

**SYLABUS**  
**CONCERNING THE EDUCATION CYCLE 2024-2030**  
*(extreme dates)*

**1. BASIC INFORMATION CONCERNING THIS SUBJECT**

Subject	<b>LASERS IN MEDICINE</b>
Course code *	<b>L/M</b>
Faculty of (name of the leading direction)	<b>Medical College of The University of Rzeszów</b>
Department Name	<b>Department of Photomedicine and Physical Chemistry, English Division</b>
Field of study	<b>Medical</b>
level of education	<b>Uniform master studies</b>
Profile	<b>General academic</b>
Form of study	<b>Stationary / non-stationary</b>
Year and semester	<b>Year II, semester III</b>
Type of course	<b>facultative</b>
Language	<b>English</b>
Coordinator	<b>Dr hab. n. med. David Aebisher, prof. UR</b>
First and Last Name of the Teachers	<b>Dr hab. n. med. David Aebisher, prof. UR</b>

\* - According to the resolutions of Educational Unit

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

Semester No.	Lecture	Exercise	Conversation	Laboratory	Seminar	ZP	Praktical	Other	Number of points ECTS
III					25				1

**1.2. The form of class activities**

classes are in the traditional form

classes are implemented using methods and techniques of distance learning

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

## 2. BASIC REQUIREMENTS

<b>PHYSICS</b>
<b>CHEMISTRY</b>
<b>BIOLOGY</b>
<b>BASIC OPERATIONS ON DIRECTORIES AND FILES.</b>
<b>SKILLS TO RECOGNIZE BASIC COMPUTER PROGRAMS.</b>

## 3. OBJECTIVES, OUTCOMES, AND PROGRAM CONTENT USED IN TEACHING METHODS

### 3.1 Objectives of this course

C <sub>1</sub>	Introduce students to aspects of laser use in medicine considering basic physics, tissue interactions, diagnostics and therapeutics, and therapeutic guidelines.
C <sub>2</sub>	Provide students with the technical basics of medical laser systems, associated instruments, modes of laser light delivery, and endoscopy
C <sub>3</sub>	Provide students with an introduction to application of lasers to diagnostics and disease treatment in medical sub-disciplines including: ophthalmology, dermatology, cardiovascular disease, urology, otorhinolaryngology, neurology, dentistry, and oncology

### 3.2 OUTCOMES FOR THE COURSE

EK (the effect of education)	The content of learning outcomes defined for the class (module)	Reference to directional effects <sup>1</sup>
<b>EK_01</b>	KNOWS THE BASIC IT AND BIostatistical METHODS USED IN MEDICINE, INCLUDING MEDICAL DATABASES, SPREADSHEETS AND BASICS OF COMPUTER GRAPHICS	<b>B.W31</b>
<b>EK_02</b>	KNOWS THE BASIC METHODS OF STATISTICAL ANALYSIS USED IN POPULATION AND DIAGNOSTIC STUDIES	<b>B.W32</b>
<b>EK_03</b>	KNOWS THE POSSIBILITIES OF MODERN TELEMEDICINE AS A TOOL TO SUPPORT THE WORK OF A DOCTOR	<b>B.W33</b>
<b>EK_04</b>	USES DATABASES, INCLUDING WEBSITES, AND SEARCHES FOR THE NECESSARY INFORMATION USING THE AVAILABLE TOOLS	<b>B.U11</b>
<b>EK-05</b>	SELECTS THE APPROPRIATE STATISTICAL TEST, CONDUCTS BASIC STATISTICAL ANALYZES AND USES APPROPRIATE METHODS OF	<b>B.U12</b>

<sup>1</sup>In 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.

	PRESENTING THE RESULTS; INTERPRETS THE RESULTS OF THE META-ANALYSIS, AND ALSO ANALYZES THE LIKELIHOOD OF SURVIVAL	
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### 3.3 CONTENT CURRICULUM

#### A. Problems of the lecture

#### B. Problems of auditorium, seminar, laboratory and practical classes

Course contents	Hours
1. Basic physics of lasers and laser interaction with tissue	5h
2. Understanding medical laser systems and laser safety	5h
3. Understanding laser diagnostics and therapeutics	5h
4. Lasers and associated laboratory equipment	5h
5. Current Photobiology	5h

### 3.4 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

## 4. METHODS AND EVALUATION CRITERIA

### 4.1 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	<b>SEMINARS</b>
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	<b>SEMINARS</b>
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	<b>SEMINARS</b>
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	<b>SEMINARS</b>
	AND ASSESSMENT OF THE ABILITY TO WORK ON A COMPUTER	

### 4.2 Conditions for completing the course (evaluation criteria)

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

3.5 - 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

### 5. 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	25
Contact hours (with the teacher) participation in the consultations, exams	25
Non-contact hours - student's own work (preparation for classes, exam, writing a paper, etc.)	
<b>SUM OF HOURS</b>	<b>25</b>
<b>TOTAL NUMBER OF ECTS</b>	<b>1</b>

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

### 6. TRAINING PRACTICES IN THE SUBJECT

<b>NUMBER OF HOURS</b>	-
<b>RULES AND FORMS OF APPRENTICESHIP</b>	-

### 7. LITERATURE

<p><b>1. Basic literature:</b></p> <p><b>THE SCIENCE OF PHOTOTHERAPY: AN INTRODUCTION</b>  <b>LEONARD I. GROSSWEINER, SPRINGER SCIENCE &amp; BUSINESS MEDIA 2005</b></p>
Additional literature

Acceptance Unit Manager or authorized person