



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

 **DIPARTIMENTO
MATEMATICA**
DIPARTIMENTO DI MATEMATICA "TULLIO LEVI-CIVITA"



COMPUTER SCIENCE
UNIVERSITY OF PADOVA

Master's Degree

WELCOME MEETING



- 1. GENERAL OVERVIEW**
- 2. PROGRAMME STRUCTURE
& STUDY PLAN**
- 3. LOGISTICS & OTHER INFOS**
- 4. Q&A**



MASTER DEGREE

AIM: beyond the basics!

- **Deepen the foundations**
- Widen the horizon to **advanced and innovative topics**, often at the border with **research**



Not only new notions but **advanced skills** for

- **Recognizing and classifying** complex problems
- Developing original **solutions**
- Contribute to **strategic decisions**



Three main study tracks, with a wide-spectrum offer and a long-term educational perspective

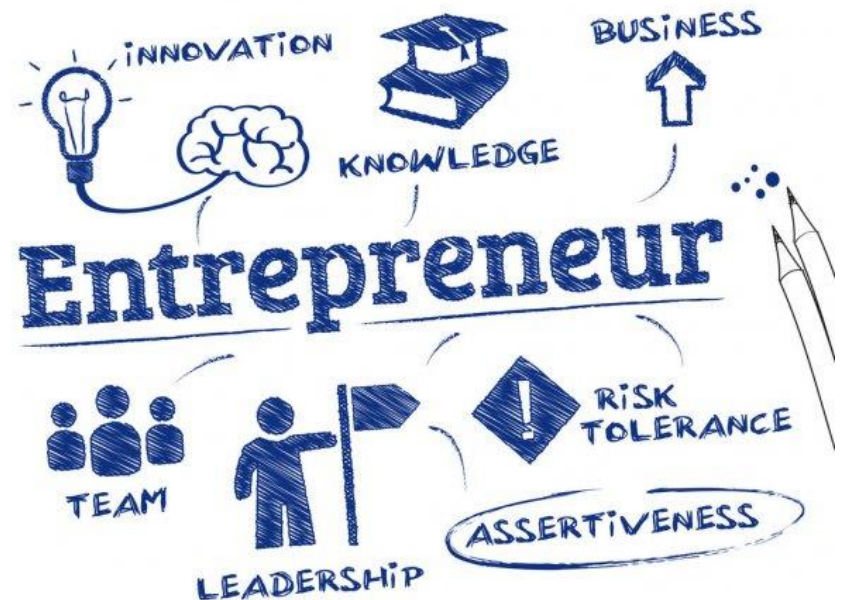
- **Artificial Intelligence [AI]**
- **Internet, Mobile and Security [IMS]**
- **Programming Languages, Systems and Algorithms [PLS]**





Focus on **informatics-driven innovation**, seen from different perspectives

- **Economic and entrepreneurship aspects**
- Courses on
 - **Economics and Management of Innovation**
 - **Start-Ups in ICT**





Interactions with **advanced technology companies, incubators and accelerators**

During the studies

- **Start-up lab** (crash course)
- **ICT challenges for start-up** (seminars)



Internships for developing the **master project**:

- Collaboration in existing projects
- Development of new products
- Start-up creation



PROGRAMME STRUCTURE & STUDY PLAN



Bureaucratic structure

120 credits in 2 years

- **78 credits (65%) for courses**
(typically, **13 courses of 6 credits**)
 - **54 credits (9 ex.) in computer science** [“caratterizzanti”]
 - **12 credits (2 ex.) in related fields** [“affini”]
(economics, math, bio, inf. theory)
 - **12 credits (2 ex.) in free-choice courses** [“liberi”]
- **6 credits (5%) for other activities** (seminars, internships, ...)
- **3 credits (2.5%) for English lang. (B2 writing/speaking)**
- **33 credits (27.5%) for the master project (one semester)**



Building a study plan

We offer students the opportunity

to build a **customised study plan**

choosing, with a **large degree of freedom**

among a **wide offer of course units**



Three mandatory courses

- **Computability** (6 credits – 1st semester)
Foundations of the theory of computation, what are the problems that a computer can solve?
- **Advanced algorithms** (6 credits – 2nd semester)
Graph algorithms, approximation algorithms, randomized algorithms...
- **Economics and management of innovation** (6 credits – 1st semester)
Taught by a professor of Economics, in cooperation with start-ups, incubators and company experts



**7 additional CS courses
("caratterizzanti")
have to be chosen:**

Advanced topics in computer and network security
Advanced topics in computer science
Artificial intelligence
Big data computing
Cyberphysical systems and IOT security
Deep learning
Formal methods for cyber-physical systems
Functional languages
IT Service Management
Knowledge representation and learning
Languages for concurrency and distribution
Machine learning
Mobile programming e multimedia
Mobile security
Natural language processing
Process Mining
Real-time kernels and systems
Runtimes for concurrency and distribution
Security and risk: management and certifications
Selected topics in algorithms
Software verification
Speech Technologies
Start-up in ICT
Vision and cognitive systems
Web information management
Wireless networks for mobile applications



7 additional CS courses
(“caratterizzanti”)
have to be chosen:

Organised in:

- **MAJORS**
groups of 5 courses
that deepen a
thematic area
- **MINORS**
groups of 3 courses
with a specific focus



MAJOR



Artificial intelligence [AI]

- ① Artificial intelligence
- ② Machine learning
- ③ Deep learning
- ④ Natural Language Processing
- ⑤ Vision and cognitive systems



MAJOR



Internet, Mobile and Security [IMS]

- ① Wireless networks for mobile applications
- ② Mobile design and multimedia
- ③ Web information management
- ④ Runtimes for concurrency and distribution
- ⑤ Advanced topics in computer and network security



MAJOR



Programming Languages, Systems and Algorithms [PLS]

- ① Functional languages
- ② Languages for concurrency and distribution
- ③ Software verification
- ④ Formal methods for cyberphysical systems
- ⑤ Selected Topics in Algorithms



MINORS

1. Internet of Things and Embedded Systems [ITES]

- ① Real-time kernels and systems
- ② Cyberphysical systems and IOT security
- ③ Mobile security

2. Data and process management [DM]

- ① Business Process Intelligence
- ② Big data computing
- ③ Knowledge representation and learning

3. Innovation and entrepreneurship in ICT [INN]

- ① IT service management
- ② Startups in ICT
- ③ Security and risk: management and certifications



Three additional CS courses

“Advanced topics in Computer Science”

- Container for advanced topics
- Held by international professors
- The content changes every year

“Explainable AI”

- New course

“Speech technologies”

- course in live streaming
- can be attended from a dedicated classroom



One more elective course in the following group (CS related – “*affini*”), with natural connections to Majors/Minors

- Cryptography [IMS, ITES]
- Data mining [DM]
- Type theory [PLS]
- Game theory [AI, PLS]
- Bioinformatics [DM]
- Structural bioinformatics [AI]
- Mathematical models and numerical methods for big data [DM]
- Methods and models for combinatorial optimization [AI, IMS]



Free choice courses [“liberi”] (12 credits):
chosen **freely** among the courses of **all**
Master’s Degree in Padua

- **Coherence** with the study plan
- **Possibly (and typically)** chosen among the courses of the **Master’s in Computer Science** (CS or in CS related)



3 credits English Language **B2 productive skills**

- Managed by **CLA (UNIPD Language Centre)**
- **No exam** for students who have a certificate for the same level
- If no certificate, you can take a **test** at CLA
- **Courses organised by CLA**
- Informations at this link (School of Science)
<https://studenti.scienze.unipd.it/english>



3+3 credits Other Activities

Altre conoscenze utili per il lavoro

Tirocini formativi e di orientamento

- “**StartUp Lab**” minicourse, “**ICT challenges**”
- Non academic courses (e.g., “**Soft Skills in Action**”), (e.g. Hackatons), workshops, ...
- **Short Internships** (coherent with the study plan)
- **Service activities for the CS course** (e.g. tutoring, revising lecture notes, etc.)
- Educational activities in **computational thinking** (es. CINI-MIUR initiative “**Programma il Futuro**” e **CoderDojo**)

More details
moodle



MASTER PROJECT

- **One semester full-time** (33 credits)
- Significant work on **research/innovation problems in CS** (e.g. development of original research results or innovative software products)
- In some cases as an **extended internship** within a partner organization for
 - Cooperating in the development of innovative projects
 - Working on new products
 - Creating a start-up



STUDY PLAN

Automatically approved if it “follows” a Major

- It contains **at least 4 courses** from a **Major**
- The remaining courses can be chosen **freely**

Customised study-plan

- Individual study path defined by the student
- Submitted for approval to the “**Mentoring committee**” [[link](#)]



STUDY PLAN

When?

- First filled **during 1st semester of the 1st year** (deadline around the end of the semester)
- Later modifiable in various occasions
- **No need of enrolling to courses** (just register to exams on Uniweb, registration opens 15 days before the exam)

For information about dates and procedures to fill in the study plan see the webpage of the **School of Science**: [Link](#)





STUDY PLAN

Note

- All courses are formally at 1st year, for maximum flexibility
 - You are not supposed to give all exams during 1st year
 - Courses of the 1st semester can be taken during 1st or 2nd year
- **Idea:**
 - **1st year**
 - 1st semester: courses (~ 30 credits, 5 courses)
 - 2nd semester: courses (~ 30 credits, 5 courses)
 - **2nd year**
 - 1st semester: courses (~ 30 credits, 5 courses)
 - 2nd semester: master project



- **Erasmus+** and other programs for doing exams/thesis out of Italy
- Various possible **destinations**
 - EU (Spain, Belgium, Netherlands, Estonia, Finland, ...)
- **6 to 12 months**, for **exams** or **master project**
- Call from the **School of Sciences**
- **Suggestion**: wait the 1st semester, 2nd year

LOGISTICS & RESOURCES,
OTHER INFO



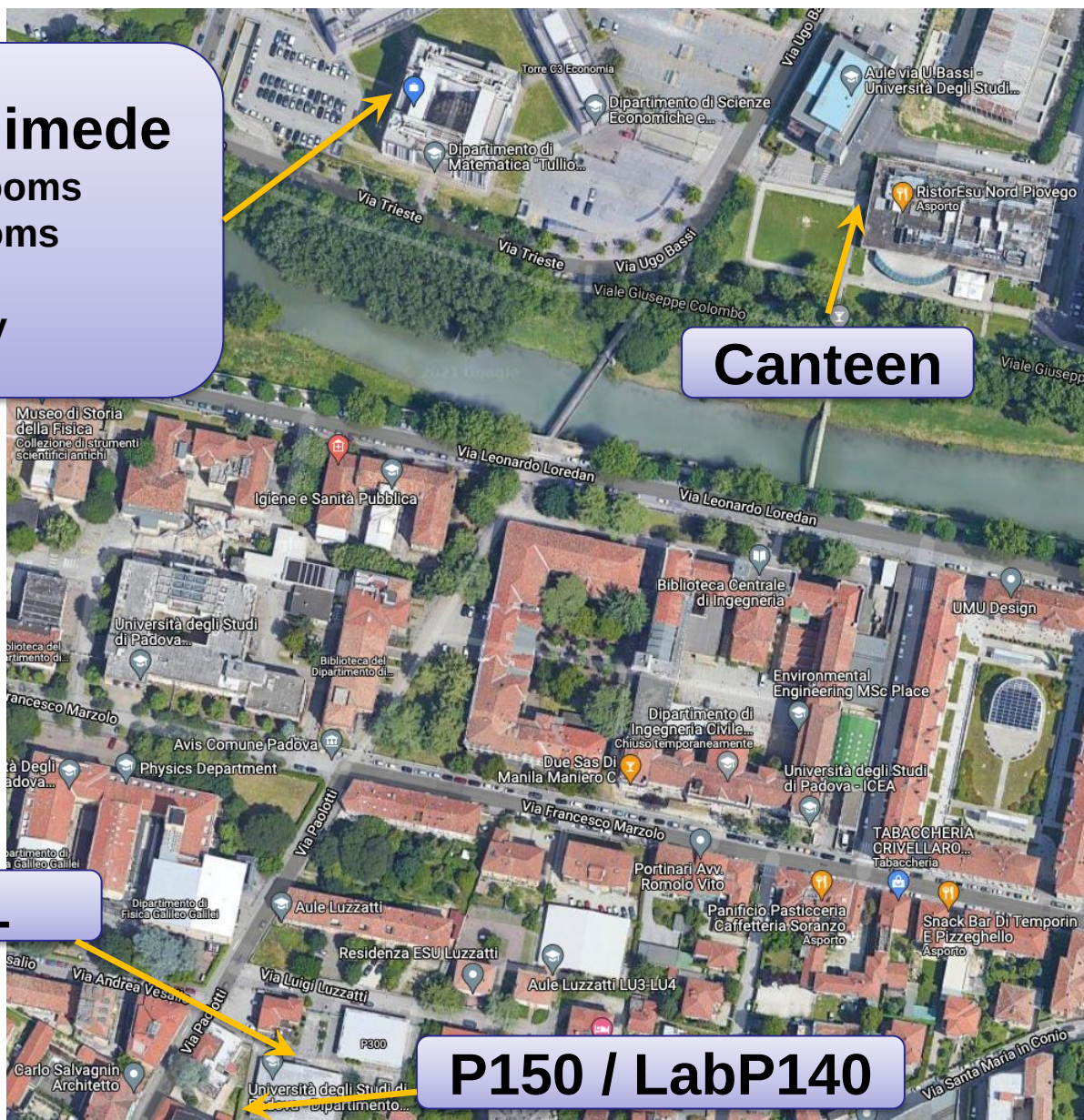
Torre Archimede

Lecture Rooms
Study rooms
Labs
Library

Canteen

LuF1

P150 / LabP140





UNIVERSITÀ
DEGLI STUDI
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DEPARTMENT BUILDING

TORRE ARCHIMEDE

Classrooms and Labs [[link](#)]

Buildings and Facilities [[link](#)]

Offices [[link](#)]



Address: Via Trieste, 63 Padova



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LIBRARY

LIBRARY

<http://bibliotecamatematica.cab.unipd.it/>

<https://www.facebook.com/bibliomathunipd>

**Torre Archimede,
Floor -1**

Textbooks

Research books

Journals





- **Lectures**
 - **In person** with **support for students** who cannot be in Padua yet
- **Exams**
 - **In person** only



- **Lectures timetable**

http://agendastudentiunipd.easystaff.it/index.php?view=easycourse&_lang=en

- **Exams/Finals calendar**

http://agendastudentiunipd.easystaff.it/index.php?view=easytest&_lang=en



<https://stem.elearning.unipd.it>

- **Moodle sites for courses** are essential sources of information
 - **Lecture notes**
 - **Assignments**
 - **News**
- You should be able to access as a **“guest”**
- Whenever you have a valid login **register!**



Who can I contact if I have some doubts?

Depending on the issue ...

- Teaching Secretariat [[email](#)]
- School of Science [[email](#)]
- Student Representatives [[link](#)]
- (Student) Tutors
- Course Professors
- Head of degree



- **WEB PAGES**

- Master's Degree [[link](#)]
- School of Science [[link](#)]
- Math Department [[link](#)]
- University [[link](#)]

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