



# UNIVERSITÀ DEGLI STUDI DI PADOVA

## Master Degree in Cybersecurity Welcome Day!

Padua, September 27, 2021



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# Overall Introduction



# What secrets are we unveiling today?

SHHHHH!

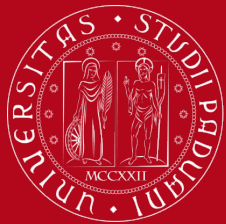


What is a MS in  
Cybersecurity?

What is unique  
to Cybersecurity  
at UNIPD?

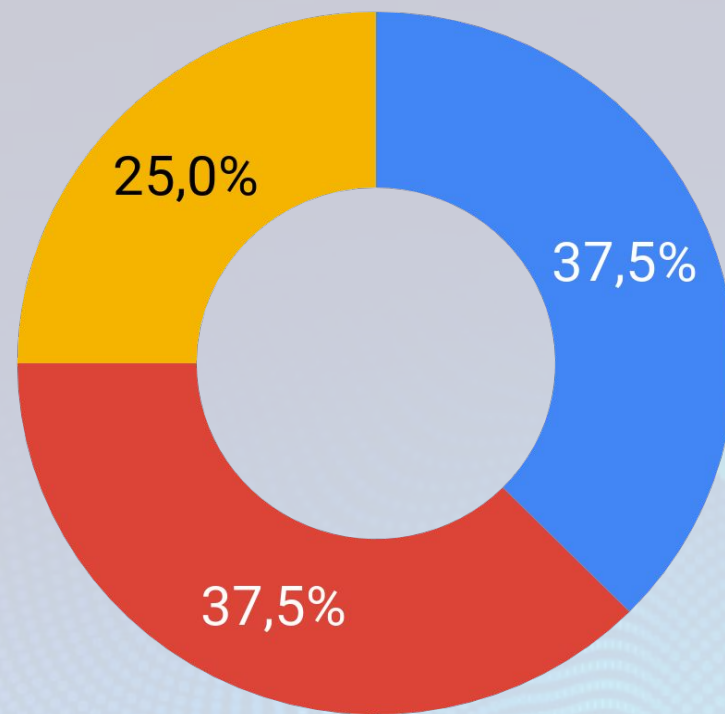
What is the overall  
organisation of the  
MS program?

What are the details on  
the specific areas of  
the program?



# What is a Master Degree in Cybersecurity (LM-66)?

- Cybersecurity is a **highly inter-disciplinary** master degree (LM-66)
- It builds on **three main areas of expertise**: science, technology, and law/psychology/business
- It allows you to get the **national qualification** for the **engineering profession** and enroll to the register of professional engineers (albo degli ingegneri)



- Scientific, e.g. computer science and math
- Technology, e.g. engineering
- Law, Psychology, and Business



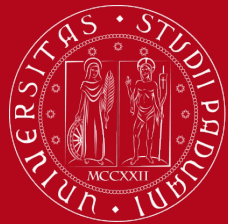
# How does Cybersecurity look like in Italy?

- Usually, some sort of “**curriculum**” within an existing master degree
  - Computer Science (LM-18)
  - Computer Engineering (LM-32)
  - Telecommunications Engineering (LM-27)
- Only few **native Cybersecurity** master degrees (LM-66)
  - rooted in a single Department, mostly Computer Science
  - complement scientific & technological competences with law and business skills



## Cybersecurity @ UNIPD is unique in that

- **joint inter-disciplinary effort of several departments**
  - Department of Mathematics  
→ scientific area
  - Department of Information Engineering  
→ scientific and technological area
  - Other Departments  
→ psychology, law, and business area
- **deepen the three core areas of expertise by**
  - strengthening **engineering** and **physical layer skills**
  - complementing with an innovative **machine learning perspective**
  - boosting the **psychological** expertise



- We build on the **scientific excellence** of the contributing departments in several research fields, among which
  - many areas of cybersecurity (computer security, network security, ethical hacking, etc.)
  - machine learning and artificial intelligence
  - big data analytics and information access
  - telecommunication networks
  - quantum cryptography and communication
  - cognitive and computational neuroscience
  - human-computer interaction



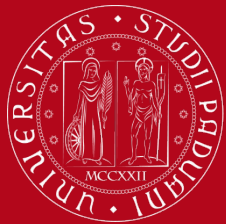
# How do we make Cybersecurity@UNIPD unique?

We rely on **strong industrial connections** in several areas, among which

- security
- defense
- banking
- logistics & transportation
- insurance
- consultancy
- web development
- business analytics
- automotive
- electronics
- telecommunications
- bio-medical



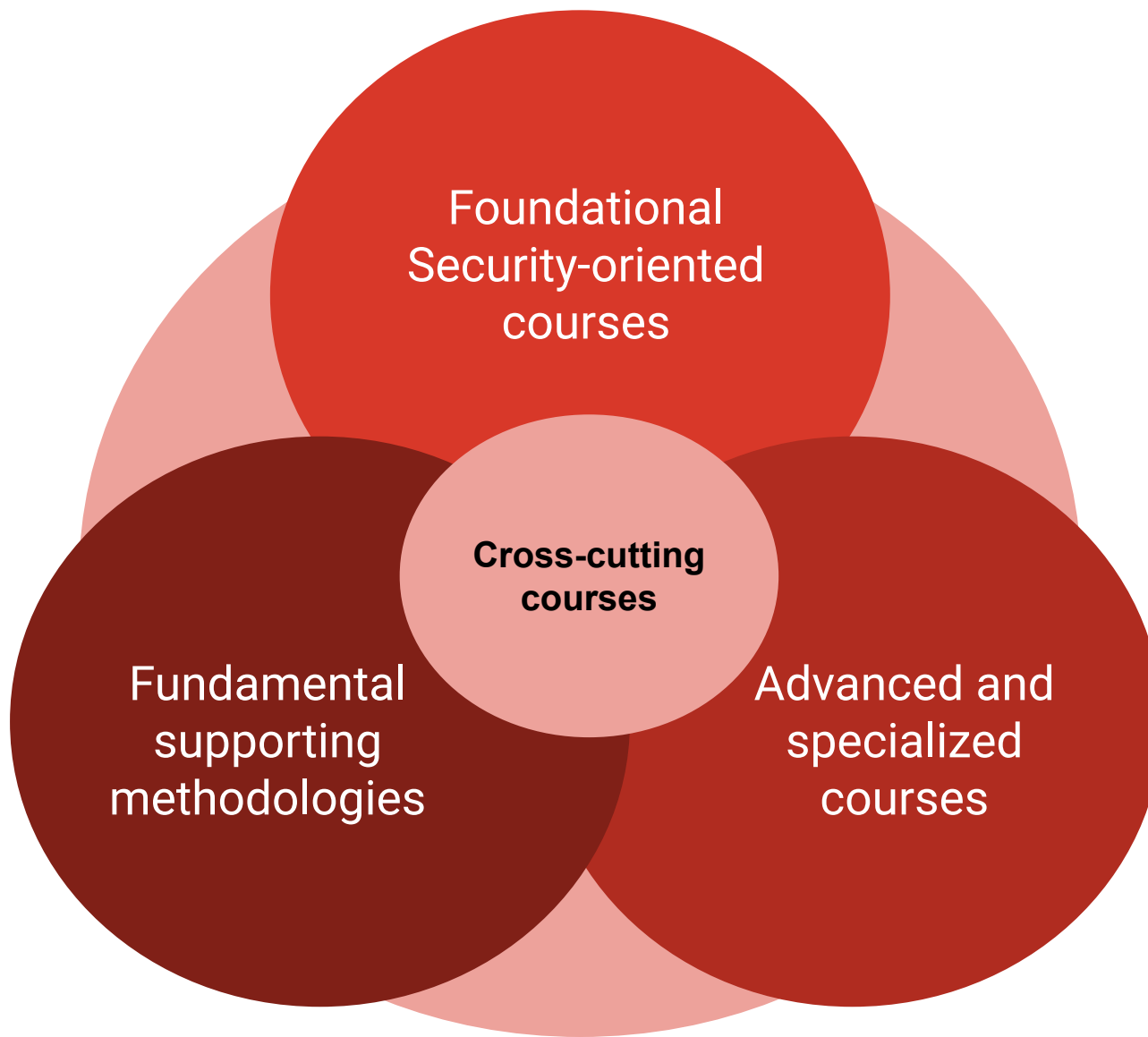
# Study Plan

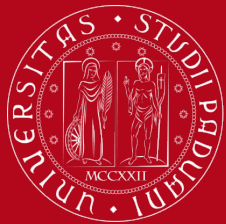


- **Master degree**
  - fully in **English**
  - **120 ECTS\*** in total
  - **6 ECTS** courses
- **60 ECTS** of mandatory courses
  - base courses on core security
  - supporting methodologies
  - advanced topics
- **12 ECTS** of elective courses
- **12 ECTS** of courses freely chosen by the student
- **3 ECTS** English (B2 level)
- **3 ECTS** Extra Activities (seminars, project, ...)
- **30 ECTS** Thesis, possibility of internship in a company

\*1 ECTS (European Credit Transfer System) = 25 hours of student work





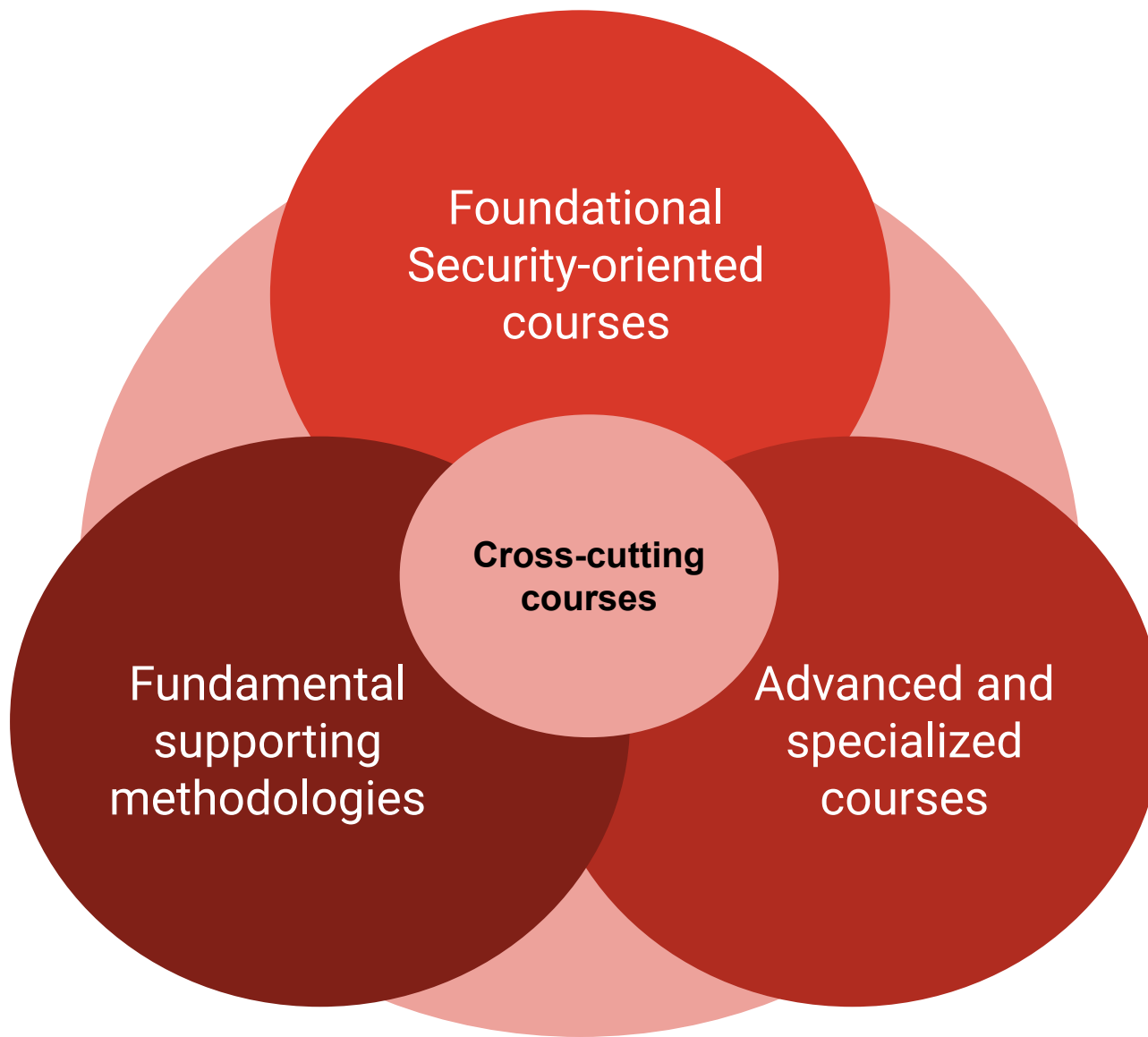


- **60 ECTS of mandatory courses**
  - **CYBERSECURITY AND CRYPTOGRAPHY: PRINCIPLES AND PRACTICES (12 ECTS)**
  - **INFORMATION SECURITY (6 ECTS)**
  - MACHINE LEARNING (6 ECTS)
  - DEEP LEARNING (6 ECTS)
  - COGNITION AND COMPUTATION (6 ECTS)
  - STOCHASTIC PROCESSES (6 ECTS)
  - BIOMETRICS (6 ECTS)
  - ADVANCED TOPICS IN COMPUTER AND NETWORK SECURITY (6 ECTS)
- 1 course (6 ECTS) among:
  - HUMAN COMPUTER INTERACTION
  - LAW AND DATA
  - SERVICE MANAGEMENT



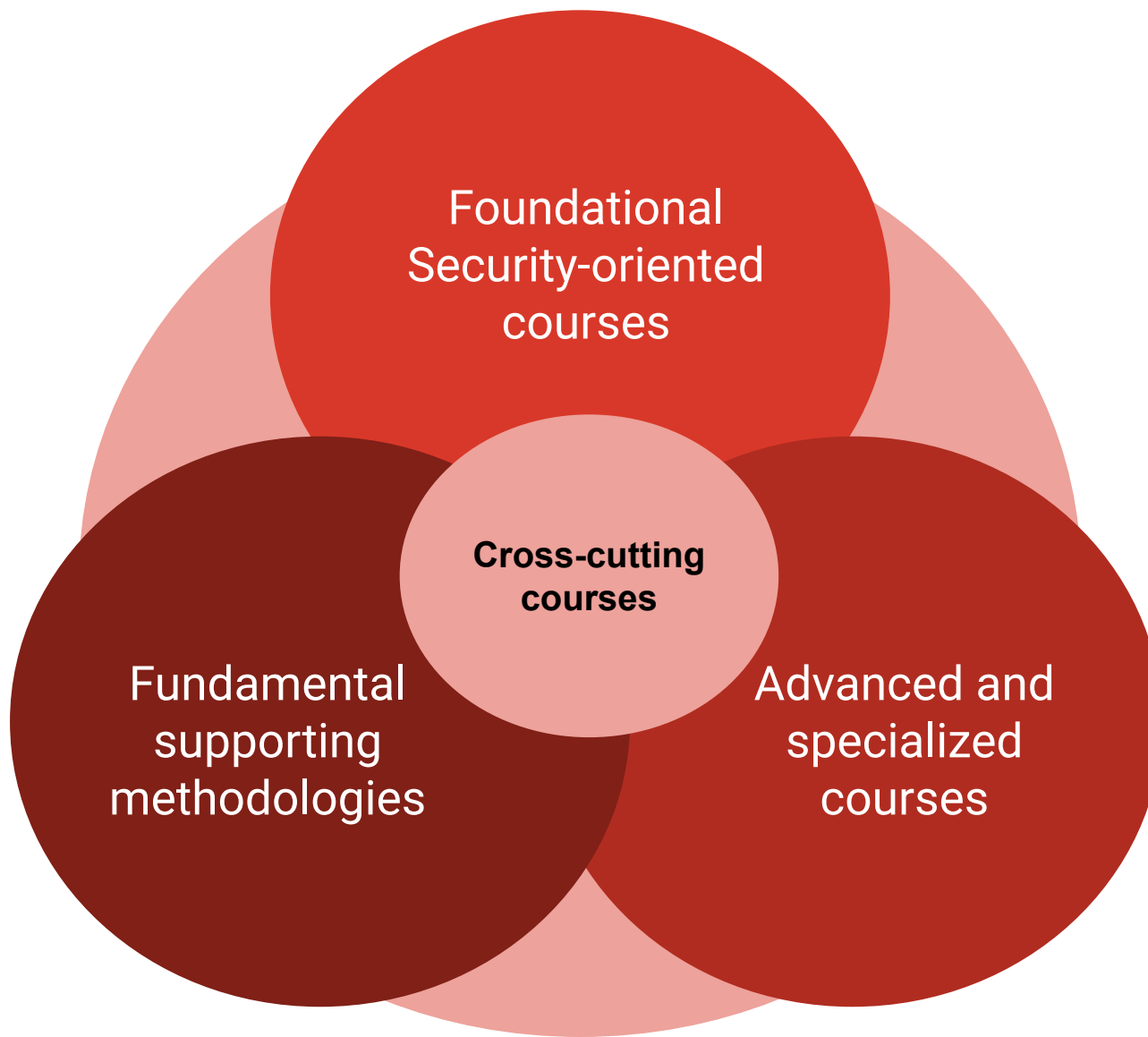
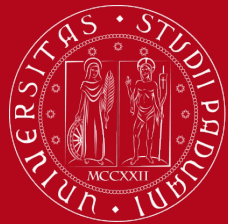
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Mandatory courses:  
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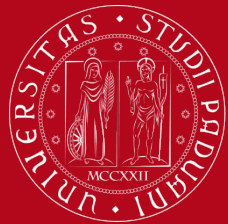


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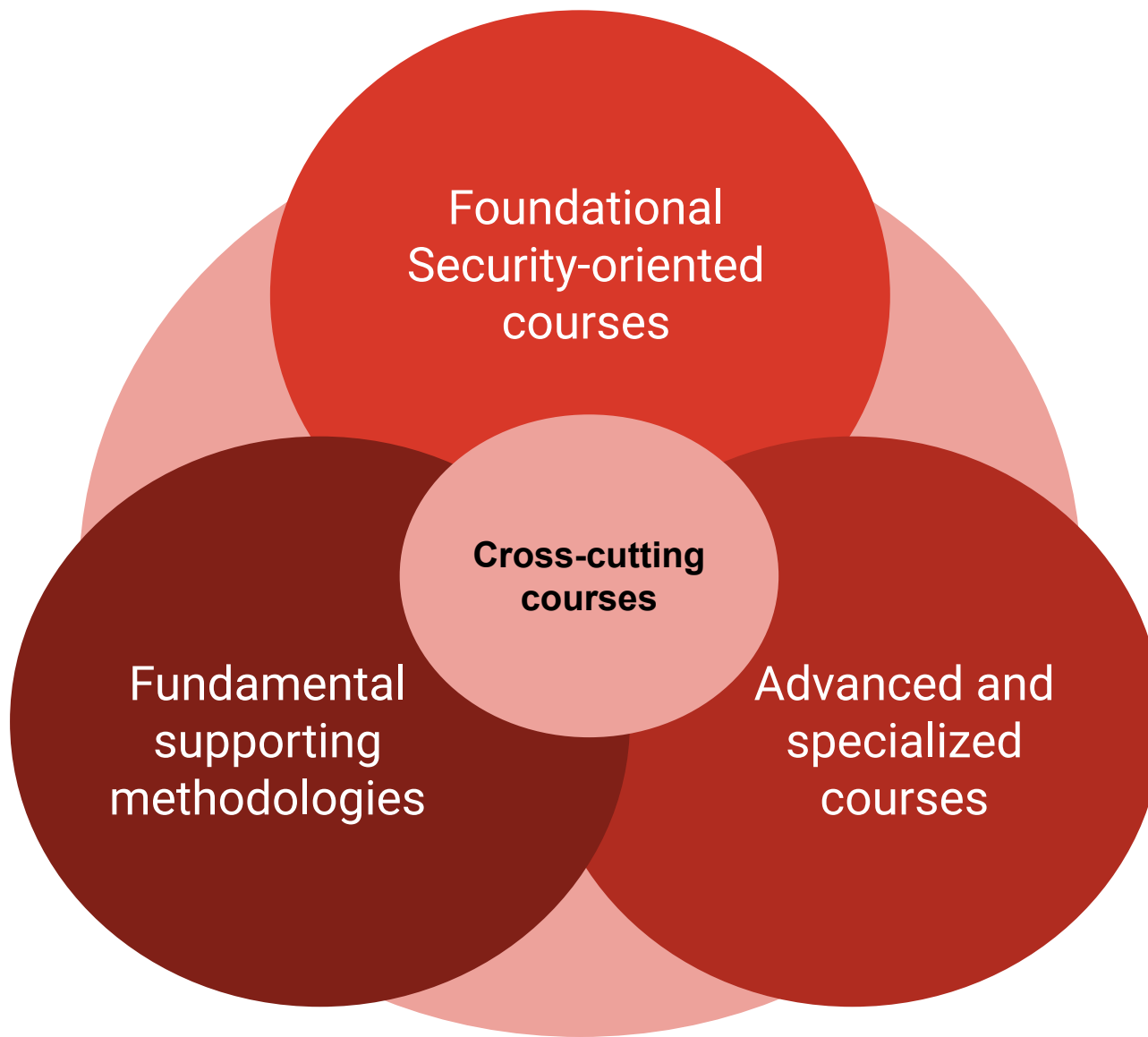


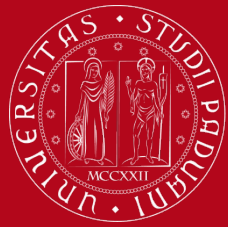
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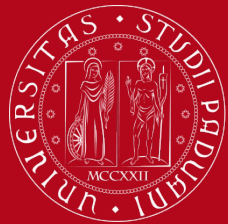
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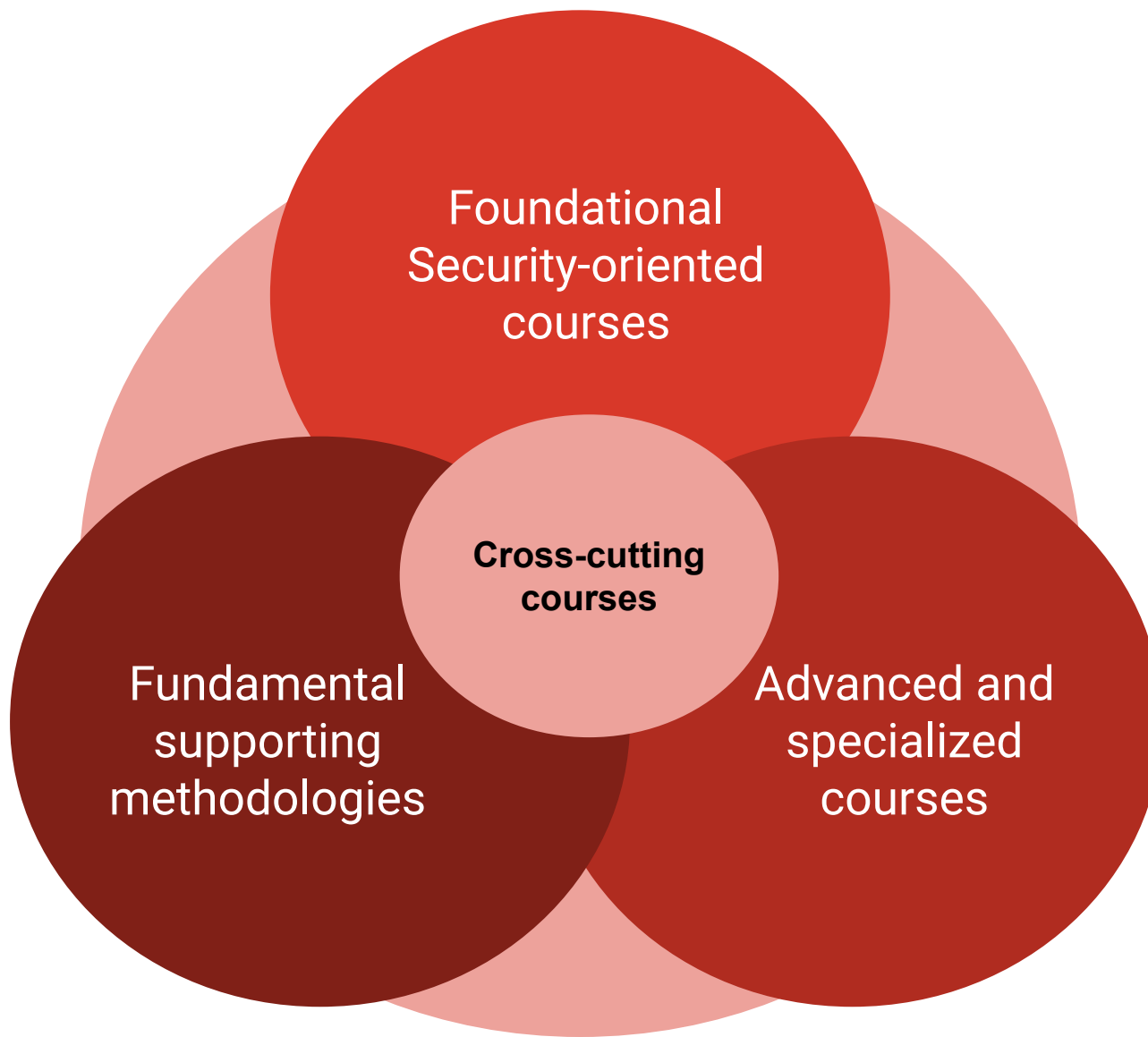


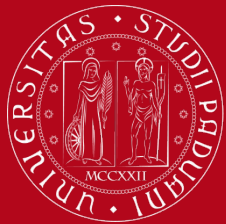
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Same rationale  
for elective courses





- **12 ECTS among those listed in the program**
  - **ETHICAL HACKING**
  - **SECURITY AND RISK: MANAGEMENT AND CERTIFICATIONS**
  - **MOBILE AND IOT SECURITY**
  - **QUANTUM CRYPTOGRAPHY AND SECURITY**
  - **QUANTUM INFORMATION AND COMPUTING**
  - **SOFTWARE VERIFICATION**
  - **DIGITAL FORENSIC**
  - **GAME THEORY**
  - **FOUNDATIONS OF DATABASES**
  - **WEB APPLICATIONS**
  - **FORMAL METHODS FOR CYBER-PHYSICAL SYSTEMS**
  - **METHODS AND MODELS FOR COMBINATORIAL OPTIMIZATION**
  - **WIRELESS NETWORKS**
  - **VISION AND COGNITIVE SYSTEMS**
  - **INTERNET OF THINGS AND SMART CITIES**
  - **BIG DATA COMPUTING**
- **12 ECTS completely at the student's choice**



- We have designed a solid study program which blends together *computer science, ICT engineering, & psychology/economics/law competences* to offer you
  - Strong background on core security topics
  - Solid knowledge of underlying technologies, methodologies, and principles
  - 360 degree understanding of cross-disciplinary implications of security aspects!



## How about English?

- 1) 3 CFU
- 2) TAL B2 Speaking
  - a) A check for suitability, a threshold exam
  - b) You may have a pre-existing certification
- 3) Not “a course”
  - a) But there are support courses available
  - b) shared with other curricula (science, engineering,...)
- 4) Next Friday (2:30 P.M., on Zoom) presentation of the support courses and the exam by CLA
  - a) **<https://unipd.zoom.us/j/88070557974>**
- 5) A web page with information about last year courses and exams is available
  - a) <http://cla.unipd.it/attivita/corsi/corso-tal-b2-speaking/>



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# CONTACTS

<https://cybersecurity.math.unipd.it/>

[cybersecurity@math.unipd.it](mailto:cybersecurity@math.unipd.it)

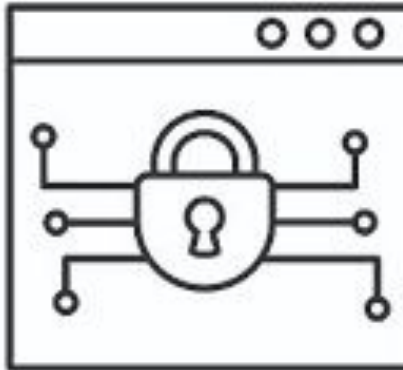
*The Administrative Staff of Mathematics Dept:*

Loretta Dalla Costa  
Pierina Morello  
Laura Provasi  
Angela Puca





# Master Degree in Cybersecurity



THANK YOU!

# Question & Answers

# Master Degree in Cybersecurity

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