SLOVENSKO
OGRODJE
KVALIFIKACIJ

Magister mikrobiologije/magistrica mikrobiologije

Selected qualifications

Name of qualification	Magister mikrobiologije/magistrica mikrobiologije
Translated title (no legal status)	Master of Science in microbiology
Type of qualification	Diploma druge stopnje
Category of qualification	Izobrazba
Type of education	Master's education
Duration	2 years
Credits	120 credits

Admission requirements

• A completed first-cycle programme in Microbiology or a comparable first-cycle programme in the microbiology field, either in Slovenia or abroad; or
• a completed first-cycle study programme in another field, either in Slovenia or abroad, if the candidate additionally completes 10–60 credits in subjects from the first-cycle academic study programme in Microbiology; these credits are determined with reference to how different the field is and are defined for each candidate separately by the competent studies committee; the candidate must pass these additional examinations before enrolling in the master's programme; or
• a completed professional higher education programme in microbiology under the former system, either in Slovenia or abroad; or
• a completed professional higher education programme in another field under the former system, if the candidate additionally completes 10–60 credits in subjects from the first-cycle academic study programme in Microbiology; these credits are determined with reference to how different the field is and are defined for each candidate separately by the competent studies committee; the candidate must pass these additional examinations before enrolling in the master's programme.

ISCED field

Field
Naravoslovje, matematika in statistika

ISCED subfield

subfield biologija

Qualification level

SQF 8
EQF 7
Second level

Learning outcomes

The qualification holder will be able to:

(general competences)

- demonstrate proficiency in communication skills (written and verbal),
- use modern sources of information,
- pursue teamwork,
- critically assess hypotheses, express them and test them in the laboratory,
- organise own time effectively,
- demonstrate awareness of the importance of responsible behaviour in the workplace,
- work within heterogeneous groups,

(subject-specific competences)

- demonstrate understanding of the importance of microbiology, the positive and negative effects of

microbes in ecology, microbial biotechnology and medico-sanitary microbiology,
- demonstrate understanding of the organisation and functioning of the structural components of microbial cells and viruses,
- demonstrate understanding of biological processes in microorganisms (metabolism, transport, cellular cycle, signalling, responses to environmental stress factors, regulation of gene and protein expression, regulation of enzyme activity at the molecular level),
- demonstrate understanding of ecological processes involving microbes,
- autonomously and critically evaluate professional and scientific literature in various fields of microbiology,
- demonstrate knowledge of the principles of scientific work,
- independently design microbiological experiments,
- address complex questions from the field of molecular microbiology (e.g. quantification of gene expression, mutagenesis, evaluation of regulatory regions using bioinformatic tools) with the help of experimental approach and information sources,
- demonstrate knowledge of the theoretical and practical basis of the key methodologies used in microbial biochemistry,
- demonstrate understanding of the basics of modelling and carry out simple simulations,
- keep a research log, prepare a laboratory report and final report, and give an oral report on own work,
- demonstrate in-depth knowledge of good laboratory practice,
- seek out important information and report on it in written and oral form,
- demonstrate in-depth knowledge of the physical and chemical properties of various ecosystems and the role of microorganisms in various ecosystems (oil, water, sediments, digestive organs),
- demonstrate knowledge of the principal biogeochemical processes and the effects of microbes on the circulation of matter and global changes on Earth,
- demonstrate mastery of knowledge about the distribution, activity and importance of soil microorganisms for the conservation of soil quality,
- monitor and regulate biogenic processes in the soil,
- demonstrate mastery of knowledge about the distribution, activity, interactions and importance of microorganisms in land, water and marine ecosystems,
- evaluate microbial water pollution and demonstrate awareness of the problems surrounding the release of GMOs into the environment,
- demonstrate knowledge of biological evolution theory and the basics of population genetics,
- demonstrate knowledge of the molecular basis of variability in living beings, molecular phylogeny and the evolution of genes, gene families and genomes,
- use traditional methods in microbial ecology: sampling, monitoring the metabolic activities of microorganisms, establishing the number of microorganisms and isolating them from complex environmental samples,
- demonstrate knowledge of methods of molecular microbial ecology such as isolation of DNA from environmental samples, cloning, sequencing, bioinformatics approaches to phylogenetic classification and identification of the diversity of microorganisms in different ecosystems, monitoring gene expression in the environment and in pure cultures, at an in-depth level,
- demonstrate knowledge of key biotechnological processes; demonstrate knowledge of and use biotechnologically important microorganisms in the agri-food and pharmacy sectors and nature conservation biotechnology,
- demonstrate mastery of basic knowledge about handling equipment and apparatus in the management of modern biotechnological procedures in industry and nature conservation biotechnology,
- demonstrate understanding of methods of obtaining primary and secondary metabolites and the production of heterologous biological agents using microorganisms,
- monitor microbiological processes in food from production and processing to the consumer,
- participate in the addressing of environmental problems using biotechnological procedures,
- demonstrate knowledge of ethical dilemmas surrounding the use of biotechnological procedures,

- demonstrate knowledge of various technologies and systems for the preparation of antibodies in medical diagnostics and therapy,
- demonstrate proficient understanding of elements of safety in biotechnological production,
- demonstrate knowledge of the fundamental principles and terminology of economics and enterprise,
- demonstrate mastery of basic knowledge in the fields of human anatomy, physiology and pathophysiology, with an emphasis on communicable diseases,
- demonstrate in-depth knowledge and understanding of the mechanisms of pathogenesis leading to viroses, bacterioses, mycoses and parasitoses, and the means by which these infectious diseases spread,
- demonstrate understanding of the functioning of antimicrobial agents and measures to prevent infections with pathogenic microbes,
- demonstrate knowledge of laboratory diagnostics in medical bacteriology, mycology, parasitology, virology,
- demonstrate knowledge of the appearance, movement and distribution of diseases in a population,
- demonstrate mastery of knowledge about forms and methods of implementation of epidemiological research and epidemiological statistics,
- demonstrate knowledge of the sanitary aspect of microbiology and its importance for quality of life,
- demonstrate knowledge of the principles of safe work in clinical and sanitary laboratories,
- demonstrate knowledge of HACCP principles, supervision of the assurance of quality and safe work in food production plants and laboratories,
- demonstrate knowledge of problems relating to GMOs.

Assessment and completion

Examination performance is graded as follows: 10 (excellent); 9 (very good: above-average knowledge but with some mistakes); 8 (very good: solid results); 7 (good); 6 (adequate: knowledge satisfies minimum criteria); 5–1 (inadequate). In order to pass an examination, a candidate must achieve a grade between adequate (6) and excellent (10).

Progression

Students may enrol in the next year if by the end of the academic year they have completed all course units prescribed by syllabuses and accumulated at least 60 credits.

Transitions

Third-cycle doctoral study programmes (SQF level 10)

Condition for obtaining certificate

In order to complete the programme, students must complete all prescribed course units, for a total of 120

credits.

Awarding body

University of Ljubljana, Faculty of Bioengineering

URL

http://www.bf.uni-lj.si/en/