Master of Science (MSc) in Biology

As a continuation of the Bachelor (BSc) in biology, the program Master of Science (MSc) in biology allows students to develop advanced knowledge and skills in scientific research and to experience the frontiers of contemporary life science. The extended knowledge provided by studies at the MSc level enables students to understand complex biological systems and get hands-on experience studying them. Students will acquire the capacity to recognize relevant biological problems, to formulate testable hypotheses and to verify/falsify them by designing suitable experimental approaches employing state-of-the art methodology and techniques. A central aspect of the education at the MSc level is the development of the student's ability to establish or adapt methodological approaches to existing biological problems, including modern approaches in quantitative biology. During practical work on concrete research projects, students will develop high standards of professional expertise and integrity as well as autonomy and self-management. The ultimate goal of the MSc program is the personal and professional development of talented and motivated students into spirited young biologists. The MSc degree will open the door to a doctorate in life sciences, as well as a broad range of careers, including teaching, research and development in academia and the private sector, functions in public or private regulatory agencies, or work in the media sector and political institutions.

DESCRIPTORS:

Subject knowledge, understanding and skills

Describe and explain complex biological systems, especially – but not only – in the field of their chosen master's topic.

Define the key concepts and methods used in the field of their chosen master, identify and explain interrelationships between them.

Further develop standards of good laboratory practice and record keeping.

Developing scientific writing skills in English, e.g. writing reports, reviewing scientific topics or developing project proposals.

Application of knowledge and skills

Identify unsolved problems and key questions that exist within a specific biological field.

Formulate a scientific hypothesis; design and conduct laboratory experiments and/or field investigations to test it.

Design appropriate experimental strategies to investigate particular biological problems, including the use of appropriate positive and negative controls; critically assess the advantages and drawbacks of a specific strategy.

Integrate new developments of quantitative biology, systems biology, computational life sciences, and/or bioinformatics in experimental approaches.

Acquire, analyze and interpret data from personal scientific investigation(s) including the possibilities of computer-based analysis.

Undertake field, clinical, and/or laboratory investigations of biological systems in a competent, responsible and autonomous manner, applying ethical and risk considerations.

Judgment

Extract, compile, critically analyse and judge the significance of data from the literature, thereby outlining the state-of the-art in a specific field.

Evaluate biological information, taking into account underlying scientific theories, concepts and practical aspects.

During their research experience, evaluate ethical implications and risk consideration in work with for example human subjects, patient materials, animals as well as environmental issues, and respect the rules and regulations.

Develop the capacity to constructively and critically judge the research work of others in the form of peer review.

Communication and organizational skills

Communicate results in English concisely and effectively in both written and oral forms to a scientific audience (reports, oral presentations, posters).

Integrate into a research team and to develop respectful and responsible conduct with colleagues at all levels.

Self-directed study and self-management

During the research experience develop high standards of professional expertise and integrity as well as autonomy and self-management.