



# Secure and Optimized Converged Networks, 7.5 credits

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For the Development of Organisations, Products and Quality of Life



# Introduction and course overview

## **Knowledge and understanding**

- describe different techniques and tools for advanced troubleshooting TCP/IP network
- explain symmetrical and asymmetrical encryption and managing of Internet Key Exchange

## **Skills and abilities**

- manage and configure Virtual Private Network (VPN)
- plan, configure and troubleshoot Multiprotocol Label Switching (MPLS) for the large networks
- identify and analyze security problems in the computer network
- configure Firewalls with Intrusion Prevention
- plan, design, implement and troubleshoot an optimized secure network (Project)

## **Judgement and approach**

- describe results of projects in technical reports and by oral presentation
- solve the complex task in the project



# Introduction and course overview

## Examples of Course Contents

- Virtual Private Network (VPN) and encryptions
  - Multiprotocol Label Switching (MPLS). MPLS VPN
  - Security zones and Demilitarized Zone (DMZ).
  - Firewalls. Firewalls statefull packet inspections.
  - Intrusion detection (IDS) & Intrusion prevention (IPS).
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- Network Maintenance, Troubleshooting Processes, Troubleshooting Tools
  - Troubleshooting Switched Solutions, Troubleshooting NAT/PAT, DHCP
  - Troubleshooting Routing Solutions, Troubleshooting Security

# Introduction and course overview

## Course Disposition

- Lecture part
- Laboratory exercises
- Project part
- Seminar
- 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**



# Introduction and course overview

## Lectures

### *Week 35*

- Introduction, Network Maintenance, Troubleshooting Processes, Troubleshooting Tools

### *Week 36*

- VPN, MPLS, MPLS VPN

### *Week 37*

- Troubleshooting Switched Solutions, Troubleshooting NAT/PAT, DHCP

### *Week 38*

- Guest lecture: Security

### *Week 39*

- Troubleshooting Routing Solutions, Troubleshooting Security



# Introduction and course overview

## LABs

### Security part

W 36 Basic GRE, Site-to site VPN, IPSec VTI, Easy VPN,

W 37 Frame mode MPLS, 4.2 MPLS VPN

W38 CBAC, IPS

### Troubleshooting part

W39 Assembling Maintenance and Troubleshooting Tools

W40 Troubleshooting Complex Environments



# Introduction and course overview

## **Project W41**

### ***Part 1 Create own troubleshooting case study***

- Create network documentation (Topology diagram and IP addressing table)
- Write scenario and implement five problems or error
- Describe verification commands and corrective action (commands used)
- Write short report

### ***Part 2 Troubleshooting***

- Troubleshoot another group's case study
- Solve the problems
- Document verification commands and corrective action

### ***Part3 Presentation***

- Describe results of the project
- Describe results of troubleshooting



# Introduction and course overview

## Seminar

You should find and present one scientific paper in the area:

- network security
- firewalls
- encryption
- MPLS
- VPN

You should read and prepare questions for another group's scientific paper.

W 35-37 Submitting of paper

W 40 Presentation





# Introduction and course overview

## Examination

### W42 Skills Exam

- Skills Exam based on mandatory labs, case study and project.
- You allowed to use own hand-made notes.

### W43 Written Exam

**The Final Exam CCNP TSHOOT is optional**



# Introduction and course overview

## Course materials

Course home page

<https://www.hh.se/english/ide/education/student/coursewebpages/secureandoptimizedconvergednetworks.4876.html>

## Extra materials



# Introduction and course overview

## Teachers

Olga Torstensson <[Olga.Torstensson@hh.se](mailto:Olga.Torstensson@hh.se)>

- Examiner, course responsible, lecturer
- CNAP account administrator
- Conducting the laboratory exercises, project and seminar
- Written exam

Malin Bornhager [Malin.bornhager@hh.se](mailto:Malin.bornhager@hh.se)

- Lecturer
- Practical exam

