

Theoretical Chemistry and Theoretical Biochemistry

Students at the Ruhr-University are introduced to the basics of Theoretical Chemistry early on in the third semester within the framework of the **Bachelor's** undergraduate degree course. Afterwards, the main emphasis of the degree can be placed on Theoretical Chemistry in the form of optional courses, which culminate in a Bachelor's thesis. Theoretical Chemistry is also a specialized field in the subsequent **Master's** postgraduate programme which offers a rich choice of courses throughout the degree and concludes with a Master's thesis. A characteristic trait of the Master's degree is that it involves research-orientated teaching and learning, thus paving the way for a future scientific career. For this reason, the entire Master's degree course is held in the English language.

Another unique feature of Bochums' degree courses is that Theoretical Biochemistry can be chosen from the fifth semester onwards as a "focal point" in the field of "Biomolecular Chemistry". In particular, practical classes are offered which are tailored to convey the specialized knowledge required for the course. Finally, it is then possible to complete a theoretical dissertation in Biochemistry.

To supplement these Master's degree courses in Chemistry and Biochemistry an International Master Programme "Molecular Sciences and Simulation" (IMOS) is on offer in which Theoretical Chemistry plays an integral part. IMOS interfaces between the classical disciplines of Chemistry and Physics with a strong focus on the areas of theoretical concepts, molecular spectroscopy and computer simulations. This postgraduate degree course is tailored to meet the needs of outstanding students who want to learn state-of-the-art spectroscopical methods coupled with quantum chemistry and molecular simulations, thus equipping them with the means to tackle current scientific problems in the field of (bio)molecular sciences successfully.

The postgraduate doctoral study course in the field of Theoretical Chemistry or Biochemistry results in the title Dr. rer. nat. and is generally the result of a 3-year postgraduate programme which is, akin to the Master's course, held solely in English. This can follow a Master's degree or, to save time, begin directly after an excellent Bachelor's degree as a so-called "fast track doctoral course". The framework of the doctoral studies is embedded in the Graduate School of Chemistry and Biochemistry which also advises foreign students in all non-scientific aspects of student life.

The Bachelor's, Master's and doctoral courses are naturally open to students of higher semesters coming from other national and international universities.

The course to obtain a teaching degree in chemistry is similarly structured. It concludes in a Master of Education (M.Ed.) after a so-called "dual" Bachelor's degree. Theoretical Chemistry can also be studied here as a specialized subject starting in the undergraduate studies right through to the final examination.

At this point we would like to refer the reader to **the official study regulations and curriculum** which give detailed information about the range of possibilities available in the Bachelor's and Master's degree as well as the doctoral course in Chemistry and Biochemistry.

The many **practical classes**, in which the theoretical methods discussed in the lectures are then put into practice are typical for the nature of the teaching methods of Theoretical Bio/Chemistry in Bochum. For this purpose, a modern **virtual laboratory**, our "Theoretikum", is available and equipped with many powerful desktop computers and the latest software.

It is possible, by prior arrangement, to visit a member of our staff for a few days and "look over their shoulder" to get a better idea of the research done on a daily basis in the Center for Theoretical Chemistry. In addition to these offers, we are able to arrange work experience during the semester break for more advanced students in the chemical industry or supercomputing centers.

Further information specific to Theoretical Chemistry can be found on our "Teaching" webpages:

- Lectures
- Practicals
- Chemistry Curriculum
- Biochemistry Curriculum
- Physics Curriculum
- IMOS Curriculum
- PhD Program

More general information about the undergraduate and postgraduate studies in chemistry and biochemistry is available on the Faculty Website under the heading "Course Programs" and on the homepage of our Graduate School.