

Note:

The following curriculum is a consolidated version. It is legally non-binding and for informational purposes only. The legally binding versions are found in the University of Innsbruck Bulletins (in German).

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Curriculum for the Continuing Education Programme:  
**University Course “Summer School Molecular Analysis of Environmental Samples  
(MAnES)”**  
at the Faculty of Biology at the University of Innsbruck

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## § 1 Qualification profile

The *Summer School MAnES* University Course offers young scientists and established researchers interested in molecular methods of biomonitoring and analysing nutritional relationships a comprehensive introduction to the application of different molecular techniques.

Graduates of the *Summer School MAnES*

- have advanced knowledge of the technological possibilities for analysing DNA traces. They are able to select a suitable methodological and budgetary approach from a wide range of possibilities and to plan the associated work and to transfer the acquired knowledge to the solution of new problems that arise in the course of their research and work activities,
- have the practical knowledge to independently plan and carry out the necessary steps for analysing DNA traces. They are also able to correctly operate the required equipment and work in a cleanroom environment without contamination, design probes (i.e. species-specific primers) for the detection of species in environmental samples and statistically analyse results obtained with such probes,
- are able to carry out bioinformatic analyses of ‘raw’ metabarcoding data (i.e. raw results from high-throughput sequencing) independently and are familiar with the basic work steps and options within the analysis process. In addition, they are able to statistically analyse the results obtained and prepare them visually using common open-source software.

## § 2 Scope and duration

The university course covers 5 hours or 7.5 ECTS-Credits. One ECTS-Credit corresponds to a workload of 25 hours.

## § 3 Acceptance and admission

- (1) Persons can be admitted to the university course, who
  - have a Bachelor's degree in a relevant subject or another equivalent degree from a recognised post-secondary educational institution,
  - have at least three years of relevant or equivalent professional experience.
- (2) In any case, relevant professional qualifications and experience shall be deemed to be:
  - degrees in the life sciences (e.g. biology, molecular biology, biomedicine, bioinformatics),
  - professional experience as a medical-technical assistant in a molecular biology laboratory and in a specialist office for environmental analyses.
- (3) Persons shall be selected by the course director on the basis of their professional suitability. If more than 16 people apply, the applicants to be admitted shall be selected on the basis of objective criteria, in particular previous education, motivation and a balanced composition of the group of participants.
- (4) Participants who have been admitted to the continuing education university course and have paid the course fee shall be admitted to the University of Innsbruck as non-degree students by the Rectorate.

## § 4 Types of courses

Courses with continuous performance evaluation:

**Lectures with practical elements (VU)** focus on the practical treatment of concrete scientific tasks that are discussed during the lecture parts of the course. Maximum number of students per course: 16.

## § 5 Compulsory module

The following compulsory module covering 7.5 ECTS-Credits is to be passed:

	<b>Molecular Analysis of Environmental Samples</b>	<b>h</b>	<b>ECTS-Credits</b>
	<p><b>VU Molecular Analysis of Environmental Samples</b></p> <p>The course covers the scientific process from the conceptualisation of research questions and experiments, sampling, laboratory analysis of the samples obtained using diagnostic and DNA sequence-based techniques, bioinformatic analysis of the raw data obtained, their statistical evaluation and the interpretation of the results obtained.</p> <p>This includes the use of programmable statistical programmes, familiarisation with relevant publications, as well as the collection of environmental samples and their processing in the clean room laboratory (lysis, DNA extraction, DNA amplification, preparatory work for high-throughput sequencing). The second part of the course focuses on bioinformatic and statistical analysis as well as the interpretation of the generated data. Participants also have the opportunity to present personal research projects as part of the course.</p>	5	7,5
	<b>Total</b>	<b>5</b>	<b>7,5</b>
	<p><b>Learning Outcomes:</b></p> <p>Students are able to formulate research questions in the field of molecular analysis of trophic interactions and eDNA-based biomonitoring and to develop research designs appropriate to the research question.</p> <p>Students will be able to perform the common laboratory steps for analysing minute amounts of DNA in environmental samples in a cleanroom laboratory environment.</p> <p>Students master the basics of common techniques for the bioinformatic analysis of metabarcoding and qPCR data, as well as their statistical evaluation.</p>		
	<b>Prerequisites: none</b>		

## § 6 Examination regulations

- (1) The module is completed by the positive assessment of the course. In the case of lectures with practical elements (VU), the assessment is based on at least two written, oral and/or practical contributions by the participants.
- (2) The examination method and the assessment criteria shall be announced by the course instructor before the start of the university course.

## § 7 Final certificate

Upon successful completion, graduates of the university course are issued with a certificate of completion.

**§ 8 Coming into force**

The curriculum comes into force on the first day of the month following its publication in the bulletin.

For the Curriculum Committee:  
Univ.-Prof. Dr. Peter Schönswetter

For the Senate:  
Univ.-Prof. Dr. Walter Obwexer

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