

## BIOENGINEERING, B. Sc.

### INFORMATION ABOUT STUDY PROGRAMME

Bioengineering is an interdisciplinary field where new materials and technologies with a wide variety of applications are developed with the help of both the natural sciences and engineering. Historical examples of early biotechnologies include cheese, wine and bread. Modern examples, however, involve engineering at the molecular-biological level to produce substances used in detergents and cosmetics, active pharmaceutical ingredients and medicines, raw chemical materials for industrial manufacturing, biofuels and even new varieties of plant species.

*Bioengineering B.Sc.* has a very pronounced focus in the natural sciences. The curriculum introduces a tight inter-meshing of biology and chemistry with engineering and technology from the first semester onwards. Your studies will focus on the three main areas, or colours, of biotechnology: health and medicine (red), agriculture (green) and industry (white). Through your choice of electives, you can also add additional emphasis in plant biotechnology and industrial biotechnology. The broad scope of your studies is complemented by small group work and modern laboratories for teaching and research.

*Bioengineering B.Sc.* is taught in English and began in winter semester 2012-2013 in Kleve. It has since achieved international recognition, particularly among students: over 60 countries are represented by the students currently pursuing their degree in this programme.

### CAREER PATHS AND SKILLS

Bioengineering B.Sc. prepares graduates for a variety of career paths in different sectors within the chemical, pharmaceutical or biotechnological industries, but also for careers in research as well. Bioengineers are typically found in government agencies, agrotechnology, the food industry, the environmental industry or in waste management. Depending on your branch and specialisation, you can look forward to many interesting roles and activities: managing industrial production processes, contributing to R&D of new chemical production processes, or performing analyses and evaluating the findings.



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## STUDY PROGRAMME SUMMARY

**Place of study:** Kleve

**Start date:** Winter semester

**Duration of study:** 7 semesters

**Study model:** Full-time studies

**Degree awarded:** Bachelor of Science, B. Sc.

**Language:** English

**Study or Internship abroad:** mind. 20 weeks

**Restricted admission:** No

## COURSE SCHEDULE

### 1st Semester

- Cell Biology and Microbiology
- Fundamentals of Chemistry
- Basics of Physics I
- Mathematics
- International Project Management
- Basics of Economic Sciences and Law

### 3rd Semester

- Physical Chemistry
- Instrumental Analytics
- Measurement and Control Engineering
- Process Engineering
- Current Topics in Biology
- Data Analysis and Applied Statistics

### 5th Semester

- Downstream Processing
- Industrial Biotechnology
- Integrated Management Systems and Quality Management
- Elective Modules 2

### 7th Semester

- Academic Methods and Principles
- Elective Modules 3
- Bachelor Thesis
- Colloquium

### Elective Modules 2:

- Metabolic Engineering
- Biological Physics
- Environmental Biotechnology and Microalgae
- Pharmaceutical Biotechnology and Immunology
- Biopolymers
- Module from any Bachelor Study Course of Faculty of Life Sciences at Rhine-Waal University of Applied Sciences

### 2nd Semester

- Genetics and Molecular Biology
- Applied Chemistry
- Biochemistry
- Bioengineering Physics II
- Applied Microbiology
- Applied Mathematics

### 4th Semester

- Bioprocess Engineering
- Enzyme Engineering
- Project
- Bioinformatics
- Elective modules 1

### 6th Semester

Internship or study abroad (mind. 20 weeks)

### Elective Modules 1:

- Technical Enzymology and Biocatalysis
- Agricultural Biotechnology and Biofuels
- Nanobiotechnology
- Fluid Mechanics and Systems Dynamics
- Module from any Bachelor Study Course of Faculty of Life Sciences at Rhine-Waal University of Applied Sciences

### Elective Modules 3:

- Project reg. Academic Principles and Methods in Preparation of Bachelor Thesis
- Language Course
- Module from Catalogue 1 and 2 of study programme
- Module from any Bachelor Study Course at Rhine-Waal University of Applied Sciences

## Contact

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