Appendix number 1.5 to The Rector UR Resolution No. *12/2019*

**SYLLABUS**

**LASERS IN MEDICINE**

**concerning the cycle of education 2024-2030**

Academic year 2024/2025

# BASIC INFORMATION CONCERNING THIS SUBJECT

|  |  |
| --- | --- |
| Subject | **Diagnostic systems in medicine** |
| Course code \* | **SDM/B** |
| Faculty of (name of the leading direction) | **Medical College of The University of Rzeszów** |
| Department Name | **Department of Photomedicine and Physical Chemistry, English Division** |
| Field of study | **Medical** |
| level of education | **Uniform master studies** |
| Profile | **General academic** |
| Form of study | **Stationary / non-stationary** |
| Year and semester | **Year I, semester II** |
| Type of course | **facultative** |
| Language | **English** |
| Coordinator | **Dr hab. n. med. David Aebisher, prof. UR** |
| First and Last Name of the Teachers | **Dr hab. n. med. David Aebisher, prof. UR**  **Mgr inż. Klaudia Dynarowicz** |

**\* *-* According to the resolutions of Educational Unit**

* 1. **Forms of classes, number of hours and ECTS**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Semester No. | Lectur e | Exercise | Conversatio n | Laborator y | Seminar | Z P | Praktial | Other | **Numbe r of points ECTS** |
| II |  |  |  |  | 15 |  |  |  | 1 |
|  |  |  |  |  |  |  |  |  |  |

* 1. **The form of class activities**

**X classes are in the traditional form**

X **classes are implemented using methods and techniques of distance learning**

**SEMINARS- HYBRID FORM, ON LINE**

**1.3 Examination Forms** (exam, **credit with grade** or credit without grade)

# BASIC REQUIREMENTS

**PHYSICS CHEMISTRY BIOLOGY**

**BASIC OPERATIONS ON DIRECTORIES AND FILES.**

**SKILLS TO RECOGNIZE BASIC COMPUTER PROGRAMS.**

1. **OBJECTIVES, OUTCOMES, AND PROGRAM CONTENT USED IN TEACHING METHODS**
   1. **Objectives of this course**

|  |  |
| --- | --- |
| C1 | Introduce students to aspects of diagnostics in medicine considering basic physics, tissue interactions, diagnostics and therapeutics, and therapeutic guidelines |
| C2 | Provide students with the technical basics of medical laser systems, associated instruments, modes of laser light delivery, and endoscopy |
| C3 | Provide students with an introduction to application of diagnostics and disease treatment in medical sub-disciplines including: ophthalmology, dermatology, cardiovascular disease, urology, otorhinolaryngology, neurology, dentistry, and oncology |

# OUTCOMES FOR THE COURSE

|  |  |  |
| --- | --- | --- |
| **EK** (the effect of education) | The content of learning outcomes defined for the class (module) | Reference to directional effects  1 |
| **EK\_01** | Student knows the basic methods of diagnostics used in  medicine | **B.W31** |
| **EK\_02** | Student knows the basic equipment in medical physics | **B.W32** |

1In the case of a path of education leading to obtaining teaching qualifications, also take into account the learning outcomes of the standards of education preparing for the teaching profession.

|  |  |  |
| --- | --- | --- |
| **EK\_03** | student knows how to proceed with problems in medical physics laboratory | **B.W33** |
| **EK\_04** | student knows how to prepare report and presentation | **B.U11** |
| **EK-05** | Selects the appropriate statistical test, conducts basic statistical analyzes and uses appropriate methods of presenting the results; interprets the results of the meta-  ANALYSIS, AND ALSO ANALYZES THE LIKELIHOOD OF SURVIVAL | **B.U12** |

# CONTENT CURRICULUM

* + 1. **Problems of the lecture**
    2. **Problems of auditorium, seminar, laboratory and practical classes**

|  |  |
| --- | --- |
| **Course contents** | **Hours** |
| 1. Basic of medical physics | 3h |
| 2. Understanding medical physics and diagnostics safety | 2h |
| 3. Understanding diagnostics and therapeutics treatment | 2h |
| 4. Diagnostics laboratory equipment (MRI, CT, X-ray) | 2h |
| 5. Current Physical medicine | 2h |
| 6. Current Medical Physics | 2h |
| 7. New trends in diagnostics (laser and optical methods) | 2h |

* 1. **Didactic methods**

Seminar

multimedia presentation, distance learning methods

text analysis with discussion, project method (research, implementation, practical project), group work (task solving, discussion), didactic games, distance learning methods

# METHODS AND EVALUATION CRITERIA

* 1. **Methods of verification of learning outcomes**

|  |  |  |
| --- | --- | --- |
| Symbol of effect | Methods of assessment of learning outcomes (Eg.: tests, oral exams, written exams, project reports, observations during classes) | Form of classes |
| EK\_ 01 | LECTURES - FINAL WRITTEN TEST SEMINARS - FINAL CREDIT WITH AN ASSESSMENT INCLUDING: STUDENT'S SKILLS, ATTENDANCE  AND ASSESSMENT OF THE ABILITY TO WORK ON A COMPUTER | **SEMINARS** |
| EK\_ 02 | LECTURES - FINAL WRITTEN TEST SEMINARS - FINAL CREDIT WITH  AN ASSESSMENT INCLUDING: STUDENT'S SKILLS, ATTENDANCE AND ASSESSMENT OF THE ABILITY TO WORK ON A COMPUTER | **SEMINARS** |
| EK\_03 | LECTURES - FINAL WRITTEN TEST SEMINARS - FINAL CREDIT WITH AN ASSESSMENT INCLUDING: STUDENT'S SKILLS, ATTENDANCE  AND ASSESSMENT OF THE ABILITY TO WORK ON A COMPUTER | **SEMINARS** |
| EK\_04 | LECTURES - FINAL WRITTEN TEST SEMINARS - FINAL CREDIT WITH AN ASSESSMENT INCLUDING: STUDENT'S SKILLS, ATTENDANCE  AND ASSESSMENT OF THE ABILITY TO WORK ON A COMPUTER | **SEMINARS** |
|  |  |  |

* 1. **Conditions for completing the course (evaluation criteria)**

Seminars - final credit with an assessment of the ability to work on a computer, presentation, written test

5.0 - has knowledge of each of the contents of education at the level of 90% -100%

4.5 - has knowledge of each of the content of education at the level of 84% -89%

4.0 - has knowledge of each of the content of education at the level of 77% -83%

* 1. - has knowledge of each of the content of education at the level of 70% -76%

3.0 - has knowledge of each of the content of education at the level of 60% -69%

2.0 - has knowledge of each of the contents of education below 60%.

Skill assessment

5.0 - the student actively participates in classes, recognizes and knows how to properly call computer programs. Skillfully uses basic information techniques,

4.5 - the student actively participates in classes, with little help from the teacher he recognizes and is able to correctly name computer programs. He uses basic information techniques well

4.0 - the student actively participates in classes, with minor corrections of the teacher, committing minor mistakes in recognizing computer programs. He uses the information techniques well.

3.5 - the student participates in classes, with numerous corrections and teacher's instructions recognizes and is able to correctly name computer programs, often making mistakes while using information techniques

3.0 - the student participates in classes, with very many corrections and teacher's instructions recognizes and is able to correctly name computer programs, very often making mistakes when using information techniques

2.0 - the student passively participates in classes, commits blatant mistakes in recognizing and correct naming of computer programs, misusing information techniques

1. **Total student workload required to achieve the desired result in hours and ECTS credits**

|  |  |
| --- | --- |
| Activity | **The average number of hours to complete the**  **activity** |
| Contact hours (with the teacher) resulting from the study schedule of classes | 15 |
| Contact hours (with the teacher) participation in the consultations, exams | 15 |
| Non-contact hours - student's own work  (preparation for classes, exam, writing a paper, etc.) |  |
| SUM OF HOURS | 15 |
| TOTAL NUMBER OF ECTS | 1 |

*\* It should be taken into account that 1 ECTS point corresponds to 25-30 hours of total student workload.*

# TRAINING PRACTICES IN THE SUBJECT

|  |  |
| --- | --- |
| **Number of hours** | - |
| **Rules and forms of**  **APPRENTICESHIP** | - |

1. **LITERATURE**

|  |
| --- |
| 1. **Basic literature**:  **Leonard I. Grossweiner, The Science of Phototherapy: An Introduction. Springer Science & Business Media 2005**  **Joseph Hornak Introduction to MRI.2005** |
| Additional literature |

Acceptance Unit Manager or authorized person