

COURSE OVERVIEW

Introduction to Computer and Network Security

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UNIVERSITÀ
DI TRENTO



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COURSE INFORMATION

- Lecturer: *Silvio Ranise* [silvio.ranise@unitn.it or ranise@fbk.eu]

Department of Mathematics, University of Trento
&
Center for Cybersecurity, Fondazione Bruno Kessler

- Office hours

By appointment only. Please email me.

- Teaching assistant: *Salvatore Manfredi* [smanfredi@fbk.eu or salvatore.manfredi@unitn.it]



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AIMS & OBJECTIVES

By the end of the course, you should be able to:

- understand the **theoretical** and **practical** problems of **information security**
- understand and recognize **threats** to fundamental security properties: **confidentiality, integrity, and availability**
- understand how the main **security mechanisms** - such as **authentication** and **authorization** together with **access control** and **cryptography** - can be applied to **mitigate vulnerabilities**
- understand the role and importance of **compliance**

TOPICS

- Basic notions
- Authentication
- Introduction to cryptography
- Applications of cryptography
- Access Control
- Application & IoT security
- Privacy & GDPR
- NIS2 & AI Act

Focus on how to **defend** (more precisely, how to mitigate risks) rather than how to **attack** (although some basic ideas on how to exploit vulnerabilities to perform attacks will be given)

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EXAM

- Written exam (questions and/or exercises) at the end of the course
- Dates: TBA
- Past papers will be made available online in the Moodle page of the course

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TEACHING

- I will use mainly slides but occasionally will suggest some reading material that can be found online
- Lectures are on Wed 16:30-18:30 and Thursday 08:30-10:30
- Materials will be made available on Moodle
- You can find some useful material in the following book
 - *Computer Security*
A book by Dieter Gollmann
- And also at the following site
 - <https://www.cybok.org/>



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PROJECTS

Opportunities for curricular internship and/or thesis may arise, subject to approval from the lecturer

- **Workload:** approximately one week of full-time work per academic credit, including reading, writing, coding, preparation, and presentation – e.g., 6 weeks for undergraduate internship
- **Location:** *Center for Cyberscurity* (FBK north building, first floor)
- Past and current project topics are available online (FYI)
 - <https://cs.fbk.eu/internships/>
- A first round of topics for this year will be presented soon, stay tuned



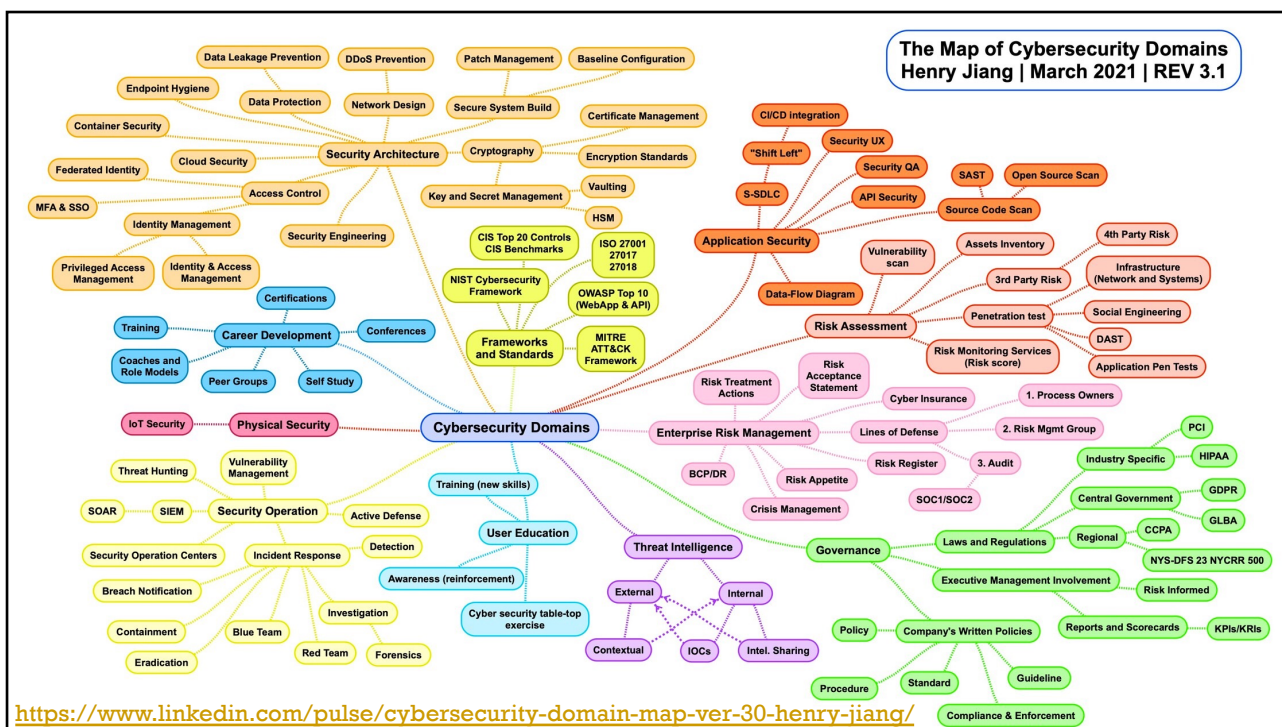
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BE CAREFUL

- Cyber security is getting more and more import in curricula at all education levels
- Foundations of cyber security are under active development and lack a systematic view compared to other disciplines (such as Mathematics, ...)
- Efforts are ongoing to develop a coherent view of the discipline
 - Example: <https://cybered.acm.org/>
- However, there is not even a single, agreed-upon, definition of cyber security
 - <https://www.enisa.europa.eu/publications/definition-of-cybersecurity>
- Keep in mind that the term “cybersecurity” has several different ramifications
 - Information security substantially contributes to cyber security
 - Computer and Network security can be seen as part of cyber security
- Cyber security is conceptually spread over **several different domains**

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SOME REMARKS ON TEACHING...



- Slides are
 - a bit **verbose** as they aim to give as much information as possible but only a selection will be presented during the lectures, you are supposed to study all of them
 - **redundant** and sometimes present the same concepts from different perspectives and in different ways... this is done on purpose since, as already explained above, cybersecurity is a young field still discussing its fundamentals
- Remind that the title of the course contains the word **Introduction**, this is intentional and means that **breadth will be preferred over depth**, you will be exposed to several different notions with particular emphasis to those that will not be covered in later courses
- If a concept is unclear or presented in different ways in two slides and you are uneasy, then **discuss and ask questions** to clarify

What I have is a malevolent curiosity. That's what drives my need to write and what probably leads me to look at things a little askew. I do tend to take a different perspective from most people.

David Bowie