

UNIVERSITÀ
DEGLI STUDI
DI PADOVA

DIPARTIMENTO
MATEMATICA
DIPARTIMENTO DI MATEMATICA "TULLIO LEVI-CIVITA"



COMPUTER SCIENCE
UNIVERSITY OF PADOVA

Master's Degree

WELCOME MEETING

AGENDA

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

GENERAL OVERVIEW: OBJECTIVES

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**

GENERAL OVERVIEW: STUDY TRACKS

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]**



GENERAL OVERVIEW: INNOVATION

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

- **Economic and entrepreneurship aspects**

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



GENERAL OVERVIEW: COMPANIES

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

H-FARM

M31

StartCube Incubatore Universitario d'Impresa

DIGITAL MAGICS

tag Talent Garden Digital CoWorking Campus

rockstart. We love startups.

CONFINDUSTRIA SERVIZI INNOVATIVI E TECNOLOGICI

PROGRAMME STRUCTURE & STUDY PLAN

PROGRAMME STRUCTURE: FORMAL

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**

PROGRAMME STRUCTURE: STUDY PLAN

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

PROGRAMME STRUCTURE: STUDY PLAN

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

PROGRAMME STRUCTURE: STUDY PLAN

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

PROGRAMME STRUCTURE: MAJORS

MAJOR



Artificial intelligence [AI]

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

PROGRAMME STRUCTURE: MAJORS

MAJOR

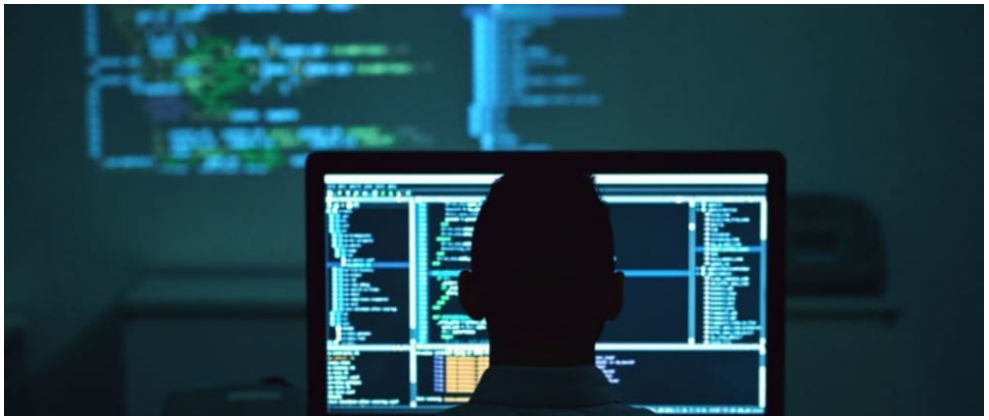


Internet, Mobile and Security [IMS]

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

PROGRAMME STRUCTURE: MAJORS

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

PROGRAMME STRUCTURE: ATCS

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

PROGRAMME STRUCTURE: CS RELATED

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]

PROGRAMME STRUCTURE: FREE

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)

PROGRAMME STRUCTURE: ENGLISH

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

More details moodle

- **"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)**

PROGRAMME STRUCTURE: MS PROJECT

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

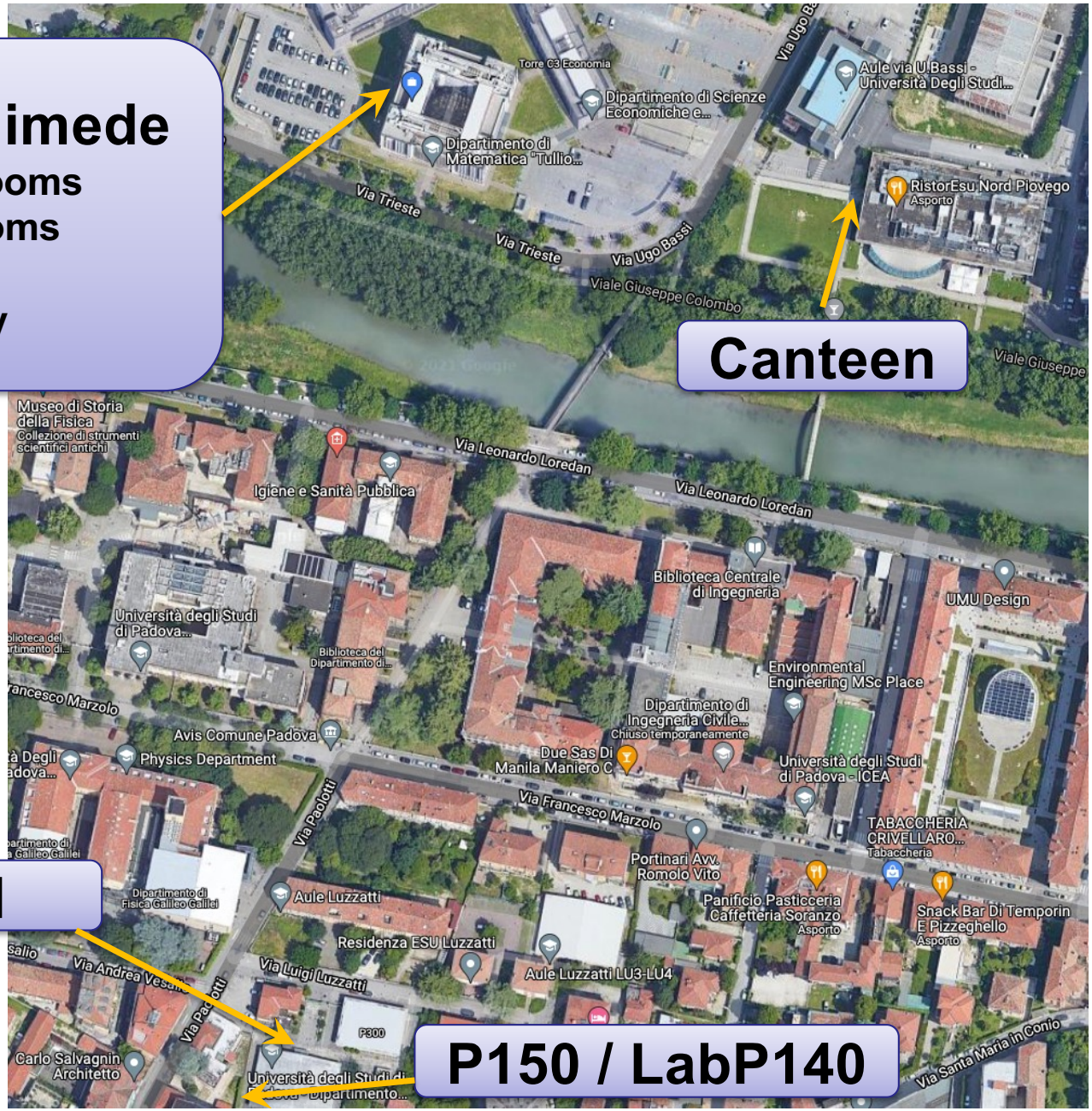
EXCHANGE PROGRAMS

- **Erasmus+** and other programs for doing exams/thesis out of Italy
- Various possible **destinations**
  - EU (Spain, Belgium, Nertherlands, 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

SOME GEOGRAPHY

Torre Archimede
Lecture Rooms
Study rooms
Labs
Library



TORRE ARCHIMEDE

Classrooms and Labs [link]

Buildings and Facilities [link]

Offices [link]









Address: Via Trieste, 63 Padova

LIBRARY



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

https://www.facebook.com/bibliomathunipd

Torre Archimede,

Floor -1



Textbooks

Research books

Journals

LECTURES AND EXAMS

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

LECTURES AND EXAMS

- **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!**

CONTACTS AND LINKS

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

CONTACTS AND LINKS

- **WEB PAGES**
  - Master's Degree [link]
  - School of Science [link]
  - Math Department [link]
  - University [link]


THANK
YOU
GRAZIE
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TERMA KASIH
RAIBH MAITH AGAT
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MATUR NUWUN
MATONDO
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RAIBH MAITH AGAT
SPASIBO
MAAKE
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