Table of Contents

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

Railway Systems Engineering • RWTH Aachen University • Aachen ................................................................. 2
# Master's degree

## Railway Systems Engineering

**RWTH Aachen University • Aachen**

## 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>The language of the programme is English. Participants can attend elective subjects taught in German.</td>
</tr>
<tr>
<td><strong>Programme duration</strong></td>
<td>4 semesters</td>
</tr>
<tr>
<td><strong>Beginning</strong></td>
<td>Winter and summer semester</td>
</tr>
</tbody>
</table>
| **Application deadline** | EU/EEA applicants: 15 July for the following winter semester and 15 January for the following summer semester  
Non-EU/non-EEA applicants: 1 March for the following winter semester and 1 September for the following summer semester |
| **Tuition fees per semester in EUR** | None |
| **Combined Master's degree / PhD programme** | No |
| **Joint degree / double degree programme** | No |
| **Description/content** | How can innovative ideas in rail vehicle construction enable new transport concepts? How can transport networks be logically developed, expanded, relieved, and ecologically planned? How can factors like rolling stock and routing be managed in a way that need-oriented and smooth railway traffic is possible? How do random disturbances in transportation have to be considered in order to avoid jamming or to optimise safety strategies? How can we shift more passenger and freight transport to the rails? Is driverless operation possible for all kinds of rail transport means? When the interaction of technical possibilities, infrastructure, and human behaviour is supposed to be optimised, transport engineers are called upon for their interdisciplinary perspective.  
Students of the Railway Systems Engineering programme acquire this interdisciplinary expertise by studying the perspectives of three engineering disciplines: civil engineering, mechanical engineering, and electrical engineering. The specialisation Railway Systems Engineering (RSE) concentrates on the further development of railway engineering. Students work with rail vehicles, rail transportation systems, and infrastructure developments in rail transportation. This Master's |
Course Details

Course organisation

The faculties of Civil Engineering, Mechanical Engineering, Electrical Engineering and the School of Business and Economics have established an interdisciplinary study programme on the field of transportation called Transport Engineering and Mobility.

The Master’s programme is offered in six specialisations, covering all kinds of transportation. While five of them are only offered in German, the Master’s programme Railway Systems Engineering (RSE) is offered in German (“Bahnsystemingenieur”) as well as in English.

The RSE Master’s programme is organised by the Research Center Railways, a cooperation between three institutes from the three different engineering faculties mentioned above. These are:

Institute of Transportation Science and Chair of Railway Engineering and Transport Economics (VIA)
See: http://www.via.rwth-aachen.de

Chair and Institute of Rail Vehicles and Transport Systems (IFS)
See: http://www.ifs.rwth-aachen.de

Chair and Institute for Power Electronics and Electrical Drives (ISEA)
See: https://www.isea.rwth-aachen.de/

Exemplary study plan
First semester:

- Railway Systems
- Principles of Rail Vehicle Technology
- Power Electronics - Fundamentals, Topologies and Analysis
- Environmental Sustainability in Transport Engineering
- Introduction to Scientific Computing
Second semester:

- Railway Control Systems
- Rail Vehicle Vibration Dynamics
- Mechatronic Systems in Vehicle Engineering
- Electrical Drives
- Mobility Research and Transport Modelling
- Power Electronics - Control, Synthesis and Applications

Third semester:

- Track Guiding Technology
- Sustainability Strategies in Politics and Companies
- Railway Capacity Management and Operations
- Railway Operations Lab
- Internship of 12 weeks

Fourth semester:

- Master's thesis
- Multibody Dynamics

Types of assessment

This programme includes written examinations, oral examinations, homework, and seminar papers.

A Diploma supplement will be issued

Yes

International elements

- Language training provided
- Study trips
- Projects with partners in Germany and abroad
- International comparisons and thematic reference to the international context

Integrated internships

An internship is integrated into the Master's degree programme. This internship should take place at a railway-specific company or research institution and should encompass typical engineering tasks. After successful completion of the internship, students will be awarded up to 20 ECTS credit points.

Course-specific, integrated German language courses

No

Course-specific, integrated English language courses

No

The course of study can be taken entirely online

No

Digital learning and teaching modules

- Video learning

Description of e-learning elements

Faculty members provide audio slide casts.

Participation in the e-learning course elements is compulsory

No
Can ECTS points be acquired by taking the online programmes? No

Can the e-learning elements be taken without signing up for the course of study? No

Costs / Funding

Tuition fees per semester in EUR None

Semester contribution All RWTH students must pay a social contribution to student services amounting to approx. 260 EUR per semester. This is not a tuition fee. Please visit our website for further information on how the fee is spent: http://www.rwth-aachen.de/re-enrollment/?lidx=1

Costs of living The cost of living is approximately 800 EUR per month (plus the social contribution fee each semester).

Funding opportunities within the university Yes

Description of the above-mentioned funding opportunities within the university RWTH offers a variety of scholarships. Please find more information online: http://www.rwth-aachen.de/go/id/dyiv/lidx/1

Requirements / Registration

Academic admission requirements Academic admission requirements include a first university degree that proves the necessary engineering background education as outlined in the exam regulations. The applicants should have completed 18 ECTS credit points in mathematics/statistics (at least 14 ECTS credit points in mathematics and 2 ECTS credit points in statistics), and 11 ECTS credit points in mechanics. Furthermore, they have to prove knowledge equivalent to at least 10 ECTS credit points in at least two of the following topics: construction material science, geotechnology, environmental management, hydromechanics, thermodynamics, or electrical engineering. Additionally, subject-specific knowledge worth 50 ECTS credit points is required. From this subject-specific knowledge, at least 10 ECTS credit points each need to be out of two of the following fields: transportation science, mechanical engineering, electrical engineering, construction engineering, urban planning, and computer science.

If up to 30 ECTS credit points of the requirements are not fulfilled, students have to attend additional courses from the Bachelor's degree programme. These courses are only offered in German.

In addition, proof of the Graduate Record Examination (GRE) General Test is required. Applicants who are nationals of a member state of the European Union or of the European Economic Area (EEA) as well as foreign students are exempt from this requirement.

Language requirements In addition to the subject-related prerequisites, applicants must show proof of a profound level of the English language, at least equivalent to B2 level of the Common European Framework of Reference for Languages (CEFR).
The following language tests are accepted as proof of English language skills:

- Test of English as Foreign Language/TOEFL, Internet-based test IBT, with at least 90 points
- International English Language Testing System, IELTS, with a grade of at least 5.5
- Certificate of Advanced English CAE
- First Certificate in English FCE, with a grade of at least B
- Any official certificate that certifies English language skills at level B2 of the Common European Frame of Reference for Languages, CEFR
- Placement test of the RWTH Aachen Language Center at the B2 level (This language certificate can only be obtained by individuals who are already enrolled as students at RWTH Aachen.)

Application deadline

EU/EEA applicants: 15 July for the following winter semester and 15 January for the following summer semester
Non-EU/non-EEA applicants: 1 March for the following winter semester and 1 September for the following summer semester

Submit application to

Please submit your application online: http://www.rwth-aachen.de/go/id/dqml/lidx/1/

Services

Possibility of finding part-time employment

International students may take up work in the private sector during the semester or the semester break for up to three months without having obtained a work permit. Students thus may take up full-time work for 120 days or part-time positions for 240 days. This regulation is also stated on the residence permit. During the semester, students are allowed to take up jobs with working hours of up to 20 hours a week. Student assistants are more flexible as regards working hours.

Accommodation

University accommodation in Aachen is limited. Therefore, participation in individual allocation procedures is usually required. Because of the demand for university accommodation, it can be necessary to switch to the private accommodation market. Family and couples apartments are in especially high demand. Therefore, it is likely that students who require this kind of accommodation must seek accommodation on the private market. The majority of RWTH Aachen University’s students are committed to the private accommodation market. There are a number of options for finding private accommodation in and around Aachen. The International Office can provide students with information beforehand or upon their arrival. Prices for university accommodation vary between 200 EUR and 330 EUR per month. Accommodation on the private market is priced between 290 EUR and 550 EUR per month, depending on the size and the number of rooms. For short-term accommodation, there are many hotels, a few youth hostels, and a boardinghouse located in and around Aachen (reservation is recommended). Please visit https://www.rwth-aachen.de/housing for further information.

Career advisory service

The RWTH Aachen University Career Center offers support by providing opportunities that strengthen your professionalism and exercise your individual skills in the application process. All enrolled RWTH Aachen University students can participate in the Career Center seminars. Please find more information online: https://www.rwth-aachen.de/go/id/sff/?lidx=1

Specific specialist or non-specialist support for international students and doctoral candidates

- Welcome event
- Buddy programme
- Cultural and linguistic preparation
- Visa matters
With 260 institutes in nine faculties, RWTH Aachen University is one of Europe’s leading institutions for science and research. Currently, more than 44,500 students are enrolled in 144 academic programmes. More than 8,500 of them are international students hailing from 130 different countries. The scientific education students receive at RWTH Aachen University is firmly rooted in real-world application. As a
result, our graduates are highly sought after by businesses to work as trainees and fill executive positions. National and international rankings show that our graduates have a high aptitude for managing complex tasks, constructively solving problems in teams, and taking on leadership responsibilities. Thus, it should come as no surprise that one in five board members of German corporations is an alumnus of RWTH Aachen University.

Work conducted in the research centres at RWTH Aachen University is strongly oriented towards the current needs of industry, commerce, and the professions. This has resulted in numerous innovations, patents, and licences. The individual competence centres at RWTH Aachen University collaborate effectively across departments and faculties in interdisciplinary groups and forums, while still maintaining a strong focus on their own department specialisation. For instance, the computer science and biology departments - and even the social sciences - all have a clear connection to the school’s engineering focus. This has been a crucial factor in motivating multinational corporations such as Philips, Microsoft, and Ford to locate their research institutions in the Aachen region.

Excellence in teaching and research constitutes the basis from which RWTH Aachen University works with other leading institutions and technical universities around the world.

University location

As Germany’s westernmost city, Aachen is located on the borders of Belgium and the Netherlands. Its population is about 260,000. Aachen's historic centre around the distinctive cathedral (UNESCO world heritage site) is characterised by a student lifestyle. At the city’s doorstep, the hilly Eifel landscape with its rivers, lakes, and forests offers a picturesque countryside for outdoor recreation. Aachen benefits from its central location in the heart of Europe!

Contact

RWTH Aachen University
Faculty of Civil Engineering

Mies-van-der-Rohe-Straße 1
52074 Aachen

support@fb3.rwth-aachen.de
Course website: https://www.fb3.rwth-aachen.de/go/id/otan/?lidx=1

https://de-de.facebook.com/IO.ISC/
https://twitter.com/RWTH
https://www.instagram.com/rwthaachenuniversity/?hl=de

Last update 03.08.2020 01:21:08
International Programmes in Germany - Database

www.daad.de/international-programmes
www.daad.de/sommerkurse

Editor
DAAD - Deutscher Akademischer Austauschdienst e.V.
German Academic Exchange Service
Section K23 - Information on Studying in Germany
(responsible: Judith Lesch)
Kennedyallee 50
D-53175 Bonn
www.daad.de

GATE-Germany
Consortium for International Higher Education Marketing
www.gate-germany.de

Disclaimer
The data used for this database was collected and analysed in good faith and with due diligence. The DAAD and the Content5 AG accept no liability for the correctness of the data contained in the "International Programmes in Germany" and "Language and Short Courses in Germany".

The publication is funded by the German Federal Ministry of Education and Research and by contributions of the participating German institutions of higher education.