# Course Orientation

CPEN 442

# Teaching staff

- Instructor
  - Dr. Konstantin (Kosta) Beznosov
    - www.ece.ubc.ca/~beznosov
    - Research interests:
      usable privacy and security of
      - social media, mobile devices, IoT,
        cryptocurrencies

- Teaching Assistants
  - Masoud Mehrabi Koushki, Ph.D. student
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# Outline

- Course orientation
  - course site
  - syllabus
  - calendar
  - term project
  - Q&A
- Introduction into computer security

# What background should I have?

- From students' anonymous comments:
  - "This class involves fairly amount of programming. I am just wondering for those in EE, are they capable of doing all these coding from scratch."
  - "This course definitely needed a strong programming background (which I happen to have). My peers without strong programming backgrounds had trouble with many of the assignments."
  - "It was helpful to have taken CPSC 317 (Networking) and CPSC 310 (Software Engineering) and also concurrently taking MATH 342 at the same time."
  - "I was lacking nearly all prerequisites for the course, and without my work experience with databases and web application programming I doubt I would have been able to keep up with the assignments. However, the focus of the quizzes and the projects was on problem-solving and applying new concepts, which my academic background had provided to me thoroughly."
  - "An Electrical Engineering student (as opposed to a Computer Engineering student) does not have the background information to do some of the assignments."

# How Much Time Does the Course Require?

- A lot!

| | | [SD] | [D] | [N] | [A] | [SA] | Med. | Mode | S.D. | N | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q1** | The assigned workload for the course was heavy. | 0 | 0 | 3 | 8 | 13 | 5 | 5 | .70 | **24** | **4.4** |

- From student anonymous comments:
  - "I felt the assignments … were extremely time-consuming …"
  - "Coursework was too heavy - it was just more and more work dumped onto the student."
  - "Prof has extremely high expectations on students but I found them hard to meet …"
  - "The course was very time-consuming, …"
  - "I spent more time on this course than on my capstone fourth year project course, as a reference."
  - "The assignments and quizzes are very difficult. The workload of the course rivals the fourth year capstone 14 course(10credits)."
  - "Homeworks, Quizzes and Projects were very hard …"
  - "… the expectations for the course were quite high …"

# How Much Time Does the Course Require?

- From students' anonymous comments:
  - "If a student is taking a full course load during the semester, it is quite unrealistic to have as many assignments and quizzes and expect students to start on the project early."
  - "quizzes, assignments, and term project and exam is too much …"
  - "Lots of assignments, projects, one of my most intense courses."
  - "With quizzes, lengthy assignments, and a pretty much full flegged project, as well as a final exam which is pass final to pass the course there was a lot of work to do."
  - "Very heavy workload, the term project was huge, and there were no weeks that did not include either a due assignment or a quiz."
  - "The assignments are all quite hard and take a lot of time, and the term project runs in parallel."
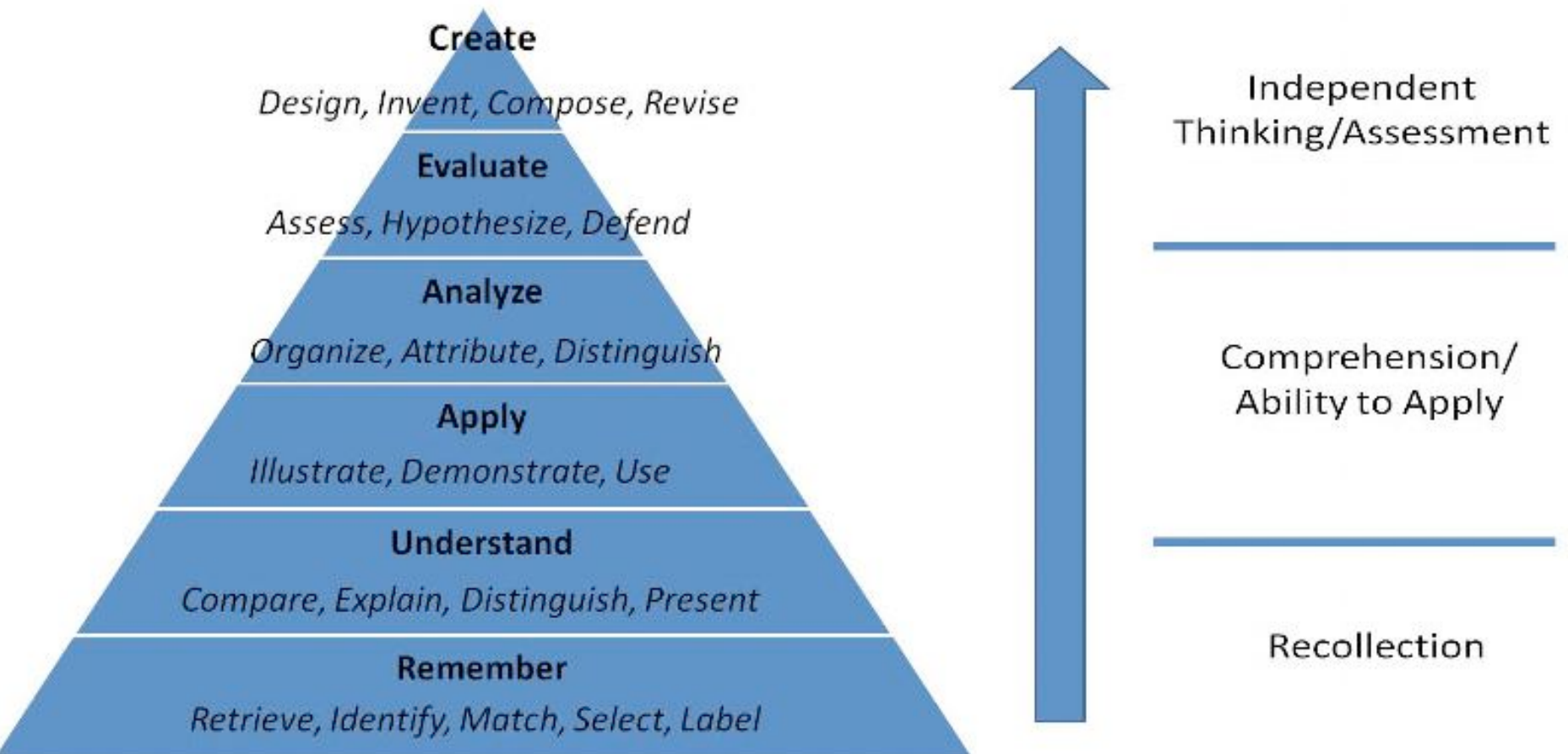  - "In this course I spent rough 16 hours week …"

# repeat after me

- This course is hard!
- This course takes a lot of time!

# course information flows

- **courses.ece.ubc.ca/cpen442**: calendar, lecture slides, syllabus, office hours, deadlines,
- **piazza.com**: out of classroom announcements, Q&As
- e-mail through piazza.com: urgent announcements
- course calendar
- announcements
  - non-urgent: in the class & on piazza
  - urgent: through piazza or UBC e-mail
- office hours
  - in the calendar

# Bloom's taxonomy of learning

**Create**

*Design, Invent, Compose, Revise*

**Evaluate**

*Assess, Hypothesize, Defend*

**Analyze**

*Organize, Attribute, Distinguish*

**Apply**

*Illustrate, Demonstrate, Use*

**Understand**

*Compare, Explain, Distinguish, Present*

**Remember**

*Retrieve, Identify, Match, Select, Label*

Independent Thinking/Assessment

Comprehension/ Ability to Apply

Recollection

source: www.nltslibrary.info

# Key Points

- A lot of
  - hard work -- 15-20 hours/week
  - programming
- All the course material is on courses.ece.ubc.ca/cpen442
- Start early!
  - First assignment due September 13
  - First quiz on September 11
  - Project proposals due October 11

assignment #1 review

# term projects

# term project types

- design
    - come up with a technological solution to a real security or privacy problem
    - evaluate your solution
- analysis
    - analyze security of a real system/product/service
    - fail the project if no vulnerabilities are found
- implementation
    - implement and extensively test security functionality or a feature/mechanism in a real system

# security analysis projects

- <u>authorized</u> analysis of a
  - UBC system
  - third-party system
- <u>~~unauthorized~~</u> ~~analysis of a~~
  - ~~UBC system~~
  - ~~third-party system~~

# authorized security analysis projects

1. **pre**authorized projects to analyze a UBC or third-party system
    1. Be the first group to "claim" the project. (send Kosta e-mail with subject "412: claiming project #…")
    2. Meet with the system owner to scope out the project.
2. with authorization obtained by the students, analysis of a UBC or third-party system
    1. get authorization from Kosta by September 28
    2. get authorization from UBC IT Security by October 7
    3. get authorization from the system owner by October 13
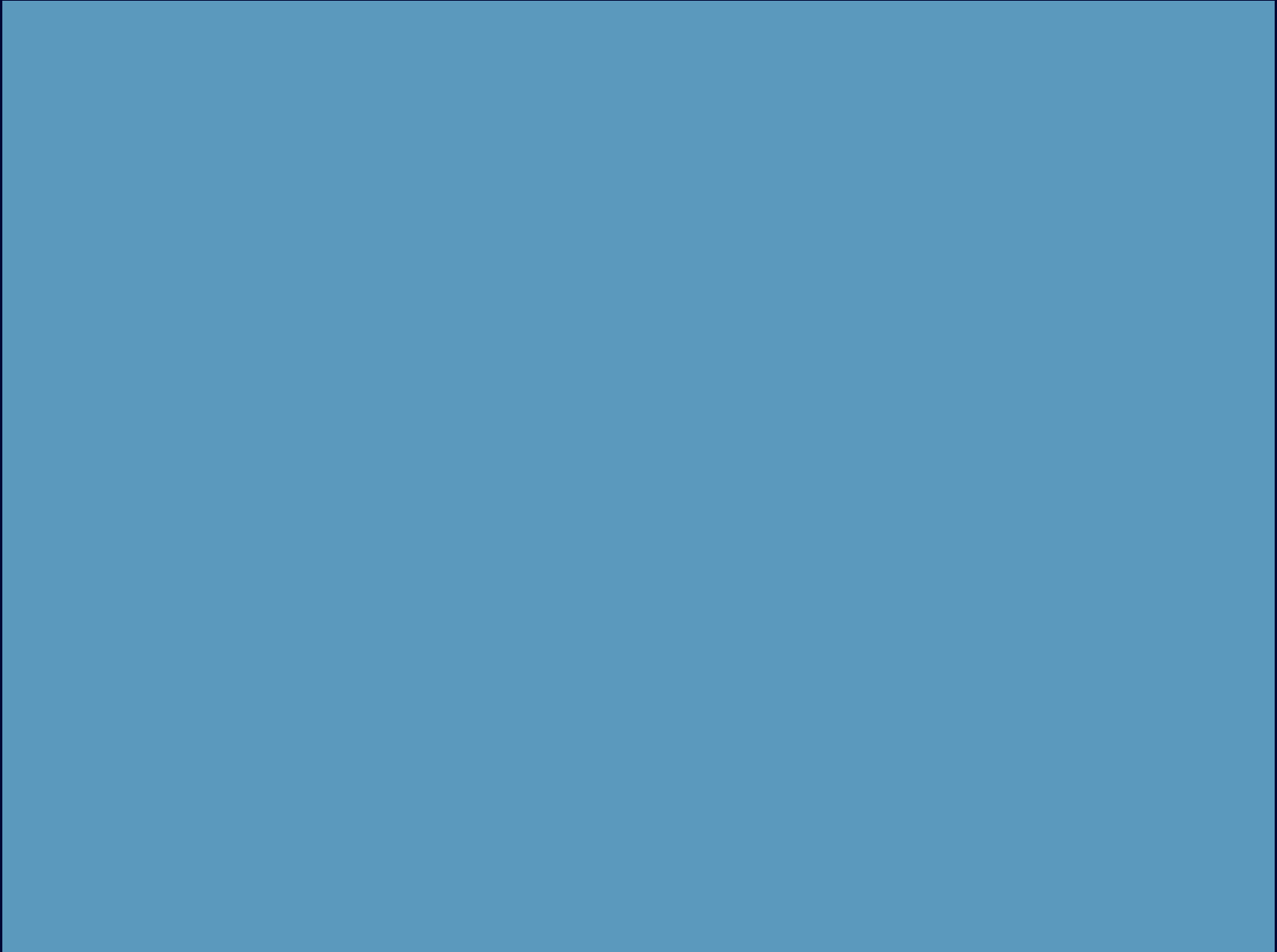    4. Meet with the system owner to scope out the project.

# examples of good analysis projects

- **Analysis of GridGear Solutions' Smart Meter & Web Application System**, by Connie Ma, Derek Chan, Jake Larson, Pascal Turmel (2016)

- **Security Analysis of Mobile Telephony Customer Account Management**, by Nikola Radoicic, Andrej Satara, Rudi Plesch, Nabeel Huq (2013)

- **Security Analysis of the i>clicker Audience Response System,** by Derek Gourlay, Yik Lam Sit, Yuan Sunarto, Tim Wang (2010)

- **Analysis of Smart Card Laundry System**, by Jon Lee, Niel Paul, Choon-Sean (Steven) Cheong, Dicky Bratawijaya (2009)

- **Security Analysis of Vancouver's Pay-by-Phone Metered Parking**, by Chris Lee, Benjamin Wai, James Wang, Leo Wong (2008)

- **Security Analysis of Microsoft Notification Protocol**, by Jason Poon, Oliver Zheng (2007)

http://courses.ece.ubc.ca/cpen442/term_project/previous_years_reports.html

# Analysis of Smart Card Laundry System
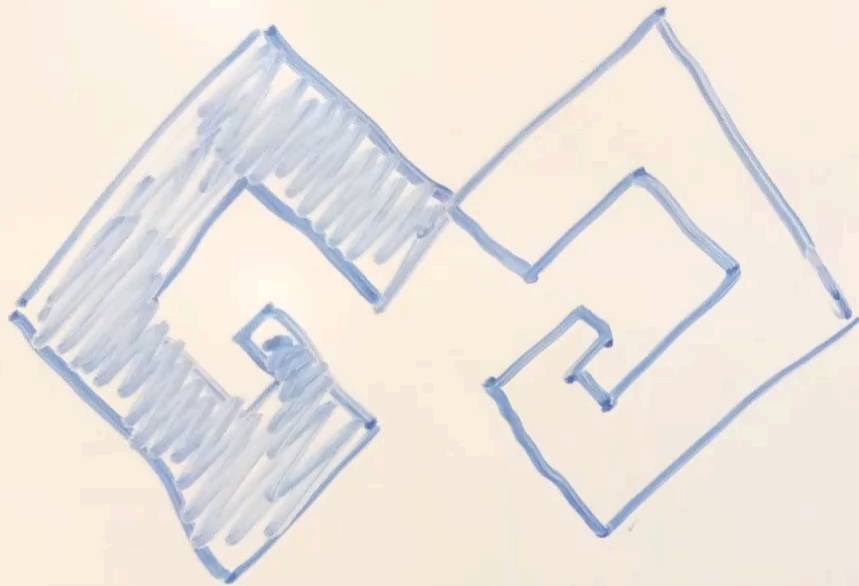best presentation, best analysis project (2009)
**Jon Lee, Niel Paul, Choon-Sean Cheong, Dicky Bratawijaya**

# "Analysis of GridGear Solutions' Smart Meter & Web Application System"
Best Analysis Project, Best Presentation, Best Videoclip (2016)
**Connie Ma, Derek Chan, Jake Larson, Pascal Turmel**

# examples of good design projects

- "Design of Expiring Barcodes" by Red Kernel Garsuta, Jae Yeong Bae, Matthew Mackenzie, Anni Wang (2016)

- "Design and Evaluation of New Smartphone Unlockign Mechanism `The Locker'" (2015)

- "Password Gamification" by Peter Cheung, Peter Yeung, Crystal Ng (2012)

- "Paper De-shredder" by Hei Wang Chan, Evan Gillespie, Delfino Leong (2010)

http://courses.ece.ubc.ca/cpen442/term_project/previous_years_reports.html

# "Design of Expiring Barcodes"

Second Best Design Project, Most Holistic Approach to Security Engineering, Second Best Videoclip (2016)

## Red Kernel Garsuta, Jae Yeong Bae, Matthew Mackenzie, Anni Wang

# "Design of Smartphone Unlocking Mechanism `The Locker'"

Best Design Project, Most Holistic Approach to Security Engineering, Best Videoclip (2015)

## Calvin Chan, Daniel Chong, Shibo Weng

The Lockers

Phone Unlocking Mechanism

# term project milestones

- **October 11**
  - proposal presentations
  - written proposals and authorizations due
- **November 8**
  - **Introduction, Related Work, and Methodology sections of the report due**
- **November 27**
  - project video clips due
- **December 3 (all day)**
  - project presentations
- **December 6**
  - final project reports due

# Questions