CS 5600 – Computer Networks
Fall 2016

Instructor:
Dr. Abusayeed Saifullah
Assistant Professor, Department of Computer Science
Email: saifullaha@mst.edu Phone: 573 341 7717

Class Meeting:
Tuesdays and Thursdays 3:30 -- 4:45pm.
Location: B12-B Bertelsmeyer Hall

Office Hour:
Thursday 2:20pm - 3:20pm, and by appointment
306 Computer Science

TA:
Mahbubur Rahman
TA Office Hour: Tuesday 11:00 -- 12:00pm
Location: 337 Computer Science

Course Description:
This is a networking class targeted for senior undergraduate and entry-level graduate students. The objective of the course is to make students familiar with the basic network concepts including network architecture, protocols, standards, applications, security, and network programming. Topics covered include:

1. Introduction: Applications of computer networks, Network classification, Internet, Protocol stack, standardization
2. Application Layer: Web, FTP, Mail access protocol, DNS, P2P Applications, Socket Programming
3. Transport Layer: TCP, UDP, Principles of reliable data transfer, Flow control, Congestion control
4. Network Layer: Routing protocols, Internet protocol (IP)
5. Link Layer: Error detection and correction, Media Access Control protocols including ALOHA, CSMA, TDMA
6. Wireless networks: Ad-hoc network, 802.11, 802.15.4, Bluetooth, Wireless sensor network, Mobile network
7. Security: Symmetric-key cryptography, Public key algorithms, Digital signatures

Prerequisite:
CS3800 (or equivalent). The instructor also assumes that the students have sufficient background in algorithms, basic data structures, and at least one programming language.

Textbook:
Coursework and Weight:
- Homework (5 homeworks each of equal weight): 20%
- Midterm (2 midterm exams each of equal weight): 30%
- Final exam: 25%
- Project (in group of maximum 3 students): 25%

Score Distribution (on a Scale of 100) for Letter Grades:
- A: [90 - 100]
- B: [80 - 90)
- C: [70 - 80)
- D: [60 - 70)
- F: < 60%

Tentative Schedule:
The first lecture: Aug 23 Tuesday
Lectures 1-2: Introduction
**Homework 1** to be assigned after Introduction is complete (due within 1 week)
Lectures 3-5: Application layer
**Homework 2** to be assigned after Application layer is complete (due within 1 week)
Lectures 6-8: Transport layer
**Homework 3** to be assigned after Transport layer is complete (due within 1 week)
Lectures 9-13: Network layer
**Homework 4** to be assigned after Network layer is complete (due within 1 week)
Lectures 14-20: Link layer
**Homework 5** to be assigned after Link layer is complete (due within 1 week)
Lectures 21-23: Wireless networks
Lectures 24-26: Network security
The last lecture: Dec 8 Thursday

**Midterm exam 1**: October 04 Tuesday (in class)
*Topics to be covered in Midterm exam 1*: Introduction, Application layer

**Midterm exam 2**: November 03 Thursday (in class)
*Topics to be covered in Midterm exam 2*: Transport layer

**Final exam**: Dec 12 Monday 3:00—5:00pm (in classroom)
*Topics to be covered in Final exam*: Network layer, Link layer, Wireless networks, Security

**Project**:
This is a group project that involves socket programming. Each group must have up to 3 members (there may be few exceptions). Students should form their groups as early as possible. For socket programming, you may use any language and platform. But using C on Linux will make your implementation much easier. “Beej’s Guide to Network Programming Using Internet Sockets” is a good tutorial to learn socket programming.
**Project group:** You must form your group of 3 members by Sep 15 Thursday. One member from each group must email the group information to the TA by Sep 15.

**Project mid-term demo** (25% of project weight): October 20 Thursday (in class).

**Project final demo** (75% of project weight): Nov 29 and Dec 1 or Dec 1 and 6 (in class)

**Late Work Policy:** Homework/tests cannot be submitted/taken late unless there is prior approval from the Instructor, or there is formal evidence of medical/other emergencies.

**Classroom Policy:** Class attendance is required. The instructor does not allow any usage of cell phones, laptops, or similar portable electronics during the lectures/exams. In case you need to make/receive any emergency call during lectures, you may do it going outside without interrupting anyone.

**• Student Honor Code and Academic Integrity:**

Please take a few minutes to stress the importance of academic integrity in class. Discuss why it should matter to the student, why it matters to you and your discipline, why it matters to Missouri S&T, and why it matters to future employers. Include a statement on your syllabus about the Honor Code developed and endorsed by the Missouri S&T Student Council: the Honor Code can be found at this link: [http://stuco.mst.edu/about/honor.shtml](http://stuco.mst.edu/about/honor.shtml). Encourage students to read and reflect upon the Honor code and its emphasis on HONESTY and RESPECT.

Page 30 of the Student Academic Regulations handbook describes the student standard of conduct relative to the University of Missouri System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage ([http://registrar.mst.edu/academicregs/index.html](http://registrar.mst.edu/academicregs/index.html)). Additional guidance for faculty, including the University’s Academic Dishonesty Procedures, is available on-line at [http://ugs.mst.edu](http://ugs.mst.edu). Other informational resources for students regarding ethics and integrity can be found online at [http://ugs.mst.edu/academicintegrity/studentresources-ai](http://ugs.mst.edu/academicintegrity/studentresources-ai).

**• S&Tconnect:** [https://blackboard.mst.edu/](https://blackboard.mst.edu/) (S&Tconnect tab)

S&Tconnect provides an enhanced system that allows students to request appointments with their instructors and advisors via the S&Tconnect calendar, which syncs with the faculty or staff member’s Outlook Exchange calendar. S&Tconnect will also facilitate better communication overall to help build student academic success and increase student retention. S&Tconnect Early Alert has replaced the Academic Alert system used by Missouri S&T. If training is needed, please contact Rachel Morris at rachelm@mst.edu or 341-7600.

**• Classroom Egress Maps:**

Faculty should explain where the classroom emergency exits are located. Please include a statement in your course syllabus asking the students to familiarize themselves with the classroom egress maps posted on-line at: [http://designconstruction.mst.edu/floorplan/](http://designconstruction.mst.edu/floorplan/).
• Disability Support Services: http://dss.mst.edu

Any student inquiring about academic accommodations because of a disability should be referred to Disability Support Services so that appropriate and reasonable accommodative services can be determined and recommended. Disability Support Services is located in 204 Norwood Hall. Their phone number is 341-4211 and their email is dss@mst.edu. Instructors may consider including the following statement on their course syllabus as a means of informing students about the services offered:

"If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation."

• LEAD Learning Assistance http://lead.mst.edu

The Learning Enhancement Across Disciplines Program (LEAD) sponsors free learning assistance in a wide range of courses for students who wish to increase their understanding, improve their skills, and validate their mastery of concepts and content in order to achieve their full potential. LEAD assistance starts no later than the third week of classes. Check out the online schedule at http://lead.mst.edu/assist, using zoom buttons to enlarge the view. Look to see what courses you are taking have collaborative LEAD learning centers (bottom half of schedule) and/or Individualized LEAD tutoring (top half of the schedule). For more information, contact the LEAD office at 341-7276 or email lead@mst.edu.

• The Burns & McDonnell Student Success Center

The Student Success Center is a centralized location designed for students to visit and feel comfortable about utilizing the campus resources available. The Student Success Center was developed as a campus wide initiative to foster a sense of responsibility and self-directedness to all S&T students by providing peer mentors, caring staff, and approachable faculty and administrators who are student centered and supportive of student success. Visit the B&MSSC at 198 Toomey Hall; 573-341-7596; success@mst.edu; facebook: www.facebook.com/SandTssc; web: http://studentsuccess.mst.edu/