



Deutscher Akademischer Austauschdienst
German Academic Exchange Service



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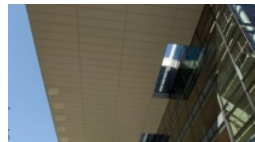
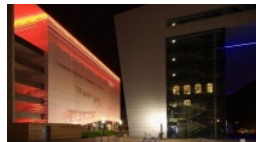
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Master's degree



Advanced Computational Methods in Civil Engineering

RWTH Aachen University • Aachen



Overview

Degree	Master of Science
Teaching language	<ul style="list-style-type: none">English
Languages	The language of the programme is English. Participants can attend elective subjects taught in German.
Programme duration	4 semesters
Beginning	Winter and summer semester
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	<p>Over the last few decades, computational methods in civil engineering have grown to become an essential tool for engineers.</p> <p>Nowadays, nearly every engineering problem can be solved solely with this tool. As a reaction to the ever-growing importance of computational methods for the modern civil engineer, the Faculty of Civil Engineering at RWTH Aachen University has developed the new specialisation Advanced Computational Methods in Civil Engineering (AdCom) for the Civil Engineering Master's degree programme. Taught completely in English, this specialisation lends itself not only to the tendencies of present-day engineering but also to the future of civil engineering. AdCom graduates are able to apply and develop numerical methods and simulations for the realisation of innovative civil engineering structures. The curriculum is interdisciplinary with courses from the faculties of Civil Engineering, Mechanical Engineering and Mathematics. This allows students to obtain a deeper understanding of the key skills in structural mechanics, fluid mechanics, and numerical mathematics.</p>

Students will learn to master challenges such as those which arise from the use of new resource-conserving materials and advanced composite materials as well as those that arise from the trend towards extremely light load-bearing structures. The development of state-of-the-art lightweight structures, which are subject to dynamic loads such as wind and traffic, will be just one of many expertises that our students possess. The knowledge and use of numerical methods, mechanical principles and the development of software code account for just a fraction of skills that make up our students' repertoire, which enables them to assess the strength and limits of numerical modelling in civil engineering.

The curriculum of Advanced Computational Methods in Civil Engineering is highly scientific and research-oriented and thus prepares graduates for a PhD programme and ultimately a scientific career in research or in industry. To prepare students for such a future, a new research module and a scientific mini-thesis are a part of the curriculum in addition to the Master's thesis.

Future opportunities

The Master's programme has a strong focus on research that is accompanied by an excellent international reputation. This is especially present in the second year, where students work side by side with university researchers, thus gaining unique insights and experience in modern scientific methodologies.

Engineers with expertise in computational methods are multidisciplinary trained professionals. They are able to pursue a successful career not only in academics but also in an industrial environment, which could range from classic civil engineering to the various areas of mechanical engineering.

Course Details

Course organisation

The faculty of Civil Engineering offers a Master's programme with eight areas of specialisation. While seven of them are only offered in German, the Master's programme [Advanced Computational Methods in Civil Engineering \(AdCom\)](#) is offered in English.

The AdCom Master's programme is organised by the **Chair of Structural Analysis and Dynamics (LBB)** and the **Institute of Applied Mechanics (IFAM)**.

LBB website: www.lbb.rwth-aachen.de

IFAM website: www.ifam.rwth-aachen.de

Example of a study plan

First semester:

- Plates and Shells
- Mechanics of Materials
- Structural Steel III
- Finite Elements in Fluids

Second semester:

- Brittle-Matrix-Composite Structures: Modelling and Design Methods
- Continuum Mechanics
- Nonlinear Structural Analysis
- Finite Element Technology

Third semester:

- Research Module: Numerical Methods in Structural Mechanics and Dynamics
- Selected Topics of Inelasticity Theory
- Advanced Structural Analysis
- Numerical Methods for Fluid-Structure Interaction

Fourth semester:

- Master's Thesis

- Porous Media Mechanics

Curriculum available at: https://www.fb3.rwth-aachen.de/global/show_document.asp?id=aaaaaaaabwolovz

A Diploma supplement will be issued	Yes
International elements	<ul style="list-style-type: none"> • Language training provided • Study trips • Projects with partners in Germany and abroad • International comparisons and thematic reference to the international context
Course-specific, integrated German language courses	No
Course-specific, integrated English language courses	No

Costs / Funding

Tuition fees per semester in EUR	None
Semester contribution	All RWTH students must pay a social contribution to student services, which amounts to approx. 317 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 1,132 EUR per month (including social contribution fee for 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	<p>One of the prerequisites for studying this Master's degree programme is a first university degree, which proves the necessary background education.</p> <p>Applicants must have a profound knowledge in following areas:</p> <p>Mathematical-physical basics (38 CP):</p> <ul style="list-style-type: none"> • mathematics: 16 CP • statistics: 3 CP
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- mechanics: 16 CP
- hydromechanics: 3 CP

Civil engineering basics (80 CP), whereof at least 20 CP each must be demonstrated from two of the areas listed below:

- constructive engineering
- water management
- construction operations and geotechnics
- transportation

The examination board may admit a student to a Master's course of study on the condition that they obtain additional qualifications. Proof of completion of such additional requirements must be provided before registering for the Master's thesis.

Admission to the Master's programme civil engineering is not possible if your additional requirements exceed the CP listed below:

- mathematical-physical basics: 9 CP
- civil engineering basics: 26 CP
- the total scope of all additional requirements: 30 CP

In addition to the subject-related prerequisites, applicants must show proof of a profound level of the English language (see below).

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 as well as applicants who have successfully passed the German "Abitur" (regardless of where they have earned their Bachelor's degree) are exempt from this requirement.

Language requirements	<p>Applicants must show proof of a profound level of the English language, at least equivalent to the B2 level of the Common European Framework of Reference for Languages (CEFR).</p> <p>The following language tests are accepted as proof of English language skills:</p> <ul style="list-style-type: none"> • 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	<p>EU/EEA applicants: 15 July for the following winter semester and 15 January for the following summer semester</p> <p>Non-EU / non-EEA applicants: 1 March for the following winter semester and 1 September for the following summer semester</p>
Submit application to	<p>Please submit your application online: http://www.rwth-aachen.de/go/id/dqml/lidx/1/</p>

Services

Possibility of finding part-time employment	<p>International students may take up work in the private sector during the semester or in the semester breaks for up to three months without having to obtain a work permit. Students may thus take up full-time work for 120 days or part-time positions for 240 days. This regulation is also stated</p>
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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 with regard to working hours.

Accommodation

Availability of 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.

Especially family and couples apartments are very high in demand, so that accommodation from the private market is seemingly mandatory. 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.

Accommodation on the private market is priced between 290 EUR and 550 EUR per month, of course 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 seminars at the Career Center.

Please find more information online: <https://www.rwth-aachen.de/go/id/sff/?lidx=1>

Support for international students and doctoral candidates

- Welcome event
- Buddy programme
- Cultural and linguistic preparation
- Visa matters



Civil Engineering RWTH Aachen University – All About Transportation

This is the official YouTube channel of the Open Educational Resource Initiative of the Faculty of Civil Engineering at RWTH Aachen University. This channel offers a variety of videos showing the many facets of basic and current research in the area of civil engineering.

» more:

<https://www.youtube.com/watch?v=vkzgcJGdUnA&list=PLxQWK4LR7JyMLcOZhyBdxbwW4MbM11Ce4>

RWTH Aachen University



RWTH Aachen main building

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With 260 institutes in nine faculties, RWTH Aachen University is one of Europe's leading institutions for science and research. Currently, more than 47,000 students are enrolled in 173 academic programmes. More than 14,150 of them are international students hailing from 138 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

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🌐 Course website: <https://www.fb3.rwth-aachen.de/cms/Bauingenieurwesen/Studium/Studiengaenge/Masterstudiengaenge/Text-M-Sc-Bau/Studienschwerpunkte-Bauingenieurwesen-M/~otcz/Advanced-Computational-Methods-in-Civil/>

● <https://twitter.com/RWTH>

📷 <https://www.instagram.com/rwthaachenuniversity/?hl=de>

Last update 25.04.2024 14:31:17

International Programmes in Germany - Database

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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.



Federal Ministry
of Education
and Research