Carl Benz School

Karlsruhe Institute of Technology

Carl Benz School of Engineering

Mechanical Engineering College
of the Karlsruhe Institute of Technology

Mechanical Engineering (International) Bachelor Program & Summer Schools

Karlsruhe, Germany | English-Taught

Carl Benz School of Engineering

Carl
Benz
School

A message from the chairman of the industrial associates board

Germany is well-known for its developing capability and manufacturing of high-end goods of value and quality. German products, especially from the mechanical and automotive engineering industries and those resulting from electrical and optical manufacturing processes, are highly successful in the world market. Mechanical engineers from Germany have always had an excellent reputation and are in high demand worldwide.

Such engineers are the result of a very successful and systematic education in the engineering sciences. German technical universities have been educating and training budding engineers for over 250 years. The Karlsruhe Institute of Technology (KIT) is one of them. Outstanding rankings and evaluations vouch for the standard of research and education at KIT worldwide. It is located in the German federal state of Baden-Württemberg, a leading area with the highest innovation performance in Germany due to its technology centers, Karlsruhe and Stuttgart. These two cities are the top locations for leading companies like Bosch, Siemens and Daimler.

The Carl Benz School of Engineering is the Mechanical Engineering College of KIT. The college offers outstanding international students the opportunity to study mechanical engineering in English at KIT. Carl Benz School students also have the chance to take part in technological innovations happening in the research facilities of the outstanding institutes. Besides receiving an excellent education, the graduates will also meet the demands of international companies looking for prospective world-class engineers and scientists.

The Carl Benz School strives to offer the best education and training in mechanical engineering, in close cooperation with industry, to nurture and prepare new leaders in engineering, development and production.

Carl Benz and Gottlieb Daimler, two distinguished engineers who changed the world by laying the foundation for the production of cars and developing the automobile, also lived in the vicinity of Karlsruhe in their time. Carl Benz was a student at the Karlsruhe Polytechnic College which is now known as KIT. History connects the Carl Benz School to its roots of quality and excellence and provides a network for future graduates. We are proud of our heritage. The institution provides the perfect environment to educate potential future pioneers in new technologies.

Prof. Dr. Herbert Kohler

Chairman of the Industrial Associates Board of the International Department of the Karlsruhe Institute of Technology gGmbH

Former Vice President Group Research & Sustainability

Former Chief Environmental Officer Daimler AG

The Karlsruhe Institute of Technology (KIT): Study with the Best

QS WORLD UNIVERSITY RANKINGS

#1 Germany

QS Employability Ranking #10 #46

Europe | Worldwide

The Karlsruhe Institute of Technology (KIT) is one of the leading universities for mechanical engineering in Germany and Europe. Outstanding rankings and evaluations vouch for the standard of research and education at the KIT*.

This is without a doubt the most beneficial result of the 2006 merger of the Karlsruhe Research Centre and the former University of Karlsruhe, which dates back to 1825. Currently, the KIT is one of the largest research and teaching institutions in the world.

Students also rate mechanical engineering studies in Karlsruhe among the top programs in Germany due to a systematic, balanced curriculum and excellent teaching staff.

World-Class Mechanical Engineering at the KIT

The Department of Mechanical Engineering at the KIT comprises more than 20 institutes, which manage student courses and research in the various branches of engineering. The department is consistently awarded top reviews for all its activities.

Nationwide, the KIT is one of the universities most strongly engaged in research. Nevertheless, admidst all the research and teaching activities of the department, the importance of practical relevance is stressed. Main aspects are energy and environmentally-friendly technologies, automotive research and technology, materials science and technology, product design and development, production technology and mechatronics, and micro systems technology.

Constantly ranked amongst the top, the KIT is one of the best institutions where one can receive a high quality engineering education for a bright future.

A particular specialty is theoretical mechanical engineering. This fundamental and methodological research in mechanical engineering is counterbalanced at the KIT and complemented by application-oriented research. The department benefits greatly from its international connections and its many research collaborations with the industry. This priority represents the perfect basis for an English-taught Mechanical Engineering (International) Bachelor Program at the Carl Benz School of the KIT.

KIT Infrastructure

As Carl Benz School is the Mechanical Engineering College of the KIT, Carl Benz School students benefit from the comprehensive university infrastructure of the KIT. For example, they have access to the 24/7-Library, the cafeteria or the KIT culture, music and sport programs.

As a university with a long mechanical engineering tradition, the KIT has numerous student organisations related to engineering where students can put the theory from their lectures into practice.

There is, for instance, a formula student team (KA-RaceIng), a group working on autonomous model cars (KITcar), students building and flying sailplanes (Akaflieg) or a team for innovative field robots (KaMaRo Engineering e.V.).

* www.carlbenzschool.kit.edu/rankings.php

Karlsruhe Institute of Technology

Bachelor Program Mechanical Engineering (International)

A bachelor degree from the Karlsruhe Institute of Technology (KIT), one of the leading technical universities worldwide

The Carl Benz School of Engineering (CBS) offers high school graduates the unique opportunity to study internationally renowned German engineering in English. The three-year bachelor program (B.Sc.) aims to prepare future engineers for a successful, international career in the field of mechanical engineering.

The Karlsruhe Institute of Technology (KIT) is ranked #1 in mechanical engineering amongst all German universities and achieves numerous top placements every year. As the Mechanical Engineering College of the KIT, the CBS offers high-quality lectures by excellent professors of the KIT. All students receive an individualized all-in-one service package, support, additional training as study and career guidance in order to develop their professional profile.

Basic criteria for admission include excellent grades in mathematics and physics. Furthermore, applicants must be proficient in the English language. Recommended high school degrees are an International Baccalaureate, A-Level or Abitur.

BACHELOR OF SCIENCE (B.SC.) OF THE KIT

3 Years (6 Semester)

SPECIALIZATION & BACHELOR THESIS (Semester 5 - 6)

Special: Smart Projects
SmartFactory@Industry | SmartCoop@KIT | SmartScience@KIT

Global Production Management

Global Production Engineering
Global Logistics | Virtual Engineering
Automated Production Systems

Automotive Engineering

Automotive Engineering
Vehicle Ride Comfort & Acoustics
Machine Dynamics

Energy Engineering

Technical Combustion
Heat & Mass Transfer
Fundamentals Energy Technology

ADVANCED COURSES (Semester 5 - 6)

Machines & Processes | Fluid Mechanics | Measurement & Control Systems | Production Operation Management

FUNDAMENTAL COURSES (Semester 1 - 4)

Advanced Mathematics
Computer Science in Mechanical Engineering
Material Science

Mechanical Design
Engineering Mechanics
Manufacturing Technology
Electrical Engineering & Electronics

Advanced Engineering Mechanics
Advanced Mechanical Design
Technical Thermodynamics
Wave & Quantum Physics

PRE-SEMESTER (Preparatory Course)

ADDITIONAL SOFT SKILL COURSES: e.g. International Project Management | Intercultural Training | Academic Writing | Professional Application & Interview Preparation | Technical English | German Language Courses

www.carlbenzschool.kit.edu/mechanical-engineering-international.php

Bachelor Program Mechanical Engineering (International)

...together with the CBS College Program!

Elite Teaching & Small Classes

CBS offers state-of-the-art technology expertise in English programs from one of the most prestigious technical universities in the world. While mechanical engineering classes at KIT allow for 600 students in the 1st-semester, the CBS admits a maximum of 50 students.

Strong Industry Network

Many graduates are keen to enter the German labor market. To facilitate this, a hands-on industry training, the so-called **SmartFactory@Industry,** is part of the CBS College Program. Students will be able to build up networks with potential employes at a very early stage.

What`s unique at Carl Benz School?

Study the Future of Engineering

The B.Sc. is divided into core studies in the general field of Mechanical Engineering, including a specialization in Automotive Engineering, Global Production Management and/ or Energy Engineering.

International Orientation

CBS is diverse, open-minded and very internationally oriented. There are more than 90% international students on campus and our alumni come from over 50 countries around the world.

Join the CBS College Program, a core part of the student experience

The College Program was developed over the past 20 years to provide international students the tools, skills, and experiences they need to achieve academic and professional success.

Dedicated student counselors and a close student community have their back so they can focus on what's important. Within the College Program, our students enjoy:

Study Counselling & Career Guidance

CBS provides students with support by offering individualized study guidance as well as helpful career guidance workshops to prepare them for a smooth start into their careers.

Secure On-Campus Housing

We guarantee to at least 50 first-year College Program students a room in our campus dormitories in the heart of Karlsruhe where academic and leisure activities can be found under one roof.

Mentoring Program

A gentle start into the academic world: The mentors are the first contact persons in the institutes and foster the understanding for research in Mechanical Engineering at the KIT.

Smart Projects

SmartFactory@Industry, SmartCoop@KIT and SmartScience@KIT are an integral part of the College Program experience that combine academic study with practical experience to develop a versatile academic and professional profile.

Administrative Support

College Program Participants gain access to the CBS Student Office as a central point for support in academic procedures: translation of official documents, arrival support, assistance on emergencies and facilitation of the University registration process.

Social Events & Teambuilding

At Carl Benz School, students can take part in Social Events as our Welcome Back Events, Bachelor Presentations, Graduation Ceremonies, Movie Nights and many more.

CBS Language Courses

Ich spreche Deutsch!

Our CBS Language Courses as a part of the College Program contain Technical English, Intercultural Communication as well as German as a foreign language. In small groups, students can choose between levels A1, A2, B1 and B2.

Academic Support Program

Through the Academic Support Program, students receive the opportunity for exclusive contact to esteemed KIT lecturers, allowing for a more guided academic development.

Strong Industry Network

In order to facilitate first steps into industry, CBS offers e.g. excursions to industry partners and industry training programs as part of the CBS College Program. Students will be able to build up networks with potential employes at a very early stage.

As an alumnus of CBS, it is an affair of the heart for me to pass on my expertise and experiences to current students and to support them facing the challenges of their studies. I am looking forward to many interesting conversations as part of the CBS mentoring program.

Johannes Schubert,
CBS Alumnus, Mentor

It has been very helpful to get in touch with someone who had been at a similar stage in their career as me. The program has helped me gain perspective on my career choices.

Dhruvin Dalal, CBS Student, Mentee

Follow the path to success

Bachelor Program Mechanical Engineering (International) and the CBS College Program

ng
stry network

r 3

Career Guidance

Career Guidance offers support for the perfect application with career workshops or CV assistance and many more.

Specialization

- Global Production Management
- Automotive Engineering
- Energy Engineering

B.Sc. Thesis

To conclude their journey, students write their Bachelor's Thesis with a KIT institute.

Graduation

Congratulations on your bright future ahead! Explore your options in the industry or continue with a Master's program

mentor
nts to
one.

he
Program
Engineering
ional)

The Student Association of the International Department (SAID) acts as the connection between students, the university and staff.

German Language Courses

The Carl Benz School offers optional German language courses from levels A1 to C1 as a part of the curriculum to open doors to the German job market.

> 80% international students

Year 1

,
academic
als.

Administrative Support

CBS College Program participants gain access to the CBS Student Office as a central point for day-to-day administrative needs.

Secure on-campus housing

Study Counseling

The Study Guidance Program strives to provide and shape profound knowledge for the academic, professional and personal development.

Elite teaching in small classes

Carl Benz School

Bachelor Program Specializations: The Most Promising Topics in Engineering

Specialize in one of the hot subjects relevant for the future of engineering

Automotive Engineering

The automotive industry is currently experiencing a drastic boost in innovation with regards to the development of marketable electro motors, optimization of combustion engines and light-weight design.

Students who choose to specialize in Automotive Engineering profit from the fact that the automotive industry is Germany's largest industry sector with a turnover of approximately 404 billion Euros in 2015, covering 20% of Germany`s industry revenues overall. Ten out of the 100 largest automotive suppliers have either their headquarters or one of their subsidiaries near Karlsruhe. At the KIT more than 40 institutes with 800 scientists are conducting research for safer, more comfortable and more efficient cars.

Energy Engineering

The specialization in Energy Engineering is the best choice for those who want to pursue a future career in an ever-expanding and increasingly important sector.

Students learn about forms and sources of energy, energy production and storage. They also study the management of energy, the utilization of renewable energy sources, learn about economic efficiency in the energy industry and the understanding of technical combustion systems, e.g. engines and turbines.

Global Production Management

Production management is a vital key to the operation of companies. This specialization opens doors to countless career opportunities, including the new dual training program *SmartFactory@Industry.*

Students learn about production planning and control, production logistics, distribution centers, the optimization of logistical networks, material flow processes and project management. The evaluation of methods in terms of technical and economic aspects and virtual product development processes (product lifecycle management) are equally as important and are included in the curriculum.

The SAID (Student Association of the International Department) is a student led and run organization at CBS that acts as the connection between students, the faculty and staff.

Founded in 2005 as the study body of the Carl Benz School of Engineering, the SAID has always strived towards enhancing the university experience for students during their time at CBS.

The SAID as a part of the CBS College Program provides students with support for their educational, residential or social concerns thanks to the immense knowledge and experience provided by the SAID members that represent all the different intakes.

Hands-On Experience: Smart Projects

The Smart Projects are an integral part of the CBS College Program experience that combine academic study with practical experience to develop a versatile academic and professional profile - in a smart way.

A variety of options are available to meet your individual needs and long-term goals. Students will participate in exclusive training programs with partner companies, academic institutes and more.

Smart Factory@Industry

is a hands-on industry training, which, together with industry partners, aims to enhance the practical as well as theoretical knowledge of CBS College Program students in the field of smart applications and Industry 4.0.

Smart Factory@Industry was a direct enabler for my job.

Isha Ghandi, CBS Alumna, Project Manager at Daimler AG

Photo: Daimler AG

SmartCoop@KIT

is an exclusive training program offered in cooperation with institutes of the KIT Department of Mechanical Engineering, whose innovation-driven research interlinks joint projects with industry partners. The research-oriented 3-month project offers select CBS College Program participants the opportunity to gain first-hand experience in exploring fundamental engineering-scientific research topics as a part of a student assistant program.

By doing the SmartCoop project, I was able to gain new skills and apply the theoretical knowledge I gained in lectures to solve a real life task. As well as having gained practical knowledge, I was also able to improve my problem-solving skills.

Abdelrahman Elbadawi, Intake 2019 Student in the CBS College Program

SmartScience@KIT

The research-oriented 3-month project offers select CBS College Program participants the opportunity to gain first-hand experience in exploring fundamental engineering-scientific research topics as a part of a student assistant program.

In this project, I was able to apply my knowledge and improve my problem solving and research skills. It has been the perfect opportunity for me to delve deeper into concepts taught in my engineering degree and gain a better understanding of them.

Shreyas Karthik Ravichandran, Intake 2018 Student in the CBS College Program

For High School Students

This summer is your chance to discover one of the most exciting professions in the world!

Each year the CBS summer program provides high school students (ages of 16 - 19) with a passion for mathematics, physics, and technology with an inside view of mechanical engineering studies in Germany. Students are taught by highly qualified professionals and benefit from a full range of activities, cultural trips and workshops.

In addition, students are well supervised by a team of summer school counselors who make sure students are safe and happy at all times as well as making sure the summer school is fun, full of laughter and that all students make friends from around the world.

www.carlbenzschool.kit.edu/summer-programs.php

Germany: Carl Benz Summer School

The aim of the one-week course is to offer a unique combination of engineering courses and leisure activities. The lectures and excursions focus on railway system technology, automobiles, robotics, energy and virtual engineering. Participants also have the chance to experience various hands-on activities during the workshops.

Many exciting excursions acquaint students with Karlsruhe and the German culture. The highlight of the excursions will certainly be the visit to the most popular theme park in Germany – the Europa-Park in a village called Rust.

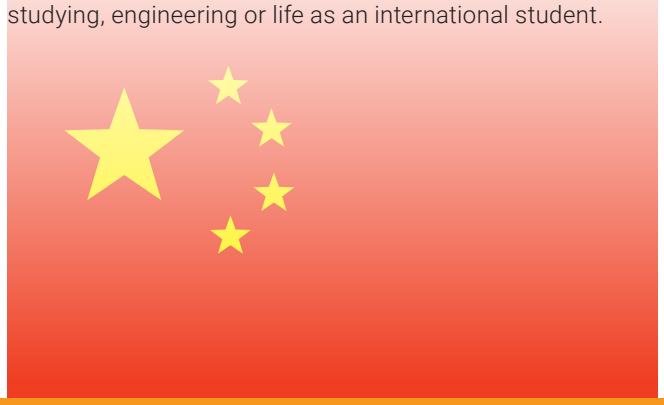
The Carl Benz Summer School is a great opportunity to gain first impressions of student life in Germany and to learn more about a possible future career in engineering!

Summer Schools:
Sneak Preview into Mechanical Engineering

China: Summer Engineering Academy

Since 2017, the Carl Benz School is hosting the one-week Summer Engineering Academy for future engineers at the KIT Branch in Suzhou, China. Exciting workshops, lectures and industry visits provide great insights into the world of mechanical engineering. Lecture topics focus on the compelling subjects of mechanics, mathematics and thermodynamics and are exemplified within practical workshops.

Additionally, a glimpse into the specifics of what it will be like to study mechanical engineering at an international university is offered. The young talents learn about future job perspectives of an engineer with an international profile. Parents of the bright students are also invited to the last day of the summer school to listen to a separate, exclusive presentation and are welcome to ask any questions about studying, engineering or life as an international student.



»Normally, when you have holidays, you forget about what you learned in school. At the summer school you can practice and use what you have learned every single day. This experience also helped me to get a clearer idea of what path to follow in my future.«
Nester from Spain

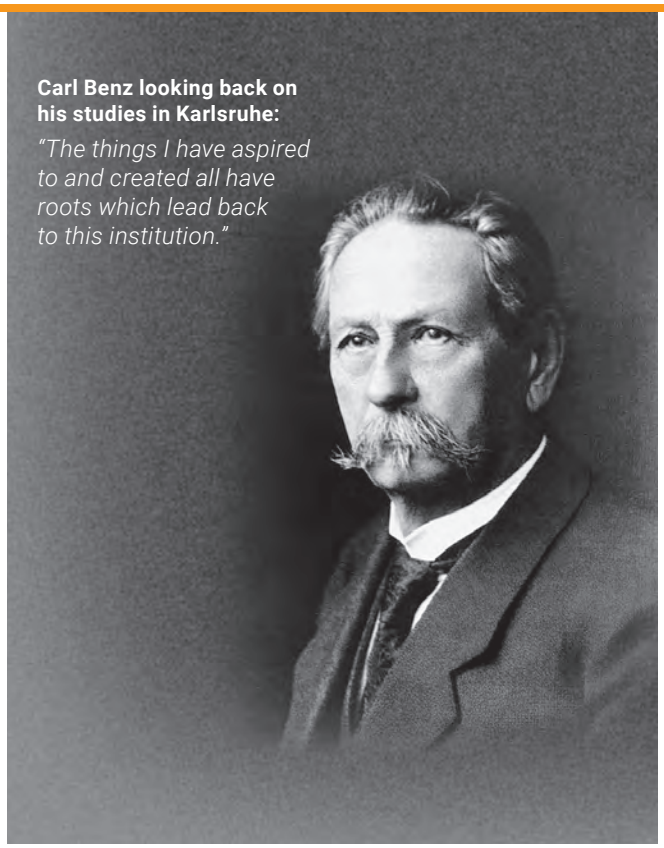
»The CBS Summer School was a really good balance between hands-on activities and lectures. I got a really good taste of what mechanical engineering at CBS is like. My favorite part was the trip to the Mercedes Benz factory. It really showed what you can do with engineering.«
Toby from England

»I like the Summer Engineering Academy because the content includes both pratical and theory and gave us a lot of knowledge. It shows us what we will have to face in university and that's really good.«
Kotchakorn from Thailand

»I joined the Summer Engineering Academy because I wanted to get a better idea of what it would be like to work as an engineer. I also wanted to see what I would learn in university. The math and physics we learned are pretty different to what I learn in school. It is cooler. I am happy I took part.«
Cesar from Brazil

A Passion for Engineering: Carl Benz, the inventor of the automobile

The CBS as the Mechanical Engineering College of the KIT is very proud to be named after Carl Benz. At the roots of his studies, the school aims to educate bright engineers with an innovative mind-set to follow in his footsteps, and influence the technological developments of tomorrow.



Carl Benz looking back on his studies in Karlsruhe:
"The things I have aspired to and created all have roots which lead back to this institution."

Now & Then: Mechanical Engineer Careers

Carl Benz was born in Karlsruhe, Germany in 1844. Benz was able to study Mechanical Engineering at the KIT – at that time, the Polytechnical College. He graduated in 1864 with a degree in Mechanical Engineering.

Early business misfortunes did not prevent him from developing new types of engines and from patenting key engine components. These patents, among them the patent for the first internal combustion engine, soon led to substantial revenue increases. Carl Benz's true genius became obvious thanks to his successive inventions, registered whilst designing what would become the production standard for his two-stroke engine. After years of testing and modifications, Benz created the first commercial vehicle, the Model 3, an automobile with a four-stroke engine of his own design between the rear wheels. It was gasoline-powered, the power being transmitted by means of two roller chains to the rear axle with wooden wheels. This became the first produced automobile.

What followed has been the birth of the success story of one of the global key players in the automotive industry, the DAIMLER AG.

Brilliant Career Perspectives Today

Being a mechanical engineer can be very exciting these days as graduates can be a part of technological innovations such as the development of next generation electric cars and new technologies for robotics. As a mechanical engineer, one can get involved in the processes of design, manufacturing, testing and even in the sales department of a product or device.

Employment of mechanical engineers is expected to grow about as fast as the average for all occupations until 2024. But mechanical engineers can work in many industries and on many types of projects. As a result, their growth rate will differ depending on the industries that employ them. Students are therefore advised to carefully choose education programs regarding the most recent advances in technology.

Mechanical engineers often work on the newest industrial pursuits. The fields of alternative energies, remanufacturing, and nanotechnology may offer new opportunities for occupational growth. Nanotechnology involves manipulating matter at the tiniest levels, for example, may affect the employment of mechanical engineers because they will be needed to design production projects on the basis of that technology. Nanotechnology will be useful in areas such as healthcare and designing more powerful computer chips.

Karlsruhe in the heart of Europe: Technology region within a leisure paradise

A Great Place to Live and Study

Karlsruhe is one of the leading technology, commercial and innovation regions in Europe. It's location in the heart of Europe, near the world renowned Black Forest, offers easy access to mountains, lakes, rivers, forests and castles. Students therefore enjoy a high quality of living with a wide variety of leisure activities and are surrounded by nature. The federal state Baden-Württemberg, in which Karlsruhe is located, is one of the safest states in Germany. Frankfurt airport as Germany's largest and Europe's 4th largest airport is only one hour away by train.

- **City's population:** 306,000 – KIT Students: 24,500
- **Cultur & Sports:** Karlsruhe's academic centers of excellence in music, art, design, media and technology offer extensive cultural & sports opportunities for everybody`s taste:
  - The world-famous Center for Art & Media Karlsruhe, called "ZKM" is located there.
  - The music festival "DAS FEST" in July each year is one of Germanys largest open-air festivals.
  - Many innovative events & international trade fairs tale place at the Trade Fair Center of Karlsruhe.
  - Karlsruhe has more than 1,500 sport clubs that offer 60 different kinds of sports. A wide variety of sport clubs are also based within the KIT for students.
- **What's special about Karlsruhe:** Karlsruhe is also called "the city of justice", since the German Federal Constitutional Court and Federal Court of Justice are seated there. The unique fan-shaped city architecture was a role model for Washington DC in the USA.
- **Mobility:** Karlsruhe is rated among the most bicycle-friendly cities in Germany and runs a high frequency tram and subway network for a car-free city center. Cities all over Europe can be reached comfortably & fast by train from the Karlsruhe main station: Paris 2.5 hours, Amsterdam 5.5 hours, London 6 hours, Prague 7 hours.
- **Costs of Living:** Karlsruhe is 0.55% less expensive than Berlin. A single person estimated monthly costs are 878.31€ without rent. Rent in Karlsruhe is, on average, 30.98% lower than in Berlin (source: www.numbeo.com).
- **Weather:** Karlsruhe is one of the warmest & sunniest places in Germany. The max. average monthly temperature in July is 25,5°C with about 1,961 annual hours of sunshine.

© Large Image: A collage of satellite photos of cloud-free Europe from Sentinel-3 (ESA17518615), created by the European Space Agency (ESA).

Carl Benz School of Engineering
Overview and Contact Information

B.Sc. in Mechanical Engineering (International)

Degree	Bachelor of Science (B.Sc.) from the Karlsruhe Institute of Technology (KIT)
Specializations	Global Production Management, Automotive Engineering, and/or Energy Engineering
Key Facts	■ Study Mechanical Engineering in English at one of the leading technical universities worldwide
	■ Join the CBS College Program for an excellent international study environment with safe on-campus housing, study & career guidance, mentoring program, german courses, social events, smart projects and academic & administrative support
Academic Requirements	■ High school degree recommended: IB, GCE A-level, Abitur
	■ Excellent grades in Mathematics & Physics (e.g., HL or AP)
	■ SAT (Math & Evidence-Based Reading and Writing; at least 1.200 points)
	■ English proficiency test (e.g. TOEFL or IELTS)
	■ German language classes are offered
	■ Motivation Letter
Program Start	October each year (winter term); we recommend the participation at the CBS Pre-Semester from August - September each year for an ideal study preparation.
Application	The application portal of the KIT is open from December until April 30th each year. Registration for the CBS College Program is possible year-round. To ensure your exclusive participation in the CBS College Program, you can apply for the College Program in parallel while applying to B.Sc. in Mechanical Engineering (International).

Quick links to the CBS

Carl Benz School Website
www.carlbenzschool.kit.edu

Admission Requirements
www.carlbenzschool.kit.edu/admission-requirements.php

College Program Application Portal
https://cbs-college-program.applicationportal.org/home.html

Carl Benz School of Engineering

Mechanical Engineering College of the
Karlsruhe Institute of Technology (KIT)

International Department of the
Karlsruhe Institute of Technology gGmbH

Schlossplatz 19 | 76131 Karlsruhe, Germany

Phone: +49 (0) 721608 47880
Email: info@carlbenzschool.kit.edu
Website: www.carlbenzschool.kit.edu

Follow and connect with us:

Publisher: Carl Benz School of Engineering
Photos: Daimler AG; European Space Agency (ESA), International Department GmbH; Karlsruhe Institute of Technology (KIT); istockphoto.com; fotolia.com; Robert Landwehr
Edition 1/2023 - Content might be subject to change