

DRIM classes for 2025-2026

This is a preliminary list of classes for the 2025-2026 academic year. This document will be updated periodically. If you wish to attend a class, please contact the designated reference persons as soon as possible.

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Consiglio Nazionale delle Ricerche (CNR-ISTC and CNR-STIIMA)

Reference person: Andrea Orlandini <andrea.orlandini@istc.cnr.it>, Nicola Pedrocchi <nicola.pedrocchi@stiima.cnr.it>

The courses can be BASIC (to establish cultural foundations), ADVANCED (advanced study of specific topics), CROSSOVER (on interdisciplinary subjects).

Name	Teacher	Ore	Class description	Available online	Time of the year (please check)	Language	Final evaluation	Level
Automated Planning	Andrea Orlandini, Alessandro Umbrico, andrea.orlandini@istc.cnr.it, umbrico.alessandro@gmail.com	10	The course presents Artificial Intelligence automated planning. It introduces models and resolution approaches for both "classic" and temporal planning. Different methodologies for the synthesis of action plans and their execution will be presented, as well as applications in relation to the control of autonomous robots.	Yes	June 2026 (ask for details)	English	yes	BASIC

Istituto Italiano di Tecnologia (IIT)

Reference person: Lorenzo Natale <Lorenzo.Natale@iit.it>

The courses can be BASIC (to establish cultural foundations), ADVANCED (advanced study of specific topics), CROSSOVER (on interdisciplinary subjects).

Name	Teacher	Ore	Class description	Available online	Time of the year (please check)	Language	Final evaluation	Level
Open Science and Research Data Management (OS&RDM)	Anna Maria Pastorini, Valentina Pasquale, anna.maria.pastorini@unige.it, valentina.pasquale@iit.it	10	This training module for PhD Students aims to introduce early-career researchers to the principles of scholarly communication, Open Science and Research Data Management. Students will gain a better understanding of the available research e-infrastructures, tools, and services for Open Access publishing, Research Data Management and FAIR Data. Students will also learn the importance and the transformative potential of Open Science practices in research, especially to improve reproducibility and increase research integrity. They will learn what means to make data FAIR, as required by many funders, including the European Commission, and how to draft a data management plan. Finally, they will have the chance to practice on common tools for Research Data Management, like Data Stewardship Wizard, Zenodo, and Dataverse.	yes	Feb 2025 (ask for details)	English	yes	CROSSOVER
Modern C++	Marco Accame, Valentina Gaggero, Nicolò Genesio, marco.accame@	30	The students will learn the new syntax and philosophy of Modern C++ (releases C++11, -14, -17, -20) with hands on the code at every lesson.	yes	May 2026	English	yes	BASIC

	iit.it, valentina.gaggero@iit.it							
Mechanical Drawing Fundamentals	Diego Torazza, diego.torazza@iit.it	18	This course provides an introduction to Mechanical Technical Drawing with mention to manufacturing techniques. The aim of the course is to give a base knowledge in understanding and preparing mechanical technical drawings, so there is no need of prior background of mechanical drawing. Mechanical drawing is the main way to communicate design need to technicians, workshops, suppliers. A base knowledge of rules and methods helps the researcher, even if not directly engaged in mechanical design, to better contribute to interdisciplinary team working when involved in the design of experimental setups, scientific devices, and the writing/understanding of technical specifications.	No	To be confirmed	English	yes	BASIC
ComputerAided Design	Diego Torazza, diego.torazza@iit.it	12	The aim of the course is to gain and apply knowledge of 3D CAD concepts and techniques by using high-end CAD systems (PTC Creo).	No	To be confirmed	English	yes	ADVANCED
Perceptual systems	Monica Gori, Alessia Tonelli, monica.gori@iit.it, alessia.tonelli@iit.it	12	From birth, we interact with the world through our senses. How the brain process and transform sensory signals into perceptual outputs is one of the main questions in the field of experimental psychology. The goal of the course is to present the perceptual from the anatomical, physiological, and functional points of view. A particular focus will be on how physical stimuli are transduced into sensory signals by our peripheral sensory apparatus in a hierarchy organize complex	NaN	not active this year	NaN	NaN	NaN

			behaviour. In the last part of the course, these topics will be described in relation with cross-sensory interaction and multisensory integration in the adult and the developing brain. Students will learn how the functioning of the main sensory systems, i.e. vision, audition, touch, smell and taste. Moreover, it will be explain the process of multisensory integration and cross-modal interaction.					
Robotic Virtual Prototyping Design	Ferdinando Cannella, Mariapaola D'Imperio, ferdinando.cannella@iit.it	18	The aim of the Robotic Virtual Prototyping Design course is to give the basic knowledge about the Finite Element Analysis (FEA) and Multi-Body Simulations (MBS) applied to the robotics. These computational techniques predict the behavior of physical systems: joined together permit to study the dynamics taking in account the body flexibility, the control and optimization. It will be introduced mainly applied to the mechanical field, in particular to the robotic anthropomorphic arm. The student gets 6 credits if he/she attends the entire course and accomplishes the final project.	yes	May-Jun 2026	English	yes	CROSSOVER
Mechatronics and AI	Ferdinando Canella, Gabriele Marchello, ferdinando.cannella@iit.it	18	The aim of the Mechatronics and Artificial Intelligence (AI) course is to give the basic knowledge about AI and Deep Learning (DL) applied to mechatronics. The course will provide the students with an overview of AI, DL and the possible applications, and will focus in the last lectures on reinforcement learning (RL) techniques. AI, DL and especially RL can be adopted to control the behavior of mechatronic systems acting in complex environment, and solving tasks too hard to be tackled with traditional approaches. The student	yes	Not available	English	yes	ADVANCED

			gets 6 credits if they attend the entire course and passes the final project.					
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Politecnico di Milano (POLIMI)

Reference person: Andrea Maria Zanchettin <andreamaria.zanchettin@polimi.it>

The courses* can be BASIC (to establish cultural foundations), ADVANCED (advanced study of specific topics), CROSSOVER (on interdisciplinary subjects).

* A tuition fee (stamp duty, regional tax for “diritto allo studio”) applies to all courses for non-POLIMI students.

** Subject to the availability of streaming infrastructure (WebEx) in the classroom, live interaction with the class might be compromised for remote students.

From the doctoral programme in Information Technology - <https://phd-inf.polimi.it>

Name	Teacher	Ore	Class description	Available online	Time of the year	Language	Final evaluation	Level
HYBRID SYSTEMS	Maria Prandini	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1380&ac_ins=0&lang=IT&c_insegn=063934&jaf_currentWFID=main	Yes**	July 27-31, 2026	ENG	Yes	BASIC
LEARNING THEORY	Alberto Metelli	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1380&ac_ins=0&lang=IT&c_insegn=063914&jaf_currentWFID=main	No	March 6, April 1, 2026	ENG	Yes	CROSSOVER
MODEL PREDICTIVE CONTROL	Marcello Farina	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1380&ac_ins=0&lang=IT&c_insegn=063924&jaf_currentWFID=main	no	September 7-11, 2026	ENG	Yes	BASIC
OBJECT-ORIENTED MODELLING AND SIMULATION	Francesco Casella	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1380&ac_ins=0&lang=IT&c_insegn=063924&jaf_currentWFID=main	No	October 13-17	ENG	Yes	CROSSOVER

			380&ac_ins=0&lang=IT&c_insegn=063930&jaf_currentWFID=main					
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REINFORCEMENT LEARNING	Marcello Restelli	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1380&ac_ins=0&lang=IT&c_insegn=063910&jaf_currentWFID=main	Yes**	Feb 2-20, 2026	ENG	Yes	BAISC
STOCHASTIC DYNAMIC PROGRAMMING	Ola Jabali	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1380&ac_ins=0&lang=IT&c_insegn=063925&jaf_currentWFID=main	Yes**	May 4-8, 2026	ENG	Yes	CROSSOVER

From the doctoral programme in Mechanical Engineering - <https://www.mecc.polimi.it/en/phd>

AI APPLICATIONS TO INDUSTRIAL ROBOTICS	Loris Roveda	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1383&ac_ins=0&lang=IT&c_insegn=061805&jaf_currentWFID=main	Yes	June 15-19, 2026	ENG	Yes	BASIC
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From the doctoral programme in Bioengineering - <https://www.phdbioengineering.polimi.it>

AI METHODS FOR BIOENGINEERING CHALLENGES	Luca Mainardi	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1373&ac_ins=0&lang=IT&c_insegn=064005&jaf_currentWFID=main	TBD	January 20-28, 2026	ENG	Yes	CROSSOVER
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OPEN-SOURCE DATA SCIENCE: STRUCTURING, SHARING, AND EXPLOITING MULTI- CENTER AND MULTI- SOURCE BIOMEDICAL DATA	Stefania Coelli	25	https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?evn_dettaglioinsegnamento=evento&aa=2025&k_cf=82&k_corso_la=1373&ac_ins=0&lang=IT&c_insegn=063918&jaf_currentWFID=main	T BD	January 26 – February 6, 2026	ENG	yes	CROSSOVER
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Politecnico di Torino (Polito)

Reference person: Giuseppe Quaglia <giuseppe.quaglia@polito.it>, Carmen Visconte <carmen.visconte@polito.it>

The courses can be BASIC (to establish cultural foundations), ADVANCED (advanced study of specific topics), CROSSOVER (on interdisciplinary subjects).

Name	Teacher	Ore	Class description	Available online	Time of the year (please check)	Language	Final evaluation	Level
Advanced scientific programming in matlab	Paolo Bardella paolo.bardella@polito.it	30	The course aims to provide advanced skills in scientific programming, and to teach sound methodologies for the development of reliable, optimized and maintainable codes. A basic knowledge of MATLAB and the C language represents a prerequisite of this course. During this course, many common methods used in Scientific Computing will be presented, with particular attention to the most recent programming techniques in MATLAB. At the end of the course, the student will have expanded his/her knowledge of MATLAB and will be able to choose the best approach for the solution of numerical problem he/she will face.	yes	January 2026	English	yes	ADVANCED
Development and management of data-acquisition systems	Alessio Carullo alessio.carullo@polito.it	25	The course, open to all those who perform experimental activity and do not have specific knowledge on analogue and digital electronic circuits, is conceived to analyze and study multi-channel data-acquisition systems, to develop the know-how required for choosing and configuring the components of the measuring chain according to the requirements. Sensors and circuitry commonly employed in the industrial field to adapt the sensor output signals to the analogue-to-digital converter will be studied. Furthermore, the performance of different architectures of	No	Jun 2026	English	yes	ADVANCED

			data-acquisition systems will be analyzed (dedicated systems, data-acquisition boards for personal computer, micro-controller based boards), also revising the most common development environments. Eventually, guide lines for the estimation of the expected uncertainty will be provided. Laboratory experiments will be arranged in order to develop and analyze some case studies.					
Machine learning for pattern recognition	Sandro Cumani sandro.cumani@polito.it	20	This course gives a broad yet rigorous introduction to machine learning and statistical pattern recognition. It focuses on supervised generative and discriminative learning models, analyzing some important topics such as model architectures, training and evaluation techniques. The course will compare different models and classification approaches on the popular MNIST digit recognition dataset. It will also discuss about the applications of the proposed machine learning approaches to image, speech, and speaker recognition. Students will be asked to apply the acquired knowledge to develop their own classification system using labeled training and evaluation data provided during the course. Each system will then be evaluated on another unlabeled and previously unseen data set.	no	Jun/July 2026	English	yes	ADVANCED
Principi, materiali ed applicazioni della robotica nella biomedicina	Alberto Arezzo alberto.arezzo@mac.com marina.indri@polito.it	20	Introduzione alla Robotica: Storia, definizioni, problemi di base, applicazioni, problemi aperti Materiali per la chirurgia robotica: panoramica dei nuovi sistemi di materiali multifunzionali intelligenti utilizzati negli strumenti e nelle apparecchiature chirurgiche (materiali intelligenti, attuatori e sensori). Applicazioni della robotica alla chirurgia: panoramica sull'effettiva limitazione della chirurgia endoscopica, potenziali	yes	Feb 2026	Italian	yes	ADVANCED

			applicazioni della robotica alla chirurgia, analisi dei risultati, prospettive future Applicazioni della robotica all'urologia: panoramica sull'effettiva limitazione dell'urologia endoscopica, potenziali applicazioni della robotica all'urologia, analisi dei risultati, prospettive future Automazione in chirurgia robotica: esempi attuali e “prossimo futuro” di applicazioni dell'intelligenza artificiale nella robotica chirurgica. Sulla base della nostra ricerca, la maggior parte delle applicazioni correlate rientrano nelle seguenti quattro sottocategorie: Automazione della sutura, Apprendimento automatico per la valutazione delle abilità chirurgiche, Apprendimento automatico per il miglioramento dei materiali robotici chirurgici, Apprendimento automatico per la modellazione del flusso di lavoro chirurgico					
Research design and methodology	Federico Bella federico.bella@polito.it	11	This course is intended to explain to PhD students how high-quality scientific research can be carried out during the three years of the doctorate course. The lessons will address the path that goes from the assignment of the research project to the literature analysis, from the design of research activities to the interaction with other scientists, from the production of tangible results to the analysis of the metrics commonly adopted to assess the quality of research and researchers. The overall aim of the course is that of making PhD students aware of what a PhD is and which is the spirit required to face it.	No	Mar 2026	English	yes	CROSSOVER
Facing the scientific publishing world	Federico Bella federico.bella@polito.it	13	This course is intended to introduce the world of scientific publishing to PhD students starting their academic career. The lessons will address the main pillars of this sector, from the fundamentals of journals organization to the rational	No	Mar 2026	English	yes	CROSSOVER

			construction of an article, from the peer-review process to the evaluation of research and researchers through internationally recognized metrics. The main aim of this course is to make PhD students aware of the international scientific publishing system.					
Writing research proposal and EU projects	Cattivelli Valentina valentina.cattivelli@polito.it	10	The figure of the researcher has become more complex. In addition to knowing how to do research and translate the results of their efforts into scientific papers, the researcher must possess project management skills that include knowing how to monitor European, national, and regional funding opportunities, as well as how to write project proposals in response to such calls. The ongoing European programming 2021-2027 offers considerable opportunities for the researcher who aspires to obtain more funds to finance its own research. Although only an introduction, this course aims to help PhD candidates develop certain project management skills, i.e., the search of funding opportunities, the analysis of the essential elements and requirements of the calls, and the preparation of a project proposal.	No	Sept 2026	English	yes	CROSSOVER
Innovation management	Francesca Montagna francesca.montagna@polito.it	8	Innovation Management is nowadays a recognized discipline that concerns scientific knowledge and professional skills. In the current economic environment, the transfer of technological development results into products and services, which must be both profitable for businesses and useful to society, is in fact not immediate and requires special capabilities. These required capabilities and skills are transversal and common to the different expressions of technology, as well as to various disciplines and industrial sectors. In this sense, they constitute a fundamental professional and cultural background for	No	Nov 2026	English	yes	CROSSOVER

			Engineers, Architects and Designers. Innovation management covers both strategic and technical-operational decisions, as well as the definition of those core competences for the management and support of innovation processes and product and service development. The course mainly aims at blending a managerial perspective, so to make the doctoral student capable of understanding the innovation process, to the more traditional perspectives from the specific design disciplines. It also provides indications on the main current research questions and on the work being carried out by researchers in the field. The course is based on lessons, with wide use of cases drawn from experience and empirical research and case studies where students are required to analyse information in a quantitative manner. At the end of the course, students will have acquired a concrete ability to analyze and manage business and design decisions related to technological innovation in both strategic and operational terms. They also acquire full mastery of approaches for the management of R&D and innovative processes, product and service development.					
Intellectual Property Rights and Innovation	Federico Caviggioli federico.caviggioli@polit.it	6	This course aims to provide students with fundamental knowledge on the Intellectual Property Rights (IPRs) that are available to protect creativity and innovation. The definitions and the main characteristics of patents, trademarks, copyrights, designs, creative commons, etc. will be examined. Students will be introduced to some of the sources of IPR data which can be searched to perform preliminary prior art analyses. In particular, the course will focus on patent data as a source of information which could help the researchers in	No	Mar 2026	English	yes	CROSSOVER

			developing new technical developments from a scientific perspective and improve their understanding of a technological field. The definition of such a technology landscape can be also useful for supporting the communication of technology trends and their socio-economic impact, in particular for project funding.					
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Scuola Superiore Sant'Anna (SSSA)

Referenti: Arianna Menciassi <arianna.menciassi@santannapisa.it> e Calogero Oddo <Calogero.Oddo@santannapisa.it>

The courses can be BASIC (to establish cultural foundations), ADVANCED (advanced study of specific topics), CROSSOVER (on interdisciplinary subjects).

Name	Teacher	Ore	Class description	Available online	Time of the year (please check)	Language	Final evaluation	Level
Neuromorphic Computing	Calogero Maria Oddo, Calogero.Oddo@santannapisa.it	20	The course will explore computational and physical models that emulate the neural dynamics and the efficiency of biological neurons of peripheral and central nervous system.	Yes	Dec 2026/Jan 2027 (not held in academic year 2025-26)	English	yes	CROSSOVER
Graphical programming for measurement, test, and control systems in bioengineering	Calogero Maria Oddo, Calogero.Oddo@santannapisa.it	20	The main competences developed will be fundamentals and technical abilities of graphical programming for biomedical engineering. The main software used will be LabVIEW (Core 1 module), with the aim to address the following detailed topics: introduction to graphical programming; navigating the graphical programming environment; what is graphical programming; project explorer; parts of a Virtual Instrument (VI); front panel; block diagram; searching for controls, Vis, and functions; selecting a tool; dataflow; building simple Vis; troubleshooting and debugging Vis; implementing a VI; data types; documenting code; while and for loops; timing a VI and data feedback in loops; plotting data; case structures; developing modular applications; data structures: arrays and clusters; managing file and hardware resources; introduction to data exchange via UDP; Euler method for discrete fixed-step solution of differential equations and graphical implementation; hands on examples with graphical programming.	Yes	Course calendar: Feb 10, 2026, h. 9-13 Feb 12, 2026, h. 14-18 Feb 17, 2026, h. 9-13 Feb 24, 2026, h. 9-13 Feb 27, 2026, h. 9-13	English	yes	BASIC
Fundamentals of Surgical and Interventional Robotics	Arianna Menciassi, arianna.menciassi@santannapisa.it	10-12	The course will be focused on methodologies and guidelines related to robotic technologies for minimally invasive therapy, diagnosis and	Yes	Course calendar:	English	yes	CROSSOVER

			surgery. Lectures will introduce different solutions for targeted therapies both minimally invasive and no invasive, e.g. which exploit external generators of therapeutic actions. At the end of the course the student will be able to identify the most appropriated targeting/therapeutic solutions for the different human body districts, at different scales, and for different pathologies. Final exam: presentation of a topic/paper or written test (in a fixed day). In case of a topic/paper presentation, all students are invited to prepare the exam in the same day for organizing a sort of workshop open to other interested researchers. Competence to be acquired along the course: • the design principles behind robotic technology for MIS; • different technologies and paradigms for autonomous, teleoperated, hand held robots for minimally invasive surgery; • actuation technologies for robotic tools for minimally invasive surgery.		May 4-6-7-11-13-14, 2026, h. 15-17			
Neural Networks and Deep Learning: Theoretical Foundations	Giorgio Buttazzo, giorgio.buttazzo@santannapisa.it	30	The objective of the course is to provide key concepts and methodologies to understand neural networks, explaining how to use them for pattern recognition, image classification, signal prediction, system identification, and adaptive control. Topic will include fully connected networks, unsupervised learning, self-organizing maps, clustering algorithms, autoencoders, reinforcement learning, supervised learning, and convolutional networks for various tasks.	Yes	Starts on Jan 13, 2026	English	yes	BASIC
Neural Network and Deep Learning: Advanced Topics	Giorgio Buttazzo, giorgio.buttazzo@santannapisa.it	20	This module presents some advanced topics related to deep learning algorithms, including recurrent networks and natural language processing, transformers, deep reinforcement	Yes	Starts on Feb 24, 2026	English	yes	CROSSOVER

			learning, model-based reinforcement learning, semi-supervised learning, contrastive learning, neural networks for multi-object tracking, and generative networks.					
Neural Network and Deep Learning: Trustworthy AI	Giorgio Buttazzo, giorgio.buttazzo@santannapisa.it	20	This module presents methods aimed at improving safety and security of neural networks, with a focus on autonomous driving applications. Topics include explainable and trustworthy AI, anomaly detection, adversarial attacks and defenses, simulation frameworks for autonomous driving, and hardware-in-the-loop simulation.	Yes	Starts on March 31, 2026	English	yes	ADVANCED
Neural Networks and Deep Learning: Implementation Issues	Giorgio Buttazzo, giorgio.buttazzo@santannapisa.it	30	The objective of the course is to present practical and implementation issues useful to deploy neural networks on a variety of embedded platforms using different languages and development environments. Topics include implementing neural networks from scratch in C, TensorFlow, Keras, and PyTorch. Neural Networks for autonomous driving. Model optimization for embedded platforms. Accelerating deep networks on GPGPUs and FPGA.	Yes	Starts on May 5, 2026	English	yes	ADVANCED

Università Cattolica (UNICATT)

Reference person: Antonella Marchetti: antonella.marchetti@unicatt.it; Federico Manzi: federico.manzi@unicatt.it

The courses can be BASIC (to establish cultural foundations), ADVANCED (advanced study of specific topics), CROSSOVER (on interdisciplinary subjects).

Name	Teacher	Ore	Class description	Available online	Time of the year (please check)	Language	Final evaluation	Level
Developing In Human-Robot Interaction	Antonella Marchetti, Cinzia Di Dio, Federico Manzi, Giulia Peretti and Laura Miraglia Contacts: antonella.marchetti@unicatt.it federico.manzi@unicatt.it	16	Social robots represent the new frontier of interactions. We are looking at a future in which these entities will be included and integrated within many types of everyday activities, where they will be our new friends, collaborators, educators, and care assistants. In this course we will therefore offer a look at the state of the art in the development of robots as socially effective agents in psychology, highlighting their strengths, and trying to project our thinking into a future where these entities can be perceived as social partners. We will approach to the main psychological developmental steps in early infancy (e.g., gaze, imitation, action understanding), embodied cognition, social cognition (i.e., Theory of Mind) with respect to social and educational robotics. These will help to better understand the role of developmental psychology in AI and Human-Robot Interaction.	yes	June/July 2026 Dates: 23 June (10:00-12:00). 25 June morning (10:30-12:30) 25 June afternoon (14:30-16:30). 1 July (9:00-14:00) 2 July (9:00-14:00)	English	yes	BASIC

Università degli Studi di Padova (UNIPD)

Reference person: Giulio Rosati <giulio.rosati@unipd.it>

The courses can be BASIC (to establish cultural foundations), ADVANCED (advanced study of specific topics), CROSSOVER (on interdisciplinary subjects).

Name	Teacher	Ore	Class description	Available online	Time of the year (please check)	Language	Final evaluation	Level
Python programming for Data Science and Engineering	Stefano Tortora, stefano.tortora@unipd.it	20	Aim: Python is an easy-to-learn and powerful high-level language and it is becoming more and more popular for scientific applications such as machine learning, statistics, manipulating and transforming data, but also computer vision and robotics. The first objective of the course is to become familiar with Python syntax, environments and basic libraries. Secondly, the learner will be guided in performing basic inferential data analyses and introduced to the application of common machine learning algorithms. Topics: 1- Introduction to the Python Programming Language ○ What is different in Python? ○ The Python Language Syntax ○ Basic and advanced data structures 2- Modules and Packages ○ NumPy and SciPy: Numerical and Scientific Python ○ Pandas: Labeled Column-Oriented Data	yes	Mar/Apr 2026	English	yes	BASIC

			○ Matplotlib: MATLAB-style scientific visualization ○ Scikit-learn: Basics of Machine Learning in Python					
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Università della Calabria (UNICAL)

Reference person: Giuseppe Carbone <giuseppe.carbone@unical.it>

The courses can be BASIC (to establish cultural foundations), ADVANCED (advanced study of specific topics), CROSSOVER (on interdisciplinary subjects).

Name	Teacher	Ore	Class description	Available online	Time of the year (please check)	Language	Final evaluation	Level
Advanced scientific programming applied to process optimization using Matlab	Alessio Caravella, alessio.caravella@unical.it	16	The course deals with parametric optimization of processes of interest for engineers. In particular, the Students will acquire the ability of formalizing and solve problems dealing with minimization of objective functions depending on parameters to optimize. For this purpose, the commercial software MATLAB® will be used.	Ask the teacher	Jan/Feb 2026	English	Yes	ADVANCED
Introduction to stochastic and mathematical modelling of discrete systems	Vittorio Astarita, vittorio.astarita@unical.it	12	The course begins with some introduction to probability theory and its applications to engineering problems. This will provide the foundation for the subsequent discussion of Markov chains. The course will then focus on the theory of Markov chains, including their definition, properties, and applications. Students will learn about discrete-time Markov chains and continuous-time Markov chains, as well as methods for analyzing these chains, such as the stationary distribution, and the limiting behavior of Markov chains. The course will also cover game theory and its application to engineering problems. Students will learn about the basics of game theory, including the concept of Nash equilibrium. In addition, the course will introduce students to the Monte Carlo method, a powerful tool for solving complex engineering problems. Students will learn how to simulate random events using	Ask the teacher	Feb 2026	English	Yes	BASIC

			Monte Carlo simulations and will apply this technique to a range of problems. Finally, the course will introduce students to Blockchain systems and digital currencies. Students will learn about the basics of Blockchain technology, including distributed ledgers and smart contracts, and will explore the potential applications of this technology to engineering problems. Throughout the course, students will be exposed to representative case studies that demonstrate the application of the aforementioned theories to real-world engineering problems. By the end of the course, students will have a better understanding of probability theory and its applications to engineering, as well as a general view on practical toolkits for solving complex engineering problems.					
Introduction to Python	Vittorio Astarita, vittorio.astarita@unical.it	12	This course is designed to provide an introduction to the fundamental concepts of the Python programming language. Students will learn the syntax and semantics of Python, including variables, data types, and control structures. The course will cover basic data structures such as lists, dictionaries, and tuples, as well as functions and modules. Students will also learn about file input/output, error handling, and debugging techniques. By the end of the course, students will have gained a solid foundation in Python programming, which they can use to solve real-world problems.	Ask the teacher	Feb/Mar 2026	English	Yes	BASIC
How to conduct a Systematic Literature Review: design, methods and supporting tools	Salvatore Ammirato, Marilena De Simone salvatore.ammirato@unical.it, marilena.de	8	Topics: Motivation and goals of a systematic literature review (SLR); Methodology; Literature search, Exclusion and inclusion criteria, Metadata Analysis, Synthesis and results presentation. Applications: Designing a SLR; Paper location and selection; Paper analysis; Results synthesis; Digital tools for SLR; The	Ask the teacher	Nov/Dec 2025	English	Yes	CROSSOVER

	simone@uni cal.it		MySLR digital platform; How to conduct a review with MySLR; Project works					
Spin-off creation: key fundamentals for a good plan	Gianpaolo lazzolino, gianpaolo.ia zzolino@uni cal.it	8	The course describes the main steps for constructing a business plan also referred to projects arising from results obtained in research. The main areas of a business plan are described with reference to the s.c. technology firms. The course proposes insights deriving from cases of spin-offs at the University of Calabria	Ask the teacher	May 2026	English	Yes	CROSSOVER