissions and assignments. Each assignment must be turned in by the date it is due.

Each student may turn in **one** assignment up to 7 days late without penalty. Subsequent assignments will be assessed a 20% penalty for up to 4 days late and a 30% penalty for up to 7 days late. After 7 days, any assignment will be accepted with a 60% penalty until January 24, the last day of classes in the semester, until the solutions are posted on line, or any date announced by the instructor.

Students who are called up to Miluim duty will have their assignment deadlines extended in accordance with college policy.

11 Cheating

Cheating of any sort will not be tolerated. Student collaboration is encouraged, but within limits as set forth in the college's rules on academic integrity. Any students caught cheating will be immediately referred to the office of the Deacon and may receive a failing grade for the course.

Cheating includes:

- Copying information, content, or verbatim text to answer questions, solutions, or aid in programming projects from other students, internet sites, books (other than the ones listed in the bibliography), other other unaffiliated individuals.

- Copying source code **without attribution** from other students, **web sites**, online repositories, text books, open source programs, or other unaffiliated individuals.
- Other forms of academic misconduct as described on the site: www.vpul.upenn.edu/osl/acadint.html or as reasonably assessed by the instructor, program head, or deacon.

12 Exams

Due the different course requirements, there will be different exams for the ISE and EEE students.

EEE Final EEE students will be give a final based on material from the entire 14 weeks of the semester

ISE Final ISE students will be given a final based on material from the first 9 weeks of the semester.

For both ISE and EEE, the exam will be worth 80% of the final grade.

13 Grading

The instructor will not address questions about specific individual grades during the lecture or review sessions. Students may contact the instructor *in person* during office hours or after the lecture/review sessions at the instructor's convenience.

Students may request a regrade for projects or exams using the regrade request form found on the course web site. The instructor will regrade the entire item submitted, without prejudice to the grade previously assigned to it.

Final grades will be calculated by combining grades from quizzes, assignments, and exams. The grades are weighted as follows:

4%	Quizzes
16%	Assignments
80%	Final Exam

14 Books

The following books are used in the class. They are shown below in the bibliography as well: Tanenbaum [3], Kurose and Ross [1], Peterson and David [2]. As a rule, the lecture notes follow the Peterson and Davie book's presentation.

The library has copies of the books listed, but students are encouraged, to purchase one or more of the books listed.

15 Contact Information

Instructor: Michael J. May

Email: mjmay@kinneret.ac.il

Office Hour: Wednesdays 11:00am – 12:00pm or by appointment

References

- [1] James F. Kurose and Keith W. Ross. *Computer Networking: A Top-Down Approach*. Addison-Wesley, 4/E edition, 2008.

- [2] Larry L. Peterson and Bruce S. Davie. *Computer Networks: A Systems Approach*. Morgan Kaufmann, 3rd edition, 2003.
- [3] Andrew S. Tanenbaum. *Computer Networks*. Prentice-Hall, 4th edition, 2003.