

# TCOM 502 – Tentative Syllabus and Schedule

## **Week 1**

**Topics:** Brief review of addressing and name resolution; Address translation and NATs

**Documents:**

*Recommended Textbook:* Chapter 9

*Other Books:*

- Internet Routing Architecture: Chapter 4 (also in Bulkpack)
- An Engineering Approach to Computer Networking: Chapter 10 (also in Bulkpack)

*Blackboard material:*

- Primer on IP addresses (External Links)
- Paper on NAT traversal problems with SIP (Papers and Reports)
- Geoff Huston article on “Addressing the Future Internet” (External Links)
- Mark Handley's paper on “Why the Internet Only Just Works” (External Links)

*Standard Documents:* RFC 1541, 1631, 2391

*Slides:* overview.ppt, naming\_and\_addressing.ppt

## **Weeks 2 and 3**

**Topics:** Packet forwarding technology

**Documents:**

*Recommended Textbook:* Chapter 13

*Bulkpack:* Material on lookups

- Radix tree routing tables
- Balanced trees

*Blackboard material:*

- Tutorials on IP Lookup (Presentations or External Links)
- Overflow probability in a lookup cache (Handouts)
- Data Structures and Algorithms (External Links)
- NIST Links to trie and tree structures (External Links)

*Slides:* lookup.ppt

## **Weeks 4 to 9 (week 8 is Spring Break)**

**Topics:** Unicast Routing Protocols

- Intra-domain: RIP (quick review), EIGRP, OSPF and IS-IS
- Inter-domain: BGP

**Documents:**

*Recommended Textbook:* Chapters 12 & 14

*Other Books:*

- Internet Routing Architecture
- IS-IS Network Design Solutions
- Complete IS-IS Routing Protocol
- OSPF – Anatomy of an Internet Routing Protocol
- BGP Design and Implementation
- BGP4 Inter-Domain Routing in the Internet

*Bulkpack:* Material on routing protocols

- Intra-Domain Routing (Distance Vector Protocols)
- Intra-Domain Routing (Link State Protocols)
- Inter-Domain Routing (BGP)

*Blackboard material:* Various presentations and tutorials on routing protocols

- OSPF Tutorial (Presentations & External Links)
- Introduction to EIGRP (External Links)
- DUAL Loop-Free Routing paper (Handout)
- Multipath Computation Example (Handout)
- IS-IS NANOG presentation (Presentations)
- OSPF vs. IS-IS NANOG presentation (Presentations)
- Interop EIGRP paper (Handout & Papers and Reports)
- BGP tutorials (External Links and Presentations)
- Geoff Huston papers on Peering Agreements (Papers and Reports)

*Standard Documents:* RFC 2453, 1771, 1772, 2328, 1195 (and many others)

*Slides:* routing.ppt

## **Week 10**

**Topics:** Multicast Routing Protocols (quick review if time permits)

- DVMRP, CBT and PIM

**Documents:**

*Recommended Textbook:* Chapter 15

*Blackboard material:* Dave Meyer NANOG Multicast presentation (Presentations)

*Standard Documents:* RFC 2362, 3446, 3973, 3569

*Slides:* multicast.ppt

## **Weeks 11 and 12**

**Topics:** MPLS, VPNs and MP-BGP

**Documents:**

*Other Books:*

- An Engineering Approach to Computer Networking (Sections 14.8 & 15.4)

*Bulkpack:* Material on MPLS

*Blackboard material:*

- Juniper's MPLS NANOG presentation (Presentations)
- BGP/MPLS Layer 3 VPNs NANOG presentation (Presentations)
- MPLS VPN Tutorial (Presentations)
- Cisco's MPLS VPN Deployments presentation (Presentations)
- Juniper's VPN Guide (External Links)
- Juniper's Guide on Traffic Engineering and MPLS (External Links)

*Standard Documents:* RFC 3031, 3036, 3209, 4364

*Slides:* mpls.ppt

## **Weeks 13 to 15**

**Topics:** RSVP Signalling (including TE extensions and traffic contracts)

### **Documents:**

*Other Books:*

- An Engineering Approach to Computer Networking (Chapter 14 & Section 15.4)

*Bulkpack:* Material on Traffic Management

*Blackboard material:*

- Cisco's RSVP tutorial (Presentations)
- Network Calculus (External Links)
- Open Networking Lab Tutorial (External Links)
- Juniper's Guide on Traffic Engineering and MPLS (External Links)

*Standard Documents:* RFC 2205, 3209, 2702, 3272, 2697, 2698

*Slides:* rsvp.ppt, IP-services.ppt