



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

Master in

Industrial Mechanical Engineering

2022/23



At a Glance

Degree class: LM-33
ECTS credits: 120
Duration of the course: 2 years
Courses will be taught in: English
Places available: 40 EU + 10 non-EU
Campus: Bozen-Bolzano
Tuition fees: ca. €1350 per year

Course description

This Master of Science (“laurea magistrale”) trains industrial mechanical engineers able to work in a wide range of areas and interdisciplinary projects combining mechanical and digital manufacturing engineering skills with management and logistics competencies.

By paying particular attention to the latest engineering technologies and AI developments in manufacturing started with the industry 4.0 revolution, beyond a common training on advanced mechanical and industrial engineering subjects, students have the chance to highly customise their competencies choosing among the following tracks (pre-defined study plans):

- **Computational Mechanical Design**
- **Digital Manufacturing and Automation**
- **Digital Manufacturing and Management**
- **Logistics and Production (double degree with the OvGU Magdeburg)**

The first three are offered entirely in Bozen-Bolzano and are characterised by a strong connection with companies. The fourth is offered as a double-degree programme with the Otto von Guericke University Magdeburg (OvGU, Germany) where students spend one to two semesters and earn also the OvGU Master of Science degree as “Wirtschaftsingenieur in Logistik” (Management Engineering – Logistics).

This programme is grounded in South Tyrol while maintaining a strong international outlook. This is guaranteed by being taught entirely in English with teaching staff as well as students coming from Italy, Europe and the entire world.

Courses combine theory and engineering practice. Lecture halls are equipped with modern technologies to allow hybrid and remote teaching, and e-learning tools are adopted to complement and support the lectures. Laboratory and project activities are seamlessly integrated into the programme’s activities and students have access to state-of-the-art software tools and equipment in the Smart Mini Factory and the Mechanical Lab, among others. Courses are taught by unibz leading research professors, supported by experts from relevant industries. In-class learning is further enriched by excursions to trade fairs as well as local, regional and international companies.

The master is offered as a full-time programme, though thanks to the modern teaching tools adopted, an increasing number of students are able to work in South Tyrolean companies during their studies.

Upon graduation, students can take the Italian state examination for the profession of Ingegnere Industriale Senior (Senior Industrial and Mechanical Engineer) and after passing this examination to join the Ordine degli Ingegneri (Italian Chamber of Engineers) - Section A.

Structure of the Programme

The first part of the programme (40 ECTS credits) provides students with the fundamental master-level mechanical and industrial engineering knowledge. This combines traditional and novel mechanical engineering subjects, including mechanical and mechatronic design, manufacturing technologies and simulation, with management and systems engineering courses including contents in project, process and technology management as well as robotics

and control.

The second part of the programme (50 ECTS credits) is dedicated to deepening students' knowledge in the subjects of the selected track (pre-defined study plans(*)), carrying out a study (term) project, and attending elective courses of up to 15 ECTS credits. These subjects are reported in the following.

- **Computational Mechanical Design**, including the following characterising subjects: machine design, finite element analysis (FEA), dynamics of mechanical systems (MBD), computational thermo-fluid dynamics (CTFD), and design with composite materials;
- **Digital Manufacturing and Automation**, including the following characterising subjects: electric drives and control systems, mobile robotics, artificial intelligence (AI) applications in industry, and digital factory and industrial maintenance;
- **Digital Manufacturing and Management**, including the following characterising subjects: digital transformation, sustainability management, artificial intelligence (AI) applications in industry, business software, digital factory and industrial maintenance, and management control and business planning;
- **Logistics and Production** (offered as a double-degree programme with Otto von Guericke University of Magdeburg), including the following characterising subjects: supply chain practice – ERP, logistic strategies and methods, business decision making, management control and business planning, digital transformation, sustainability management, and digital factory.

The **third and last part of the programme (30 ECTS credits)** is dedicated to the research for and the writing of the master thesis. Students have the option of carrying out their master thesis in house at unibz or in cooperation with local or international companies. Previous theses have been carried out at companies and research centers such as BMW, 3M, Intercable, Progress, Leitner, and Fraunhofer Italia.

(*students not enrolled in the double-degree program may submit their own study plan, compliant with the rules (ordinamento) of the study programme for approval to the course council.

Study Plan - Computational Mechanical Design

1st Year

- 10 CP Design and Manufacturing of Industrial Products
 - 5 CP Reverse Engineering and Rapid Prototyping
 - 5 CP Advanced Manufacturing Technologies and Systems
- 10 CP Project, Process and Technology Management
 - 5 CP Project Management
 - 5 CP Process and Technology Management
- 5 CP Automatic Control
- 5 CP Functional Mechanical Design
- 10 CP Industrial Automation and Digital Manufacturing
 - 5 CP Mechatronics and Robotics
 - 5 CP Digital Manufacturing and Simulation
- 5 CP Thermo-Mechanicals Measurements
- 5 CP Finite Element Analysis (FEA)
- 5 CP Advanced Topics of Machine Design
- 5 CP Dynamics of Mechanical Systems

2nd Year

- 5 CP Computational Thermo-Fluid Dynamics (CTFD)
- 5 CP Design with Composite Materials
- 5 CP Free choice course
- 5 CP Free choice course
- 5 CP Free choice course
- 5 CP Study Project
- 30 CP Master thesis

Study Plan - Digital Manufacturing and Automation

1st Year

- 10 CP Design and Manufacturing of Industrial Products
 - 5 CP Reverse Engineering and Rapid Prototyping
 - 5 CP Advanced Manufacturing Technologies and Systems
- 10 CP Project, Process and Technology Management
 - 5 CP Project Management
 - 5 CP Process and Technology Management
- 5 CP Automatic Control

- 5 CP Functional Mechanical Design
- 10 CP Industrial Automation and Digital Manufacturing
 - 5 CP Mechatronics and Robotics
 - 5 CP Digital Manufacturing and Simulation
- 5 CP Thermo-Mechanicals Measurements
- 5 CP Digital Factory and Industrial Maintenance
- 5 CP Mobile Robotics
- 5 CP Electric Drives and Machines

2nd Year

- 5 CP Programmable Controllers for Industrial Automation
- 5 CP AI Applications in Industry
- 5 CP Free choice course
- 5 CP Free choice course
- 5 CP Free choice course
- 5 CP Study project
- 30 CP Thesis

*** Free choice courses

Students can choose courses of their choice. Every year the Faculty publishes the list of free choice courses offered.

Study Plan - Digital Manufacturing and Management

1st Year

- 10 CP Design and Manufacturing of Industrial Products
 - 5 CP Reverse Engineering and Rapid Prototyping
 - 5 CP Advanced Manufacturing Technologies and Systems
- 10 CP Project, Process and Technology Management
 - 5 CP Project Management
 - 5 CP Process and Technology Management
- 5 CP Automatic Control
- 5 CP Functional Mechanical Design
- 10 CP Industrial Automation and Digital Manufacturing
 - 5 CP Mechatronics and Robotics

- 5 CP Digital Manufacturing and Simulation
- 5 CP Thermo-Mechanicals Measurements
- 5 CP Digital Factory and Industrial Maintenance
- 5 CP Digital Transformation and Sustainability Management
- 5 CP Design and Development of Business Software

2nd Year

- 5 CP Management Control and Business Planning
- 5 CP AI Applications in Industry
- 5 CP Free choice course
- 5 CP Free choice course
- 5 CP Free choice course
- 5 CP Study project
- 30 CP Master Thesis

Study Plan - Logistics and Production (Double Degree Programme with the Otto-von-Guericke-Universität Magdeburg)

1st Year (unibz, Bolzano-Bozen)

- 10 CP Design and Manufacturing of Industrial Products
 - 5 CP Reverse Engineering and Rapid Prototyping
 - 5 CP Advanced Manufacturing Technologies and Systems
- 10 CP Project, Process and Technology Management
 - 5 CP Project Management
 - 5 CP Process and Technology Management
- 5 CP Automatic Control
- 5 CP Management Control and Business Planning
- 10 CP Industrial Automation and Digital Manufacturing
 - 5 CP Mechatronics and Robotics
 - 5 CP Digital Manufacturing and Simulation
- 5 CP Thermo-Mechanicals Measurements
- 5 CP Digital Factory and Industrial Maintenance
- 5 CP Digital Transformation and Sustainability Management

2nd Year (OvGU, Magdeburg)

- 5 CP Logistic strategies and methods (offered at OvGU Magdeburg)

- 5 CP Supply Chain Practice / ERP (offered at OvGU Magdeburg)
- 5 CP Business Decision Making (offered at OvGU Magdeburg)
- 5 CP Free choice course (offered at OvGU Magdeburg)
- 5 CP Study Project (Individual or Team) - Laboratory in Mechanics/Automation
- 30 CP Thesis

***Free choice courses**

Students can choose courses of their choice. Every year the Faculty publishes the list of free choice courses offered. Among these, 5 credits have to be acquired selecting 1 course from the catalogue Logistics Operations “ Faculty of Economics” at the OvGU. The catalogue will be yearly updated and it is visible at the Faculty website of OvGU.

Study project syllabus

In all tracks students need to do a study project (term project) in the third semester which allows them to put into practice the theory and knowledge acquired. Study projects are individual or team projects and are carried out at unibz or companies. It is also possible to combine the study project with an internship. More specific information can be found in the syllabus.

Exchange Programmes and Internships

This master programme offers exchange programmes with the Technical University of Munich (Germany), Otto von Guericke University Magdeburg (Germany), University of Girona (Spain), Technical University of Graz (Austria), KU Leuven (Belgium), University of Antwerpen (Belgium), Brno University of Technology (Czech Republic), University of Ljubljana (Slovenia) and Chiang Mai University (Thailand). Beyond this, the free mover programme is a gateway to universities all over the world!

Career Opportunities

Our graduates are able to design and analyse mechanical systems and structures, to define and manage the suitable production systems, as well to manage materials procurement, operations and logistics. In doing so, the programme provides students with the tools for a career as an engineer or a consultant. This includes research and development, engineering design, calculation and analysis, manufacturing, automation technology, production systems procurement, production, operations management, internal and external logistics and quality assurance.



Master in Industrial Mechanical Engineering

2022/23

Application and Admission

You can find all you need to know in order to apply and gain admission to this study programme by browsing through the information below.

Deadlines and important dates

Early Bird Application

Application: 01/03 - 28/04/2022 (by noon local time)

Language exams: 17 - 18/03/2022 (registrations 1 - 10/03/2022) and 13 - 14 and 19 - 21/04/2022 (registrations 24/03 - 05/04/2022)

Admission procedure and publication of ranking lists: by 17/05/2022

Payment of the 1st instalment of the tuition fees: by 27/05/2022 (by noon local time)

Enrolment: 13/07 - 14/10/2022 (by noon local time)

Late Application (only for EU citizens)

Application: 19/05 - 23/08/2022 (by noon local time)

Language exams: 27/06 - 02/07/2022 (registrations 19/05 - 20/06/2022) and 25/07/2022 (registrations 08 - 18/07/2022)

Admission procedure and publication of ranking lists: by 06/09/2022

Payment of the 1st instalment of the tuition fees: by 13/09/2022 (by noon local time)

Enrolment: 27/07 - 14/10/2022 (by noon local time)

Preparatory courses and Freshers Days

Mathematics pre-course: 22/08 - 02/09/2022

Intensive language courses: 05 - 23/09/2022 (Monday to Friday, 8 h/day)

Freshers Days: 26 - 27/09/2022

1st semester

Classes: 26/09 - 23/12/2022

Exams (extraordinary session): 15 - 23/12/2022

Holidays: 24/12/2022 - 08/01/2023

Classes: 09/01 - 21/01/2023

Exams: 23/01 - 18/02/2023

2nd semester

Classes: 27/02 - 06/04/2023

Holidays: 07/04 - 10/04/2023

Classes: 11/04 - 10/06/2023

Exams (extraordinary session): 17 - 27/05/2023

Exams: 12/06 - 08/07/2023

Autumn session

Exams: 28/08 - 30/09/2023

Available places

EU citizens and citizens are treated equally

Early Bird Application: 25

Late Application: 15

Non-EU citizens (living abroad)

Early Bird Application: 10

The programme will only be offered if a minimum of 12 newly enrolled students is reached.

Entry requirements

In order to gain admission to this programme you need one of the following qualifications:

- Italian bachelor degree (old or new system)
- University diploma
- Foreign qualification obtained abroad and recognized as suitable

Curricular requirements:

1. The admission requirements are:
 - an Italian bachelor degree in the degree class L-9 (Industrial Engineering) ex D.M. 270/2004
 - an Italian bachelor degree in the degree class 10 (Industrial Engineering) ex D.M. 509/1999
 - an Italian degree in another degree class (old or new system), university diploma or other foreign qualification gained abroad and recognized as suitable
2. In the first two cases mentioned above (1a and 1b), you must also have acquired the number of ECTS credit points needed for the Italian degree Laurea in Ingegneria Industriale (class L-9, DM n. 2359, 16 March 2007):
 - Min. 36 ECTS credit points () in the scientific-disciplinary areas of basic subjects.
 - Min. 45 ECTS credit points in the scientific-disciplinary areas of the characterizing subjects of industrial mechanical engineering
3. In the third case mentioned above (1c), the Admissions Committee will check the requirements to determine whether the contents and courses attended are equivalent to the disciplinary fields mentioned at point (2). If you have gained a foreign qualification, the number of credit points awarded to scientific disciplinary sectors will be based on the contents of the exams passed.

4. If you do have the necessary curricular requirements you will not be admitted if your average grade in the bachelor (not including the final exam) is lower than 22/30 (Italian system) or 3,0 (German system)

If you have not yet graduated at the time of application: you can apply if you have acquired at least 150 ECTS credit points. Until your graduation, you will be admitted conditionally. You must have achieved your degree by the enrolment deadline, otherwise you will be excluded.

To be admitted you must fulfil the language requirements indicated in the section “Language requirements”.

Requirements for the Double Degree Programme

In order to gain access to the Double Degree Programme, you need to certify also:

1. 25 credit points within the competence of science and computer science (including at least 15 credits in Mathematics / statistics and 5 credits in Computer Science)
2. at least 20 credit points in the engineering competence (at least 10 credits in Mechanics and 5 in Construction)
3. at least 10 credit points in Economics
4. at least 15 credit points in logistics and production management (logistics, traffic engineering, production planning and control)

At the end of the 3rd semester you must have passed the exams of the 1st semester and document at least 10 weeks of internship in the industrial sector.

If you do not fulfil the requirements in time, you will not be able to graduate with the Double Degree.

Language requirements

The official teaching language is English. Therefore, the following language requirements apply, otherwise you will be excluded from the admission procedure:

Entry level (to gain admission)

English: B2

The levels of the Common European Framework of Reference apply.

You can demonstrate your language proficiency in the application portal (in the section “upload language certificates” and/or “enrol for language exams”) after you have created an application in the section “create/manage applications”.

- In case your final certificate has been awarded by an **Italian** public institution, you need to submit a self-declaration.
- In case your final certificate has been awarded by a **foreign** public institution, you need to upload diploma scanned copy of the original.

You can demonstrate language proficiency through:

1. **the main teaching language in your final high school year** if English (recognised as C1)

2. **a bachelor or master degree** in English (recognised as C1). unibz graduates must upload the language certificates obtained and/or declare that they have passed language exams at the unibz Language Centre (B2, B2+ or C1)
3. **a recognised language certificate** (see the list of recognised certificates) If you cannot upload the certificates, you can send them by e-mail as PDF files or deliver them in person to the Language Centre by the application deadline (see "Deadlines" section).
4. **language exams organised by the unibz Language Centre**. You can register for these exams online through the application portal (in the section "enrol for language exams") after you have filled out your application in the section "create/manage applications". The registration periods are indicated in the "Deadlines" section. If you start your application outside a language exams registration period, you must return to the portal during one of the periods indicated above in order to register for an exam.

Information regarding the structure of the language proficiency exams, their duration, their administration, and typical processing time for the publication of the results can be found on the following webpage: <https://www.unibz.it/en/services/language-centre/language-exams/>.

Online application

Your application must be submitted online through the Application Portal. The deadlines are indicated in the "Deadlines" section.

- You need to create an account and upload a valid ID card or passport (front/back). Please note: if your document is invalid, incomplete or unreadable, you will be excluded from the admission procedure;
- Fill in the online form and upload the attachments listed under "Admission procedure";
- If you gained your qualification abroad, you must also upload the diploma of your qualification: if you are not yet in possession of the diploma, you'll need to upload it upon enrolment;
- Complete and submit the online application by the deadline. Once the application has been sent, it cannot be modified. Filled-in forms which have not been sent correctly will not be taken into consideration.

Please note: Mendacious declarations will be criminally prosecuted and will result in the automatic exclusion from the ranking list.

EU-Citizens and equivalent

You might apply for more than one study programme. If you are excluded in the first session, you might apply again in the second one.

Considered as equivalent are:

1. Citizens from Norway, Iceland, Liechtenstein, Switzerland, San Marino and the Vatican City State;
2. Non-EU citizens with a valid permit to stay in Italy (see article 39, paragraph 5 of decree no. 286 of 25.07.1998: "**permesso di soggiorno**" (residence permit) for work, family reasons, political or humanitarian asylum, religious reasons). In this case, you apply directly to the University as described above and must submit a copy of your valid permit to stay. A permit to stay for study reasons or a visa for tourism is **not**. If the permit has

expired, you must attach a renewal request. **Please note** that if you do not upload the permit in the application portal, you will be automatically considered a non-EU citizen living abroad and therefore subject to the admission procedure through the Italian authorities in your country of origin.

Non-EU-Citizens (living outside of Italy)

Only one application period is offered. After the deadline it is not possible to apply anymore. Application fee: € 30.

Once the ranking list has been published, if you have gained admission, secure it by paying the first instalment and then start your visa application on the University portal. The application on University is mandatory, otherwise you will not be allowed to enrol. On University you can apply for one study programme only.

Admission procedure

You are ranked on the basis of your grade average of the passed exams of the first degree (excluded the final grade of the degree).

A test/interview is required only in case the ranking does not lead to a final ranking list (see Section "Deadlines").

The commission's decision will be based on the competences and soft skills. The Faculty secretariat informs you in case an interview takes place.

In the application portal, you shall upload:

1. Qualification:

- **if graduated in Italy:** diploma supplement or self-declaration (following the Italian D.P.R. no. 445/2000) of the degree awarded with the exams passed (if graduated) or with the exams passed (if not graduated yet);
- **if graduated abroad:** diploma supplement or final degree certificate with exams passed (if graduated) or transcript of records (if not graduated yet) in Italian, German or English.

The above must contain the following information: final grade, exams passed with grade and date of passing, credit points, scientific fields (the latter only for Italian titles).

For qualifications obtained abroad, also: scale of grades awarded by the university of provenance (with a minimum final grade to obtain the qualification and a maximum final grade achievable).

The Faculty reserves the right to request a description of the contents of the courses and/or teaching hours where necessary.

2. Excel file: Please use the file available in the application portal. Applications without a completed excel file will not be considered.

3. Curriculum vitae (English)

Please note: mendacious declarations will be sanctioned by criminal law and will result in your automatic exclusion.

Further documents are required only if you are interested in participating in the double degree programme with the Otto von Guericke University Magdeburg (OvGU):

4. Documentation about previous internships in industry (indicating the number of days/weeks and companies). The missing upload of the form leads to the exclusion from the ranking list for the Double Degree Programme.

Ranking lists

The Admission Committee will only evaluate the documents uploaded in the portal by the application deadline. The ranking lists with the admitted students will be published here and are only valid for the respective academic year.

The general ranking list includes all students who submitted the application for the master.

The second ranking list includes only the students who express their interest in attending the Double Degree Program with Otto von Guericke University Magdeburg (OVGU) through the application portal.

Students on the **waiting list** of the ranking for the double degree programme with Otto von Guericke University Magdeburg (OVGU) of the Early Bird Application will be inserted in the ranking list for the double degree programme of the Late Application (only for those who secured their admission; see chapter below), if there still are available places.

Securing your admission and enrolling

If you have been admitted to more than one study programme, you can only secure your admission in one of them. Doing so you refrain from the admission to other programmes.

1. Choose the study programme and pay the fees (to secure your admission) in the application portal.

The deadlines are indicated in the “Deadlines” section.

If you do not meet this deadline, you will automatically be excluded and the next applicant in the ranking list will be admitted.

For EU citizens and citizens given parity of treatment only: any remaining places of the early bird application, will be offered in the late application.

Please note that you do not gain full student status by only paying the tuition fees. This status will only be acquired upon enrolment. If you have secured your admission, there will be no refund of the tuition fees unless you do not pass your secondary school final exam or, in the event of non-EU applicants living abroad, you do not receive the documents necessary for enrolment from the Italian authorities in your country.

2. Enrol online in the application portal.

The deadlines are indicated in the “Deadlines” section.

Enrolment is recommended as early as possible, so you have the possibility to upload incomplete documents before the deadline.

If you do not meet the enrolment deadline, you will be excluded and the next applicant in the ranking list will be admitted.

Admission with reservation:

If you do not have the required academic qualification, you will be given a conditional offer for a study place and you must submit your qualification upon enrolment. If you achieve your qualification after the enrolment deadline, you cannot enrol, and you will lose your place which will be offered to the subsequent applicant in the ranking list. **Advice:** If you achieve your qualification after the enrolment deadline, you should not pay the tuition fees to confirm the study place. You will be able to submit a late enrolment request and, only if there are study places still available, you can enrol by 16 December 2022.

If you have gained your qualification abroad, you must certify that at the universities in the country where you gained your qualification, you can access to a study programme similar to that chosen at unibz. Therefore you must upload (if not uploaded upon application):

- diploma of your qualification
- official translation of your diploma into Italian (translation is not necessary if it has been issued in German or English)

and one of the following:

- the Diploma supplement, where it must be indicated: that you have achieved at least 180 credit points (ECTS) and that the study title gives access to a Master course. In case of doubt, unibz reserves the right to request the Statement of comparability
- Statement of comparability of your qualification, issued by the Italian Information Centre on Academic Mobility and Equivalence (CIMEA), in the case the Diploma supplement is missing
- declaration of equivalent value of your qualification, issued by the Italian consulate or embassy abroad, as an alternative to the Statement of comparability

Please note that if you do not possess a valid admission qualification, you could be excluded with Rector's decree even after enrolment.

If you are a non-EU citizen living abroad:

If you are eligible for admission (check the ranking lists) and have also applied on University, the Italian Authorities in your own country will issue you the entry visa for studies/university.

This will allow you to arrive in Italy to enrol for the study programme that you have applied for, after passing the admission procedure.

According to Italian law, within 8 working days of your arrival in Italy, you must have applied for the residence permit: as soon as you arrive, get in touch with the Advisory Service and you will be given the necessary information for starting the procedure.

Once you will obtain your residence permit (permesso di soggiorno), you have to hand it in at the Student Secretariat personally or via e-mail.

Students intending to transfer from another Italian University to unibz must submit to the Student Secretariat - at the beginning of the academic year - a copy of the transfer application presented at the university of provenance.

Tuition fees

Fees amount to € 1351.50

- **1st instalment** (€ 751.50)*: includes the provincial tax for the right to study of € 151.50 and a revenue stamp of € 16.
- **2nd instalment** (€ 600): must be paid by 31 March 2023.

Delayed payment of the second instalment will result in a fine being levied. If you have not paid the tuition fees, you will be unable to take exams and will not be able to transfer to other universities or other study programmes.

If you drop out of a programme, interrupt your studies or are excluded from studies, you are not entitled to reimbursement of the fees.

Exemption from the tuition fees (and the provincial tax) is granted to:

- Students with a disability recognized under article 3, paragraph 1, of Law No 104/1992, or with a disability up to or exceeding 66%: the disability certificate, issued by the health authorities, must be handed in at the beginning of the academic year.
- Foreign students who have been granted a scholarship from the Italian government.

Students who benefit from a scholarship granted by the Autonomous Province of Bozen-Bolzano are entitled to receive a refund of the tuition fees.

Recognition of credit points from previous studies

Credit points from previous university studies can only be recognised after enrolment if the exams taken at the university of provenance are equivalent in content to those offered at unibz. You can fill out the application after enrolment.

The Advisory Service provides support regarding your choice of study. In many cases a simple call or a short request is enough to get the relevant information (Tel. +39 0471 012100).

Advisory Service

Universitätsplatz 1 - piazza
Università, 1
Italy - 39100, Bozen-Bolzano
Tel +39 0471 012100
Fax +39 0471 012109
apply@unibz.it

Opening Hours

Tuesdays: 10:00-12:00
Thursdays: 14:00-16:00

Alternatively, you may call us
throughout the week or book an
online appointment