



FH KREMS  
UNIVERSITY OF APPLIED  
SCIENCES / AUSTRIA

Bachelor

# Applied Chemistry



## THE PERFECT SKILLS SET FOR TODAY'S CHEMICALS INDUSTRY

The **Applied Chemistry degree programme** is a direct response to the changing skills profile of chemical industry professionals and satisfies the new requirements faced by the industry by means of practical training. Rapid technological advances and the advent of Industry 4.0 mean that today's chemical industry professionals require a specific set of skills. In-depth knowledge of chemistry is still essential, but employers also expect expertise in process analysis and process management due to the wider application of networked IT systems. This innovative programme skilfully combines in-depth training in chemistry, the latest computer-based methods as well as groundbreaking topics such as the use of **renewable raw materials and waste recycling and reuse**.

**Chemometrics** – the application of statistical methods in the planning, development and selection of chemical processes and experiments – and related IT-supported analysis of large volumes of data (big data analysis) are becoming key aspects of quality assurance and online process optimisation. IT-supported modelling of chemical molecules and computer-based simulation of experiments are also crucial for effective drug design in the pharmaceuticals industry.

*“As chairman of the Association of the Austrian Chemical Industry and a company CEO, I'm delighted that the Applied Chemistry programme has been introduced. This will help to satisfy the growing demand for employees with academic qualifications.”*

Hubert Culik MAS, chairman of the Association of the Austrian Chemical Industry

## PROGRAMME CONTENTS AND SPECIALISATION OPTIONS

Students acquire in-depth knowledge of basic chemistry subjects (general, analytical, inorganic, organic and physical chemistry, and biochemistry), related disciplines (mathematics, informatics, statistics and physics) and chemical process engineering. This is accompanied by comprehensive practical training in the laboratory, which incorporates instrumental analysis. The increased focus on synthetic preparation methods in direct combination with modern analytical techniques, chemical databases and software tools lays the foundations for completing professional tasks in the field of synthesis (API synthesis in the pharmaceuticals industry, synthesis of materials in the polymers and materials sector). The programme also addresses analytical issues relating to quality assurance in the environmental and pharmaceutical industry and at public authorities. Basic principles of **material chemistry** and **surface chemistry** are an integral part of the curriculum, giving graduates an insight into these key sectors of the chemicals industry. This also opens the door to internships in these particular segments.

In the final semester, students have a choice of two specialisations: the **Instrumental Analysis and Chemometrics** elective enhances students' skills in instrumental analysis, statistical analysis of measurements, multidimensional data analysis and experimental design, preparing them for day-to-day professional tasks in the fields of product safety, as well as environmental, pharmaceutical, forensic and polymer analysis.

In the **Organic and Pharmaceutical Chemistry** elective, students acquire advanced skills in computerised simulation of chemical processes and organic and pharmaceutical chemistry. This addresses industry demand for professionals who can be deployed in the pharmaceutical industry and the production of fine chemicals.

## CAREER OPTIONS FOR PROGRAMME GRADUATES

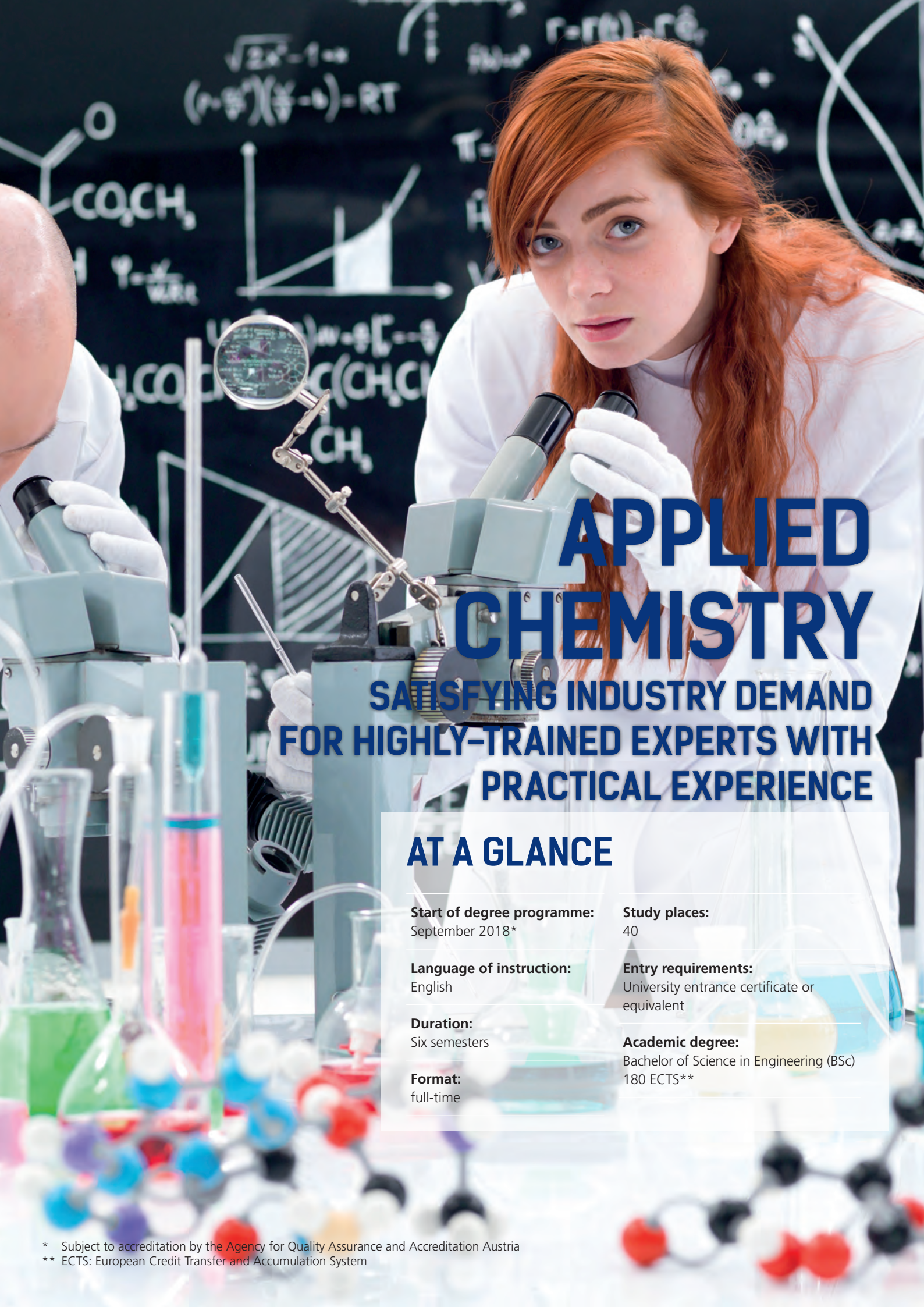
After completing the programme, students will be fully prepared to enter today's chemicals industry and will be able to:

- generate, visualise and interpret process data and big data, and use this as a basis for developing chemometric models
- work in computer-based process control and modelling
- implement scale-up processes using their process-engineering experience
- perform analysis in laboratories (e.g. in the basic chemical sector, pharmaceuticals industry, food chemistry, and environmental analysis) and for forensics/forensic science or pharmaceutical (incl. doping) organisations
- synthesise drugs in the pharmaceuticals industry
- manufacture basic chemicals for polymer production
- develop production and testing processes in order to ensure product quality

With **English as the language of instruction**, graduates will be ideally placed to enter the jobs market in Austria or abroad.







# APPLIED CHEMISTRY

SATISFYING INDUSTRY DEMAND  
FOR HIGHLY-TRAINED EXPERTS WITH  
PRACTICAL EXPERIENCE

## AT A GLANCE

**Start of degree programme:**  
September 2018\*

**Study places:**  
40

**Language of instruction:**  
English

**Entry requirements:**  
University entrance certificate or equivalent

**Duration:**  
Six semesters

**Academic degree:**  
Bachelor of Science in Engineering (BSc)  
180 ECTS\*\*

**Format:**  
full-time

\* Subject to accreditation by the Agency for Quality Assurance and Accreditation Austria  
\*\* ECTS: European Credit Transfer and Accumulation System

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