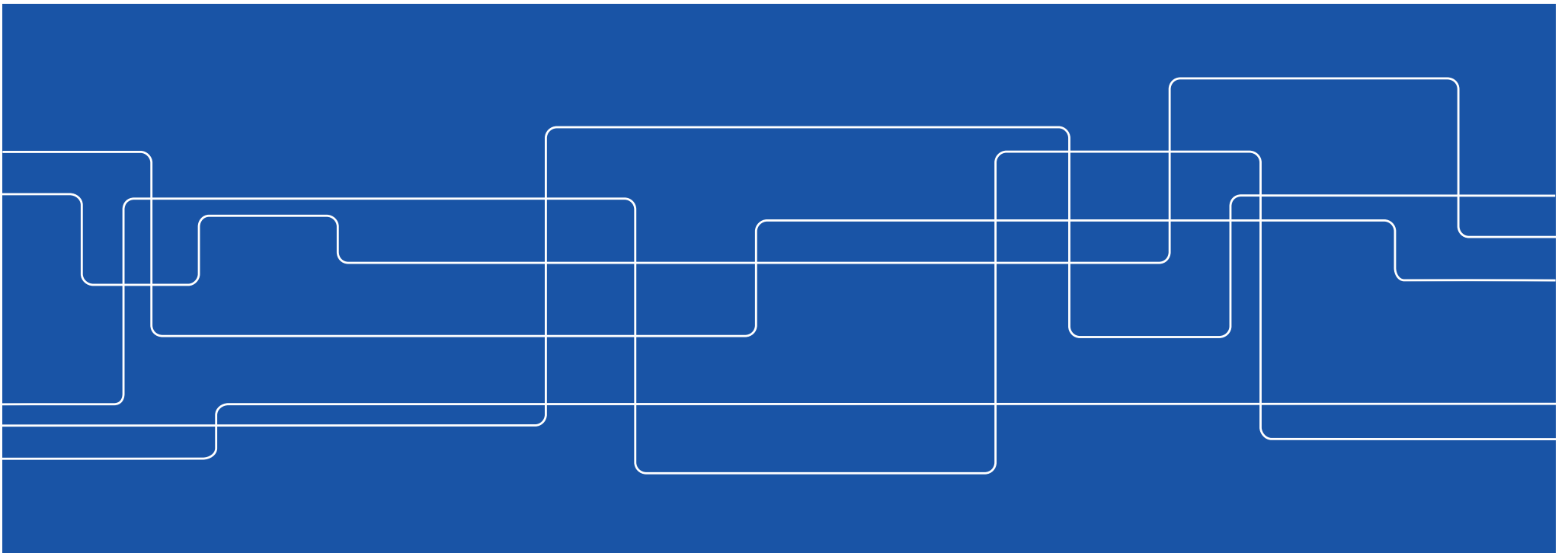# IV1013 Introduction to Computer Security

Course Overview

Peter Sjödin

In a Nutshell

- Three modules, each containing

  – Three to five lectures combined with exercises

  – Two project assignments

  – A home assignment (exercise)

  – Supervision and workshop activities

  – Support for project assignments

Course Staff

- Course responsible: Peter Sjödin

- Lecturers: Markus Hidell, Peter Sjödin, Anders Västberg

- Teaching assistants: TBD

- Contact info on course web (more later)

Language of Instruction

- Lectures in Swedish

- Supervision and workshop in Swedish and English

- Course material in English

- You can use English or Swedish for submission reports and any other communication
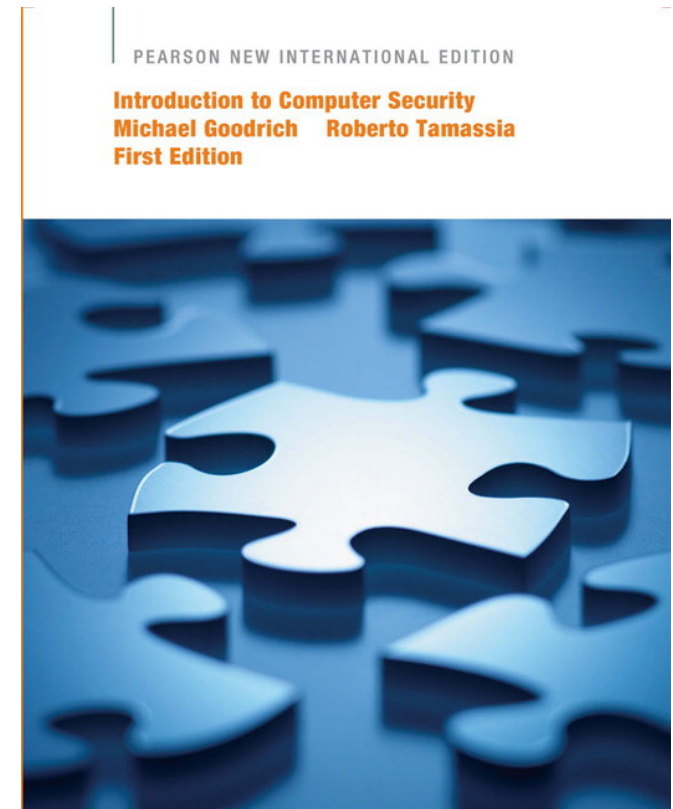
  - You decide!

Zoom Meetings

- We plan to use Zoom for all lectures, supervisions, etc.
- We have a permanent Zoom meeting that we plan to use for all course activities
- https://kth-se.zoom.us/j/842180267

Course Textbook

- Reading instructions on course web
- We don't cover the entire book

PEARSON NEW INTERNATIONAL EDITION

Introduction to Computer Security
Michael Goodrich   Roberto Tamassia
First Edition

Introduction to Computer Security
New international edition.
Michael Goodrich, Roberto Tamassia.
Pearson, Aug 2013.

Course Homepage

- Canvas
- URL: https://kth.instructure.com/courses/17285
- Only registered students can participate
  - Open for everyone to read

Course Homepage – Content

- Course material
  - Lecture slides
  - Reading instructions
- Project and lab instructions
- Home assignments
  - Online assignments – "quizzes"
- Problems for recitations
- Discussion forums
  - Help each other
  - Discussions about content
  - Teacher contacts
  - Only for the purposes of discussing course content, course organization and assignments.

Course Homepage – Notifications

- All important announcements and other course communication is done in Canvas

- It is your responsibility to keep yourself updated

- We recommend that you subscribe to email notifications from Canvas

  - You have to do this yourself. We can't change your settings.

- Go to Account -> Notifications in Canvas

  - We strongly recommend that you select "Notify me right away" for "Announcements" (at least)

Course Organization

- Three modules consisting of
  - Lectures/exercises
  - Home assignment
  - Project assignments

Cryptography

- Symmetric-key encryption
- Public-key encryption
- One-way hash
- Digital Signatures

Network Security

- Security of Internet protocols
- Network applications security
- Network systems – firewalls, intrusion detection

Operating Systems and Software

- Authentication and passwords
- Operating systems
- Malware
- Software vulnerabilities

Prerequisites

- Students should have a background in
    - Mathematics, in particular discrete math (IX1500, for example)
    - Computer networks (IK1203)
    - Computer organization (IS1200)
    - Programming – Java and C (ID1018)
- Recommended background
    - Operating systems (IS1350)

Lectures

- Overview

- Complements course literature

- Follows the organization of the textbook

Home Assignments

- 3+1 home assignments
    - One per module, and one make-up
- About one week to complete each assignment
- Online assignments – Canvas quizzes
- Pass/Fail
- 45 points total
- 32 points for pass
- At least one point on each of three assignments
    - In other words, you need to score on three out of four

Home assignments is examination part: UPG1 (P/F 1.5 hp)

Submitting Home Assignments

- Electronic submissions
  - System closes at "due date" – sharp deadline
  - We don't accept submissions any other way
- You can submit as many attempts as you like!
  - It is the last attempt that counts
- There are some Canvas peculiarities you need to consider
  - You cannot have an attempt open when the assignment closes
    - Then you won't get any points
  - Deadline is "due date" in Canvas

Grading of Home Assignments

- Automatic grading
- Some problems have special instructions for formatting the solution
- Follow the instructions carefully!
- We can do manual grading and grade adjustments
- We will only do that if absolutely necessary
  - After the fourth assignment
- For borderline cases

Project Assignments

- Two assignments per module
  - Optional, larger project assignments at the end of the course
- Use existing tools and/or write your own code to solve problems
- Individual solutions
  - We encourage you to discuss and collaborate
  - But solutions must be individual
  - We will check for uniqueness
  - Two students submitting the same solution counts as plagiarism

Project assignments is examination part: PRO1 (A-F 6 hp)

Project Assignment Submissions

- Strict deadline
  - You must submit before the regular deadline
  - If you don't, you will not get a result on the assignment
- Procedures for submission and reporting vary between assignments
  - More instructions on course web

Programming Assignments Requirements

- Many security vulnerabilities come from incomplete or erroneous software

  - Lack of user input validation

  - Built-in assumptions about usage

- Therefore, in this course, we pay special attention to quality

  - Your software will be tested

    - Varying input parameters

    - Error detection and error handling

- This means that programming assignments in this course are not only about solving programming problems

  - You are also designing and implementing applications

Assignment Grading

- You must submit solutions to all six assignments meeting the minimum requirements
- Assignments can then give up to grade "C"
- Point system
  - Assignments have different levels of difficulty
  - For some assignments, you can choose the level
    - Basic, medium, advanced
- Points are awarded based on:
  - Assignment level
  - Quality of the solution
  - When solution is submitted (regular deadline or make-up during endgame)

Project Assignments – Supervision

- Supervision occasions
  - One scheduled occasion per week
  - Teaching staff is available in Zoom
  - Discuss and ask questions

- Canvas forum
  - Teaching staff present
  - Discuss and ask questions

Assignment Environment and Infrastructure

- You will do the assignments in a pre-defined environment
  - Linux Ubuntu
- Runs in a virtual machine on your own computer
- VirtualBox from Oracle
  - https://www.virtualbox.org
  - Workshop where you can get help with the installation
- Assignments distributed online
- Submissions are done electronically
  - Deadlines are strict!

Project Assignments Endgame

- After the third module, we will open up all submissions again
- If you made and submitted a serious attempt before the regular deadline, you may use the endgame opportunity to make up
  - There will be a reduction in score, though, since you are using more time.
  - 75% of the regular point scale.
- At the endgame, there will also be some more assignments
  - Not mandatory
  - An opportunity to get more points

Final Exam

There is no written exam

Summary

- Three course modules

- Lectures and exercises

- Home assignments

- Project assignments

- Late submissions are not accepted

  – Use the possibility to submit multiple times!