



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

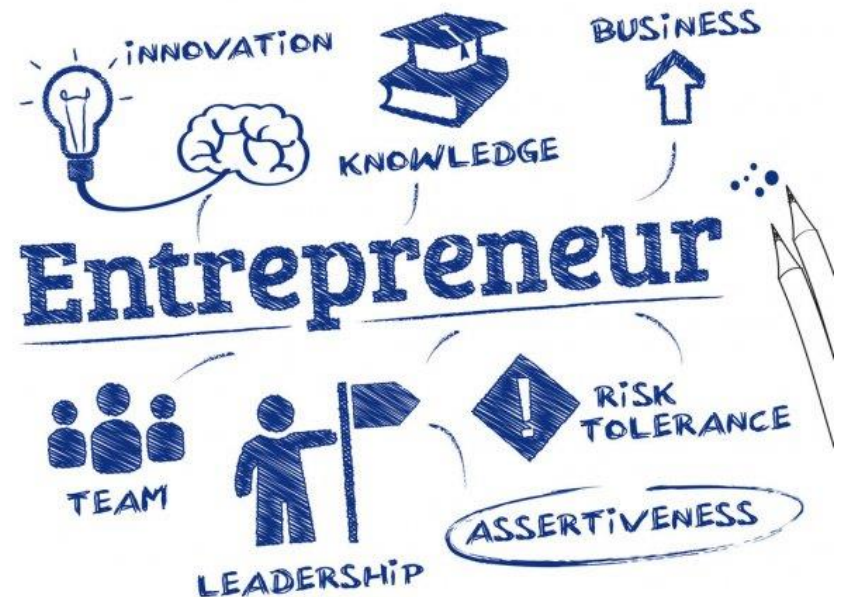
- **Artificial Intelligence [AI]**
- **Internet, Mobile and Security [IMS]**
- **Programming Languages, Systems and Algorithms [PLS]**





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)
Algorithms on graphs, strings, parallel, randomized, ...
- **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 Algorithms
Advanced Topics in Computer and Network Security
Advanced Topics in Computer Science
Artificial Intelligence
Big Data Computing
Business Process Intelligence
Computability
Computer Vision and Cognitive Systems
Cyber Physical 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 Design and Multimedia
Mobile Security
Natural Language Processing
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
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



Two additional CS courses

“Advanced topics in Computer Science”

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

“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 (already in October)
- **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 **first semester of the 2nd year**
 - Meanwhile you can **give exams** in your ideal study plan
 - **No need of enrolling to courses** (just register to exams on Uniweb, registration opens 15 days before the exam)
- Later modifiable in various occasions

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



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SOME GEOGRAPHY

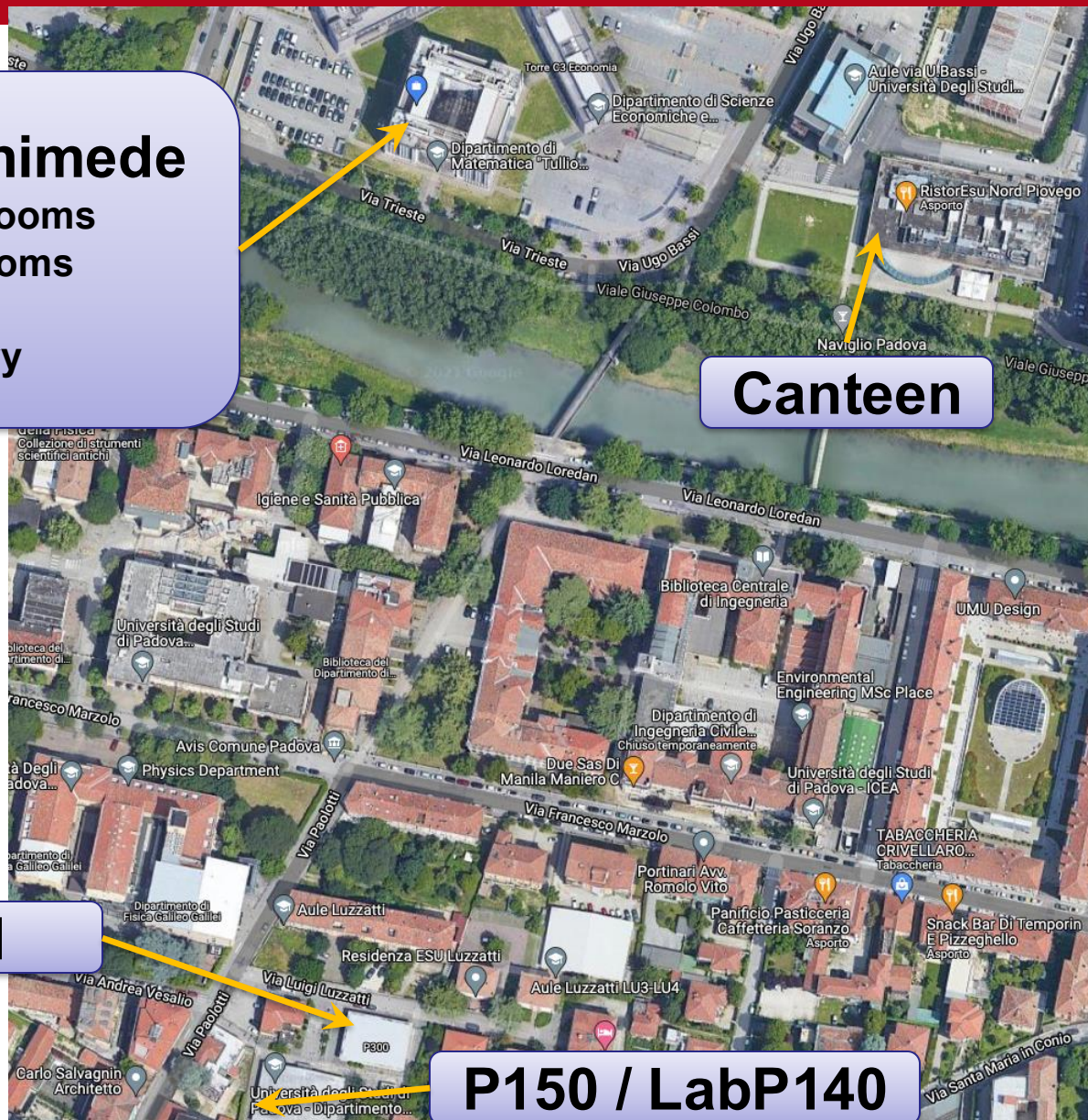
Torre Archimede

Lecture Rooms
Study rooms
Labs
Library

Canteen

LuF1

P150 / LabP140





UNIVERSITÀ
DEGLI STUDI
DI PADOVA

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





- **Lessons**
 - **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
- (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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