



SENSE – SCIENCE & ENGINEERING SUMMER EXPERIENCE



Before taking part in SENSE, I could have never imagined research to be fun.

Actually, I did not like research at all. I am studying Human Biology as a major. Later on, I want to become a doctor. That is why I need to go to a Medical School. I had never worked in a laboratory and never ever thought of doing so. Then I chose to take part in SENSE because I needed to get laboratory experience for my studies. The program gave me the opportunity to travel while doing this. Additionally, I expected that SENSE would give me an opportunity to explore biology from a laboratory focus, as well as meeting others.

The SENSE program met my expectations and beyond. I got the opportunity to work on a small project in the field of microbiology including the cloning of plasmid-DNA and the following transformation of different bacteria. After this transformation process, I tested the new abilities the bacterium got from the introduced foreign DNA. While doing the laboratory work, I was able to learn all the basics needed for working there. I had only read about these procedures in my genetics class before.

The people I was working with were all willing and eager to help me so that I got to know the basic procedures needed for working in a lab. That gives me a solid foundation for further research. Now I can say the laboratory work on an actual project changed my view of research. It is easier for me to imagine working in a laboratory because working in a lab is fun. This might help me when I am doing my doctor's thesis.

Furthermore, I also was able to meet many people from different countries and walks of life; an experience I am grateful for and owe to the SENSE program, and this was what I liked best. I also appreciate the help given by the International Office in supporting my adjustment to Germany. I am really glad about this because as a person in a new country much of how good your experience is depends upon your adjustment to the new country and the International Office made sure that it was smooth.

Kenza Martin studies Human Biology and Africana Studies - Bioethics at the State University of New York at Albany (SUNY Albany) in her junior year.

TECHNISCHE UNIVERSITÄT BRAUNSCHWEIG

- Germany's oldest Institute of Technology
- university rankings among the TOP 10 in engineering courses in Germany
- 12,500 students
- 1,600 academic staff
- more than 60 degree programs
- excellent research facilities
- member of the TU9-Network, the consortium of Germany's leading Institutes of Technology

CITY OF BRAUNSCHWEIG

- lively student city right in the heart of Europe
- important cultural and political centre since the Middle Ages
- one and a half hours away from Germany's capital Berlin

BRAUNSCHWEIG RESEARCH REGION

- Europe's most active region for research and development
- 27 internationally renowned research institutes
- major companies like Volkswagen and Siemens
- close partnerships between university and industry
- awarded German »City of Science« in 2007

ACCOMMODATION

The TU Braunschweig provides housing for all students in the summer program. Most students prefer to live in one of the university's eight halls of residence which are situated in the direct surroundings of the three university campuses. The choice of accommodation available ranges from single study bedrooms to single and shared apartments. Meals are available at the five university restaurants and cafeterias.

VISA

U.S. or Canadian Citizens do not need a visa for entry in Germany. Students of other nationalities must apply for a visa from the German embassy.

SUPPORT AND SERVICES

We want you to feel at home at Braunschweig and settle in quickly. This is why we provide a pre-departure orientation and buddy scheme for all students in the summer program. Your buddy student will pick you up from the station, help you with all formalities and introduce you to student life in Braunschweig – the best way to get to know people and all the places students at Braunschweig go to. You will be enrolled at the TU Braunschweig as a full-time student and have access to all facilities of the university.

MORE INFORMATION AND CONTACT:

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TECHNISCHE UNIVERSITÄT
CAROLO-WILHELMINA
ZU BRAUNSCHWEIG



RESEARCH MADE IN GERMANY

JUNE 28 – AUGUST 13, 2010
INTERNATIONAL SUMMER SCHOOL
IN SCIENCE AND ENGINEERING



WWW.TU-BRAUNSCHWEIG.DE/INTERNATIONAL/SENSE

WELCOME TO EUROPE'S MOST ACTIVE RESEARCH REGION!

The TU Braunschweig offers you a **seven-week summer program** for **undergraduate students** in the fields of Mechanical Engineering, Electronics and Electrical Engineering, Physics, Computer Sciences and Biosciences. The intensive program includes:

- Scientific work and practical training on real research projects
- International project management
- Working experience in a German research institute
- German language training
- Intercultural sensitivity training



WHO CAN APPLY?

The program welcomes undergraduate students who wish

- to get an impression of research and work in Germany through academic studies and practical work experience,
- to add valuable intercultural experience to the academic training at their home university,
- to prepare themselves for an international career.

ENTRY REQUIREMENTS

For application to this program you should be studying at least in your second year of university or college education (Sophomore year) and be majoring in the fields of Mechanical or Electrical Engineering, Computer Sciences, Business Administration, Physics or Biosciences, depending on the course modules you are applying for.

PROGRAM DESCRIPTION

The program offers a modular structure, allowing you to arrange courses according to your own interests and ambitions. It is designed for participants of various academic backgrounds to give you an interdisciplinary approach to your chosen field of study. You will be working on real research projects in the laboratories at our university.

You will be introduced to practical research and will receive your own part of a project to work on under the guidance of experienced researchers and professors.

At the end of the program you will document your project work in the form of a written paper and will present your results in a final presentation. You can supplement the practical scientific work with lectures, excursions to companies and research institutes, depending on the modules you choose.

CREDIT TRANSFER

The program awards 9 ECTS credits, which correspond to 6 US semester credits. Grades are given for each module and you will receive a transcript of records that facilitates the credit transfer to your home university. The European ECTS-credits and grades are usually accepted in the US. However, you should confirm the academic recognition of the program with your university before applying.

APPLICATION

Application deadline is February 28, 2010. Details on the application process and the online application form are available on the following website:

www.tu-braunschweig.de/international/sense

FEES

Tuition fee	600 €
Student fee and insurances	300 €
Housing (single room)	700 €
Excursions and cultural program	100 €
Total	1,700 €

Participants from partner institutions may be charged an additional study abroad fee by their home university.

SCHOLARSHIPS

Tuition waiver scholarships are available for students from partner universities. Participants must be nominated for a tuition waiver by their home university.

June 28, 2010 ORIENTATION DAY

MODULE 1: WEEK 1, 2 & 3 – 6 h / day, 3 ECTS Credits LANGUAGE AND CULTURAL TRAINING

- Introduction to the German language and culture
- Intercultural sensitivity training

WEEK 4, 5, 6 & 7 – 2 h / day GERMAN LANGUAGE COURSE

MODULE 2: WEEK 4 & 5 – 4 h / day, 3 ECTS Credits STUDY COURSE IN MECHATRONICS AND MICROMECHANICS

- Introduction to mechatronics and micromechanics
- Modelling and simulation of mechatronic systems
- Design of microsystems
- Ongoing research projects

MODULE 4: WEEK 4 & 5 – 4 h / day, 3 ECTS Credits STUDY COURSE IN SENSORS AND METROLOGY

- Introduction to sensors, measurement, science and metrology
- Sensors and instrumentation
- Determination of measurement uncertainty
- Ongoing research projects

MODULE 5: WEEK 4 & 5 – 4 h / day, 3 ECTS Credits STUDY COURSE IN ROCKET PROPULSION AND FLUID MACHINERY

- Compressible flows, space missions, rocket design, propellants, combustion chamber
- Engine cycles, compressor aerodynamics, components matching
- Turbine blade design, subsonic and supersonic inlets, nozzles

MODULE 6: WEEK 4 & 5 – 4 h / day, 3 ECTS Credits STUDY COURSE IN AUTOMOTIVE ENGINEERING

- Basics of vehicle engineering, incl.: vehicle dynamics, driving dynamics
- Basics of vehicle design, incl.: chassis & braking, vehicle transmissions & drivetrain
- Advanced driver assistance systems
- Alternative & hybrid drives, race cars, construction (CAD), experiments

MODULE 7: WEEK 4, 5, 6 & 7 – 4 h / day, 6 ECTS Credits STUDY COURSE IN CORPORATE COMMUNICATION: WEB DESIGN AND WEB 2.0

- Internal and social communication
- Valuable internet communication
- Sustainable and integrated communication

MODULE 8: WEEK 4, 5, 6 & 7 – 8 h / day, 6 ECTS Credits PRACTICAL LAB WORK IN ADVANCED BIOLOGY – WEEKLY GROUP SEMINARS

- Introduction to independent scientific lab work
- Work on an individual project in the fields of microbiology, biochemistry, cell biology or genetics

MODULE 3: WEEK 6 & 7 – 4 h / day, 3 ECTS Credits STUDY COURSE IN SIMULATION OF MECHATRONIC SYSTEMS

- Modelling of mechatronic systems
- Numerical integration and vibration analysis
- Possibilities and limitations of numerical treatment of mechatronic systems

MODULE 9: WEEK 6 & 7 – 8 h / day, 3 ECTS Credits INDEPENDENT STUDY IN ENGINEERING, BUSINESS, NATURAL SCIENCES OR COMPUTER SCIENCES

- Introduction to independent scientific work
- Work on an individual scientific project in the fields of: Corporate Communications, Aviation & Aerospace Engineering, Vehicle Engineering, Production Technology, Physics, Computer Science, Biotechnology, Biochemical Engineering or Information Systems Technology

August 12, 2010
GERMAN LANGUAGE TEST

August 13, 2010 CLASSES END: FINAL PRESENTATION