



# Pomeranian Medical University in Szczecin

## SYLLABUS of the MODULE (SUBJECT) General Information

| Module title: Biophysics with imaging elements 2025/2026 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module type                                              | Obligatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Faculty PMU                                              | Faculty of Medicine and Dentistry                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Major                                                    | Medicine                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Level of study                                           | long-cycle (S2J)                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Mode of study                                            | full-time studies                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Year of studies, semester                                | Year 1, semester II                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ECTS credits (incl. semester breakdown)                  | 1,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Type/s of training                                       | seminars (20h)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Form of assessment*                                      | <input checked="" type="checkbox"/> graded assessment:<br><input type="checkbox"/> descriptive<br><input checked="" type="checkbox"/> test<br><input type="checkbox"/> practical<br><input type="checkbox"/> oral<br><br><input type="checkbox"/> non-graded assessment<br><br><input type="checkbox"/> final examination<br><input type="checkbox"/> descriptive<br><input type="checkbox"/> test<br><input type="checkbox"/> practical<br><input type="checkbox"/> oral |
| Head of the Department/ Clinic, Unit                     | Dr n. med. Karolina Jeziarska,<br>karolina.jeziarska@pum.edu.pl                                                                                                                                                                                                                                                                                                                                                                                                           |
| Tutor responsible for the module                         | Dr n. med. Karolina Jeziarska,<br>karolina.jeziarska@pum.edu.pl                                                                                                                                                                                                                                                                                                                                                                                                           |
| Department's website                                     | <a href="https://www.pum.edu.pl/wydzialy/wydzial-lekarsko-biotechnologiczny/zaklad-fizyki-medycznej/information-for-students">https://www.pum.edu.pl/wydzialy/wydzial-lekarsko-biotechnologiczny/zaklad-fizyki-medycznej/information-for-students</a>                                                                                                                                                                                                                     |
| Language                                                 | English                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

\* replace  into  where applicable

**Detailed information**

|                                      |             |                                                                                                                                                                                                                                                                                                |
|--------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module objectives</b>             |             | Lectures and exercises are designed to introduce students to the basic issues of physics and biophysics regarding the physical foundations of physiological processes and to familiarize themselves with the physical phenomena underlying modern medical diagnostics and therapy in medicine. |
| Prerequisite /essential requirements | Knowledge   | physics and mathematics at the matriculation level                                                                                                                                                                                                                                             |
|                                      | Skills      | is able to define and estimate the measurement error, graphically present the results of measurements, know the basic mathematical functions, know the operations on exponents and logarithms                                                                                                  |
|                                      | Competences | openness to knowledge, self-study habit, willingness to cooperate in a group, teamwork skills                                                                                                                                                                                                  |

**Booklist**

Obligatory literature:

Physics of the Body / John R. Cameron, James G. Skofronick, Roderick M. Grant ; 2nd Ed. Medical Physics Publishing 2017 ISBN 9781930524941

Modified MasteringPhysics for Physics: Principles with Applications 7<sup>th</sup> Edition

Supplementary literature:

Physics: Principles with Applications / Douglas C. Giancoli PEARSON EDUCATION; 7<sup>th</sup> Edition, 2016 ISBN 9781292057125**TEACHING PROGRAMME****SEMINARS**

|                    |                                                    |
|--------------------|----------------------------------------------------|
| <b>Sem 1 (2h)</b>  | Ionising radiation I                               |
| <b>Sem 2 (2h)</b>  | Biophysics of the process of hearing and seeing    |
| <b>Sem 3 (2h)</b>  | Lasers, photometry and optical fibres. Ultrasounds |
| <b>Sem 4 (2h)</b>  | Medical diagnostics I                              |
| <b>Sem 5 (2h)</b>  | Cardiovascular System                              |
| <b>Sem 6 (2h)</b>  | Laboratory techniques I                            |
| <b>Sem 7 (2h)</b>  | Ionising radiation I                               |
| <b>Sem 8 (2h)</b>  | Laboratory techniques II                           |
| <b>Sem 9 (2h)</b>  | The impact of physical factors on the human body   |
| <b>Sem 10 (2h)</b> | Medical diagnostics II                             |

**Student's workload**

|                                                                                            |                        |
|--------------------------------------------------------------------------------------------|------------------------|
| Form of student's activity<br>(in-class participation; activeness, produce a report, etc.) | Student's workload [h] |
|--------------------------------------------------------------------------------------------|------------------------|

|                                                          | Tutor |
|----------------------------------------------------------|-------|
| Contact hours with the tutor                             | 20    |
| Time spent on preparation to seminars/ practical classes | 5     |
| Time spent on reading recommended literature             | 5     |
| Time spent on writing report/making project              | 2     |
| Time spent on preparing to colloquium                    | 10    |
| Time spent on preparing to exam                          |       |
| Other .....                                              |       |
| Student's workload in total                              | 42    |
| <b>ECTS credits for the subject (in total)</b>           | 1.0   |
| <b>Remarks</b>                                           |       |
|                                                          |       |