

# Computer Security: Administrative matters

**Myrto Arapinis**  
School of Informatics  
University of Edinburgh

January 12, 2015

# Teaching staff

**Lecturer:** Dr. Myrto Arapinis

**Course TA:** Joseph Hallett

**Course secretary (ITO):** Victoria Swann

# Course webpage

`http://www.inf.ed.ac.uk/teaching/courses/cs/`

Contains important info:

- ▶ Lecture slides
- ▶ Tutorial sheet exercises
- ▶ Course organization
- ▶ etc

# Tutorials

- ▶ You should receive email from the ITO informing you of preliminary allocation of tutorial groups
- ▶ See link on course web page for current assignment of tutorial groups
- ▶ If you can't make the time of your allocated group, please email Victoria suggesting some groups you can
- ▶ Tutorial attendance is mandatory. If you miss two tutorials in a row, your PT (DoS) will be notified

# Grading

- ▶ Written Examination: 75%
- ▶ Assessed Assignments: 25%
  - There are two assessed coursework exercises, each worth 12.5% of the final mark.
  - Coursework 1 is due on Mar. 06 at 16:00
  - Coursework 2 is due on Mar. 27 at 16:00

# Computer Security: Introduction

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# What is computer security?


## Correctness:

- ▶ allow intended use of computer systems

## Computer security:

- ▶ prevent harmful undesired behavior
- ▶ considers a malicious entity actively trying to circumvent any protective measures in place


# Online banking

Securely signed in | More info | Change details  
Ms Bridget Johnson Sign Out

## My accounts

Last login: 25 May XXXX (01:26 PM)

+ Make a quick transfer



+ **Reward Current Account** **£745.82** [Make a payment](#)


11-02-76, 29976651

Overdraft limit: £0.00

▶ [Apply](#)

☑ [Upgrade](#)

+ See mini statement



+ **ISA Saver Online** **£6,019.23** [Make a transfer](#)

11-18-11, 73322110

[Contact us](#) +

[Help & support](#) +

[Apply online](#) +

### My account tools

- ▶ [Mobile Alerting Service](#)
- ▶ [Start / stop paper statements](#)

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- ▶ [Rates, rewards & fees](#)

## Your current offers

Halifax Personal Loans Whatever your plans, our personal loans could help. X.X% APR representative

☑ [Apply online](#)



# Social networks



The image shows a screenshot of Mark Zuckerberg's Facebook profile. At the top left is a profile picture of Mark Zuckerberg smiling. To its right is a large cover photo of a dog's face. The name "Mark Zuckerberg" is displayed with a blue verification checkmark. Below the name are buttons for "Follow", "Message", and a settings icon. A navigation bar contains links for "Timeline", "About", "Photos", "Friends", and "More". Below this is a section to "Follow Mark to get his public posts in your news feed" with a green "Follow" button and a row of follower avatars. The "About" section on the left lists his role as "Founder and CEO at Facebook" (since February 4, 2004), his education at "Harvard University", his location in "Palo Alto, California", and that he is "From Dobbs Ferry, New York". It also states he is followed by 18,821,144 people. On the right, a post from a user named "Khalil" is shown, which includes a message to Mark Zuckerberg and a link to a Pastebin.com page.

**Mark Zuckerberg** ✓

Follow Message ⚙

Timeline About Photos Friends More ▾

Follow Mark to get his public posts in your news feed. [Follow](#)

18,821,144 Followers

### About

**Founder and CEO at Facebook**  
February 4, 2004 to present

**Studied Computer Science at Harvard University**  
Past: Phillips Exeter Academy and Ardsley High School

**Lives in Palo Alto, California**

**From Dobbs Ferry, New York**

Followed by 18,821,144 people

**Khalil** shared a link.  
about a minute ago ⚙

Dear Mark Zuckerberg,

First sorry for breaking your privacy and post to your wall , i has no other choice to make after all the reports i sent to Facebook team .

My name is KHALIL, from Palestine .  
... See More

Hi Khalil, I am sorry this is not a bug. Thanks, Emrakul Securit - Pastebin.com  
pastebin.com

# Mobile telephony



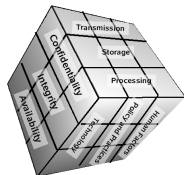
# Electronic voting



## Some significant security breaches

- ▶ **Adobe** (2013) - stole source code, 130 million customer records (including passwords)
- ▶ **Target** (2013) - stole around 40 million credit and debit cards
- ▶ **Sony Pictures Entertainment** (2014) - stole personal information about Sony Pictures employees and their families, e-mails between employees, information about executive salaries at the company, copies of unreleased Sony films
- ▶ **Apple** (2014) - goto fail - encrypted traffic, including usernames, passwords, and even Apple app updates could be captured
- ▶ **OpenSSL** (2014) - heartbleed bug - steal secret keys used to identify the service providers and to encrypt the traffic, the names and passwords of the users and the actual content

# Basic security properties



**Confidentiality:** some information should never be revealed to unauthorised entities

- ▶ Corporate secrets (product plans, source code, ...)
- ▶ Personal information (credit card numbers, ...)

**Integrity:** data should not be altered in an unauthorised manner since the time it was created, transmitted or stored by an authorised source

- ▶ Installing unwanted software (spyware, botnet client, ...)
- ▶ Destroying records (accounts, logs, plans, ...)

**Availability:** Information on and services should be accessible

# Security analysis

Is the computer system secure?

- ▶ What are the assets?
  - ▶ grade database system for this class
  - ▶ major online banking site
  - ▶ the system to control nuclear weapon launch
- ▶ What are the security objectives
  - ▶ confidentiality, authentication, anonymity, integrity, unlinkability, non-repudiation, . . .
- ▶ What is the threat model?
  - ▶ the attacker has physical access
  - ▶ the attacker can install malware on the system
  - ▶ the attacker controls the network



# Course topics

- ▶ Cryptography
- ▶ Network protocols
- ▶ Access control
- ▶ Secure coding
- ▶ Web security