

1. Study Program Data

1.1 High Education Institution	"VICTOR BABEȘ" UNIVERSITY OF MEDICINE AND PHARMACY OF TIMIȘOARA
1.2 Faculty	MEDICINE
1.3 Department	XV
1.4 Study Domain ¹⁾	MEDICINE
1.5 Cycle Studies ²⁾	Bachelor's degree
1.6 Study programme/ Qualification	M

2. Course Data

2.1.Course	Hybrid Imaging and Nuclear Medicine							
2.2 Course tutor	Assoc.Prof. Daniel Malita, Assoc.Prof. Agneta Pusztai							
2.3 Practical activity tutors								
2.4. Year of study	IV	2.5 Semester	II	2.6 Assessment	Colloquium	2.7 Course rank	Content ³⁾	DS
							Mandatory /Compulsory ³⁾	DO

3. Duration/Estimated Time (number of hours/ semester of teaching activity)

3.1 Number of hours/ week	1	3.2 lecture/course	1	3.3 laboratory	0
3.4 Total hours of curriculum	14	3.5 lecture/course	14	3.6 laboratory	0
Time distribution for course activities					hours
Study support- manuals, lectures, references and notes					20
Additional documentation – library, dedicated platforms from domain					10
Documentation for seminars/ practical activity/ projects, themes, portfolios and essays					4
Tutoring					
Assessment					2
Other activities					
3.7 Total number of hours for individual study	34				
3.8 Total number of hours per semester	50				
3.9 Number of credits ⁵⁾	2				

4. Preconditions (if applicable and requested)

4.1 Courses-studied curriculum / rules for attending the course	According to the university curriculum: Cross-sectional/radiological Anatomy, Biochemistry, Biophysics, Pathophysiology, Morphopathology, Medical/surgical Semiology	
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4.2 Practical activities/seminars /projects studied curriculum, basic skills/ rules for attending the course	According to the university curriculum: Radiological Anatomy.	
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5. Condition (if applicable and requested)

5.1 Courses	<ul style="list-style-type: none"> • Audio-video equipment • Mobile phones must be turned off during classes; phone calls are not allowed during class time, nor leaving the classroom to answer personal phone calls. • Student tardiness to class will not be tolerated as it disrupts the educational process. • Attendance at lectures is mandatory, with a maximum of 30% of total absences allowed.
5.2 Laboratory/practical activity/ project	Not applicable.

6. Key competencies and basic skills

Professional Competencies	<p>C1. Operating with the laws and principles in medical physics at all levels;</p> <p>C2. Acquiring basic knowledge for understanding the technical principles of hybrid imaging and nuclear medicine used in current medical practice (CT, MRI, SPECT, SPECT/CT, PET-CT, PET-MR);</p> <p>C3. Mastering the fundamental concepts of multiparametric hybrid imaging that allow the detection and characterization of lesions through various hybrid radio-imaging and nuclear medicine methods;</p> <p>C4. Understanding the indications, contraindications, possibilities, and limitations of hybrid imaging and nuclear medicine methods and selecting examination requests adapted to each clinical case;</p> <p>C5. Understanding and correctly interpreting images and preparing imaging and nuclear medicine reports, correlating with clinical elements, for establishing a diagnosis.</p>
Transversal Competencies	<p>C1. Identifying the objectives to achieve, available resources, completion conditions, work stages, timeframes, deadlines, and associated risks;</p> <p>C2. Identifying team roles and responsibilities, applying relationship and work efficiency techniques;</p> <p>C3. Efficient use of informational, communication, and work optimization resources;</p> <p>C4. Continuous improvement of theoretical, practical, and pedagogical knowledge as well as expanding professional horizons.</p>

7. Disciplines/Course objectives (based on the key competences)

7.1 Disciplines/Course general objectives	Students' acquisition of general concepts of hybrid imaging, multiparametric imaging, and specific nuclear medicine.
7.2 Disciplines/Course specific objectives	Presentation of current semiological aspects and interpretation algorithms in the evaluation of multiparametric imaging, CT, and MRI, as well as through hybrid imaging techniques and nuclear medicine in patients with specific characteristics of the involved organ.

8. Content

8.1 Course	Teaching method	Number of hours	Notification
1.Introduction to nuclear medicine: basics of nuclear medicine physics	Interactive Lecture	1	-Interactive Oral Presentations with PowerPoint, accompanied by rich imagery (scintigraphic images, PET-CT), discussing
2. Interaction of radiation with matter. Biological effects of ionizing radiation. Radioprotection in Nuclear Medicine.		1	

3. Radiopharmaceuticals used in scintigraphic explorations. Radiopharmaceuticals used in PET.		1	technical aspects, method limitations, imaging semiology, positive diagnosis, and differential diagnosis.
4. SPECT technique. PET technique. Principles of the technique, data acquisition and reconstruction, clinical applications.		1	-The material is reviewed and supplemented with the latest relevant information for the specialty. -Each lecture begins with educational objectives and ends with a summary of the presented concepts.
5. Hybrid systems - SPECT/CT, PET-CT, and PET-MRI - technical aspects, image acquisition, advantages and limitations, clinical applications.		1	
6. Hybrid imaging and nuclear medicine in brain tumor pathology		1	
7. Hybrid imaging and nuclear medicine in cervical tumor pathology		1	
8. Hybrid imaging and nuclear medicine in thoracic tumor pathology		1	
9. Hybrid imaging and nuclear medicine in gastrointestinal tumor pathology		1	
10. Hybrid imaging and nuclear medicine in hepatobiliary pancreatic tumor pathology		1	
11. Hybrid imaging and nuclear medicine in renal-urinary tumor pathology		1	
12. Hybrid imaging and nuclear medicine in prostatic and uterine tumor pathology		1	
13. Hybrid imaging and nuclear medicine in bone tumor pathology		1	
14. Hybrid imaging and nuclear medicine in oncohematology		1	
8.2 Seminars/ Laboratory/practical activity/ projects	Teaching-learning, methods	Number of hours	Notification
Not applicable	Not applicable		Not applicable

9. Correlations between the content of the course and the requirements of the professional field and relevant employers

The course content is in line with the evolution of medical imaging at both national and global levels, becoming a mandatory and central component in the pre- and post-therapeutic assessment of oncology patients. The main objective of the course is to familiarize medical students with state-of-the-art imaging methods in medical oncology.

Students participating in hybrid, multiparametric imaging, and nuclear medicine courses will acquire basic knowledge regarding examination techniques, indications, and limitations of each method, as well as image interpretation techniques. They will also develop the ability to integrate the obtained results into the clinical and biological context of the patient.

10. Assessment

Activity	10.1 Assessment criteries	10.2 Assessment methods	10.3 Percentage of the final grade
10.4 Course	Knowledge for a grade of 10: • Recognition of normal and pathological appearance of the investigated organs • Integration into clinical context	<i>Final evaluation:</i> • Multiple Choice Questions (10 questions) • Recognition of 5 scintigraphic/PET-CT images	90%
		• Continuous assessment: case discussions, seminars	10%
10.6 Minimum performance standard-basic knowledge			
Knowledge for a grade of 5: Identification of anatomical elements investigated through scintigraphy and PET-CT.			

Date 22.04.2024	Signature of the course holder Assoc.Prof. Daniel Malita Assoc.Prof. Agneta Pusztai
Signature of the Head of Discipline	Prof. Florica Birsasteanu
Date of approval in the Department 23.04.2024	Signature of the Head of Department Prof. Bogdan Andor