

Internet Protocols ECSE-6600

<http://www.pde.rpi.edu/>

Or

<http://www.ecse.rpi.edu/Homepages/shivkuma/>

GOOGLE: “Shiv RPI”

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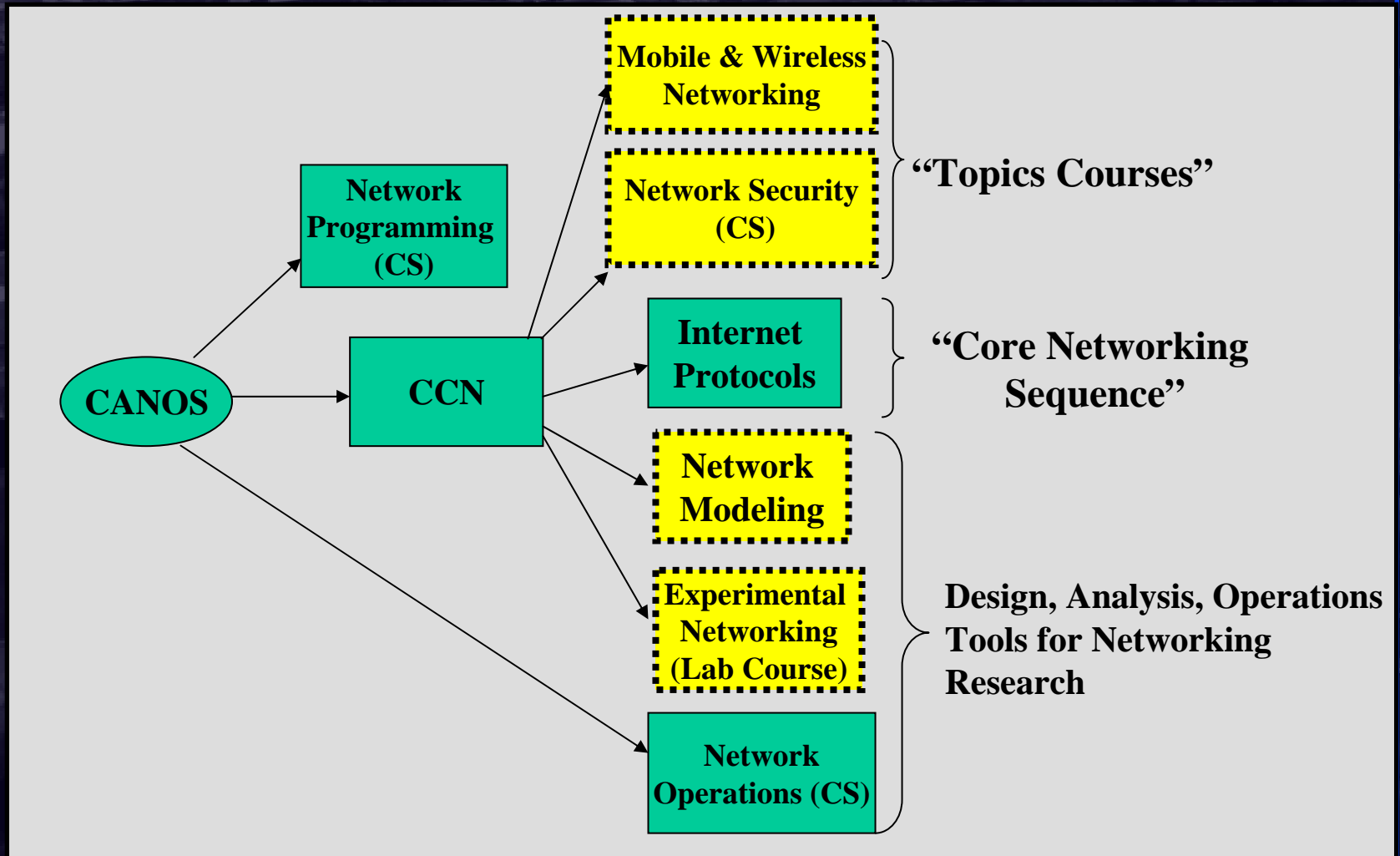


- ❑ Introductions: course description & calendar
- ❑ Answers to frequently asked questions
- ❑ Prerequisites
- ❑ Informal Quizzes

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 Point-of-contacts:**
 - ❑ Nadeen Thompson: thompn@rpi.edu, x8501
 - ❑ Stephen Tytko: tytkos@rpi.edu, x2575
- ❑ **TA:**
 - ❑ TBD
 - ❑ (check WebCT announcements)

Networking Courses @RPI



Course Description: Goals

- ❑ Fundamental protocol concepts in the context of concrete/real protocols (including protocols that did not survive)
 - ❑ As if YOU designed the protocols grappling through the tradeoffs...
 - ❑ Where do these ideas really come from?
 - ❑ Identify common themes, building blocks...
 - ❑ Look beyond alphabet soups, idiosyncratic differences and stove-pipes!
 - ❑ Broad foundation of advanced material of lasting value: you can draw upon them in future (even in related fields)!
- ❑ Insights into design and implementation: lab exercises
- ❑ Preparation for possible research/advanced development in networking (reading of papers, fundamental perspective, case-study)
- ❑ In-class work (informal quizzes) & discussion (be prepared!)

Syllabus

- ❑ **Core problems**: heterogeneity, scale, coordination of distributed components, handling failures, sharing resources, managing congestion
- ❑ **Building Blocks**: workload units (call vs packet), multiplexing, indirection, virtualization, identifiers/namespaces/structures/scopes, signaling/state management, randomization, distributed coordination and control, redundancy
- ❑ **Core protocols**: Transport (TCP, UDP), IP, Routing, Addressing/Naming.
- ❑ **Advanced topics**: Multicasting, Peer-to-Peer, Next-generation IP, Better-than-best-effort Internet (QoS), High-Speed Routers, IP Telephony, Security ... (may not cover all)

Course Description Highlights

- ❑ Lectures
- ❑ Informal quizzes: Every week (every 2 classes)
- ❑ Be prepared: I will randomly call on students to explain ideas.
- ❑ Remote students: download latest class material from WebCT or class web page for each class
- ❑ WebCT bulletin board: Post your questions! TA will monitor regularly.
- ❑ WebCT: Grades, papers, RFCs, Internet drafts...

- ❑ **Grading:**

- ❑ **Informal Quizzes & Paper Summaries:** {15 pts}
- ❑ **2 Labs: Hands-on TCP and IP** {20 pts}
- ❑ **1 Research Case Study:** {15 pts}
- ❑ **3 exams: 15 pts, 15 pts, 20 pts:** {50 pts}

- ❑ **Quiz dates: Feb 15th, Mar 22nd, May 3rd.**

- ❑ **[2 days later for delayed schedule]**

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

- ❑ Considerable paper readings in the class + research case study (writing skills)
- ❑ Labs require advanced C programming skills
- ❑ Informal quizzes given every week
- ❑ 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.