

University of Trento

# Department of Civil, Environmental and Mechanical Engineering

English-taught Masters

[www.dicam.unitn.it/en](http://www.dicam.unitn.it/en)



UNIVERSITY  
OF TRENTO - Italy

Department of Civil, Environmental  
and Mechanical Engineering



Fakultät für Naturwissenschaften und Technik  
Facoltà di Scienze e Tecnologie  
Faculty of Science and Technology



# The Department of Civil, Environmental and Mechanical Engineering (DICAM)

Research and teaching activities of the Department of Civil, Environmental and Mechanical Engineering (DICAM) are developed in six main subject areas of engineering and architecture:

- Environmental Resources, Security and Climate Change
- Mechanics, Materials and Smart Structures
- Surveying, planning and design for sustainable places
- Architectural Sciences
- Modelling and Simulation in Engineering and Sciences
- Energy and Green Technologies

The primary objective is to improve the well-being of individuals and society, focussing on the quality of urban and natural environments, the enhancement of quality of life and security, and the harmonious development of society through the innovation of products.

In all these sectors, DICAM pursues high level scientific and teaching objectives, both in research and training, in line with the most important research-intensive universities. The Department also promotes the development of tight relations with public authorities and private companies at local, national and international level.

The mission of the Department includes the following specific targets.

- The promotion of research in key areas of Engineering, Planning and Applied Sciences, such as Environmental Protection, Landscape, Architecture, Natural Renewable Resources, Energy, Biomedical Sciences, Smart Structures and Materials, Risk Prevention, Infrastructures and Efficient and Sustainable Structures, Building and Estates, Service Networks and Territory.
- The training of professionals (engineers and architects) and researchers for future generations, able to contribute to the economic and cultural growth of society, in an innovative and creative way.

DICAM currently offers the following degrees:

- Bachelor's Degree in Civil Engineering (B.Sc.)
- Bachelor's Degree in Engineering Environmental and Land Engineering (B.Sc.)
- Bachelor's Degree in Viticulture and Oenology in cooperation with the University of Udine and the Edmund Mach Foundation (San Michele all'Adige, Trento) (B.Sc.)
- Master's Degree in Civil Engineering (M.Sc.)
- Master's Degree in Environmental and Land Engineering (M.Sc.)
- Master's Degree in Energy Engineering, in cooperation with the Free University of Bolzano – in English (M.Sc.)
- 5-year Master's Degree in Architecture and Building Engineering (M.Sc.)

DICAM also hosts the Doctoral School in Civil, Environmental and Mechanical Engineering. The School organizes a three-year doctoral programme. The mission of the School is to train young researchers in Engineering, Architecture and Applied Science, through the acquisition and development of knowledge, capabilities and skills

in the research fields embraced by the School. The activity is organized in advanced courses (mainly during the first year of the programme) and research on the theme chosen for the Doctoral Thesis.

The research activity in the specific topic selected by the candidate falls into four main categories:

- Civil and Environmental Engineering
- Mechanics, Materials, Chemistry and Energy
- Modelling and Simulation
- Architecture and Planning, Landscape

The output of the research activity must be an original and innovative piece of work.

## Living in Trento

Trento lies at 190 metres altitude in the wide glacial Adige river valley, at the heart of natural and historical itineraries between lake Garda and the Dolomites. The city has a rich history and represents a crossroads between the contrasting cultures of the Mediterranean world and Northern Europe. Thanks to its positions, the area has developed with an open-minded outlook towards the outside world and increased its potentials in terms of resources and opportunities. Originally a Roman city, it became famous for the Council (1545 -1563) which gave rise to the Counter-Reformation. The artistic and historical heritage of the city is to be found in its monuments, which embody the centuries of history written under the dual influences of northern and Italian cultures, still evident today in the variety of architectural styles.

The cultural and social life is marked by many events such as exhibitions, traditional costume festivals, typical markets, historical and international festivals. These events usually take place in the city centre but also up in the mountains as the popular Sounds of Dolomites, a seducing music festival that each summer attracts thousands of visitors.

Trento and its surroundings are full of extraordinary beauty, with unique mountains (the Dolomites were included in Unesco World Heritage in 2009) and nearly 300 lakes, scattered across the region and offering a range of holiday experiences. Visitors can take a break from ordinary life and enjoy the relaxing natural environment, but the region also offers a unique opportunity to people who prefer a more action-packed experience and exciting outdoor activities such as skiing, hiking, windsurfing, rafting or climbing.

In order to facilitate the arrival and stay of international students, the University of Trento operates a “Welcome Office”. The Welcome Office supports students in the administrative issues related to their pre-arrival, visa and housing procedures.

The office encourages multi-cultural exchange between international and national students and periodically organizes initiatives and socio-cultural events open to all international guests with the aim of helping them to settle down, both at University and in the local community.





# Master's degree in Energy Engineering

The interuniversity Master's degree in Energy Engineering is offered jointly by the University of Trento, Department of Civil, Environmental and Mechanical Engineering, and the Free University of Bolzano-Bozen, Faculty of Science and Technology.

The courses are taught alternatively at the campuses of Trento and Bolzano.

## Course language

The official teaching language is English. Elective courses are offered in Italian and German.

## Study Plan

Students must obtain 120 ECTS in total. The study plan features a first year of core subjects that are common for all students and two different curricula that are offered in the second year, which are “Technologies for energy efficiency” and “Renewable and innovative technologies for energy supply”.

### **Common core (first year):**

- Electrical Systems Engineering
- Fluid Machines Engineering
- Engineering Thermodynamics, Heat and Mass Transfer
- Environmental Fluid Mechanics/Hydropower Plants
- Building HVAC Systems
- Advanced Applications of Building Physics
- Electric Power Conversion Equipment

### **Curriculum “Technologies for energy efficiency”:**

- Power Production, CHP and District Heating Systems
- Applied Mechanics and Technologies for Energy Efficiency
- Special Issues of Building Physics
- District heating systems design

### **Curriculum “Renewable and innovative technologies for energy supply”:**

- Power Production, CHP and District Heating Systems
- Hydropower and wind power systems
- Advanced materials for Energy Engineering or Mechanics and Structural Design for Energy Engineering
- Bioenergy or Electrochemical energy storage and Conversion
- Further credits are obtained through elective courses (12 ECTS), language skills (3 ECTS) and the master's thesis (15 ECTS).

## Programme overview

<b>Main application deadline</b>	Non-EU: January/February each year EU: between April and June each year
<b>Intake</b>	September each year
<b>Duration</b>	2 years full time
<b>Minimum requirements</b>	<ul style="list-style-type: none"><li>• Bachelor's degree (or equivalent title) in the broad class of Industrial Engineering or Civil and Environmental Engineering or closely related scientific disciplines.</li><li>• English at B2 level CEFR and Italian or German at A1 level CEFR.</li></ul>
<b>Selection criteria</b>	Academic record and Interview

## Career opportunities

The course aims at training experts who will be able to deal with the various aspects of planning, implementing and managing integrated energy systems, such as production plants supplied from renewable sources, low energy consumption buildings and transport networks for electric and thermal energy from the production site to local consumption sites. Energy engineers will work as independent professionals or in public and private companies, industries of the energetic and thermo-energetic sectors and public and private utilities. Graduates can move on to Doctoral Schools.

The professional profile of the master graduate in Energy Engineering is oriented towards the design and operation of small to medium size energy production plants, in particular exploiting renewable sources, combined heat and power (CHP) in district heating, and of energy efficient industrial systems and buildings. Energy conversion, energy distribution and energy utilisation systems are the main areas of interest.

## Admission requirements

The necessary academic requirements to be eligible for the Master are:

- a. Bachelor's degree obtained in Italy or equivalent

**or**

a Bachelor's degree in Industrial Engineering or Civil and Environmental Engineering or closely related scientific disciplines obtained abroad;

- b. documents proving your studies in the following scientific areas (for detailed information please refer to the study course Regulations):

- Mathematics
- Chemistry
- Physics
- Thermodynamics and heat transfer
- Electrotechnics
- Fluid mechanics
- Materials Science
- Technologies and production systems
- Mechanics of structures
- Fluid machines

The evaluation of curricular requirements is made by a Selection Committee that will assess the equivalence between the contents of the courses attended in previous careers.

- c. for candidates holding a degree obtained in Italy: an average (GPA) not lower than 22/30, final examination mark excluded.

## Language requirements

In order to be admitted to the programme, you must have proven language skills at B2 level in English, and A1 level in at least one of the two other teaching languages (German, Italian) (Common European Framework of Reference).

The six levels of the Common European Framework of Reference are:

- A1-A2: Basic Users
- B1-B2: Independent Users
- C1-C2: Proficient Users.

For further information please refer to the annual call for admission.



ART> UniTrento

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