ECE 2305: Introduction to Communications and Networks

D-term 2014

Professor:	D. Richard Brown III
Office:	AK313
Phone:	508.831.5351
email:	drb@ece.wpi.edu
Office Hours:	Wednesdays 1:30-3:00pm or by appointment
Teaching Assistant:	Radu David, radud@wpi.edu
TA Office Hours:	Tuesdays 1:30-3:00pm, AK207
Senior Tutors:	Jordan Brauer, Nathan Ferreira, Dennis Koufos, Long Pham
ST Office Hours:	Mondays 1:00-2:30pm AK108
	Thursdays 10:30am-noon AK207
Lectures:	MT–RF 3:00-3:50p, AK219
Recommended Background:	ECE 2010
Course Website:	http://spinlab.wpi.edu/courses/ece2305_2014
Required Textbook:	*Data and Computer Communications*, 10th ed.
	by W. Stallings (available in campus store)

Course catalog description: This course provides an introduction to the broad area of communications and networking, providing the context and fundamental knowledge appropriate for all electrical and computer engineers, as well as for further study in this area. The course is organized as a systems approach to communications and networking. Topics include key concepts and terminology (delay, loss, throughput, bandwidth, etc.), types of transmission media, addressing, switching, routing, networking principles and architectures, networking protocols, regulatory and applications issues.

Course Outcomes: This course serves as an introduction to two related (but distinct) areas – *communications* and *networking* – and serves as the gateway to several follow-on courses in both of these areas. By the end of this course, students will be able to:

1. describe layered protocol architectures and discuss the roles of each layer,

2. describe various transmission media, their characteristics, their impairments, and tradeoffs between different media,

3. calculate and compare performance metrics in communication networks including throughput, latency, SNR, and error rate,

4. describe and compare common multiplexing techniques in communication networks,

5. describe and compare circuit switched and packet switched communication networks,

6. demonstrate familiarity with modern networking standards including Ethernet and TCP/IP.

Academic Honesty: `http://spinlab.wpi.edu/courses/ece2305_2014/honesty.html`.

Students with Disabilities: If you need course adaptations or accommodations because of a disability, or if you have medical information to share with me, please make an appointment with me as soon as possible. If you have not already done so, students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Disability Services Office (DSO) to ensure that such accommodations are implemented in a timely fashion. The DSO is located in Daniels Hall, 508.831.5235.

Grading, Exams, Homework, Project:

Homework	20%	(due promptly at start of each Tuesday class)
Labs	20%	(due promptly at start of each Tuesday class)
Quizzes	60%	(held promptly at start of each Thursday class)

Homework and a lab will be assigned weekly on Tuesday, to be handed in promptly at the beginning of the following Tuesday class. The homework portion will provide an opportunity to practice your mastery of material covered in lecture and assigned readings. The lab will require use of a networked computer with freely available software; consequently, the lab can be completed at home, if desired. Each homework problem will be graded out of 3 points (0=nothing or nonsense, 1=honest effort, 2=pretty close, 3=correct). Homework solutions will be posted immediately after lecture, and graded homeworks and labs will be returned to your mailboxes by Wednesday 5pm. Please include your mailbox number next to your name when you turn in your homework+lab.

The quizzes will test your knowledge of material from assigned readings, lectures, homeworks, and labs, and will be conducted during the first half (30 minutes) of the Thursday class session. Quizzes will be closed-book, though you will be permitted to bring one 8.5"x11" sheet of notes. No late material (homework, labs) will be accepted unless prior arrangements have been made well in advance of the due date; such situations will be handled on a case-by-case basis. Similarly, absences during quizzes will not be accommodated unless prior arrangements have been made well in advance; again, such situations will be handled on a case-by-case basis. A student's submitted assignment must be his/her own work, and reflect his/her own understanding of the material. This policy will be strictly enforced.

Week of	Chapter(s)	Subjects
17-Mar	1, 2.1-2.3	Course introduction, protocol architectures and layers. **no HW due, no quiz.**
24-Mar	3.3, App.3A, 4.1-4.4, 25.2	Point-to-point data communications. Transmission media, impairments, attenuation, line of sight propagation models. **HW #1 due, quiz #1.**
31-Mar	3.4, 5.1-5.2, 25.3	More on point-to-point data communications. Channel capacity, signal encoding techniques. **HW #2 due, quiz #2.**
07-Apr	6, 7.1-7.2, App.7A, 22.2	Error detection and correction. Flow control, data-link control. **HW #3 due, quiz #3.**
14-Apr	8.1-8.3, 18.1-18.3	Network fundamentals: Multiplexing. Local area networks. **HW #4 due, quiz #4.**
21-Apr	10, 15.2, 16.1	Circuit and packet switching. **HW #5 due, no quiz.**
28-Apr	12, 15	Internet and transport protocols. **HW #6 due, quiz #5.**
05-May	–	Course wrap-up. **No HW due, quiz #6***.

Note: This syllabus is subject to change.

* Quiz #6 will be held on Tues 06-May.