



## MODULE / SYLLABUS

EDUCATION CYCLE 2024-2027

<b>Module/subject name:</b>	<b>RADIOLOGY</b>		
<b>Direction:</b>	<b>NURSING</b>		
<b>Level of study*:</b>	<b>1st degree (bachelor's degree)</b> II degree (master's degree)		
<b>Education profile:</b>	<b>practical</b>		
<b>Type of studies*:</b>	<b>stationary/</b> part-time		
<b>Type of classes*:</b>	mandatory X complementary <input type="checkbox"/> optional <input type="checkbox"/>		
<b>Year and semester of study*:</b>	Year of studies*: IX II <input type="checkbox"/> III <input type="checkbox"/>	Semester of studies*: 1 <input type="checkbox"/> 2X 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/>	
<b>Number of ECTS credits assigned</b>	<b>1.5</b>		
<b>Language of instruction:</b>	<b>Polish</b>		
<b>PSW Department Name:</b>	<b>Faculty of Health Sciences</b>		
<b>Contact (phone/email):</b>	tel.55 279 17 68 e-mail:dziekanat@psw.kwidzyn.edu.pl		
<b>Type of module/subject related to vocational training*:</b>	<ul style="list-style-type: none"> <li>• basic science X</li> <li>• social sciences and humanities <input type="checkbox"/></li> <li>• teaching the basics of nursing care <input type="checkbox"/></li> <li>• teaching in the field of specialist care <input type="checkbox"/></li> </ul>		
<b>Person responsible for the module/subject:</b>			
<b>Person(s) in charge:</b>	According to the study plan		
<b>Forms of student workload</b>		<b>Student Load (number of teaching hours)</b>	
<i>Contact hours with an academic teacher (according to the study plan)</i>			
Lectures (W)			<b>15</b>
Seminar (S)			
Conversations			
Exercises (C)			<b>12</b>
Practical classes (PK)			
<b>BUNA - independent student work</b> (according to the study plan)		<b>11</b>	
Student workload related to professional practice (according to the study plan)			
<b>Total student workload- total number</b>		<b>38</b>	
<b>Number of ECTS points per subject/module</b>		<b>1.5, including 0.5 BUNA</b>	
<b>Teaching methods</b>	<ul style="list-style-type: none"> <li>• informative lecture,</li> <li>• exercises, didactic discussion,</li> <li>• self-education</li> </ul>		
<b>Objectives and purpose of the course</b>	Preparing the student for issues in the field of radiology.		
<b>Teaching tools</b>	Multimedia board and projector, boards. Medical teaching aids (medical phantoms and simulators, trainers and models, including anatomical models).		
<b>Prerequisites:</b>	Basic knowledge of anatomy and physiology, based on high school education.		
<b>Learning outcomes matrix for a module/subject in relation to the methods of verifying the achievement of the intended learning outcomes and the form of implementation of didactic activities</b>			
Symbol learning effect	A student who passes a module (subject) knows/understands/is able to:	Methods of verifying the achievement of intended learning outcomes	The form of teaching activities * enter symbol
A.W26.	It presents imaging methods and principles of performing imaging using these methods as well as principles of radiological protection.	<i>Written and/or oral colloquium, project or oral response</i>	W/C/BUNA
A.U11.	Applies the principles of radiation protection.	<i>Written and/or oral colloquium, project or oral response</i>	Ć/BUNA
O.K4.	Takes responsibility for the professional activities performed.	<i>Written and/or oral colloquium, project or oral response</i>	Ć/BUNA

O.K7.	Notices and recognizes own limitations in terms of knowledge, skills and social competences and performs self-assessment of educational deficits and needs.	<i>Observation, self-assessment</i>	W/C/BUNA
*W-lecture; S-seminar; K-conversations; C-exercises; ZP-practical classes; PZ-professional internships; BUNA-independent student work			
<b>EXAMPLES OF METHODS FOR VERIFYING LEARNING OUTCOMES</b>			
<b>in terms of knowledge (lectures/seminars):</b> and oral exam (non-standardized, standardized, traditional, problem-based); written exam – the student generates / recognizes the answer (essay, report; short structured questions /SSQ/; multiple choice test /MCQ/; multiple answer test /MRQ/; matching test; Y/N test; answer completion test),			
<b>in terms of skills (exercises/conversations):</b> Practical exam; Objective Structured Clinical Examination /OSCE/; Mini-CEX (mini – clinical examination); Realization of assigned task; Project, presentation			
<b>in the field of social competences:</b> reflective essay; extended observation by supervisor/lead teacher; 360° feedback (opinions from teachers, colleagues, patients, other collaborators); Self-assessment (including portfolio)			
<b>BUNA</b> –the student's own work is verified by assessing the degree to which the assumed learning outcomes have been achieved: a test checking the student's knowledge of the topics specified in the syllabus, but also through term papers, projects, presentations and any other mid-semester work.			
<b>PROGRAM CONTENT TABLE</b>			
<b>Program content</b>		<b>Number of hours</b>	<b>Relating learning outcomes to CLASSES</b>
<b>LECTURES, semester II</b>			
1. Physical foundations of radiology using x-rays: historical outline and general concepts, waves (basic types and parameters), energy (length and amplitude relationship), wave-particle duality (Young's experiment for photons and electrons), interaction of ionizing radiation with matter (coherent scattering, Compton effect, photoelectric effect, pair formation phenomenon). Technical foundations of radiodiagnostics: construction and principle of operation of an x-ray tube - X-ray, CT and Accelerator/Linear Accelerator. Physical and technical foundations of radiotherapy: (teloradiotherapy and brachytherapy). Application of radioactive isotopes: radioactive transformation: (alpha, beta minus and beta plus), radiation sources (closed - brachytherapy, open - diagnostics and therapy in Nuclear Medicine). Physical basics of X-ray using ultrasound (USG): structure and principle of operation of the ultrasound head and device, Doppler USG, 3D USG, indications and contraindications to the examination.		3	A.W26. O.K7.
2. Radiological diagnostics using the example of the breast: Mammography (normal male and female anatomy, age-related differences in morphology, examination technique CC and MLO projections, normal X-ray anatomy, technical, anatomical and interpretative criteria for a correct mammogram), subtraction mammography, contrast mammography, targeted mammography, indications and contraindications for the examination. Computed tomography and PET: physical and technical basics of PET and cyclotron, beta plus isotopes used, indications and contraindications for the examination. Magnetic resonance imaging: physical and technical basics, indications and contraindications for the examination.		4	A.W26. O.K7.
3. Fundamentals of cell biology and cancer cell: stages and cell divisions (self-renewal, asymmetric division, symmetric division with maturation, cellular senescence), Hayflick limit, mutations and suppressor genes and repair systems, mutations in suppressor genes, basics of radiobiology (Bergonie' and Tribondeau's observation, interaction of radiation with living organisms, tissue radiosensitivity, post-radiation reactions, post-radiation syndromes/diseases). Principles of treatment of malignant tumors with radiotherapy (radical, palliative, symptomatic treatment).		6	A.W26. O.K7.
4. Radiological protection, occupational exposure and employee radiological protection (personal shields, permanent shields, personal and stationary dosimeters), protection of the patient against excessive exposure (justification for referral using ionizing radiation, personal shields, ALARA).		2	A.W26. O.K7.
<b>EXERCISES, semester II</b>			
1. The use of ionizing radiation in medicine.		3	A.W26. A.U11. O.K4. O.K7.
2. Imaging diagnostics – indications and preparation of the patient for examination.		3	A.W26. A.U11. O.K4. O.K7.

3. Radiotherapy indications, radiation reactions, complications, patient care, radiation protection.	3	A.W26. A.U11. O.K4. O.K7.
4. Systemic treatment in oncology, dangers, preparation of the patient, care during and after treatment.	3	A.W26. A.U11. O.K4. O.K7.
<b>BUNA - independent student work, semester II</b>		
1. Care of a patient undergoing radiotherapy.	4	A.W26. A.U11. O.K4.
2. Complications after radiotherapy.	4	A.W26. O.K7.
3. Documentation of the radiotherapy department.	3	A.W26. O.K7.

### LITERATURE LIST

#### Basic literature:

— Herring W., Szański M.(red.), *Podręcznik radiologii*, Edra Urban & Partner, Wrocław 2020.

#### Additional literature:

— Daniel B., Pruszyński B., *Anatomia radiologiczna RTG TK MR USG*, Wyd. PZWL, Warszawa 2023.

### Method of passing and forms and basic assessment criteria/examination requirements

#### How to pass

- Graded test – lecture
- Graded exam – exercises
- Pass without grade – BUNA

#### Forms and criteria for passing

##### Lecture:

The basis for obtaining credit is:

- 100% attendance; confirmed by an entry on the attendance list,
- a possible 10% absence compensated in an individual manner agreed with the teacher,
- active participation in lectures (joining the discussion initiated by the lecturer, showing interest in the issues discussed during the lecture),
- Passing BUNA

#### Written examination:

- It is a written test, multiple choice test /MCQ/ with one correct answer (each correct answer is 1 point, no answer or incorrect answer 0 points, minimum 60% of correct answers qualifies for a positive grade.

#### Test Grading Criteria

Rate	Very good (5.0)	Good plus (4.5)	Good (4.0)	Sufficient plus (3.5)	Satisfactory (3.0)	Insufficient (2.0)
% correct answers	93-100%	85-92%	77-84%	69-76%	60-68%	59% and less

#### Exercises

The basis for obtaining credit for a grade is:

- 100% attendance; confirmed by an entry on the attendance list,
- active participation in exercises (joining the discussion initiated by the lecturer, showing interest in the issues discussed during the exercises)
- obtaining the least satisfactory grade from the tasks developed during the exercises (arithmetic mean of the grades from the tasks developed in all exercises).
- correct, positively assessed oral answer to 3 questions on the content relating to the learning outcomes in the area of knowledge and skills, asked to the student during the last exercise.
- the final grade for the exercises will be given based on the arithmetic mean of the oral answers and the final grade for the completed tasks.

#### Assessment criteria – oral response

Rate	Criterion
Very good	Correct, complete, independent answer to 3 questions asked to the student by the instructor
All right	Correct answer, requiring slight guidance from the teacher, to 3 questions asked to the student
Sufficient	Correct, incomplete, requiring significant guidance from the teacher, answer to 3 questions asked to the student
Insufficient	No answer or incorrect answer to any of the 3 questions asked to the student

**BUNA assessment criteria – independent student work**

## Design

Assessment criteria	Rating: pass/fail	
Compatibility of the work content with the subject of education		
Content evaluation of the work		
Evaluation of the selection and use of sources		
Assessment of the formal aspect of the work (footnotes, language)		
*(work recommendations)		
	(rate)	(signature)

\* if any of the criteria are not met, the work should be corrected according to the lecturer's recommendations

**FINAL SUBJECT GRADE:**

— arithmetic mean of grades from lecture and tutorial tests

The final grade is calculated according to the following criteria:

3.0 -3.24 – satisfactory (3.0)

3.25 -3.74 – satisfactory (3.5)

3.75 -4.24 – good (4.0)

4.25-4.74 – good plus (4.5)

4.75 -5.0 – very good (5.0)

**Conditions for making up classes missed due to justified reasons:**

Making up missed classes is only possible in the case of a student's illness documented by a medical certificate or other unforeseen reasons. The excuse for classes and crediting the material covered by the exercises during the absence is made by the lecturer conducting the classes.

Both a student returning from dean's leave and a student repeating a year are required to attend all classes and take the exam. Only if the exam in a given year is graded at least satisfactory (3.0) can a student repeating a year due to a different subject be exempted from the obligation to attend classes and pass and pass the subject.

**Approval: Vice-Rector for Education**