

## Applied Advanced Routing

Olga Torstensson

Introduction and course overview

***<http://www.hh.se/english/ide/education/student/coursewebpages/appliedadvancedrouting.4833.html>***

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## Examples of Course Contents

- Advanced routing protocols such as OSPF, EIGRP, BGP etc.
- Management and manipulation of routing updates together with filtering and redistribution.
- Scalable networks, IPv6, OSPF routing with IPv6 addresses.
- Report writing. Presentation techniques.

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## Course Disposition

- Lecture part
- Laboratory exercises
- Project part
- Written exam by the end of the course
- Practical exam by the end of the course
  
- **YOU MUST CHECK THE COURSE HOME PAGE AND READ THOSE INTRODUCTION SLIDES**

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## Other Details

- Prerequisites:
  - Knowledge in computer communications and computer networks corresponding to the courses Computer Networks I 7.5 credits, and Computer Networks II 7.5 credits or the equivalent
  - Basic prerequisites for the master program
- Course literature:
  - Behrouz A. Forouzan, *TCP/IP Protocol Suite*, 3rd Edition, 2005, McGraw-Hill, ISBN 0-07-296772-2
  - Slides and other course material
  - CNAP material
  - RFCs

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## Reading Instructions – Forouzan’s Book

### Core Course Topics

- 5. Subnetting/Supernetting and Classless Addressing
- 6. Delivery and Routing of IP Packets
- 13. Unicast Routing Protocols
- 31. Next generation:IPv6 and ICMPv6

*All topics are not treated on the lectures but might appear on the written exam including (indirectly at least) the background material*

### Important Background Material

- 2. The OSI Model and the TCP/IP Protocol Suite
- 3. Underlying Technologies
- 4. IP Addresses: Classful Addressing
- 7. ARP and RARP
- 8. Internet Protocol
- 9. ICMP
- 11. UDP
- 12. TCP

*Do not forget other course material, e.g. the Cisco on-line material, which both covers some additional topics and some topics in more detail*

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## Laboratory Exercises

- Basic LABs:
  - Week 3
  - **Needed** for those who have not taken CCNA courses
  - Only one group for those who need the LABs
- Ordinary **mandatory** course LABs
  - Week 4-7
  - Two groups
- Home page:
  - One big file for all the ordinary LABs
  - Separate file for each basic LAB

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## Project

- Each participant shall (in group) do a project work
  - Preliminary, only **groups of 3** or 2-3 students are allowed
- The project includes:
  - A practical experiment where you setup a network and configure it (4 routers)
  - Writing a report with details on the experiment
  - Presenting the results from the experiments orally with slides (15 minutes per group)
- Please consult the teachers responsible for the project for more details

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## Project (cont.)

- Send report to [Olga.Torstensson@hh.se](mailto:Olga.Torstensson@hh.se) (6-7 pages) in time – week 9 Monday 28 February
- Please **contact your supervisor** (practical and report, respectively) to discuss the progress. Come well-prepared (e.g., with questions) for the meetings to use the supervisor in a good way.
- **Be very careful** with permissions, references, quotations etc (we have to report any suspicion of cheating)
  - You are not allowed to copy from documents on Internet etc

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## Project Schedule

- Demonstration week 9 – working network
  - Group 1: Tuesday 10.15-12.00
  - Group 2: Tuesday 13.15-15.00
- Presentation week 9 – PowerPoint presentation
  - Thursday 13.15-17.00
- Submit report week 9 – Monday latest

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## Project Topics

1. OSPF multi-area include stub area, RIP redistribution
2. OSPF multi-area include NSSA with external networks, EIGRP redistribution
3. OSPF multi-area with virtual links, IS-IS redistribution
4. EIGRP and static route redistribution
5. BGP: IBGP and EBGP, Local preference, MED, static route redistribution
6. BGP Route Reflectors , OSPF , IPv6 Tunnel
7. OSPF for IPv6 , DHCP server

### **Networks:**

Group 1: 172.16.0.0/16

Group 2: 172.10.0.0/16

Questions about the project assignment can be answered by Samar, e.g. at the LABs

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## Examination Week 10-11

- Practical exam week 10
  - Tuesday
  - All LABs must have been done and approved before being allowed to attend the practical exam
- Written exam week 11

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## Teachers

- Magnus Jonsson <Magnus.Jonsson@hh.se>
  - Lecturer
- Olga Torstensson <Olga.Torstensson@hh.se>
  - Examiner, course responsible, lecturer
  - CNAP account administrator
  - Supervises and examines the report writing and presentation part of the project
- Samar Sajadian<samsaj08@student.hh.se>
  - Supervise and examine the practical part of the project
  - Conducting the ordinary laboratory exercises
- Patrik Persson<patrpe08@student.hh.se>
  - Conducting the basic laboratory exercises
- Philip Heimer <Philip.Heimer@hh.se>
  - Practical exam

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## CNAP (Cisco) Registration

- You must have an account to access CNAP
- Mail the following information to Olga.Torstensson@hh.se to get the access:
  - Name
  - Mail address
  - Social security number (Swedish ID)
  - Course name: Applied Advanced Routing
  - Cisco login (if you already have one)

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## CCNP1 Certificate

- More information will be given later by Olga Torstensson
- There will be a chance for this later in the spring or in the summer
- The CCNP1 Final Exam (not the same as the course exam) is optional
- Requirement for Network Academy Certificate
  - To pass Final Exam with minimum 70%
  - To pass all mandatory LABs and Skills
  - More information about the requirements is given on the home page

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## Resources on Course Home Page

- Course information
- Former written exams
- Slides from the last year
- LAB manuals and schedule for the different LAB topics
- Information on the network simulator GNS3
- Slides on report writing etc from last year

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