CS 5600 – Computer Networks
(Formerly, CS 365)
Fall 2015

Instructor:
Dr. Abusayeed Saifullah
Assistant Professor, Department of Computer Science
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Class Meeting:
Tuesdays and Thursdays 3:30 -- 4:45pm.
Location: 202 Computer Science

Office Hour:
Thursday 2:30pm - 3:30pm, and by appointment
335 Computer Science

TA:
Venkata Prashant Modekurthy
TA Email: vmkf5@mst.edu
TA Office Hour: Friday 2:00 -- 3:00pm
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:
Link to course description:
http://mst.edu/~saifullah/courses/CS-5600-Abu.pdf

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: 85-100
- B: 75-84
- C: 65-74
- D: 55-64
- F: 0-54

Schedule:
The first lecture: Sep 25 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 10 Thursday

**Midterm exam 1**: October 01 Thursday (in class)
*Topics to be covered in Midterm exam 1*: Introduction, Application layer

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

**Final exam**: date TBD
*Topics to be covered in Final exam*: Transport layer, Network layer, Link layer, Wireless networks, Security

**Project**:
This is a group project. Each group must have up to 3 members (there may be few exceptions). Students should form their groups as early as possible. Each group can select its own project upon the instructor’s approval. The project must be a networking project
and must be implemented on real hardware and demonstrated before the entire class. Simulations results will not be accepted. There will be a default project that involves socket programming. If a group does not have its own project, the group can implement this default project. There is no penalty if you cannot choose your own project. 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 mid-term demo** (25% of project weight): October 15 Thursday (in class).

**Project final demo** (75% of project weight): Dec 1 and Dec 3 (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 staffmember’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](mailto: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](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](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](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/](http://studentsuccess.mst.edu/)