SLOVENSKO
OGRODJE
KVALIFIKACIJ

Magister inženir kemijskega inženirstva/magistrica inženirka kemijskega inženirstva

Selected qualifications

Name of qualification	Magister inženir kemijskega inženirstva/magistrica inženirka kemijskega inženirstva
Translated title (no legal status)	Master of Science in Chemical Engineering
Type of qualification	Diploma druge stopnje
Category of qualification	Izobrazba
Type of education	Master's education
Duration	2 years
Credits	120 credits

Admission requirements

• Completed first-cycle study programme from other professional fields not covered in the previous condition: engineering (5200), natural sciences (4000), if before enrollment in the study programme he / she completed study obligations essential for continuing studies in the scope of 47 ECTS awarded by the candidate can be done during the study at the first level, in further training programmes or by taking differential exams before enrolling in the study programme. Students must complete the following obligations: General Chemistry (8 ECTS), Inorganic Chemistry (4 ECTS), Organic Chemistry I (4 ECTS) and Organic Chemistry II (7 ECTS), Physical Chemistry I (4 ECTS), Heat Transfer (5 ECTS), Substance Transfer (5 ECTS), Separation Technique II (5 ECTS) and Chemical Reaction Technique I (5 ECTS).
• Completed first-cycle study programme in relevant profassional fields: chemistry (4420), chemical technology (5241), chemical technology and process engineering (5240), process engineering (5242), biochemical technology and engineering (5243) and education of teachers of natural sciences and mathematics - chemistry (1451).
• Completed higher professional study programme adopted before 11 June 2004 and study programme for the acquisition of specialization adopted before 11 June 2004 in other professional fields not covered by the previous condition: engineering (5200), natural sciences (4000) . Such a candidate is granted up to 30 ECTS within the study programme, and he / she is accordingly enrolled in the relevant year of study. The Study Affairs Committee determines for each candidate which subjects are awarded to him / her within the above-mentioned range of ECTS credits. Enrollment in other professional fields is decided by the Study Affairs Commission on the basis of individual applications.
• Completed higher professional study programme, adopted before 11 June 2004, in other professional fields not covered by the previous condition: engineering (5200), natural sciences (4000), if before enrollment in the study programme he / she completed study obligations essential for further studies in the scope of 47 ECTS, which the candidate can take during the study at the first level, in further training programmes or by taking differential exams before enrolling in the study programme. Students must complete the following obligations: General Chemistry (8 ECTS), Inorganic Chemistry (4 ECTS), Organic Chemistry I (4 ECTS) and Organic Chemistry II (7 ECTS), Physical Chemistry I (4 ECTS), Heat Transfer (5 ECTS), Substance Transfer (5 ECTS), Separation Technique II (5 ECTS) and Chemical Reaction Technique I (5 ECTS).
• Completed higher professional study programme, adopted before 11 June 2004, in the relevant professional fields: chemistry (4420), chemical technology (5241), chemical technology and process engineering (5240), process engineering (5242), biochemical technology and engineering 5243).
• Completed higher professional study programme, adopted before 11 June 2004, and study programme for obtaining specialization, adopted before 11 June 2004, in the relevant professional fields: chemistry (4420), chemical technology (5241), chemical technology and process engineering (5240), process engineering (5242), biochemical technology and engineering (5243), which is generally awarded 60 ECTS upon enrollment, which is enrolled in the second year of study if it meets the conditions for transition set out in accredited study programme. The Study Affairs Committee determines for each candidate which subjects are awarded to him / her within the above-mentioned range of ECTS credits. Enrollment in other professional fields is decided by the Study Affairs Commission on the basis of individual applications.
• Completed university study programme, adopted before 11 June 2004, in the relevant professional fields: chemistry (4420), chemical technology (5241), chemical technology and process engineering (5240), process engineering (5242), biochemical technology and engineering (5243) and the education of teachers of natural sciences and mathematics – chemistry (1451). As a rule, 60 ECTS + are awarded to such a candidate within the study programme, and he / she is enrolled in the second year of study if he / she meets the conditions for transfer determined by the accredited study programme with recognized obligations.
• Completed university study programme, adopted before 11 June 2004, in other professional fields not covered by the previous condition: engineering (5200), natural sciences (4000). Up to 30 ECTS + are awarded to such a candidate within the study programme, and he / she is accordingly enrolled in the relevant year of study.

ISCED field	Field Tehnika, proizvodne tehnologije in gradbeništvo
ISCED subfield	subfield kemijsko inženirstvo in procesi
Qualification level	SQF 8 EQF 7 Second level

Learning outcomes

The qualification holder will be able to:
General competences:

- conducting scientifically supported analysis and synthesis in the field of chemical and biochemical engineering and understanding the impact of technical solutions on environmental and social relations,
- holistic treatment of problems based on fundamental and advanced, analytical and synthetic approaches,
- use of acquired knowledge in solving qualitative and quantitative tasks in the field of chemical and biochemical engineering,
- identification and problem solving using scientific methods and procedures in a given specialist field,
- connecting technical applications with finance, management and business organization,
- observation and measurement of chemical properties and changes and systematic and reliable monitoring, recording and processing of data in chemical and biochemical engineering,
- acquiring knowledge from relevant literature and data sources, including computer databases,
- use of commercial computer programmes,
- effective communication, including in foreign languages, and the use of modern presentation tools,
- team work in multidisciplinary groups,
- understanding of management principles and business practices,
- understanding of their professional and ethical responsibilities,
- the ability to learn independently, even in depth, and the need for lifelong learning

The subject-specific competences acquired by graduates of the Master's programme in Chemical Engineering are the following:

- mastering in-depth knowledge of chemical engineering to understand, describe and solve complex problems of design and operation of chemical and biochemical processes,
- innovation of existing processes and development of new processes and products,
- understanding of thermal separation processes in chemical and biochemical industries,
- understanding the influence of the structure of materials on their physical and chemical properties,
- mastering mathematical modeling of chemical and biochemical processes,
- management of dynamics, regulation and management of chemical and biochemical processes,
- mastering the theory and applications of mathematical programming (optimization) in the planning, planning and operation of chemical and biochemical processes,
- mastering methodologies for preparing feasibility studies and economic evaluation of processes and projects,
- understanding of safety, health and the environment and the ability to apply the concept of sustainability (sustainability, sustainability),
- knowledge of legislation in a specific field, understanding and ability to use the concept of chemical product technology,
- knowledge and mastery of project work for practical applications of process and product techniques.

In addition to the above-mentioned common subject-specific competences, masters acquire the following narrower competences according to the chosen field of study and elective courses:

- understanding of operation and ability to design process devices and systems,
- knowledge of water and gas networks,
- knowledge of thermodynamics of mixtures,

- mastering conceptual process planning.

Elective courses in the field of chemical engineering:

- knowledge of thermodynamics of mixtures,
- knowledge of practical possibilities for better energy expression and exploitation of renewable resources,
- ability to use mathematical programming (optimization) for the synthesis of chemical and biochemical processes.

Elective courses in the field of environmental engineering:

- managing environmental management and cleaner production in processes and services,
- understanding the impact of the product on the environment at all stages of the life cycle,
- ability to assess and improve the environmental performance of chemical processes, the ability to select the most appropriate method and technology of waste treatment according to their type.

Elective courses in the field of coating engineering:

- knowledge of types of coating systems and raw materials for their production,
- control of process stages in the production of coatings,
- knowledge of optimal application and drying techniques for various coating systems.

In addition to the above-mentioned common subject-specific competences, masters acquire the following narrower competences according to the chosen field of study and elective courses:

- mastering bioseparation methods and in-depth knowledge of biocatalysis,
- knowledge of industrial microbiology,
- understanding and knowledge of modeling of bioreactor systems.

Elective courses in the field of biochemical engineering:

- understanding of techniques for preparing raw materials for industrial purposes,
- understanding of technological processes for food production.

Elective courses in the field of pharmaceutical engineering:

- knowledge and understanding of the field of active pharmaceutical ingredients,
- ability to plan, develop and manage the production of active pharmaceutical ingredients.

Assessment and completion

The methods of assessment and testing of knowledge are specified in the curricula of individual subjects. The most typical are: regular tests (arithmetic and theoretical), written exam, oral exam, arithmetic exam, theoretical exam, seminar work, presentation of seminar work, problem solving, active work in lectures, final work (diploma, master's or doctoral dissertation) and oral defense of the final work. Methods of continuous assessment and assessment of knowledge are encouraged, thus enabling students to continuously monitor their own progress in their studies. Students can check the results of the exams via the Academic Information Subsystem (AIPS) and in certain subjects via the electronic support system Moodle. Both systems ensure the protection of personal data so that only the student's results are visible to the student. Course providers and providers are always ready to provide students with additional explanations regarding the assessment in person or via e-mail. Students often come to the professors to

see the results of the knowledge test, with the professors explaining any mistakes and giving instructions for further learning.

The success of exams and studies is regularly analyzed and published in the Self-Evaluation Report of UM FKKT, which is published on the website: http://www.fkkt.um.si/sl/kakovost .

Progression

Enrollment conditions for the second year: students enroll in the second year if they have completed the study obligations of the first year in the amount of at least 51 ECTS.

Promotion under extraordinary conditions: A student who has not fulfilled all obligations may exceptionally be granted enrollment in a higher year by the FKKT Academic Affairs Commission if more than half of the obligations have been fulfilled, if he could not fulfill the obligations for justified reasons and if it is expected that student will fulfill her/his obligations.

Transitions

Third-cycle doctoral study programmes (SQF level 10)

Condition for obtaining certificate

The second-cycle master's study programme in Chemical Engineering is completed by anyone who completes all the obligations prescribed by the study programme and thus collects at least 120 ECTS and prepares and successfully defends a master's thesis.

Awarding body

University of Maribor, Faculty of Chemistry and Chemical Engineering

URL

https://www.fkkt.um.si/studenti