COURSE SYLLABUS
Spring 2014

Course Name:	**Introduction to Computer Networks**
Course Number:	**CS 372**
Credits:	**4**
Instructor name:	**Stephen Redfield**
Instructor email:	**redfiels@eecs.oregonstate.edu**
Prerequisites:	**CS 261, and either ECE 271 or CS 271**

Course Description

Introduction to wired/wireless network principles, organization, topologies, hardware, applications, and protocols in the context of the Internet protocol stack. Configuration and implementation of local area networks and intranets. Internet protocols, packet forwarding, and routing.

Measurable Student Learning Outcomes

At the completion of the course, students will be able to…

1. **Explain** the concept of packet-switching, and identify and analyze the different types of packet delay in packet-switched networks.
2. **Describe** the essential principles of a transport layer protocol (reliable data transfer, flow control, congestion control)
3. **Use** IP addressing and **apply** routing algorithms to find shortest paths for network-layer packet delivery.
4. **Describe** and **compare** data link layer services and multiple access techniques.
5. **Describe** network security issues and some of the methods that address them.
6. **Use** networking tools to observe and analyze behaviors of networking protocols

Learning Resources

- Kurose and Ross, *Computer Networking: A Top-Down Approach*, Pearson
- Python Socket Programming Documentation: (free online at http://docs.python.org/2/library/socket.html).
- Wireshark Packet Analyzer (free online at http://www.wireshark.org/).
- Pingplotter Standard Edition (free online at http://www.pingplotter.com/)
- Hall, Brian, “Beej’s Guide to Network Programming: Using Internet Sockets” (free online at http://beej.us/guide/bgnet).
- If you purchase course materials from other sources, be very careful to obtain the correct ISBN.

Proctoring (Exams)

This course requires that you take 2 exams (midterm and final) under the supervision of an approved proctor. Proctoring guidelines and registration for proctored exams are available online through the Ecampus testing and proctoring website (LINK). It is important to submit your proctoring request as early as possible to avoid delays (I suggest 2 weeks in advance). You are allowed to take the Midterm Exam between 5/08/2014 – 5/11/2014 (Thursday-Sunday, Week 6), and you may take the Final Exam between 6/09/2014 – 6/11/2014 (Monday-Wednesday, Week 11).

Evaluation of Student Performance

Various activities will be evaluated. Percentages are approximate.

- Online discussions (5%). Discussion topics will be posted, students must make a reasonable contribution to at least five discussion topics.
- Weekly summary exercises (10%): These are short "self-assessment" exercises that are evaluated for completion. After the student'sfirst submission, solutions are provided for additional assistance in learning the methods.
- Labs / reports (20%) These assignments require running specified tests with *Wireshark*.
- Programs / Projects (10%): These assignments require socket programming to solve specific problems. These are done offline, and programs will be submitted for evaluation of documentation, correctness, completeness, fulfillment of requirements, and readability. Evaluation criteria will be posted before the due date.
- Quizzes (15%): These will be completed online through blackboard.
- Midterm Exam (20%): Proctored at a proctoring center (schedule in advance!).
- Final Exam (20%): Proctored at a proctoring center (schedule in advance!).
- **NOTE:** The maximum letter grade you can qualify for is one full letter grade above what you receive on the Midterm OR the Final (whichever is higher), based on the total percentage points you qualify for (including Midterm & Final).
    - Based on all materials, Fred has a 'B' in the class. He received an 'C' on the midterm and a 'B' on the final. Fred gets a 'B'.
    - Based on all materials, Sally has an 'A' in the class. She received a 'C' on the midterm and a 'A' on the final. Sally gets an 'A'.
    - Based on all materials, Stephen has a 'C' in the class. He received an 'F' on the midterm and an 'F' on the final. Stephen gets a 'D' and has to retake the class to graduate.

Blackboard

This course will be delivered via Blackboard where you will interact with your classmates and with your instructor. Within the course Blackboard site you will access the learning materials, such as the syllabus, class discussions, assignments, projects, and quizzes. To preview how an online course works, visit the Ecampus Course Demo. For technical assistance, please visit Ecampus Technical Help.

Student Assistance

- **Contacting the instructor** — Piazza is the best forum for asking non-personal questions about the course, and students can generally expect a response within several hours. For private (e.g. grade questions) communications, the instructor is available by email: redfiels@eecs.oregonstate.edu
- **Technical Assistance** — If you experience computer difficulties, need help downloading a browser or plug-in, assistance logging into the course, or experience any errors or problems while in your online course, contact the OSU Help Desk for assistance. You can call (541) 737-3474, email osuhelpdesk@oregonstate.edu or visit the OSU Computer Helpdesk online.
- **Tutoring** — NetTutor is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Students connect to live tutors from any computer that has Internet access. NetTutor provides a virtual whiteboard that allows tutors and students to work on problems in a real time environment. They also have an online writing lab where tutors critique and return essays within 24 to 48 hours. Access NetTutor from within your Blackboard class by clicking on the Tools button in your course menu.

Communication

***Ground Rules for Online Communication & Participation**:*

- *Online threaded discussions* are public messages, and all writings in this area will be viewable by the entire class or assigned group members. If you prefer that only the instructor reads your communication, send it to the instructor directly by email, making sure to identify yourself and the course.
- Posting of personal contact information is discouraged (e.g. telephone numbers, address, personal website address).
- *Online Instructor Response Policy:* Instructor/TAs check email frequently and will respond to course-related questions within 48 hours.
- *Observation of "Netiquette":* All your online communications must be composed with fairness, honesty and tact. Spelling and grammar are very important in an online course. What you put into an online course reflects on your professionalism. Here are some references discussing
  - writing online: http://goto.intwg.com/
  - netiquette: http://www.albion.com/netiquette/corerules.html
- Please check the Discussion area and the course syllabus before you ask general course questions. If you don't see your answer there, then ask on the Piazza forums.

(Adapted from Jean Mandernach, PSY)

Guidelines for a productive and effective online classroom

- The discussion board is your space to interact with your colleagues related to current topics or responses to your colleague's statements.
- Participate actively in the discussions, after completing the readings and carefully considering the issues.
- Pay close attention to what your classmates write in online comments. Ask clarifying questions, when appropriate. These questions are meant to probe and shed new light … not to minimize or devalue comments.
- Think through and reread your comments before you post them.
- Assume the best about others in the class and expect the best from them.
- Value the diversity of the class. Recognize and value the experiences, abilities, and knowledge each person brings to class.
- It's OK to disagree with ideas, but do not make personal attacks.
- Be open to being challenged or confronted on your ideas or prejudices.

(Adapted from Susan Shaw, WS)

Course Policies

Late Work

You may submit at most ONE Lab OR Self-Check up to 48 hours late for full credit. The programming assignment may be turned in up to 48 hours late for a -10% penalty.

Makeup Exams

Makeup exams will be given only for exams excused in advance by the instructor. Excused absences will not be given for airline reservations, routine illness, or other common ailments. Excused absences will generally not be given after the absence has occurred, except under very unusual circumstances.

Incompletes

Take this course only if you plan to finish it in a timely manner (during this term). "I" or incomplete is assigned only when there is a compelling case for doing so (e.g. health reasons, military commitment). An incomplete will not be assigned unless the individual has completed over 50% of the course tasks.

Statement Regarding Students with Disabilities

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS) with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.

Course Content (**DUE DATES IN RED**)

Note: Weeks are shown Monday through Sunday. Assignments are due 11:59pm Sunday, unless otherwise noted. Assignments should be submitted to BLACKBOARD for full credit.

Unit / Week	Topics
#1: 3/31 – 4/06 **Lab #1** is assigned **Self-Check #1** assigned **Self-Check #1** due	• Basic concepts • Networking metrics • Network protocols • Network edge/core • Circuit-switching / Packet-switching **Read** K&R Chapter 1.1 – 1.4
#2: 4/07 – 4/13 **Lab #1** is due **Self-Check #2** assigned **Self-Check #2** due	• Physical media • Layering models • Security issues • Application layer **Read** K&R Chapter 1.5 – 1.8, 2.1

#3: 4/14 – 4/20
 	
Lab #2 is assigned
 	
Quiz #1
 	
Self-Check #3 assigned
Self-Check #3 due
	• Application layer protocols
	  ○ Hypertext Transfer Protocol (HTTP)
	  ○ File Transfer Protocol (FTP)
	  ○ Mail (SMTP, POP3, IMAP)
	  ○ Domain Name Services (DNS)
	  ▪ Network byte order
	Read K&R Chapter 2.2 – 2.5, 2.7

#4: 4/21 – 4/27 **Lab #2** is due **Program** is assigned **Self-Check #4** assigned **Self-Check #4** due	• Transport Layer • Socket programming • Multiplexing/Demultiplexing • Connectionless transport • Connection-oriented transport • User Datagram Protocol (UDP) • Reliable data transport **Read** K&R Chapter 3.1 – 3.4
#5: 4/28 – 5/04 **Lab #3** is assigned **Self-Check #5** assigned **Self-Check #5** due	• Transmission Control Protocol (TCP) • Flow control **Read** K&R Chapter 3.5

#6: 5/05 – 5/11 **Lab #3** is due **Midterm Exam** **Self-Check #6** assigned **Self-Check #6** due	• Congestion control • Fairness • Network layer **Read** K&R Chapter 3.6 – 3.8 **Midterm Exam** **(Available Thursday – Sunday only)**
#7: 5/12 – 5/18 **Lab #4** is assigned **Program** is due **Self-Check #7** assigned **Self-Check #7** due	• Virtual circuits • Internet protocols • Datagram routing • Internet Protocol (IPv4) • Classless Inter-Domain Routing (CIDR) • Dynamic Host Configuration Protocol (DHCP) **Read** K&R Chapter 4.1 – 4.4
#8: 5/19 – 5/25 **Quiz #2** **Lab #4** is due **Self-Check #8** assigned **Self-Check #8** due	• Routing algorithms • Fragmentation • Internet Control Message Protocol (ICMP) • Network Address Translation (NAT, NAPT) **Read** K&R Chapter 4.5
#9: 5/26 – 6/01 **Lab #5** is assigned **Self-Check #9** assigned **Self-Check #9** due	• Internet Protocol (IPv6) • Link Layer • Network interfaces • Multiple Access protocols • MAC addresses • Address Resolution Protocol (ARP) • Local Area Networks (LAN) ○ Ethernet **Read** K&R Chapter 5.1 – 5.4, 5.7
#10: 6/02 – 6/08 **Lab #5** is due **Self-Check #10** assigned **Self-Check #10** due	• Wireless networks • Network security **Read** K&R Chapter 6.1 – 6.3, 8.1 – 8.3
Finals Week 6/09 – 6/11	**Final Exam** **(Available Monday – Wednesday only)**

Expectations for Student Conduct
Student conduct is governed by the university's policies, as explained in the Office of Student Conduct: Information and Regulations.

Academic Integrity
Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit Avoiding Academic Dishonesty, or contact the office of Student Conduct and Mediation at 541-737-3656.

Conduct in this Online Classroom
In an academic community, students and faculty, and staff each have responsibility for maintaining an appropriate learning environment, whether online or in the classroom. Students, faculty, and staff have the responsibility to treat each other with understanding, dignity and respect. Disrespectful behavior to others (such as harassing behavior, personal insults, inappropriate language) or disruptive behaviors in the course (such as persistent and unreasonable demands for time and attention both in and out of the classroom) is unacceptable and can result in sanctions as defined by Oregon Administrative Rules Division 015 Student Conduct Regulations.

OSU Student Evaluation of Teaching
Course evaluation results are extremely important and are used to help me improve this course and the learning experience of future students. Results from the 19 multiple choice questions are tabulated anonymously and go directly to instructors and department heads. Student comments on the open-ended questions are compiled and confidentially forwarded to each instructor, per OSU procedures. The online Student Evaluation of Teaching form will be available toward the end of each term, and you will be sent instructions via ONID by the Office of Academic Programs, Assessment, and Accreditation. You will log in to "Student Online Services" to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.