1222·2022
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UNIVERSITÀ
DEGLI STUDI
DI PADOVA
MCCXXII

DIPARTIMENTO
DI INGEGNERIA
DELL'INFORMAZIONE

INTERNATIONAL MOBILITY @DEI

A presentation of the Department of Information Engineering for International Partners

November 8, 2021 – 10.00 AM | Prof. **Maria Elena Valcher**, Dept. Coordinator of International Mobility

The main goals of this meeting are two:

To provide some information about our most recent **study offer**, with special focus on the degrees and classes **taught in English.**

To address **possible questions** you may have about our classes, degrees, welcoming procedures for incoming students, available services etc..

As a result, we also hope to **know each other better** and possibly strengthen our collaborations, in the interest of our students.
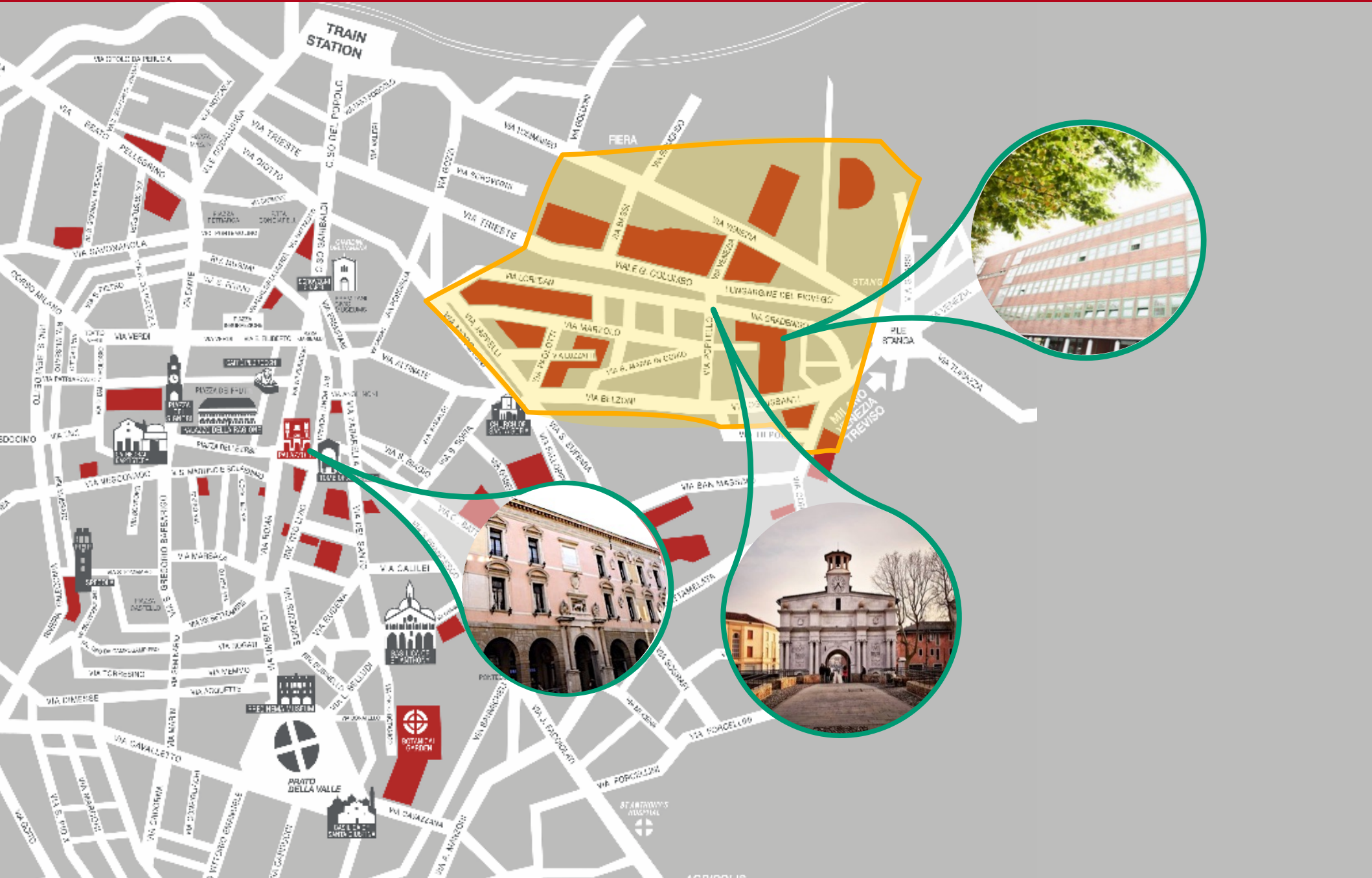
❑ Brief presentation of the goals and the program of the online meeting, as well as of the Faculty and Staff who is attending the meeting

❑ Short video presenting Padova, the University of Padova and the Department of Information Engineering (DEI)

❑ Presentation of DEI, its research areas and the English degrees and courses, as well as of the International Mobility programs we are currently involved in

❑ Q&As

❑ Short video with Veronica Costa presenting the International of Office and 3 international students talking about their experience at DEI

❑ Final Q&As

❑ Concluding remarks

In 1903 the **Chair of Electrical Engineering** was established at the Engineering Faculty of Padova University's. Subsequently the group of researchers and staff working with the Chair formed the **Institute** of **Electrical and Electronics Engineers**.

The Institute later split into two Departments:

The Department of Electrical Engineering and the

Department of Electronics and Informatics (1987-2002), know as DEI.

In 2002 the Department changed name becoming the **Department of Information Engineering** but we decided to keep the acronym DEI.

DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE

More than
110
faculty members

Approx
4000
undergraduate and postgraduate students

Approx
100
Ph.D. students

Approx
50
post-doctoral fellows

The Department is one of the highest earners of income for the University and it was classified as «**Department of Excellence**» by the Italian Ministry for University.

Our focus: **Information Engineering**

Including the areas of

- **Electronics**
- **System Theory and Automation**
- **Telecommunications**
- **Computer Engineering**
- **Bioengineering**
- **Measurement Techniques**
- **Physics and Operation Research**

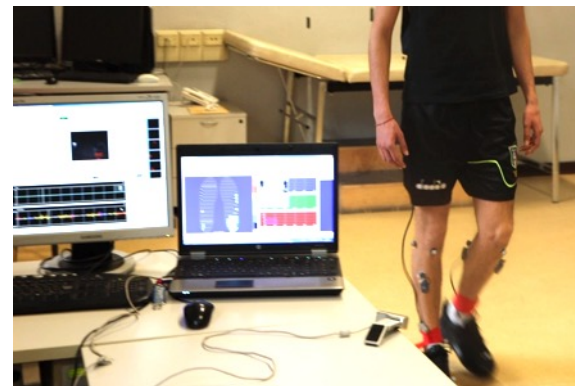More than

40

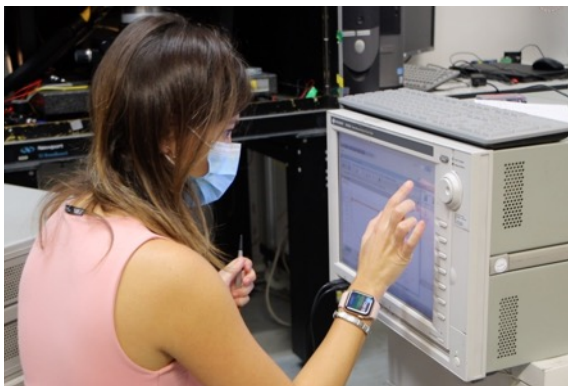## Administrative and technical staff

They are divided among **administrative offices**, the **library**, **secretaries** (didactic secretaries and the Department head's secretaries), **educational laboratories services**, **information technology services**, **general services**, and **safety services**.

48 Research Labs

11 Teaching Labs

We take pride in the fact that our Department has lots of female Faculties, Staff and Graduate Students

Bachelor Degrees

Ingegneria dell'Informazione (2 tracks: 1 in Italian and 1 in English)

Ingegneria Biomedica

Ingegneria Informatica

Ingegneria Elettronica

Master Degrees

Bioingegneria

Computer Engineering

Control Systems Engineering

ICT for Internet & Multimedia (MIME)

Ingegneria Elettronica

Cybersecurity

Information Engineering

First Bachelor **Study Track completely held in English** in the Engineering School @UniPD.

The Bachelor's degree is distinguished by a **methodological and multidisciplinary training**.

It provides in-depth training in both the physical/mathematical fundamentals and in the disciplines characterizing Information Engineering:

- Control systems
- Electronics
- Telecommunications
- Computer science
- Bioengineering

Compulsory Classes

Elective Classes

Fundamentals	Information Engineering	Course list 1	Course list 2 - Laboratories
Calculus 1	Probability theory	Systems and models	Computer engineering
Foundations of computer science	Signals and systems	Finite state systems	Internet and multimedia
Linear algebra and geometry	Electric circuits	Introduction to computer networks	Signals and measurements
Physics 1	Introduction to machine learning	Internet and security	Bioengineering
Digital systems	--------- Year 3 --------	Digital signal processing	Control systems
English (reception skills B2)	Electronics	Microcontrollers and DSP	Microelectronics
---------- Year 2 ----------	Telecommunications	Selected topics in ICT	Optics and photonics
Calculus 2	Control theory		
Physics 2	Algorithms in engineering		
Data structures and algorithms	And/Or		
	Information transmission media		

DIGITAL HEALTH AND CLINICAL ENGINEERING

INDUSTRIAL BIOENGINEERING (enterely in Italian)

BIOMEDICAL DATA ANALYSIS AND MODELING

BIOENGINEERING FOR NEUROSCIENCE

REHABILITATION BIOENGINEERING

DIGITAL HEALTH AND CLINICAL ENGINEERING

Mandatory

- Meccanica dei Tessuti Biologici
- Metodi statistici per la bioingegneria
- Elaborazione di segnali biologici
- Machine learning for bioengineering 🇬🇧
- Biomedical wearable technologies for 🇬🇧 healthcare and wellbeing
- Bioimmagini
- Analisi di dati biologici
- Clinical engineering and health technology 🇬🇧 assessment

Elective & Optional

- Biosensori
- Cardiovascular flows modelling 🇬🇧
- Innovation, entrepreneurship and 🇬🇧 finance
- Medical Big Data Sources and Clinical 🇬🇧 Decision Support Systems
- Neurorobotics and Neurorehabilitation 🇬🇧

BIOMEDICAL DATA ANALYSIS AND MODELING

Mandatory

- Modeling Methodology for Physiology 🇬🇧 and Medicine
- Metodi Statistici per la Bioingegneria
- Elaborazione dei Segnali Biologici
- Machine Learning for Bioengineering 🇬🇧
- Bioimmagini
- Meccanica dei Tessuti Biologici
- Analisi di Dati Biologici
- Control of Biological Systems 🇬🇧

Elective & Optional

- Medical Biothecnologies 🇬🇧
- Biosensori
- Sistemi Ecologici
- Innovation, Entrepreneurship and Finance 🇬🇧
- Medical Big Data Sources and Clinical 🇬🇧 Decision Support Systems

BIOENGINEERING FOR NEUROSCIENCE

Mandatory

- Modeling Methodology for Physiology and Medicine 🇬🇧
- Metodi Statistici per la Bioingegneria
- Elaborazione dei Segnali Biologici
- Imaging for Neuroscience 🇬🇧
- Bioimmagini
- Neurophysiology, neural computation and neurotechnologies 🇬🇧
- Biomarkers, precision medicine and drug development 🇬🇧
- Mathematical Cell Biology 🇬🇧

Elective & Optional

- Neurorobotics & Neurorehabilitation 🇬🇧
- Biosensori
- Robotica Medica
- Bioingegneria cellulare e dei tessuti
- Deep learning applied to neuroscience and rehabilitation 🇬🇧
- Biomedical wearable technologies for healthcare and wellbeing 🇬🇧

REHABILITATION BIOENGINEERING

Mandatory

- Meccanica dei Tessuti Biologici
- Metodi Statistici per la Bioingegneria
- Organi Artificiali
- Bioimmagini
- Biomedical wearable technologies for healthcare and wellbeing 🇬🇧
- Sports Engineering and Rehabilitation Devices 🇬🇧
- Neurorobotics & Neurorehabilitation 🇬🇧
- Robotica Medica
- Control of Biological Systems 🇬🇧
- Metodi Ingegneristici nella Progettazione di Dispositivi e Procedure Clinico-Chirurgiche

Elective & Optional

- Machine Learning for Bioengineering 🇬🇧
- Deep learning applied to neuroscience and rehabilitation 🇬🇧
- Biomedical wearable technologies for healthcare and wellbeing 🇬🇧

Internship/Research
Training & Thesis

4 CURRICULA

Artificial Intelligence
and Robotics

High Performance and
Big Data Computing

Bioinformatics

Web Information and
Data Engineering

Core Competencies
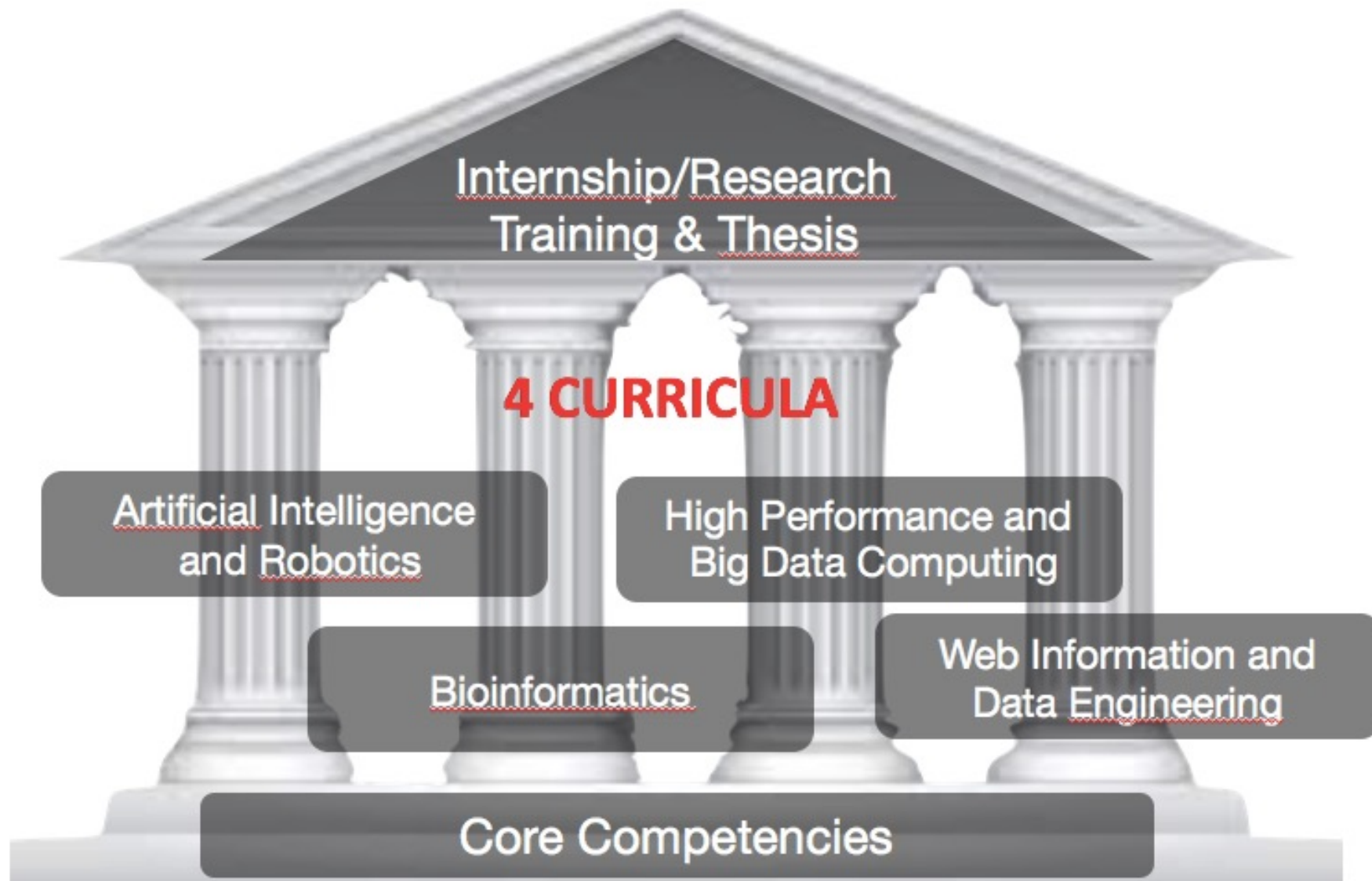
MANDATORY COURSES		
Course	CFU	Period
Automata, Languages and Computation	9	Y1.1
Machine Learning	6	Y1.1
Operations Research 1	9	Y1.1

COMMON TO ALL CURRICULA

OTHER ACTIVITIES		
Activity	CFU	
English Language/Italian Language	3	
Internship/Research Training	9	Y2
Final Project	21	Y2

COMMON TO ALL CURRICULA

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ARTIFICIAL INTELLIGENCE AND ROBOTICS

MANDATORY COURSES

Course	CFU	Period
Artificial Intelligence	6	Y1.2
Computer Vision	9	Y1.2
Intelligent Robotics	9	Y2.1

ELECTIVE COURSES: AT LEAST 27 CFU

Course	CFU	Period
Deep Learning	6	Y1.2
Robotics and Control 1	9	Y1.2
Big Data Computing	6	Y1.2
Learning from Networks	6	Y2.1
Industrial Robotics	6	Y2.1
3D Data Processing	6	Y2.2
Natural Language Proc.	6	Y2.2

OTHER CHOICES

Course	CFU	Period
Neurorobotics and Neurorehabilitation	6	Y2.1
Quality Engineering	6	Y1.1
Innovation, entrepreneurship and finance	9	Y2.1
Operation Research 2	6	Y2.2
C.E. for Music and Multimedia	6	Y2.2
Game Theory	2	Y2.1

BIOINFORMATICS

MANDATORY COURSES		
Course	CFU	Period
Inferential Statistics	6	Y1.1
Bioinformatics	9	Y1.2
Computational Genomics	6	Y2.1
Learning from Networks	6	Y2.1

ELECTIVE COURSES: AT LEAST 24 CFU		
Course	CFU	Period
Foundations of databases	6	Y1.1
Artificial Intelligence	6	Y1.2
Big Data Computing	6	Y1.2
Web applications	6	Y1.2
Distributed Systems	9	Y2.1
Advanced Algorithm Design	9	Y2.1
Computers and network security	6	Y2.2

OTHER CHOICES		
Course	CFU	Period
Imaging for Neuroscience	9	Y1.2
Structural Bioinformatics	6	Y1.2
Operations Research 2	6	Y2.2
Genomics and NGS data analysis	9	Y2.2

HIGH PERFORMANCE AND BIG DATA COMPUTING

MANDATORY COURSES		
Course	CFU	Period
Inferential Statistics	6	Y1.1
Parallel Computing	9	Y1.2
Big Data Computing	6	Y1.2
Advanced Algorithm Design	9	Y2.1

ELECTIVE COURSES: AT LEAST 21 CFU		
Course	CFU	Period
Artificial Intelligence	6	Y1.2
Bioinformatics	9	Y1.2
Search Engines	9	Y1.2
Deep Learning	6	Y1.2
Distributed Systems	9	Y2.1
Learning from Networks	6	Y2.1

OTHER CHOICES		
Course	CFU	Period
Cryptography	6	Y1.1
Computational Genomics	6	Y2.1
Game theory	6	Y2.1
Natural Language Processing	6	Y2.2
Stochastic Processes	6	Y2.2
Operations Research 2	6	Y2.2

WEB INFORMATION AND DATA ENGINEERING

MANDATORY COURSES

Course	CFU	Period
Computer Networks	9	Y1.2
Search Engines	9	Y1.2
Web Applications	6	Y1.2
Database 2	9	Y2.1 (*F*)

OTHER CHOICES

Course	CFU	Period
Geographic Information Systems	6	Y1.2
Digital Forensics	6	Y1.1
Quality Engineering	6	Y1.1
Information security	6	Y2.1
Operations Research 2	6	Y2.2

ELECTIVE COURSES: AT LEAST 18 CFU

Course	CFU	Period
Foundations of databases	6	Y1.1
Software platforms	6	Y1.1
Inferential Statistics	6	Y1.1
Big Data Computing	6	Y1.2
Distributed Systems	9	Y2.1
Concurrent and Real Time Programming	6	Y2.1
Computers and Network Security	6	Y2.2
Computer Engineering for Music and Multimedia	6	Y2.2
Natural Language Processing	6	Y2.2

Common Core: Systems Theory, Machine Learning, Digital Control, Estimation and Filtering, Control Laboratory;
to be completed with courses in key areas, e.g.

ROBOTICS	MACHINE LEARNING	INDUSTRIAL	COMPLEX SYSTEMS
Robotics and Control 1	Convex Optimization	Embedded Real-Time Control	System Biology
Robotics and Control 2	Learning Dynamical Systems	Industrial Automation	Network Systems
Robotics Lab	Reinforcement Learning	Electric Drives for Automation	Nonlinear Systems & Control
Computer Vision	Deep Learning	Industrial Robotics	Quantum Information & Computing
Intelligent Robotics			

Includes a rich offering of theory and lab courses (all in English):
optimization, math. physics, adaptive & predictive control, network science, big data computing, information theory and security, smart grids, domotics & automotive.

In addition to the 5 mandatory courses, we offer:

Electric Drives for Automation (6cfu CORE+3cfu)
Industrial Automation (3cfu CORE+6cfu)
Mathematical Methods for Optimization (3cfu CORE+6cfu)
Learning Dynamical Systems (9cfu, CORE)
Robotics and Control 1 (9cfu, CORE)
Robotics and Control 2 (9cfu, CORE)
Adaptive and Model Predictive (6cfu, CORE)
Reinforcement Learning (6cfu, CORE)
Nonlinear Systems and Control (6cfu, CORE)
Embedded Real-Time Control (6cfu, CORE)
Network Systems and Dynamics (6cfu, CORE)
Network Systems (6cfu, CORE)
Systems Biology (6cfu, CORE)
Robotics laboratory (6cfu, CORE)
Sistemi Ecologici (in Italian) (6cfu, CORE)
Industrial Robotics (9cfu, CORE)

Convex Optimization (6cfu)
Mathematical Physics (9cfu)
Digital Signal Processing (6cfu)
Quantum Information and Computing (6cfu)
Neural Networks and Deep Learning (6cfu)
Measurement Architectures for Cyber-physical Systems (9cfu)
Computer Vision (9cfu)
Computer Vision (6cfu)
Intelligent Robotics (9cfu)
Big Data Computing (6cfu)
Learning from Networks (6cfu)
Game Theory (6cfu)
Information Security (6cfu)
Automata, Languages and Computation (9cfu)
Control of Biological Systems (6cfu)
Smart Grids (6cfu)
Automotive and Domotics (9cfu)
Stochastic Processes (6cfu)

MANDATORY COURSES	CFU	PERIOD
MICROWAVE DEVICES	6	Y1-S1
ANALOG ELECTRONICS	6	Y1-S1
ELECGTRONIC MEASUREMENTS	9	Y1-S1
MICROELECTRONICS	9	Y1-S2
ANALOGUE INTEGRATED CIRCUITS DESIGN	6	Y1-S2
POWER ELECTRONICS	9	Y1-S2
OTHER ACTIVITIES		
INTERNSHIP/RESEARCH TRAINING	9	Y2
FINAL PROJECT	21	Y2

NANOELECTRONICS AND PHOTONICS

ELECTRONICS FOR ENERGY

INTEGRATED CIRCUITS

BIOMEDICAL AND HEALTH CARE

CONSUMER ELECTRONICS AND DOMOTICS

SMART INDUSTRY AND AUTOMOTIVE

NANOELECTRONICS AND PHOTONICS

Mandatory Course		
OPTOELECTRONIC AND PHOTOVOLTAIC DEVICES	9	Y2-S1
CFU: min 9, MAX 18		
NANOPHOTONICS	6	Y2-S1
BIOPHOTONICS	6	Y2-S2
QUALITY AND RELIABILITY IN ELECTRONICS	9	Y2-S1
MICROELECTRONICS AND GLOBALIZATION	9	Y1-S2
OPTICAL NETWORKS	6	Y2-S2
CFU: min 12, MAX 21		
QUANTUM OPTICS AND LASER	6	Y2-S1
NANOSTRUCTURED MATERIALS	6	Y2-S1
PHYSICS OF NANOMATERIALS	6	Y1-S1
QUANTUM TECHNOLOGIES	6	Y2-S2
INDUSTRIAL APPLICATIONS OF IONIZING RADIATION SOURCES	6	Y2-S2

BIOMEDICAL AND HEALTH CARE

Mandatory Courses		
POWER ELECTRONICS DESIGN	9	Y2-S1
SMART GRIDS	6	Y2-S2
CFU: 9		
ELECTROMAGNETIC COMPATIBILITY	9	Y2-S1
OPTOELECTRONIC AND PHOTOVOLTAIC DEVICES	9	Y2-S1
ANALOG ELECTRONICS DESIGN	9	Y2-S1
CFU: min 15, MAX 18		
ELECTROCHEMICAL ENERGY STORAGE TECHNOLOGIES	6	Y2-S2
INDUSTRIAL AUTOMATION	9	Y1-S2
SYSTEMS THEORY	9	Y1-S1
MODELLING AND CONTROL OF ELECTRIC DRIVES	9	Y2-S1

INTEGRATED CIRCUITS

Mandatory Course		
INTEGRATED CIRCUITS FOR SIGNAL PROCESSING	9	Y2-S1
RADIOFREQUENCY INTEGRATED CIRCUITS DESIGN	9	Y2-S1
CFU: 9		
ELECTROMAGNETIC COMPATIBILITY	9	Y2-S1
DIGITAL CIRCUITS FOR NEURAL NETWORKS	9	Y2-S2
ANTENNAS AND WIRELESS PROPAGATION	9	Y2-S2
ANALOG ELECTRONICS DESIGN	9	Y2-S1
CFU: min 12, MAX 15		
5G SYSTEMS	6	Y1-S1
DIGITAL SIGNAL PROCESSING	6	Y1-S1
DIGITAL CONTROL	6	Y1-S1
SYSTEMS THEORY	9	Y1-S1
WIRELESS NETWORKS	6	Y1-S1

BIOMEDICAL AND HEALTH CARE

Mandatory Course		
INTEGRATED CIRCUITS FOR SIGNAL PROCESSING	9	Y2-S1
CFU: min 9, MAX 18		
ELECTROMAGNETIC COMPATIBILITY	9	Y2-S1
DIGITAL CIRCUITS FOR NEURAL NETWORKS	9	Y2-S2
BIOPHOTONICS	6	Y2-S2
CFU: min 12, MAX 21		
IMAGING FOR NEUROSCIENCE	6	Y2-S1
BIOINFORMATICS	9	Y1-S2
DIGITAL SIGNAL PROCESSING	6	Y1-S1

CONSUMER ELECTRONICS AND DOMOTICS

Mandatory Courses		
INTEGRATED CIRCUITS FOR SIGNAL PROCESSING	9	Y2-S1
AUTOMOTIVE AND DOMOTICS	9	Y2-S1
CFU: min 0, MAX 9		
RADIOFREQUENCY INTEGRATED CIRCUITS DESIGN	9	Y2-S1
OPTICAL NETWORKS	6	Y2-S2
MEASUREMENT ARCHITECTURES FOR CYBER-PHYSICAL SYSTEMS	9	Y2-S1
ANTENNAS AND WIRELESS PROPAGATION	9	Y2-S2
QUALITY AND RELIABILITY IN ELECTRONICS	9	Y2-S1
DIGITAL CIRCUITS FOR NEURAL NETWORKS	9	Y2-S2
OPTOELECTRONIC AND PHOTOVOLTAIC DEVICES	9	Y2-S1
CFU: min 12, MAX 21		
DIGITAL SIGNAL PROCESSING	6	Y1-S1
5G SYSTEMS	6	Y1-S1
INTERNET	6	Y2-S1
3D AUGMENTED REALITY	6	Y2-S1
INTERNET OF THINGS AND SMART CITIES	6	Y2-S1
COMPUTER VISION	9	Y1-S2
COMPUTER VISION	6	Y1-S2
ROBOTICS AND CONTROL 1	9	Y2-S2
ICT FOR INDUSTRIAL APPLICATIONS	6	Y1-S2
BIG DATA COMPUTING	6	Y1-S2

SMART INDUSTRY AND AUTOMOTIVE

Mandatory Course		
OPTOELECTRONIC AND PHOTOVOLTAIC DEVICES	9	Y2-S1
CFU: min 0, MAX 18		
MEASUREMENT ARCHITECTURES FOR CYBER-PHYSICAL SYSTEMS	9	Y2-S1
POWER ELECTRONICS DESIGN	9	Y2-S1
ELECTROMAGNETIC COMPATIBILITY	9	Y2-S1
INTEGRATED CIRCUITS FOR SIGNAL PROCESSING	9	Y2-S1
AUTOMOTIVE AND DOMOTICS	9	Y2-S2
INDUSTRIAL APPLICATIONS OF IONIZING RADIATION SOURCES	6	Y2-S2
SMART GRIDS	6	Y2-S2
CFU: min 12, MAX 30		
MACHINE LEARNING	6	Y1-S1
DIGITAL CONTROL	6	Y1-S1
SYSTEMS THEORY	9	Y1-S1
CONTROL ENGINEERING LABORATORY	9	Y2-S2
DIGITAL SIGNAL PROCESSING	6	Y1-S1
COMPUTER VISION	6	Y1-S2
COMPUTER VISION	9	Y1-S2
MODELING AND CONTROL OF ELECTRIC DRIVES	9	Y2-S1
INDUSTRIAL AUTOMATION	9	Y1-S2
ROBOTICS AND CONTROL 1	9	Y2-S2
BIG DATA COMPUTING	6	Y1-S2
COMPUTER NETWORKS	9	Y1-S2
ICT FOR INDUSTRIAL APPLICATIONS	6	Y1-S2

4 curricula, 2 tracks each

TELECOM
- Telecommunications
- Industry 4.0

CYBERSYSTEMS
- Cybersystems
- Digital Arts

PHOTONICS
- Photonics
- Quantum information

LIFE & HEALTH
- Life and health
- ML for healthcare

Full course list available at: http://mime.dei.unipd.it/

(teaching semester between parentheses)

|	
Wireless Networks (1), Programming for Telecommunications (1), Internet (1), 5G Systems (1), Information Security (1), Optical and Quantum Communications (1), Quantum Cryptography and Security (1), Digital Communications (2), Network Coding (2), Satellite Communication Systems (2), Communication Network Design (2), Network Analysis and Simulation (2)	TLC/ Networks
Fiber Optics (1), Photonic Devices (1), Nanophotonics (1), Optimal and Quantum Communications (1), Quantum Optics and Laser, Optical Networks (2), Antennas (2), Biophotonics (2), Visibile Light and Metasurfaces Communications (2)	Quantum Photonics
Digital Signal Processing (1), Game Theory (1), Network Science (1), Machine Leaning (1), Neural Networks and Deep Learning (1), Information Theory (2), Network Analysis and Simulation (2), Stochastic Processes (2)	Theory
Human Data Analytics (1), e-Health (2), Secure Digital Healthcare (2), Biometrics (2), Natural Language Processing (2)	Life & Health
Multimedia Coding (1), 3D Augmented Reality (1), Digital and Interactive Multimedia (1), Digital Forensics (2), Computer Vision (2)	Multimedia
ICT for Industrial Applications (2), Internet of Things and Smart Cities (2)	Industry
Project Management (1), Public Speaking lab (1), Non verbal communication (1)	Soft-skills

Further information about all Degrees and Courses is available at https://degrees.dei.unipd.it
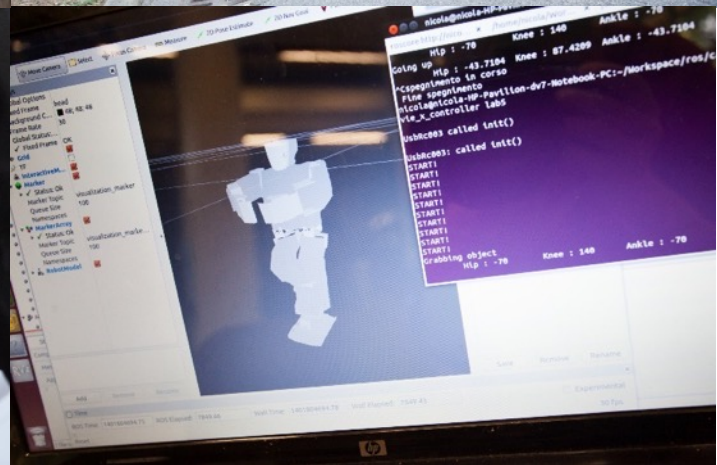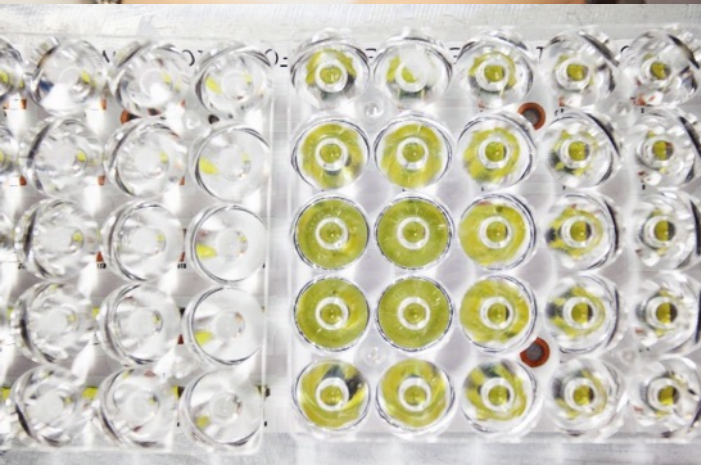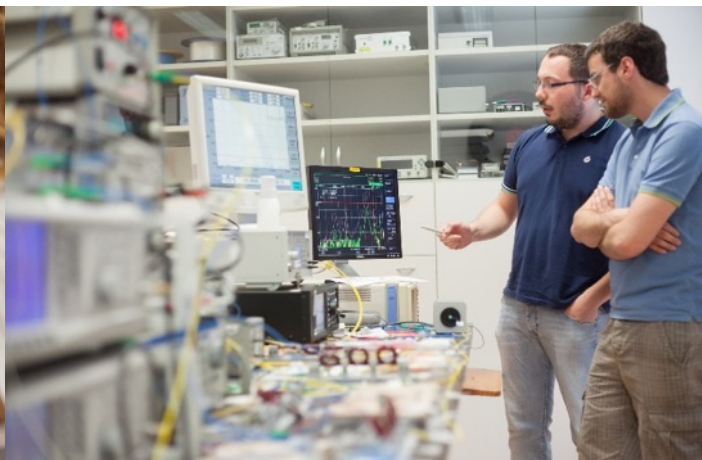
Our Department is involved in several agreements with International Partners for students exchange. For instance

✓ Erasmus + for Study
✓ Erasmus + for Traineeship
✓ SEMP (Swiss European Mobility Program)
✓ T.I.M.E. Double Degree Program
✓ Ulisse Program - University and Department Bilateral Agreements (e.g., BU, New South Wales, Sydney,….) click here for details and venues
✓ DECAMP Virtual Mobility
✓ Double Degree Programs for ICT for Internet and Multimedia Students

Looking forward to host you and your students @DEI!