imc FH KREMS UNIVERSITY OF APPLIED SCIENCES / AUSTRIA

Bachelor

School of Life Sciences

Medical and Pharmaceutical Biotechnology

Close relation to national and international biotech industry

BIOTECHNOLOGY WORLDWIDE

Biotechnology has the potential to solve many of the pressing problems in current medicine. The development of antibodies used for therapy of many diseases as well as technologies for transplantation of skin and the generation of cartilage tissue have improved the quality of life for millions of patients worldwide. But these outstanding achievements are just the first success stories of a still young discipline.

The growing pharmaceutical industry as well as the medical research institutions have an urgent need for well-trained employees. Graduates with practical problem solving skills are needed to meet the demands of the fast growing job market in Europe and worldwide.

INDUSTRY NETWORKS: BUSINESS & RESEARCH PARTNERS

Close relations to the national and international biotech industry are an additional asset for students in various fields, e.g. the development and conduction of practice-oriented industrial trainings in the following areas are on offer and enable students to get in contact with prospective employers and researchers.

Topics of this cooperation include:

- Basic principles of biological techniques (biochemical engineering)
- Behaviour training under clean room conditions classes C - A
- Development of documentation concepts for R&D projects under GLP- and GMP-near circumstances
- Development and optimisation of test methods for industrial questions with molecular-, micro-, cell- and immunobiological background
- Provision and adaptation of research reactors for questions in the area of pharmaceutical biotechnology and regenerative medicine
- Organisation of international Life Science congresses

A broad understanding of biotechnology with practical training in laboratory techniques

PROGRAMME OVERVIEW

- **Special feature:** Language of instruction is English
- **Entrance requirements:** Secondary school leaving certificate or equivalent
- **Organisation format:** Full-time
- **Duration:** Six semesters
- **Internship:** During the 5th semester students will gain six months work experience in companies and medical institutes worldwide
- **Laboratory classes:** Practical training in small groups in a quality controlled environment
- **Start of semester:** September
- **Academic degree:** Bachelor of Science (BSc.) in Engineering – 180 ECTS*

*ECTS = European Credit Transfer System

AIMS OF THE PROGRAMME

The Bachelor programme of Medical and Pharmaceutical Biotechnology is designed to teach students a broad understanding of biotechnology ranging from the biophysical and biochemical processes in cells to the setup of modern biotechnological production plants.

Additionally the students will receive practical training in laboratory techniques. Both together will enable them to later work independently in the challenging working environment of the pharmaceutical industry as well as in medical research institute.

For more detailed information on the Bachelor programme

http://biotech.fh-krems.ac.at

Biotechnology solutions improve the quality of life for millions of patients

FORMAT: FULL-TIME

The Bachelor programme Medical and Pharmaceutical Biotechnology is offered in a full-time version. Lectures take place from Monday to Friday, exceptionally on Saturdays. The weekly contact hours vary from semester to semester (between 14 and 27).

FEATURES OF THE FULL-TIME

Hours of attendance: As a rule from Monday to Friday, E-Learning modules*

Average number of hours/week: 24

Occupation during the programmes: Not required

Internship: Mandatory (22 weeks in the fifth semester)

Advantage: Studying efficiently, individual coaching and service

Information

Call toll free (within Austria)
0800-808010 or
information@fh-krems.ac.at

* By E-Learning we understand self-directed learning that occurs via the use of electronic media independent from time and location.

CORE MODULES

NATURAL AND MEDICAL SCIENCE

This important area provides the students with the scientific and medical knowledge required. In addition to the classical subjects of physics, chemistry and biology, they will also acquire detailed knowledge in more advanced subjects like molecular biology, cell biology and immunology. As a result, the students will understand how medical research will be done.

BIOPROCESS TECHNOLOGY

Students will get to know the central components of a production plant. They also learn construction principles and practice the design and use of equipment on selected study examples. The later use of even more complicated equipment will thus be facilitated.

QUALITY MANAGEMENT

Mistakes in the pharmaceutical and medical industry endanger life through doubtful products. Quality management skills are therefore a central aspect for a successful career. The students learn and practice how experiments and projects are properly planned and how the quality of medical products is assured.

MANAGEMENT AND PERSONALITY TRAINING

Human resources and the ability to work together productively are important, especially since biotechnology is a highly multidisciplinary field. Products can only be developed in teams, where people are able to communicate properly. Students therefore do not only learn the basics of business, but also how they can avoid personal conflicts and practice constructive communication.

CAREER PROSPECTS

Some examples for future job profiles are

Research scientist: Perform e.g. recombinant DNA technology or cell differentiation and characterisation experiments to demonstrate the effect of a therapeutic agent.

Production scientist /engineer: Optimisation of biotechnological fermentation processes and product purification schemes.

Quality control scientist: Development and optimization of analytical test procedures to assure e.g. the quality of therapeutic agents.

Quality assurance officer: Monitoring the correct execution of complex industrial working procedures.

Excellent career prospects in challenging areas

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FULL-TIME

CURRICULUM

		SEMESTER					
		1	2	3	4	5	6
FUNDAMENTALS OF NATURAL SCIENCES						PRACTICAL TRAINING SEMESTER	
	Introduction to laboratory techniques laboratory	2					
	Chemical calculations	1					
	General and inorganic chemistry, theory	3					
	Analytic chemistry, laboratory	2					
	Organic chemistry, theory		2				
	Organic chemistry, laboratory		2				
	Applied physics, theory	2					
	Applied physics, laboratory	3					
INTRODUCTION INTO HUMAN MEDICINE							
	Anatomy and physiology	2					
	Human genetics	1					
	Human diseases		1				
	Immunology and medical microbiology		1				
	Cell physiology and medical molecular biology			2			
	Pharmacology						2
FUNDAMENTALS OF BIOSCIENCE							
	Applied microbiology	1					
	Microbiological working techniques, laboratory	2					
	Microbiological monitoring, laboratory		4				
	Biochemistry, theory			3			
	Biochemistry, laboratory			3			
FUNDAMENTALS OF MATHEMATICS AND BIOINFORMATICS							
	Applied mathematics	3					
	Statistical applications		2				
	IT: Software applications	1					
	IT: Introduction into databases		1				
	Bioinformatics				2		
FUNDAMENTALS IN ANALYTICS							
	Applied biophysics		2				
	Biophysics, laboratory		2				
	Instrumental analytics, theory			1			
	Instrumental analytics, laboratory			2			
	Biochemical analytics, theory				2		
	Biochemical analytics, laboratory				2		
FUNDAMENTALS IN BIOTECHNOLOGY							
	Cell biology		2				
	Cell culture techniques			1			
	Cell culture, laboratory			2	2		
	Molecular biology and genetic engineering, theory		2				
	Genetic engineering, laboratory			1			
	Genetic engineering laboratory under GLP				2		
	Current issues in biotechnology			1	1		1

CURRICULUM CONTINUED

		SEMESTER					
		1	2	3	4	5	6
FUNDAMENTALS OF BIOPROCESS TECHNOLOGY						PRACTICAL TRAINING SEMESTER	
	Material science and biomaterials		2				
	Technical construction and drawing			1			
	Measurement and control systems			1	1		
	Pharmaceutical production systems				1		
	Equipment and production design				2		
	Introduction into validation				1		
	Bioprocess technology, theory				3		
	Bioprocess technology and fermentation, laboratory						5
	Laboratory documentation and reporting	1					
	Clean room training				1		
	Introduction into contamination control						1
FUNDAMENTALS OF QUALITY MANAGEMENT							
	Introduction to quality management		1				
	GLP/GMP, theory			1			
	GLP/GMP seminar				2		
	Project management				2		
	Clinical studies and GCP						1
PHARMACEUTICAL BUSINESS FRAMEWORK							
	Business administration		1				
	Cost accounting and controlling			1			
	Marketing			1			
	Drug regulatory affairs			1			
	Industrial hygiene			2			
COMMUNICATIONS AND SOCIAL SKILLS							
	English - Communication	2					
	English - Scientific presentations and discussions				2		
	English: Business communication						2
	Personality training - team building	1					
	Personality training: Presentation techniques		1				
	Personality training - interviews and assessment centers			1			
PRACTICAL TRAINING IN INDUSTRY AND BACHELOR THESIS							
	Application and preparation			1			
	Bachelor Seminar and Bachelor Thesis I + II					2	2
WEEKLY HOURS PER SEMESTER		**27**	**26**	**26**	**26**	**2**	**14**

GLP = Good Laboratory Practice, **GMP** = Good Manufactoring Practice, **GCP** = Good Clinical Practice
Curriculum is subject to alterations.

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