CMPS 284 – Computer Networks
Course Syllabus
(Last Updated: Fall 2015-16)

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Lectures
TBD

Course Website
All course material (slides, assignments and homework) will be available on Moodle. Students must regularly check Moodle for new course announcements. Lecture notes will be posted within one day after the lecture.

Catalog Description
An introduction to network architectures and protocols, placing emphasis on Internet design principles and methodology. Specific topics include application layer protocols, network programming, transport protocols, circuit switching and packet switching, routing algorithms, multicast, local and wide area networks, error detection and correction, and performance evaluation. (3 credits).
Prerequisite: CMPS 255 - Computer Architecture

Textbook
- Available at AUB bookstore

Additional References

Course Topics
• Introduction to computer networks and Internet (Chapter 1 – reference book)
• Application layer: HTTP, FTP, DNS, SMTP; socket programming (Chapter 2 – reference book)
• Transport layer: UDP, TCP (Chapter 3 – reference book)
• Network layer: IPv4, IPv6, addressing, routing, etc. (Chapter 4 – reference book)
• Link layer and LANs: Ethernet, ATM, Token Ring, etc. (Chapter 5 – reference book)
• Physical layer; new networking paradigms (if time permits - handouts)
• Discrete event simulations and OMNET++ (handouts)

Course Objectives
The objectives of this course are to educate the students in:
1. The basic principles of computer networks and Internet
2. The main technologies used for the operation of computer networks
3. Internetworking principles and how the Internet, transport, and applications protocols operate
4. The basic background in computer networks that will allow them to work in this field, and which will form the foundation for more advanced courses in networking
5. The basic skills needed to develop networking applications using socket programming and discrete event simulators

Learning Outcomes
At the end of the course, the students will be able to:
1. Describe networking models such as the OSI and TCP/IP models, and data encapsulation
2. Discuss and utilize client-server and P2P application-layer architectures and protocols, such as DHCP, DNS, SMTP, FTP and HTTP
3. Explain how different reliable and unreliable end-to-end transport protocols work
4. Explain network addressing and apply IP addressing using CIDR and NAT and construct forwarding and routing tables
5. Discuss link-layer standards and MAC protocols
6. Design and implement reliable and unreliable client/server applications using Java or C/C++ sockets under Unix/Linux or Windows
7. Demonstrate how discrete event simulations work and implement a simulator using OMNET++

Evaluation
A tentative breakdown of the course evaluation is given below. The percentages are subject to change as the course progresses.

- Written homework 0%
- Programming assignments 35%
- Class attendance & participation 5%
- Midterm 25%
- Final 35%

The instructor has the right to modify the grading criteria per his own judgment.

Examinations
Examinations will consist of multiple choice, True-False, and subjective questions. They may include questions from the assignments and homework.
Exams will be closed book, closed notes. Calculators, phones and electrical equipment are not allowed.
Cheating in exams will result in immediate loss of marks. Makeup exams will only be given in extremely rare circumstances after presenting a solid and convincing case to the instructor within one week after the exam date. Missed exam will result in a zero grade for the particular exam.
Homework and Assignments
You will be expected to implement a number of programs. In addition, there will be several written homework assignments.
Written homework consist of problems from the book, made up problems, or readings from literature. Written homework will not be graded; however, it is strongly recommended that you work out the written homework to be best prepared for the exams.

Programming assignments can be done in groups of three. Groups of two are also accepted. Form your group and notify the TA within one week after the first class. You will be assigned a group number that you must use in each submission. Each group must select one of the members as delegate; he or she will be responsible for the submissions of his/her group. If you cannot decide on your delegate, we will select one for you.

Group Work Marking Policy
When working in a group, disagreements sometimes arise. One of the objectives of this course is for you to resolve such disagreements with mature, constructive, and frank communication within the group. Therefore, when disagreements arise, it is expected that you attempt to resolve them before asking the instructor to intervene. If the group fails to reach a resolution, the group as a whole should arrange a meeting with the instructor. The instructor's role is primarily to mediate the discussion within the group, rather than to take part of the disagreement.

Note: When a problem arises, try to resolve it as soon as possible. Do not leave it until the end of the course.

When evaluating your performance, the following guidelines will be used to distribute marks among the group members:

• Normally, each member of the group will be given an equal mark. You should therefore strive to ensure that each group member makes an approximately equal contribution to the project.
• The group may propose a different distribution of the marks, provided all group members consent to the distribution. Such a proposal must be specified in the report of each submission. The marks will be distributed in such a way that the mean of the marks equals the original group mark and no individual project mark exceeds 100%.

If agreement cannot be reached, the delegate of the group must contact the instructor within three days of the date of submission of the assignment/project phase. The instructor will then ask each group member to submit a written statement detailing the contributions of each group member, the nature of the conflict, and the steps that were taken by the group to resolve the conflict. Failure to submit the statement within three days of being asked to do so will result in a mark of zero for that group member. Based on the statements, and his own judgment, the instructor will make a final decision about the mark distribution.

Note that the instructor will generally not deviate from the equal distribution of marks unless convinced that the group took sufficient and timely steps to resolve the conflict internally.

Note on Submission and Academic Integrity
Students are encouraged to talk to each other, to the TA, to the instructor, or to anyone else about any of the assignments. Any assistance, though, must be limited to discussion of the problem and outlining general approaches to a solution. Each group must write and submit its own solution. Submission guidelines will be provided in each assignment’s handout.

Consulting another student or group’s solution is prohibited, and submitted assignments and homework may not be copied from any source. These and any other form of collaboration on assignments constitute cheating. Detected cheating will not be tolerated; the parties involved in cheating will get the mark 0. Repeated cases will be reported to the Disciplinary Committee for further action, which may result in a Dean's warning or expulsion from the university.

Late submissions will get -10% for every day late and will not be accepted after 2 days of due date.

Attendance:
Attendance may be taken. Students are expected to attend all lectures. For each lecture that you miss, you will lose 1%. You are entitled for only 5 missed lectures (i.e., 5%). However, bare in mind that lectures are in sequence. If you skip one lecture, chances are you will not be able to understand the subsequent
lecture(s). Catching up on the sequence of the lectures is your own responsibility and should be done in your own time and NOT at the expense of the instructor’s or TA’s times.

**Re-grading Policy:**
If you think we made a mistake in grading, please return the assignment or homework with a note explaining your concern to the TA no later than one week after the day the assignment is returned.

**Note for Special Needs Students**
If you have documented special needs and anticipate difficulties with the content or format of the course due to a physical or learning disability, please contact the course instructor and/or your academic advisor, as well as the Counseling Center in the Office of Student Affairs (Ext. 3196), as soon as possible to discuss options for accommodations. Those seeking accommodations must submit the Special Needs Support Request Form along with the required documentation.