Branch: Chemistry and chemical engineering

Code: MOLBIO
Option: Molecular biotechnology
Level: Bachelor
Prerequisites : Scientific baccalaureate or equivalent
Opportunities:
After successful completion of the Bachelor of Science program in Molecular Biotechnology, graduates are able to apply to the labor market with the first professional qualification "Bachelor of Science". The fields of activity include the large pharmaceutical and chemical industries as well as the biotechnology sector in particular. Due to the sustained growth of the biotechnology sector, future graduates also have very good chances on the labor market.

Description
Classical biotechnology was mainly concerned with the production process and related procedural issues (such as fermentation, etc.). However, in the age of genetic engineering and synthetic biology, it has become much easier to optimise or reprogram the cell itself. Moreover, it is no longer limited to the 'overproduction' of natural substances; the efficient construction and synthesis of artificial biomolecules with improved or even new functions has also become possible. The technical know-how and thus the associated value creation for a commercial enterprise thus no longer lies primarily in the manufacturing process, but increasingly in the structure and function of the biomolecule.

Protein design can be used, for example, to produce new active ingredients in medicine or "molecular tools" for research and laboratories or a wide range of technical fields (from environmental analysis to biochips).
The Molecular Biotechnology degree programme starts with the extraction and construction of biomolecules and, in this context, combines the genetic engineering, protein chemistry and biophysical methods in an interdisciplinary approach with databases and computer simulation methods (bioinformatics). The six-semester Bachelor of Science in Molecular Biotechnology program at UUT usually starts in the winter semester. The aim of the BSc Molecular Biotechnology program is to provide students with a specialist foundation in molecular biology, biotechnology and biochemistry. The curriculum consists of compulsory modules totaling 150 credits, which teach specialized skills in molecular biology, biotechnology and biochemistry, their related fields and basic natural science subjects. In addition, students choose modules worth 10 credits from a list of elective modules. Elective modules of at least 5 credits in the area of general education/super-disciplinary foundations complete the student spectrum.
In addition, students complete a degree dissertation (12 credits), the assessment of which is included in the final grade, and conclude with a colloquium (3 credits).

Specific competences:
Due to the high proportion of compulsory courses, graduates have a sound and in some cases already profound knowledge of molecular biotechnology (e.g. in the disciplines of genetic engineering, protein engineering and metabolic engineering), which they can apply to solve simple scientific problems. They are familiar with modern analytical equipment and techniques and, thanks to numerous practical laboratory courses and exercises on different topics, graduates have methodological and technical skills.

Quality and competences
In addition, graduates have acquired additional skills in the optional field, depending on their interests, for example in the areas of soft skills, project management, bioethical issues or various languages.