Internet Protocols
ECSE-6600

http://www.pde.rpi.edu/
Or
http://www.ecse.rpi.edu/Homepages/shivkuma/

GOOGLE: “Shiv RPI”

Shivkumar Kalyanaraman
Rensselaer Polytechnic Institute
shivkuma@ecse.rpi.edu
Overview

- Introductions: course description & calendar
- Answers to frequently asked questions
- Prerequisites
- Informal Quiz
Who’s Who

- **Instructor:** Shiv Kalyanaraman; kalyas@rpi.edu,
  - Room: JEC 6042, Phone: x8979
- **Course secretary:** (on-campus)
  - Melissa Reardon; reardm@rpi.edu
  - Room: JEC 6049; Phone: x6313
- **PDE Production/Videostream Point-of-contact:**
  - John Hughes: hughej@rpi.edu, x6947
- **TA:**
  - Omesh Tickoo, tickoo@networks.ecse.rpi.edu, x8289
  - (or by posting a note on the WebCT bulletin board)
Networking Courses @RPI

- CANOS
  - Network Programming (CS)
  - Mobile & Wireless Networking
- CCN
  - Internet Protocols
  - Network Security (CS)
  - Network Modeling
  - Experimental Networking (Lab Course)
  - Network Operations (CS)

“Topics Courses”

“Core Networking Sequence”

Shivkumar Kalyanaraman
Course Description Highlights

- **Syllabus:**
  - Core protocols: Transport (TCP, UDP), IP, Routing, Addressing/Naming ...
  - Advanced topics: Multicasting, Security, Next-generation IP, Better-than-best-effort Internet, High-Speed Routers, IP Telephony ...

- **Goals:**
  - Breadth of topics
  - Depth in core areas, and key advanced topics
  - Insights into design and implementation
  - Preparation for possible research/advanced development in networking
  - Mix of online videos and in-class interactive work
Course Description Highlights (Continued)

- Lectures
- Informal quizzes: Every class
- Students should pre-view the videos from the Spring 2002 offering
- Class will cover a digest of the material, followed by informal quizzes and class discussion
  - I will randomly call on students to ask you to explain your answer.
- Remote students: download latest class material from WebCT or class web page for each class
- WebCT bulletin board: Post your questions!
- WebCT: Grades, papers, RFCs, Internet drafts…

- Informal Quizzes: {10 pts}
- 2 Labs: Hands-on TCP and IP {20 pts}
- 2 Homeworks: {10 pts}
- 1 Research Case Study: {10 pts}
- 3 exams: 15 pts, 15 pts, 20 pts: {50 pts}
Prerequisites

- **Required** *(no exceptions):*
  - ESCE-4670 Computer Communication Networks or equivalent
  - VERY GOOD C programming knowledge

- **Desirable:**
  - Operating Systems
  - Computer Architecture (ECSE-4730 or equivalent)

- If you **do not have the required prerequisites**, you **must drop the course** and take it later (next year).
Prerequisites

- Protocol Layers: ISO/OSI reference model
- Physical Layer: Coding, Manchester
- Transmission Media: UTP, Cat 5
- Data Communication: Asynchronous vs synchronous, Baud, bit, and Hz, Half-Duplex vs Full-duplex, Modulation/Demodulation
- Packet Transmissions: Framing, Bit stuffing, byte stuffing
- Flow Control: On-Off, Window
- Error Detection: Parity, Checksum, Cyclic Redundancy Check
Prerequisites (Continued)

- Error Recovery: Start and Stop, Go back $n$, Selective Reject
- LANs: Aloha, CSMA/CD, Ethernet, IEEE 802.3, Token Ring/IEEE 802.5, FDDI
- Addressing: Unicast/multicast, Local/Global
- LAN wiring: 10Base5, 10Base2, 10Base-T, 100Base-TX, E-LANs: Hubs, Bridges, Routers, Switches
- Routing: Distance Vector vs Link State, Spanning tree, source routing
- Transport layer: multiplexing, reliability, congestion control, introduction to TCP and UDP
- Basics of probability and queuing theory
Still trying to get into the course?

- Do you have the pre-requisites?
- Please submit course add form to course secretary: Melissa, JEC 6049 by tomorrow noon.
- Depending upon the number of people who drop the class, space available, TA resources available, we will add more students.
  - Decisions to be emailed to you.
  - Make sure you mention your email address.
Answers to FAQ's

- Lot of paper readings in the class (due every homework) + research case study (writing skills)
- Labs require advanced C programming skills
- Informal quizzes given in every class

- All homeworks/labs etc due at the beginning of the class indicated on the course calendar
  - Up to one late submission: no penalty
  - Beyond that 10% penalty: only if submitted before solutions are posted.

- All quizzes are open-book and extremely time limited.
  - Quizzes consist of design qns, numerical, multiple-choice (true-false), and short answer questions.