

## Master's degree in computer engineering 2024/2025

All regularly enrolled students can obtain their final degree after successfully passing the final evaluation of a series of activities accounting to a total of at least 120 CFU. Each personal training path must be clearly specified in advance through the so-called "Individual Study Plan", which has to be directly proposed by each student, and it must comply with all national and local regulations. The submission of the Individual Study Plan is via an online submission system which is designed to help in following the mandatory constraints while highlighting what are (and their extent of) the possibilities of free choices. You are expected to submit your individual study plan as soon as possible: its acceptance does confirm you will be awarded the master's degree as soon as you successfully pass all the chosen activities.

In order to help you in the process of submitting your Individual Study Plan, we have written this short guide that will hopefully clarify the main rules for producing a suitable Individual Study Plan. While preparing your Individual Study Plan you can refer to all the official documentation, mainly the so-called "Regolamento Didattico".

<https://didattica.unipd.it/off/2024/LM/IN/IN2547>

In general, the structure of a Study Plan of the master's degree in computer engineering is the same for all the curricula, and it is divided in the following main parts:

- **Core competencies:** three courses that are compulsory and shared among all the curricula (for a total of 24 CFU).

They are:

- Automata, Languages and computation 9 CFU
- Machine Learning 6 CFU
- Operations Research 1 9 CFU

- **Mandatory (core) courses:** these courses characterize each curriculum and are different, in number and CFUs, for each curriculum. As the name says, they are "mandatory".

The courses are, divided for each curriculum:

- Curriculum Artificial Intelligence and Robotics (a total of 33 CFU)
  - Artificial Intelligence 9 CFU
  - Computer Vision 9 CFU
  - Deep Learning 6 CFU
  - Intelligent Robotics 9 CFU
- Curriculum Bioinformatics (a total of 27 CFU)
  - Inferential Statistics 6 CFU
  - Bioinformatics 9 CFU
  - Computational Genomics 6 CFU
  - Learning from Networks 6 CFU
- High Performance and Big Data Computing (a total of 30 CFU)
  - Inferential Statistics 6 CFU
  - Big Data Computing 6 CFU
  - Parallel Computing 9 CFU
  - Advanced Algorithm Design 9 CFU

- **Web Information and Data Engineering (a total of 33 CFU)**
  - Computer Networks 9 CFU
  - Search Engines 9 CFU
  - Web Applications 6 CFU
  - Graph Databases 9 CFU
  
- **Additional courses of your curriculum:** they represent a set of courses you can freely choose to personalize your training path in your curriculum until you reach a minimum number of CFU (the minimum varies across curricula). In this way you can personalize your training path.  
They are, divided for each curriculum:
  - **Curriculum Artificial Intelligence and Robotics (18 CFU)**
    - Big Data Computing 6 CFU
    - Robotics and Control 1 9 CFU
    - Neurorobotics and Neurorehabilitation 6 CFU
    - Learning from Networks 6 CFU
    - Natural Language Processing 6 CFU
    - 3D Data Processing 6 CFU
  - **Curriculum Bioinformatics (24 CFU)**
    - Big Data Computing 6 CFU
    - Deep Learning 6 CFU
    - Search Engines 9 CFU
    - Web Applications 6 CFU
    - Distributed Systems 9 CFU
    - Natural Language Processing 6 CFU
  - **High Performance and Big Data Computing (21 CFU)**
    - Artificial Intelligence 6 CFU
    - Deep Learning 6 CFU
    - Search Engines 9 CFU
    - Computer Networks 9 CFU
    - Bioinformatics 9 CFU
    - Distributed Systems 9 CFU
    - Computers and Network Security 6 CFU
    - Learning from Networks 6 CFU
  - **Web Information and Data Engineering (18 CFU)**
    - Software Platforms 6 CFU
    - Distributed Systems 9 CFU
    - Concurrent and Real Time Programming 6 CFU
    - Computers and Network Security 6 CFU
    - Computer Engineering for Music and Multimedia 6 CFU
    - Natural Language Processing 6 CFU
    - Privacy Preserving Information Access 6 CFU
  
- **Elective courses:** You must choose courses for a total of 12 CFU. For each curriculum, we published three lists of courses for “other choices”, you are free to choose any

course from any list for a total of 12 CFU. These courses allow you to explore subjects of areas different from those required from the chosen curriculum.

- **Others:** these are mandatory activities like the final project, the language proficiency test, and the internship/research training, for a total of 33 CFU.

In case you believe the proposed schema does not fit your interest and you want to submit an Individual Study Plan that does not strictly follow the constraints on the number of CFU indicated above, **you may submit a “free” study plan, together with a written statement that explains the motivations for this plan.** In this situation, a committee will evaluate your proposal and decide if it is coherent and admissible with the master’s degree in computer science.

To be valid, the Study Plan must have at least 120 CFU credits.

## An example of the steps you will see on Uniweb (example for High Performance and Big Data Computing)

Step 1: Choose "Study plan" from the menu (top right)

The screenshot shows the Uniweb interface. At the top, there are three small images: a landscape, an interior of a grand hall, and a person using a microscope. To the right, there are language options 'ita' and 'eng', and a close button 'X'. Below this is a dark navigation menu with the following items: 'My personal area', 'Logout', 'Change Password', 'Other careers', 'Home', 'Messages', 'My photo', 'Master data', 'Identity documents', 'Registrations', 'Study Plan' (highlighted with a red bar), 'Select Plan', 'Booklet', 'Exam sessions', 'Partial exams', 'Booking notice board', 'Exam results', 'Certificates', and 'Course change'. On the left side of the page, there is a table with a red header and a green footer. The table has a legend: 'Key: Chosen Teaching activities'. The table content is mostly obscured by the navigation menu.

of this page. If you have a statutory study plan (completed : the relevant office will automatically acquire it.

Key: Chosen Teaching activities

## Step 2: Choose the type of plan: AUT (almost automatic approval), PRO (needs approval)

» Piano Carriera » Scelta Schema di Piano

Choice of the course units:

In order to complete your study plan, please select now one of the following plans and click on "ok"

Study plans

	Description	Apri
<input type="radio"/>	IN2547AUT3 - "High performance and big data computing" Track:HIGH PERFORMANCE AND BIG DATA COMPUTING	
<input type="radio"/>	IN2547PRO3 - Individual study plan for "High performance and big data computing" Track:HIGH PERFORMANCE AND BIG DATA COMPUTING	

OK

## Step 3: Check compulsory educational activities (core + mandatory)

» Piano di Studio » Rule

Choice of the course units – Study Plan of

### PLEASE NOTE

The use of the browser keys to go forward or backward in wizard can cause anomalies or errors in filling in the study plan. Keep to the navigation suggested in the page.

#### Rule - No.1 - No year of course

3 AUT core courses - Compulsory educational activities:

- ADVANCED ALGORITHM DESIGN (INQ0091643) - [ CFU: 9 ]
- AUTOMATA, LANGUAGES AND COMPUTATION (INQ0091306) - [ CFU: 9 ]
- BIG DATA COMPUTING (INP7079233) - [ CFU: 6 ]
- INFERENCE STATISTICS (INQ0091582) - [ CFU: 6 ]
- MACHINE LEARNING (INP9087775) - [ CFU: 6 ]
- OPERATIONS RESEARCH 1 (INQ0091561) - [ CFU: 9 ]
- PARALLEL COMPUTING (INQ0091598) - [ CFU: 9 ]

Next rule

### Information about the study plan you are completing

Percorso di Studio HIGH PERFORMANCE AND BIG DATA COMPUTING

scelto:

Year of offer: 2020

Cohort: 2020

## Step 4: Choose elective courses

### PLEASE NOTE

The use of the browser keys to go forward or backward in wizard can cause anomalies or errors in filling in the study plan. Keep to the navigation suggested in the page.

#### Rule - No.2 - No year of course

3 AUT choose from min 21 to max 30 credits - Choose from 21 up to 30 CP from among the following exams

#### Rule options:

- ARTIFICIAL INTELLIGENCE (INQ0091562) - [ CFU: 6 ]
- BIOINFORMATICS (INQ0091581) - [ CFU: 9 ]
- DEEP LEARNING (INQ0091579) - [ CFU: 6 ]
- DISTRIBUTED SYSTEMS (INQ0091620) - [ CFU: 9 ]
- FOUNDATIONS OF DATABASES (INQ0090799) - [ CFU: 6 ]
- LEARNING FROM NETWORKS (INQ0091104) - [ CFU: 6 ]
- SEARCH ENGINES (INQ0091599) - [ CFU: 9 ]

CFU Min:  CFU Max:

Previous rule

Next rule

### Information about the study plan you are completing

Percorso di Studio HIGH PERFORMANCE AND BIG DATA COMPUTING

scelto:

Year of offer: 2020

Cohort: 2020

#### Activities formerly selected

List of teaching activities you have selected while completing your study plan. They are classified by year of course and ordered by code.

#### Course units without year of course

Code	Description
INQ0091643	ADVANCED ALGORITHM DESIGN
INQ0091306	AUTOMATA, LANGUAGES AND COMPUTATION
INP7079233	BIG DATA COMPUTING
INQ0091582	INFERENCE STATISTICS
INP9087775	MACHINE LEARNING
INQ0091561	OPERATIONS RESEARCH 1
INQ0091598	PARALLEL COMPUTING

## Step 5: Choose "other" courses

### PLEASE NOTE

The use of the browser keys to go forward or backward in wizard can cause anomalies or errors in filling in the study plan. Keep to the navigation suggested in the page.

### Rule - No.3 - No year of course

3 AUT choose from min 12 to max 18 credits - Choose from 12 up to 18 CP from among the following exams

#### Rule options:

- COMPUTATIONAL GENOMICS (INP9087773) - [ CFU: 6 ]
- CRYPTOGRAPHY (INP9087845) - [ CFU: 6 ]
- GAME THEORY (INP9087836) - [ CFU: 6 ]
- NATURAL LANGUAGE PROCESSING (INQ0091105) - [ CFU: 6 ]
- OPERATIONS RESEARCH 2 (INQ0091640) - [ CFU: 6 ]
- STOCHASTIC PROCESSES (INP9086676) - [ CFU: 6 ]

CFU Min:  CFU Max:

Previous rule

Next rule

### Information about the study plan you are completing

Percorso di Studio HIGH PERFORMANCE AND BIG DATA COMPUTING

scelto:

Year of offer: 2020

Cohort: 2020

## Step 6: Language proficiency (English for Italian students, Italian for international students)

### PLEASE NOTE

The use of the browser keys to go forward or backward in wizard can cause anomalies or errors in filling in the study plan. Keep to the navigation suggested in the page.

### Rule - No.4 - No year of course

3 AUT choose only one activity - Choose exactly 3 CP from among the following exams

#### Rule options:

- ENGLISH LANGUAGE B2 (PRODUCTIVE SKILLS) (INP9087943) - [ CFU: 3 ]
- ITALIAN LANGUAGE (INQ0093091) - [ CFU: 3 ]

CFU Min:  CFU Max:

Previous rule

Next rule

### Information about the study plan you are completing

Percorso di Studio HIGH PERFORMANCE AND BIG DATA COMPUTING

scelto:

Year of offer: 2020

Cohort: 2020

## Step 7: Choose Internship or research training

### PLEASE NOTE

The use of the browser keys to go forward or backward in wizard can cause anomalies or errors in filling in the study plan. Keep to the navigation suggested in the page.

### Rule - No.5 - No year of course

3 AUT choose one course between Internship and Research Training - Choose exactly 9 CP from among the following exams

#### Rule options:

- INTERNSHIP (INP9087862) - [ CFU: 9 ]
- RESEARCH TRAINING (INQ0091098) - [ CFU: 9 ]

CFU Min:  CFU Max:

Previous rule

Next rule

### Information about the study plan you are completing

Percorso di Studio HIGH PERFORMANCE AND BIG DATA COMPUTING

scelto:

Year of offer: 2020

Cohort: 2020

### Activities formerly selected

List of teaching activities you have selected while completing your study plan. They are classified by year of course and ordered by code.

### Course units without year of course

## Step 8: Check final project

### PLEASE NOTE

The use of the browser keys to go forward or backward in wizard can cause anomalies or errors in filling in the study plan. Keep to the navigation suggested in the page.

### Rule - No.6 - No year of course

3 AUT Final Project - Compulsory educational activities:

- FINAL PROJECT (INP9087846) - [ CFU: 21 ]

Previous rule

Next rule

### Information about the study plan you are completing

Percorso di Studio HIGH PERFORMANCE AND BIG DATA COMPUTING

scelto:

Year of offer: 2020

Cohort: 2020

### Activities formerly selected

List of teaching activities you have selected while completing your study plan. They are classified by year of course and ordered by code.

### Course units without year of course

## Step 9: Submit study plan

Course units without year of course		Key: Chosen Teaching activities		Compulsary teaching activities	
Course unit code	Description				
INQ0091643	ADVANCED ALGORITHM DESIGN				
INQ0091306	AUTOMATA, LANGUAGES AND COMPUTATION				
INP7079233	BIG DATA COMPUTING				
INQ0091582	INFERENCE STATISTICS				
INP9087775	MACHINE LEARNING				
INQ0091561	OPERATIONS RESEARCH 1				
INQ0091598	PARALLEL COMPUTING				
INQ0091562	ARTIFICIAL INTELLIGENCE				
INQ0091579	DEEP LEARNING				
INQ0091620	DISTRIBUTED SYSTEMS				
INP9087845	CRYPTOGRAPHY				
INP9087836	GAME THEORY				
INQ0091640	OPERATIONS RESEARCH 2				
INP9087943	ENGLISH LANGUAGE B2 (PRODUCTIVE SKILLS)				
INP9087862	INTERNSHIP				
INP9087846	FINAL PROJECT				