



## COE 540: Computer Networks

---

- The goal is to begin an original work that will ultimately result in a conference (or even journal!) paper.
- There is absolutely nothing wrong with using this course project to further your own research goals.
- You cannot however turn in the same course project for two different classes, unless having permission from both instructors ahead of time. Otherwise this is a serious academic violation.



## Projects

---

- You can work on it individually or in a team of a maximum of three students.
- Different groups can work on the same project but different objectives
- The complexity of the project should be proportional to the number of students in a team

*Q: what project type?*

- Critique Literature survey
- Simulation or other quantitative experimental study

Be realistic in selecting a project. A project proposal must be submitted to, and approved by, the instructor. A final written report is also required for all projects.

## Experimental Project

- An experimental project may be either a simulation study or a performance experiment using measurements in a real system.
- A specific issue to be examined should be determined.
- The experiment, including issues, models, results, analysis, and conclusions, must be documented in a written report.
- If simulation is used, the report must include a listing of the simulator package input or documented program listing and output data in appendices.
- If measurements are used, the report must include listings of any test programs and all measurements in appendices.
- The project will be evaluated based on experimental design, analysis of results, and the written report.

## Critique Literature Survey

- A critique literature survey should describe an issue or problem area, e.g. transport protocols for carrying real-time multimedia traffic over IP
- specify criteria for evaluation, review three or four alternative approaches described in the literature, and provide an assessment or critique of the different approaches.
- The survey should highlight the relative strengths and weaknesses of each approach.
- Note that a critique review paper is not just a review of several papers on the same topic. You are expected to add "intellectual content" by comparing and contrasting the ideas in the papers.

## Project Proposal

- All projects must be approved by the instructor.
- Each student or team must submit a **brief** project proposal (no more than the equivalent of three pages) by email to the instructor at [ubaroudi@ccse.kfupm.edu.sa](mailto:ubaroudi@ccse.kfupm.edu.sa) with the subject line "COE540 proposal". Only one proposal should be submitted per team.
- The proposal must outline
  - The project objective(s),
  - required resources, including a list of two or more papers for critical review projects,
  - work plan (what will be done when),
  - deliverables, and for teams, the division of effort among the team members.

## Project Reports


- All projects require a written report. Only one report can be submitted per team. All reports must be typed and neatly formatted. In addition to technical content, neatness, spelling, grammar, writing style, and clarity will be considered in grading, reports must be organized as follows.
- **Critique review papers must be no less than 10 pages (12pt font)**, not including the cover page, proposal, references, and appendices.
- Appendices (optional). Note that the body of the report must stand on its own. Appendices should be used to provide additional detail, e.g. source code, or substantiation, e.g. numerical results that are summarized in the body of the report.



## Project Topics

---

- Please see me and talk to me about a topic for your term paper as soon as you can.
- Generally, most networking topics will be acceptable.
- Note that this paper must be written only for this class and should not be used to satisfy the requirement of any other class

- 
- 
- A project proposal is due in September 24<sup>th</sup>, 2006
    - This should consist of
      - a tentative title for your project,
      - and a clear and brief description of what you intend to investigate,
      - and what you hope to discover or accomplish.
    - This description should be as specific and concise as possible



- The proposal should lay out aggressive goals, and state which ones will definitely be accomplished, which ones may be accomplished if things go well, and then what will be left for future research after the course ends.



- The project report should be roughly in the format of an IEEE conference paper.
- There should be an abstract, conclusions, and thorough references, along with supporting sections clearly describing your methodology, analysis, simulations, and results.



## Project Grading Breakdown

- **Proposal (10 points) due September 24<sup>th</sup>, 2006:**
  - Clarity of objectives, ambitious but achievable objectives
  - Relevance of proposed research
  - Appropriateness of cited literature.
- **Progress Report (15 points) due December 5<sup>th</sup>, 2006:**
  - up-to-date achievements (i.e. preliminary design, code, results, etc.)
- **Final Report (75 points) due January 6<sup>th</sup>, 2006:**
  - Originality (15 pts)
  - Organization (5 pts)
  - Writing style, grammar, readability (10 pts):
    - Proofread, proofread, proofread,
    - Most papers are accepted or rejected based on a reading of the abstract, introduction, conclusions, and references).
  - Technical Content and Execution (25 pts):
  - References (10 pts):
    - Proper IEEE reference style, all relevant research cited, no frivolous citations, good discussion of previous state-of-the-art?
  - Oral Presentation (10 pts)



## Some Potential Project Ideas and Areas

- **Multihop wireless networks:**
  - Architectures, protocols, and algorithms to cope with mobility, limited bandwidth, limited power and/or intermittent connectivity
    - Adhoc / Sensor networks
    - Mesh networks
  - Seamless Handover in Next Generation Wireless/Mobile Networks
- **TCP over Adhoc wireless networks**
  - Scheduling algorithms
    - Namgi Kim\*, Hyunsoo Yoon, "Wireless packet fair queueing algorithms with link level retransmission" *Computer Communications* 28 (2005) 713–725
  - Cross-layer optimization algorithms
    - **Wang, Jiantao, Li, Lun; Low, Steven H.; Doyle, John "Cross-Layer Optimization in TCP/IP Networks,"** *IEEE/ACM Transactions on Networking*, v 13, n 3, June, 2005, p 582-595



## Some Potential Project Ideas and Areas

---

- QoS Differentiation and Routing
  - Jian Zhaoa, Hossam Hassaneina,\*, Jieyi Wub, Guanqun Gu, "End-to-end QoS routing framework for differentiated services networks," Computer Communications 26 (2003) 566–578.  
[www.elsevier.com/locate/comcom](http://www.elsevier.com/locate/comcom)
- UMTS-MPLS integration
  - Performance Characterization of Traffic in UMTS Core Networks
- Wireless Network Security
  - **Internet traffic modeling and attack detection**
- Multicast Protocols and Services
- Traffic Engineering and Performance Monitoring