Course Subject, Number and Title
Computer Sciences 640: Introduction to Computer Networks

Credits: 3

Canvas Course URL: https://canvas.wisc.edu/courses/ 77499
Piazza will be used heavily for class announcements and discussions.

Course Designations and Attributes
Breadth - Natural Science, Level – Advanced, L&S Credit - Counts as Liberal Arts and Science credit in L&S

Meeting Time and Location
Tuesdays and Thursdays 11:00 – 12:15 p.m. in room Mosse Humanities Building 3650

Instructional Mode: Lecture, all face-to-face

Specify how Credit Hours are met by the Course
Traditional Carnegie Definition – Two 75-minute faculty-taught classroom lectures and a minimum of two hours of out-of-class student work each week over approximately 15 weeks

INSTRUCTORS AND TEACHING ASSISTANTS

Instructor: Professor Suman Banerjee

Instructor Office Hours: Tuesdays and Thursdays 1.15 – 3.00 pm on by appointment.

Instructor Email: suman@cs.wisc.edu

Teaching Assistants
Hasnain Ali Pirzada hp@cs.wisc.edu
Yuncong (Catherine) Hao hyuncong@wisc.edu

OFFICIAL COURSE DESCRIPTION

Course Description
Architecture of computer networks and network protocols, protocol layering, reliable transmission, congestion control, flow control, naming and addressing, unicast and multicast routing, network security, network performance widely used protocols such as Ethernet, wireless LANs, IP, TCP, and HTTP.

Requisites

COMP SCI 537 or graduate or professional standing or declared in the Capstone Certificate in Computer Sciences for Professionals

LEARNING OUTCOMES

Course Learning Outcomes

Students are expected to know the following upon completion of this course:

Overall Internet architecture, basics of layering, protocols, and modularity in network design. Design of different layers of the protocol stack including:

1. Physical and Link layer — Framing, Checksums, Aloha, Ethernet, Token Ring, Wireless LANs, etc.
2. Network layer, including routing — Distance Vector, Link State, etc., forwarding, IP service model, Internet addressing.
3. Transport — UDP and TCP.
4. Network services and applications — examples include DNS, HTTP, SMTP, MIME, FTP, etc.

Some of other advanced topics — Content Delivery Networks, Software Defined Networking, Overlays and Peer-to-peer Systems, Node mobility, Security, NATs and Firewalls.

GRADING

- Quizzes and exams: 60%
- Programming assignments: 40%
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DISCUSSION SESSIONS

There are no discussion sessions for this course.

LABORATORY SESSIONS

There are no laboratory sessions for this course. Students may do their programming assignments using either their own computer or else one of the computers in the Computer Sciences Department's instructional labs. The bulk of the programming assignments should be done using virtual machines provided by the course staff.

REQUIRED TEXTBOOK, SOFTWARE & OTHER COURSE MATERIALS

Required text: Larry Peterson and Bruce Davie, *Computer Networks: A Systems Approach. Fifth Edition*, Morgan-Kaufmann, 2011, ISBN: 978-0123850591.

Recommended text: James F. Kurose and Keith W. Ross, *Computer Networking: A Top-Down Approach. 6th Edition*, Addison Wesley, 2012, ISBN: 978-0132856201.

QUIZZES

There will be four quizzes over the duration of the semester. The quizzes will be closed notes and closed book. Each quiz will be held during a class time slot. The time allotted to a quiz may vary but no more than the entire class time. Each quiz will be based on topics that were covered after the prior quiz and until this quiz. No make-up quiz is possible except as allowed by university policy.

PROGRAMMING ASSIGNMENTS

There will be a set of programming assignments, which will be done in groups. The programming assignments will usually involve writing code in the Java programming language. Some supplied skeleton Java code may also be given as a starting point. In most cases, the programming assignments will require the use of special virtual machines to be handed out to the student groups. Students may also try their programming assignments using either their own computer or else one of the computers in the Computer Sciences Department's instructional labs, however, final demonstrations have to done in the virtual machines.

OTHER COURSE INFORMATION

None

RULES, RIGHTS & RESPONSIBILITIES

See the UW-Madison's Guide to Rules, Rights and Responsibilities

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: "The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty will work either

directly with the student or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA." http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php

DIVERSITY & INCLUSION

Institutional statement on diversity: "Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world." https://diversity.wisc.edu/