Table of Contents

Master's degree ................................................................................................................................................. 2

Non-Destructive Testing (MSc) • Dresden International University • Dresden ................................................. 2
Master's degree

Non-Destructive Testing (MSc)

Dresden International University • Dresden

Overview

<table>
<thead>
<tr>
<th><strong>Degree</strong></th>
<th>Master of Science</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching language</strong></td>
<td>English</td>
</tr>
<tr>
<td><strong>Languages</strong></td>
<td>Courses are held completely in English. Also the Master’s thesis has to be written in English.</td>
</tr>
<tr>
<td><strong>Programme duration</strong></td>
<td>4 semesters</td>
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<tr>
<td><strong>Beginning</strong></td>
<td>Winter semester</td>
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<tr>
<td><strong>More information on beginning of studies</strong></td>
<td>Students should arrive in Dresden in the week before the studies start.</td>
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<tr>
<td><strong>Application deadline</strong></td>
<td>30 July for the following winter semester</td>
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<tr>
<td><strong>Tuition fees per semester in EUR</strong></td>
<td>4,800</td>
</tr>
<tr>
<td><strong>Additional information on tuition fees</strong></td>
<td>The overall tuition fee for all four semesters is 19,200 EUR. This includes a two-month German language class at the beginning of the course of study. Travel, living, and subsistence costs are not included in the tuition fees.</td>
</tr>
<tr>
<td><strong>Combined Master’s degree / PhD programme</strong></td>
<td>No</td>
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<tr>
<td><strong>Joint degree / double degree programme</strong></td>
<td>Yes</td>
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</table>
| **Description/content** | Material Science  
The micro- and meso-structures of metallic, polymer and composite materials will be explained and the related properties will be described. The course delivers a general understanding of metallic, polymeric and composite materials and the interaction of elastic or electromagnetic waves considered in NDT with different kinds of materials structure.  
Measurement Techniques  
The module covers the physical and electrical basics of different measurement technology, techniques and instruments, and the principles of their operation and application. The second part of the module deals with the statistical treatments of measuring results, measuring error, error propagation, and reliability.  
Mechanics  
The module includes the physics of waves in general, sound and vibration based on mechanical waves in the terms of vibration modes, guided waves and acoustic bulk waves as well as the determination of stresses and strains, fatigue and fracture in materials and components. Topics |
such as damage tolerance design, fatigue, fracture, notches, linear elastic and elastic-plastic material behaviour, crack propagation analysis, multi-axial stress-strain behaviour, and much more will be addressed. Hardware aspects will also be considered.

Numerical Methods & Signal Processing
The course objective is to repeat the fundamentals and to strengthen the skills in the numerical mathematics as well as to develop fundamental knowledge in signal processing.

Introduction to NDT & Quality Management
The module covers an overview on the different NDT techniques and gives an insight into standardisation and certification as well as quality management. Students acquire knowledge of standardisation, certification, and quality management processes involved in NDT as well as quality management process in general.

Acoustic Methods
The scope of the lectures is to impart complex knowledge about NDT of construction elements and materials with the aid of acoustic methods. The lecture content includes ultrasonic excitation, wave propagation in solids, beam focusing and directional introduction of ultrasound and deals with typical principles of ultrasonic transducers and measurement methods as well as phased array monitoring techniques.

Electromagnetic methods
The module covers the physical and electrical engineering basics of magnetic and electromagnetic test methods. It delves into the basics of eddy current and microwave magnetic test methods, including hardware and applications.

Radiological Methods
This module imparts the physical properties of several kinds of radiation and shows the relevant possibilities for materials characterisation and testing of components. This includes typical methods, testing systems and practical applications.

Optical Methods
This module imparts the physical properties of several kinds of radiation and shows the relevant possibilities for materials characterisation and testing of components. The module is also focused on the fundamentals of optoelectronics and thermography from a theoretical, numerical, and experimental point of view. A major focus will be on applications in electronics.

Thermal & Microscopical Methods
Students will learn fundamentals of microscopy and how to use this knowledge in NDT for the benefit of quality assurance.

Course Details

Course organisation
The study is structured modularly. All modules will usually be offered and completed in a consecutive sequence.

In the first semester, students are taught in all the major fundamental disciplines such as material and polymer materials, measurement techniques, sound & vibration and fracture & fatigue, numerical methods & signal processing, and quality management.

In the second semester, the primary emphasis is on the different NDT techniques including acoustics, optics, electromagnetism, radiology and microscopy.

The third semester is devoted to participating in the Basic Course of the German Society for NDT (DGZIP) and a research placement in a reputable research centre such as the affiliates of the different lecturers. These affiliates include BAM in Berlin and Fraunhofer as well as different companies and universities with a specific dedication to NDT.

During the fourth and final semester, students work on their Master’s theses, most likely with the institutions with which they have already undertaken their research placement.

This programme is entirely conducted in English. The modules run consecutively as a block.
primary location of teaching is in Dresden, Germany.

### Types of assessment
Credit points will be awarded after successful participation in the module examination. The written module examinations last between 120-180 minutes. In the third semester, students also have to take an oral examination in combination with a presentation. Of course, the Master’s defence in the fourth semester will also be an oral examination.

### A Diploma supplement will be issued
Yes

### International elements
- International guest lecturers

### Integrated internships
The third semester is devoted to participating in the Basic Course of the German Society for NDT (DGZfP) and a research placement in a reputable research centre such as the affiliates of the different lecturers. These affiliates include BAM in Berlin and Fraunhofer as well as different companies and universities with a specific dedication to NDT. Programme advisers will assist students with finding an appropriate research placement.

### Course-specific, integrated German language courses
Yes

### Course-specific, integrated English language courses
No

## Costs / Funding

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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<tbody>
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</tr>
<tr>
<td><strong>Semester contribution</strong></td>
<td>Included in tuition fees</td>
</tr>
<tr>
<td><strong>Costs of living</strong></td>
<td>The cost of living depends on the lifestyle of each student. It can be calculated to be approx. 850 EUR per month.</td>
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<tr>
<td><strong>Funding opportunities within the university</strong></td>
<td>No</td>
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## Requirements / Registration

**Academic admission requirements**
Master’s/Bachelor’s degree (four years or 180 credit points) preferably in mechanical engineering, electrical engineering, civil engineering, material sciences and physics
<table>
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<tr>
<th><strong>Language requirements</strong></th>
<th>Applicants must provide proof of their English language proficiency (on a level comparable to IELTS 6.0 or TOEFL 550 PBT / TOEFL 79 iBT)</th>
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<tbody>
<tr>
<td><strong>Application deadline</strong></td>
<td>30 July for the following winter semester</td>
</tr>
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</table>
| **Submit application to**  | Dresden International University  
z.H. Jana Schulle  
Freiberger Str. 37  
01067 Dresden  
Germany |

## Services

**Possibility of finding part-time employment**  
It is generally possible to study full-time and work on a part-time basis. With a student visa, students have permission to work 120 days a year. The problem is that the lecture schedule is not identical every week, which makes it difficult to have regular working hours from week to week. In the past, students have found assistant part-time jobs in sales, production, and cleaning services.

**Accommodation**  
Accommodation is available through a room contingent of DIU in a student house or on the private market. Rent for a single room in a student residence ranges between 280 and 380 EUR. Private housing can be found on the Internet at: [http://www.wg-gesucht.de/en/](http://www.wg-gesucht.de/en/).

**Specific specialist or non-specialist support for international students and doctoral candidates**  
- Welcome event  
- Visa matters  
- Pick-up service
Dresden International University was established as a subsidiary university of Dresden University of Technology in April 2003. Currently, more than 2,800 students are registered in 41 courses of studies. The innovative courses of DIU offer clearly structured qualifications on a high academic level. The aims of these programmes are the improvement of academic knowledge and the acquisition of additional practical skills. DIU’s Bachelor’s and Master’s programmes follow an interdisciplinary approach and can be completed either as full-time or part-time studies. Classes are held in English or German. Specifically designed curricula for international students are clearly structured and offer a wide range of courses. Students are thus able to...

„In addition to the double degree, studying in Dresden gave me valuable experience abroad, and I was able to learn more about the German education system. Another huge positive aspect of DIU is that many of the lecturers bring a wealth of professional experience to the classroom. After my subsequent internship at the Federal Institute for Materials Research and Testing (BAM) in Berlin, I was able to complete my Master’s thesis, and I’m now working on my PhD."
acquire a sound and diversified knowledge during seminars and workshops.

Given the interdisciplinary profile of DIU, every course comprises aspects of several academic disciplines. Therefore, the modules of a course deal with all aspects of a specific topic relevant for its comprehensive processing.

About 30% of DIU’s students are foreigners from 30 nations. The intercultural competence of the students and staff, language training and international community life are some of the factors of DIU’s internationalisation. Since 2003, DIU has intensified its international activities in order to attract foreign students to study in Dresden.

The enhancement of students’ qualifications and competencies with a diverse and continuously expanding range of courses is connected to the requirements of the international job market.

Since 2011, a joint campus in Dresden’s World Trade Centre has brought DIU and two further educational institutions - EIPOS and TUDIAS - together. They share infrastructure and back office services. They also make joint use of the available seminar and meeting rooms and lecture theatre.

University location

With its many architectural masterworks, Dresden is the perfect place for people interested in art. The town has beautiful views both night and day, even in grey November weather. From the centrally located Theatre Square, one may view a whole array of architectural wonders such as the Italian Quarter, the Semper Opera House, the Zwinger buildings complex, the old town guardhouse, the castle, and the Catholic Court Church. In inclement weather, one may take advantage of the several museums located within these buildings. In the Zwinger art gallery, one will finds works by Tizian, Rembrandt, Rubens and Raffael, and classical concerts take place here in the evening. The Old Slaughterhouse hosts rock concerts.

The town has an excellent public transport infrastructure, with modern trams and buses, and there is also the possibility of going on town tours on the special double-decker buses.

Not only do aficionados of the baroque style get something out of Dresden; the town also offers a lot of modern architecture such as the town synagogue, the glass factory, the St. Benno Grammar School, the World Trade Centre - to name but a few buildings. Those interested in technology will find exhibitions in the Dresden University of Technology, the Technical Museum, the Museum of Transport, or the Tram Museum.

The nightlife in Dresden is similarly entertaining. For those interested in sports, one should experience a performance in the new stadium, in the sports centre in the Bodenbach Street or in the ice skating rink, or in one of the many sports clubs.

Of special appeal in and around Dresden is the location on the Elbe River. The Elbe valley has many attractions to offer, all worth visiting, and giving the opportunity to meet local people. As well as museums and monuments, there are castles, mansions, stately gardens and parks affording insight into the history, geology and geography of the area. Castles in Moritzburg, in Meißen, and in Radebeul as well as the baroque garden in Großsedlitz are representative of the many places of outstanding beauty and interest.

The Saxon wine alley follows Germany’s smallest and most northerly wine production region, with an 800-year viticultural heritage. The wine terraces lie idyllically beneath castles and fortresses. Several wine bars and cellars are open for wine-tasting sessions. The area is accessible by means of quiet pathways or by cycle paths.

It is worth partaking of a day trip into the Elbe sandstone mountains area, also known as “Saxonian Switzerland”, where you have the opportunity for hiking and climbing unique rock formations. With its woods and hills of up to 800m in height, the Ore Mountains are an ideal place for walks in summer and skiing in winter.
Contact

Dresden International University
Competence Centre Natural and Engineering Sciences

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01067 Dresden

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Email: ndt@di-uni.de

Course website: https://www.di-uni.de/studium-weiterbildung/ingenieurwesen/non-destructive-testing-int

https://twitter.com/dresdenu
https://www.linkedin.com/school/diu-dresden/
https://www.instagram.com/diu_dresden/

Last update 25.08.2020 18:24:05
International Programmes in Germany - Database

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Editor
DAAD - Deutscher Akademischer Austauschdienst e.V.
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The publication is funded by the German Federal Ministry of Education and Research and by contributions of the participating German institutions of higher education.