

**CSIS 440 – Computer Networks**  
**Semester Project**  
**Fall 2017**

**Goals:**

1. Students will apply the knowledge from the course, such as computer network protocols performance evaluation, and socket programming.
2. Students will:
  - a. Develop or replicate a tool for computer networking, or
  - b. Enhance or replicate a computer network, or
  - c. Perform performance evaluation on a protocol or comparative analysis of multiple protocols.
3. Students will write a design document and present their project in class.

**Teams:**

The project will be completed in teams of up to three students. If you would like to work on an idea individually you will need to discuss this with me.

**Milestones:**

There will be four deliverables. You will receive feedback from me on all presentations. I will grade the final project product, not the intermediate presentations. The presentations and dates are:

1. **Project proposal:** short presentation (up to 15 mins) will be performed. Depending on my feedback, you may change the proposal. The presentation will include:
  - a. Title, team members, team name (optional)
  - b. Motivation: why is what you are doing important.
  - c. What you are proposing: Description of the system or network protocol that you are planning to analyze or implement, or the tool that you intend to build or extend. Clear description of project deliverables. Possible deliverables are a software prototype, automation software, a tool, a substantial experiment, etc.
2. **Initial Design:** In the design document, each team must complete the following sections: Project Introduction, Team Members and Responsibilities, Design Overview, Functional Requirements, and Resources. The teams will perform another 15 minute presentation of their design in class.
3. **Final Design:** A completed design document (i.e. all sections completed). The submitted design document will be graded based on completeness, clarity, soundness of design, and professional presentation. The completed design document shall have the six sections listed below.
  - a. Project Introduction
  - b. Team Members and Responsibilities
  - c. Functional Requirements
  - d. Materials and Resources
  - e. Design Overview
  - f. Detailed Design

4. **Project final presentation:** conference style presentation with duration 29 mins on the last week of classes. A demo can be included in the presentation in the form of live demo or video demo.

### Evaluation:

You will be evaluated on all the presentations and final products at the end of the semester. Parts of the evaluation include:

1. Your preparedness and timely delivery of the 4 presentations. *Project points: 20*
2. The completeness of your final products. If you have fulfilled at least one of the following: created a new tool, or replicated and extended a tool, or complete implementation of protocol or simulation. *The project needs to include a coding element whether this is automation, simulation, or a fully implemented tool.* The completeness of your deliverables, i.e., code, documentation and testing, as well as suggestions for resolution, will be evaluated. *Project points: 50*
3. Final presentation and paper: a professional presentation with a well written design document. *Project points: 30*

### Project ideas

You may choose one of the following topics or suggest your own:

1. Protocol implementation:
  - o Network Time Protocol (NTP)
  - o Tor
  - o Real Time Streaming Protocol
  - o Network File System Protocol
  - o Session Initiation Protocol
  - o Bitcoin
2. Tools
  - o Packet sniffer
  - o Firewall
  - o Tool that measures network performance
    1. Latency measurements
    2. Measure effects of physical obstructions in wireless
  - o Automation tool administration or maintenance work on a computer network
  - o Network traffic generator
  - o Network attack traffic generator
  - o Chat tool
  - o Network scanner
  - o Internet of Things (IoT) scanner
3. Simulation:
  - o IoT Network simulation
  - o Wireless network simulation

You are encouraged to use [GENI](#) for any of your implementation or testing.

