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Language course/short course



Robotics, Communication Networks and Innovation

RWTH Aachen University • Aachen



Overview

Course location	Aachen
Teaching language	<ul style="list-style-type: none">English
Language level of course	<ul style="list-style-type: none">English: B2
Date(s)	<ul style="list-style-type: none">July 2021 (Registration deadline of course provider: April 01, 2021)
Target group	<ul style="list-style-type: none">✓ BSc/BE students enrolled at a renowned university✓ Studying mechanical engineering or a related field✓ Minimum age to participate is 18✓ Minimum English language proficiency <p>Please note: Interested students should be studying mechanical engineering and show strong technical interests. Moreover, they should have acquired basic skills in technical mechanics, automation technology, robotics, mechatronics and have basic knowledge of computer science.</p> <p>Have a look at our application information and check out our FAQ!</p>
Description/content	<p>For further information about this programme, click here.</p> <p>Academic Content</p> <p>Robotic Systems, Kinematics and Dynamics</p> <p>The course gives an overview of the main areas of robotics, whereby the mechanical structure as well as the mechatronic components used in robotics are the focus. The fundamentals of kinematic and dynamic analysis are introduced. The aim is to develop skills in the selection, synthesis, development, equipment and implementation of robotic systems based on a given handling, welding and e-commerce task.</p> <p>After a detailed introduction into the development of robotics and different fields of application, the classification and the selection of suitable robots will be discussed. Later, the focus will be on the components and the application of robotic systems. Within the framework of a laboratory exercise, the students can solve and plan handling, welding and e-commerce tasks and check the solutions hands-on with a robot education cell on a real industrial robot. In addition to that, presentations cover the fundamental theoretical aspects of robot mathematics, hence kinematic and dynamic analysis of a handling device. The presented topics span from the bare structure of a robotic handling problem to the abstract modelling and numerical optimisation of robot motion.</p>

Information Theory and Systematic Design of Communication Systems

After showing the history of information theory and communication systems, the course introduces the basics of stochastic modelling, e.g. basic rules of probability theory, random variables, random vectors and transformations and stochastic models for mobile radio channels. Then participants will learn the elements of information transmission, such as discrete models for entropy and transinformation, capacity, source coding, channel capacity and the fundamental theorem of channel coding. Throughout the course, we will also see many applications. The second part of this lecture addresses solving the occurring problems. In the last two decades, important problems in modern communication technology have been solved by means of optimisation methods. In this course, the corresponding theory and efficient solution methods are provided. These are demonstrated with a variety of current examples from information theory and communication technology, e.g. power control in wireless networks and rate adaptation in multicarrier systems. Special emphasis is placed on modelling, convex optimisation, Lagrange duality and Karush-Kuhn-Tucker conditions. Further, we will address linear programming, branch-and-bound, heuristics for channel allocation, simulated annealing and other randomised procedures.

Average number of hours per week 30

Average number of participants per group/course 25

Costs / Funding

Dates and costs

- July 2021 (Registration deadline of course provider: April 01, 2021), costs: EUR 2,990

This price includes

- Course fees
- Accommodation
- Accompanying programme

Further information on dates and prices The programme fees amount to **2,990 EUR** for the **three-week** summer school programme.

The programme fees contain an **"all-inclusive" package**:

- ✓ Lectures
- ✓ Course materials
- ✓ Excursions and social events
- ✓ Accommodation (usually three- or four-bed rooms)
- ✓ Breakfast and lunch on weekdays
- ✓ Snacks or meals during selected social events
- ✓ A local public transportation ticket for the respective time in Aachen
- ✓ Our RWTH International Academy App

Requirements / Registration

Teaching language

- English

Language level of course

- English: B2

Language requirements

We don't require an English language proficiency test. However, we recommend a self-evaluation of your English language level according to one of the following scores to make sure that you are able to follow the lessons:

- TOEFL ibt : 72 points
- IELTS: 5.5 band score
- TOEIC: 785 points
- Cambridge: FCE, Grade C
- CEFR = B2

Submit application to

Apply for the summer school programmes via our [online application](#) form. For detailed information, please visit the [programme website](#).

EARLY BIRD DEADLINE: 1 MARCH 2021

APPLICATION DEADLINE: 1 APRIL 2021

Your short-term programme team wishes you good luck!

Services

Is accommodation organised?

Accommodation is arranged by the organiser.

Type of accommodation

All boarding houses and student accommodations are located close to the city centre and allow for easy and convenient transportation within Aachen as well as to neighbouring cities. The following information relates to the size and furnishing of standard rooms, but please note that rooms might differ from these standards. Unfortunately, a choice of rooms is not possible.

Since all participants of each individual programme will be staying in the same accommodation, you will get to know your classmates better by living in an environment that is similar to the dorms offered by the university.

Key facts

- Accommodation in three- or four-bed rooms
- Bathroom en-suite
- Internet access included (free Wi-Fi, quality might vary)
- Kitchen (might vary)
- Tap water is drinkable
- Linen included
- One towel will be provided (please bring more if required)
- Laundry service nearby

Meals

Breakfast and lunch as well as snacks during selected events are included in the programme fees. For more details, please read the information below.

Breakfast

From Monday to Friday, breakfast is included in the programme fees.

Lunch

We will provide lunch from Monday to Friday at the RWTH student restaurant. A student restaurant card will be provided on your first day.

Dinner and meals at weekends

Participants have to provide their own meals at weekends and in the evening on weekdays. A

personal budget for individual needs is advised.

Is a social and leisure programme offered?	Yes
Description of social and leisure programme	<p>SOCIAL EVENTS – Have Fun While Studying! We offer you a wide range of social activities to experience German culture and student life at RWTH Aachen University (subject to availability depending on the programme).</p> <ul style="list-style-type: none">• On-site company visits of RWTH’s industrial partners• Guided tours of RWTH institutes and renowned research centres• Intercultural training• City excursions: Maastricht (NL), Cologne, Bonn• Hiking tour to the border triangle• City rally• Sports day• Barbecue• Dinner night• Karaoke night• Get-togethers with your summer mentors <p>SUMMER MENTORS All summer school programmes will have their own summer mentors, who will help you to get to know Aachen from a true student’s perspective. With the support of the mentors, who are typically students enrolled at RWTH Aachen University, you will learn more about academic and cultural practices in Germany.</p>
Free internet access	Yes
Support in visa matters	Yes
Pick-up service from train station/airport	Yes



RWTH International Academy

Mihail Petrov
Summer School

„My time in Aachen was incredible. Through everyday companionship and studying together, I made lots of new friendships, not only with other students but also with the summer mentors, and they made Aachen unforgettable. The organisation was of the highest quality, and I can't wait to return to the beautiful city of Aachen.“



RWTH Engineering Summer and Winter Schools

RWTH Engineering Summer and
Winter Schools

» more: <https://bit.ly/2KLiEtu>

RWTH Aachen University



With 260 institutes, nine faculties and three Clusters of Excellence, RWTH Aachen University is one of Europe's leading institutions for science and research. Currently, more than 45,600 students are enrolled in 162 courses of study. Of these students, 11,280 are international students. RWTH Aachen is well-known for its state-of-the-art education that tackles some of the world's most pressing global challenges. Our graduates are highly sought after by businesses and industry as trainees and for executive positions.

As the official academy for education of RWTH Aachen University, RWTH International Academy is tasked with promoting and developing the integration of professional and academic education. Our goal is to make knowledge accessible to international participants through application-oriented educational formats and programmes, thus making a lasting contribution to lifelong learning.

University location


The student city of Aachen is a vibrant and historic place located at the border triangle of Germany, Belgium and the Netherlands. Aachen was a favoured residence of Charlemagne. After the departure of the Romans from this region, Charlemagne finally managed to forge the lion's share of Europe into something that resembled an administrative unity, with Aachen as the beating heart of the empire. The "Rathaus" (city hall) and "Dom" (cathedral) bear witness to this earliest Carolingian building history. During your time in Aachen, you have the opportunity to discover the city, its history and its most important sights. Moreover, you will experience student life at one of Europe's leading technical universities and become part of the international student community. There is no better place to encounter European culture while challenging yourself in our programmes.

Contact

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RWTH International Academy

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www.daad.de/sommerkurse

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GATE-Germany

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Disclaimer

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