

## INFORMATION PUBLICATION

applies for students enrolled in the 2020/2021 academic year

### MASTER'S STUDY PROGRAMME

## RADIOLOGIC TECHNOLOGY, second-cycle

### 1. INFORMATION ABOUT THE STUDY PROGRAMME

*Entry in the register of higher education institutions*

*Decision no. 60392-23/2009/6 of 21 May 2009*

Second-cycle study programme *Radiologic Technology* lasts 2 years (4 semesters) and comprises a total of 120 ECTS credits. After completing the programme, the graduate is awarded the professional title **magister inženir radiološke tehnologije** or **magistrica inženirka radiološke tehnologije** (abbreviation: **mag. inž. rad. tehnol.**).

ISCED:	Health care (72)	SOK:	SOK level 8
KLASIUS-P:	Radiology, radiography, X-ray, nuclear medicine technology (7251)	EOK:	EOK level 7
KLASIUS-P-16:	Medical diagnostic and therapeutic technology (0914),	EOVK:	Second-cycle
FRASCATI:	Medical sciences (3)		

### 2. Basic programme goals and general competences acquired with the programme

The basic goal of the second-cycle study programme Radiologic Technology is to train an expert, a specialist in one of the three fields of radiologic technology. Thus, in the second-cycle programme, the student may choose between diagnostic and interventional radiologic technology, nuclear medicine technology and radiotherapy technology; all these areas include knowledge that enables the second-cycle graduate a comprehensive approach to quality assurance in each of the selected areas, which is also supported with the provisions of the Ionising Radiation Protection and Nuclear Safety Act (Official Gazette of the Republic of Slovenia, No. 50/03, consolidated text) and subordinate rules that regulate individual areas in more detail.

A profession can only be developed through own research work. The possibility of gaining a master's degree and later a PhD will enable the profession to acquire own research staff and thus also own pedagogical staff with appropriate qualifications.

Moreover, the goal of the programme is to provide appropriate didactic knowledge for staff who participate in the first-cycle pedagogical process (practitioners who teach clinical training and clinical practice).

During the second-cycle study programme Radiologic Technology, the student acquires knowledge and skills, the ability to understand and apply knowledge, assess and communicate and learning skills for independent work.

The graduate masters basic theoretical and practical knowledge for working independently and in an interdisciplinary team in carrying out special diagnostic, therapeutic and interventional radiologic procedures and in the selected area of expertise and is able to assess and meet the patient's needs, taking into account the principles of professional ethics.

- Is able to analyse complex professional issues, synthesize appropriate solutions and ensure constructive participation in an interdisciplinary team.
- Has the physical and radiobiological knowledge on which contemporary radiological diagnostic and therapeutic technologies are based.
- Performs work in diagnostic procedures in line with the applicable legislation on ionizing radiation protection and is able to optimize radiation doses and assess the correct use of ionizing radiation in terms of risks and benefits for patients.
- Masters a comprehensive approach to quality assurance in the selected area of expertise.
- Is able to critically read and write scientific and professional texts.
- Is able to apply quantitative and qualitative methods of data collection and analysis in specific research problems.
- Is able to engage in research work in his/her area of expertise.
- Has the knowledge that enables him/her to use modern information and communication technology in a selected area of expertise.
- Is qualified to obtain and use information from various sources and to monitor new directions of development in radiologic technology.
- Recognizes the importance of information security and the problems posed by the use of information and communication technology in healthcare.
- Is familiar with contemporary theoretical concepts, approaches and forms of organization; has knowledge of processes in the organization and management tasks; understands the importance of systems of labour division and team participation; is familiar with the concepts for developing overall quality.
- Acquires knowledge to introduce improvements and changes in the practice of radiologic technology.
- Has developed learning skills, independently perfects his/her expert knowledge, has a positive attitude towards studies, knows how to obtain and use information from various sources and is aware of the importance of lifelong learning.
- Knows how to transfer his/her knowledge to the students of the first-cycle professional higher education study programme in radiologic technology.

### **Subject-specific competences acquired with the programme**

- The graduate in radiologic technology is able to determine the necessary and optimal performance of procedures and elements with regard to the desired quality of the radiological image.
- Is familiar with novelties in radiobiology.
- Has knowledge in the field of radiation protection and uses it in practice; understands the principles of ionizing radiation protection (justification, optimization and limit values) in line with applicable legislation and international recommendations and uses them when working with patients. Is able to monitor domestic and international legislation in this field.
- Is able to analyse complex professional issues and synthesize appropriate solutions.

- Is able to provide quality technological work within diagnostic, interventional and therapeutic radiologic procedures.

### **Contents according to the selected professional elective module in the second year of studies**

#### **1. Imaging methods in diagnostic and interventional radiologic technology**

- In the radiological treatment of disease processes, the student is able to perform the technological part of more complex imaging radiological diagnostic and interventional procedures with various imaging technologies (computer radiography, direct computer radiography, diagnostic ultrasound, computed tomography, magnetic resonance imaging).
- Has in-depth theoretical knowledge of the course of radiological diagnostic and interventional procedures, which is important in a radiological engineer's practical work.
- Is familiar with the process of quality assurance in diagnostic and interventional radiology and masters specific procedures of quality control of individual components of the diagnostic chain in diagnostic and interventional radiology.
- Is qualified to implement a specific quality control programme.

#### **2. Nuclear medicine technology**

- In the nuclear medicine treatment of disease processes, the student is able to perform the technological part of more complex interventions with various nuclear medicine technologies.
- From a technological point of view, he/she is able to initiate testings with a new radiopharmaceutical.
- Is familiar with the basics of radiopharmacy and radiochemistry and is qualified for specific hot laboratory work.
- Is qualified for the quality assurance process and familiar with specific procedures for checking the quality of individual components of the diagnostic chain in nuclear medicine.
- Is able to introduce a specific programme for quality control of gamma cameras and dose calibrators.

#### **3. Radiotherapy technology**

- The student has in-depth knowledge of radiotherapy and theoretical and practical knowledge of contemporary radiation techniques.
- He/she is qualified for quality assurance and control in radiotherapy, which covers methods and procedures for quality assurance at all levels of work in radiotherapy: preparation of treatment, radiation planning with emphasis on input parameters, dosimetry in radiation devices, irradiation in accordance with the prescribed plan.

### **3. Conditions for enrolment and selection criteria in the case of restricted enrolment**

Every year, 30 students may enrol in the second-cycle study programme Radiologic Technology.

Candidates who have completed the following may enrol:

- a) first-cycle study programme Radiologic Technology,
- b) first-cycle study programme from other areas of expertise (physics, medicine or dental medicine, midwifery, occupational therapy, physiotherapy, orthopaedic technology, sanitary

engineering, nursing and physical measurement technology), if, before the enrolment, the candidate completes study obligations from the first-degree professional higher education study programme Radiology (in the scope of 59 credit points) that are essential for further studies:

Seq. no.	Subject	ECTS
1	Diagnostic and interventional radiological methods 1	15
2	Diagnostic and interventional radiological methods 2	14
3	Nuclear medicine technology 2	10
4	Radiotherapy technology 2	10
5	Molecular biology and radiobiology	4
6	Radiophysics and radiation protection	6

- c) professional higher education study programme Radiology according to the former programme;
- d) professional higher education study programme from other areas of expertise (physics, medicine or dental medicine, midwifery, occupational therapy, physiotherapy, orthopaedic technology, sanitary engineering, nursing and physical measurement technology), if, before the enrolment, the candidate completes study obligations from the first-cycle professional higher education study programme Radiologic Technology (in the scope of 59 credit points) that are essential for further studies:

Seq. no.	Subject	ECTS
1	Diagnostic and interventional radiological methods 1	15
2	Diagnostic and interventional radiological methods 2	14
3	Nuclear medicine technology 2	10
4	Radiotherapy technology 2	10
5	Molecular biology and radiobiology	4
6	Radiophysics and radiation protection	6

When applying, all candidates must demonstrate knowledge of the Slovenian language at the B2 level, according to the Common European Framework of Reference for Languages (CEFR), with the appropriate certificate. Relevant proof of compliance with this enrolment condition shall be:

- a certificate of completion of the Slovenian language exam at B2 level or an equivalent certificate,
- a certificate of primary school completion in the Republic of Slovenia or completion of school abroad that features the Slovenian language,
- a matura certificate or certificate on completed secondary professional education, which also shows the Slovenian language course completion,
- a certificate of completed bilingual (in the Slovenian and foreign language) secondary education or completed foreign secondary school that features the Slovenian language,
- a diploma obtained at a higher education institution in the Republic of Slovenia and a certificate (statement) that the candidate has completed the programme in the Slovenian language.

**Selection criteria in the case of restricted enrolment:**

In the case of restricted enrolment, candidates will be selected according to the average grade of exams and diploma work at the first level.

#### **4. Criteria for the recognition of knowledge and skills acquired prior to enrolment in the programme**

The student may be recognized knowledge that corresponds to the content of the subjects in the second-cycle programme Radiologic Technology, acquired in other study programmes of the appropriate cycle. The Commission for Academic Affairs of the Faculty of Health Sciences is to decide on the recognition of knowledge acquired before the enrolment based on the student's written application, enclosed certificates and other documents proving successfully acquired knowledge and its content.

In recognizing knowledge acquired prior to enrolment, the Commission is to consider the following criteria:

- the adequacy of meeting criteria for accession to different forms of education (required prior education for inclusion in education),
- the relevance of the scope of education (the number of hours of prior education with regard to the scope of the subject) for which the obligation is being recognized,
- the relevance of the content of education with regard to the content of the subject for which it is being recognized.

Acquired knowledge may be recognized as a completed obligation if:

- the condition for inclusion in education was in line with the conditions for inclusion in the programme,
- if prior education covered at least 75% of the scope of the subject and if at least 75% of the content corresponds to the content of the subject for which the study obligation is being recognized.

If the Commission establishes that the acquired knowledge may be recognized, it is to be evaluated with the same number of ECTS credits as the number of credits for the subject.

#### **5. Requirements for progression through the programme**

To progress from the first to the second year of study, students need to accumulate 50 ECTS credits. The Commission for Academic Affairs may exceptionally allow a student to continue to the second year of study if he/she has achieved at least 40 ECTS credits in the first year. However, the student must have justifiable reasons for doing so, as determined by the Statutes of the UL.

#### **6. Conditions for completing studies**

In order to complete his/her studies, a student must complete all requirements demanded by courses and defend the master's thesis.

#### **7. Transferring between study programmes**

The transfer between study programmes means the termination of education in the first study programme and the continuation of studies in the second study programme, in which all or part of the obligations completed by the student in the first study programme are recognized as completed obligations of the second study programme.

In transferring between study programmes, the following criteria are in particular taken into account:

- fulfilment of conditions for enrolment in the study programme,
- the number of available places (if the number of candidates exceeds the number of planned vacancies, the selection procedure is to be carried out by assessing the average grade from exams passed in previous studies),
- comparability of study obligations that the student has completed in the first study programme.

**Conditions for transfer:**

Pursuant to the Criteria for transferring between study programmes (Official Gazette of the Republic of Slovenia, Nos. 95/2010, 17/2011), transfers are possible between study programmes accredited in the Republic of Slovenia or implemented in European Union countries, which, upon completion of studies, ensure the acquisition of comparable competencies, and among which at least half of obligations under the ECTS from the first study programme, relating to the compulsory subjects of the second study programme, may be recognized pursuant to the recognition criteria.

Pursuant to the Criteria for transferring between study programmes (Official Gazette of the Republic of Slovenia, Nos. 95/2010, 17/2011) and other regulations, transfers are possible in the following ways:

**1. Between study programmes of the same cycle**

a) Transfers are possible from all second-cycle study programmes in the field of radiologic technology, implemented in the countries of the European Union, upon taking into account all the obligations that the student has completed in this programme and that can be recognized. On this basis, it is determined to which year the student can be transferred.

b) Transfers are possible from uniform or second-cycle study programmes in the field of physics and medicine, implemented in the countries of the European Union, whereby the student, who has not previously completed the first-cycle professional higher education study programme Radiologic Technology, must pass the bridge exams laid down by the competent authorities of the ZF UL before enrolling in Year 2 of the second-cycle study programme Radiologic Technology.

c) From second-cycle study programmes in other professional fields: midwifery, occupational therapy, physiotherapy, orthopaedic technology, sanitary engineering and nursing, whereby the student, who has not previously completed the first-cycle professional higher education study programme Radiologic Technology, must pass the bridge exams laid down by the competent authorities of the ZF UL before enrolling in Year 1 of the second-cycle study programme Radiologic Technology.

**2. from non-Bologna university study programmes from other areas of expertise:** physics, medicine, dental medicine, whereby the student, who has not previously completed the first-cycle professional higher education study programme Radiologic Technology, must pass the bridge exams laid down by

the competent authorities of the ZF UL before enrolling in Year 2 of the second-cycle study programme Radiologic Technology.

Upon the fulfilment of the prescribed conditions for enrolment, the Senate of ZF UL is to decide on the recognition of obligations - and determination of the missing or additional obligations - fulfilled by the student in the previous programme based on prior consideration of the Commission for Academic Affairs, which determines the year into which the student is to be transferred depending on the scope of recognized obligations.

## **8. Methods of assessment**

Students' knowledge is evaluated and assessed by individual modules / subjects so that the learning process related to a particular subject is concluded with the examination of theoretical and / or practical knowledge. Forms of knowledge assessment (oral or written exam, colloquia, seminar papers, project assignments) are defined in syllabuses. The general rules of knowledge assessment are regulated by the Rules on knowledge assessment of the Faculty of Health Sciences, adopted by the Senate of the Faculty of Health Sciences.

Pursuant to the Statutes of the University of Ljubljana, the following grade chart is used for evaluation:

- 10 – Exceptional knowledge without or with negligible faults
- 9 – Very good knowledge with some minor faults
- 8 – Good knowledge with certain faults
- 7 – Solid knowledge but with several faults
- 6 – Knowledge only meets minimal criteria
- 5 – Knowledge does not meet minimum criteria

A student passes the exam if he/she is graded from 6 to 10.