

SYLLABUS

Concerning the cycle of education **2025- 2031**

Academic year 2025/2026

1. BASIC INFORMATION CONCERNING THIS SUBJECT

Subject/Module	Cytophysiology
Course code/module*	CF
Faculty (name of the leading direction)	Faculty of Medicine, University of Rzeszow
Department Name	Department of Medical Chemistry and Metabolomics
Field of study	Medicine
Level of education	Uniform master studies
Profile	General academic
Form of study	Stationary/non-stationary
Year and semester	Year I, semester 1
Type of course	Obligatory
Language	English
Coordinator	Assoc. Prof. Sabina Galiniak, University of Rzeszów
Name(s) of the instructor(s)	Assoc. Prof. Sabina Galiniak, University of Rzeszów

**- according to the resolutions of the Faculty of Medicine*

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

Semester No.	Lecture	Laboratory classes	Conversation	Seminar	ZP	Practical	Self-learning	Number of points ECTS
1	8	6	-	-	-	-	-	1

1.2. The form of class activities

- ☒ Classes are conducted in a traditional form (lectures and laboratory class)
- ☒ Classes are conducted using distance learning methods and techniques (lectures and seminars)

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

2. REQUIREMENTS

Basic knowledge in the field of cell biology

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

3.1. Objectives of this course

C ₁	Understanding the structure and function of the various intracellular compartments.
C ₂	Understanding the mechanisms of intracellular signaling, mechanisms regulating the cell cycle and cell death.
C ₃	Understanding the possibilities of using stem cells in medicine.
C ₄	Acquiring the ability to work with a light microscope.

3.2. Outcomes for the course

EK (learning outcome)	Content of the learning outcome defined for the subject	Reference to directional effects (KEK)
EK_01	he knows and understands methods of communication between cells and between a cell and the extracellular matrix, as well as intracellular signaling pathways, along with examples of disruptions in these processes leading to the development of cancer and other diseases	B. W17.
EK_02	he knows and understands processes: the cell cycle, proliferation, differentiation, and aging of cells, apoptosis, and necrosis, and their significance for the functioning of the organism	B. W18.
EK_03	he knows and understands functions and applications of stem cells in medicine	B. W19.
EK_04	he can use basic laboratory and molecular techniques	B. U12.
EK_05	he is ready to recognize and acknowledge one's own limitations, perform self-assessment of deficits, and identify educational needs	K.05.
EK_06	he is ready to use objective sources of information	K.07.
EK_07	he is ready to draw conclusions from one's own measurements or observations	K.08.

3.3. Content curriculum

A. Problems of the lecture

Course content – 1 st semester
1. Structure and dynamics of biological membranes. Transport across Membranes. Cell-cell junctions. Cell signaling.
2. Cytoplasm and cellular organelles.
3. Cell nucleus. Cell cycle and its control. Cell division. Cell aging and death.
4. Stem cells and their therapeutic applications in medicine.

B. The problem of laboratory classes

Course contents – 1 st semester
1. Cytology – part I. Structure and function of cell organelles (cell membrane, mitochondria, SER, RER, lysosome, peroxisome).
2. Cytology – part I. Cytoskeleton. Structure and function of the cell nucleus. Cellular processes.

3.4. Didactic methods

Lecture: Multimedia presentation-based lecture providing students with in-depth scientific knowledge in cytophysiology and skills in solving research problems.

Laboratory classes: Theoretical introduction with a multimedia presentation, followed by microscopy work, group activities, and discussion

4. METHODS AND EVALUATION CRITERIA

4.1. Methods of verification of learning outcomes

Symbol of effect	Methods of assessment of learning outcomes (E.g.: tests, oral exams, written exams, project reports, observations during classes)	Form of classes
EK_01	final test	L, LAB
EK_02	final test	L, LAB
EK_03	final test	L
EK_04	observation during classes	LAB
EK_05	observation during classes	LAB
EK_06	observation during classes	LAB
EK_07	observation during classes	LAB

4.2. Conditions for completing the course (evaluation criteria)

Lectures end with a credit without grade, exercises end with credit with grade.
Attendance at all forms of classes, including lectures, is compulsory.

LECTURES – credit without grade (EK_01–03):

Attendance at lectures is obligatory.

Information from the lectures is required in the final test.

LABORATORY CLASSES – credit with grades that includes (EK_01, EK_02, EK_04–07):

- 1) Student skills – recognition of cell structures on electron micrograph and the use of an optical microscope.
 - 2) Class attendance.
 - 3) Assessment of the final test.
 - 4) A correctly completed exercise book.
 - 5) Exercise activity.
- Rating range: 2.0 – 5.0

EVALUATION OF KNOWLEDGE:

Final test – Single-choice test questions.

The test consists of 20 questions, each with one correct answer. Students have 60 seconds to answer each question, and the total test duration is approximately 20 minutes.

The test begins once all students are seated, the teacher presented the applicable rules, clarified all doubts, and answered any questions from the students. A student representative confirms that the participants have had the opportunity to read the test rules and have received answers to all their questions.

Skill assessment:

5.0 – the student actively participates in classes, is well prepared in the field of the theory of the current material, correctly interprets the relationships between the structure and function of the discussed cell structures, correctly recognizes cell structures on electron micrographs and correctly uses the optical microscope,

4.5 – the student actively participates in the classes, with a little help from the teacher correctly interprets the phenomena, correctly recognizes the cellular structures on the electron micrographs and correctly uses the optical microscope,

4.0 – the student actively participates in the classes, he is not always able to solve the problem on his own and correctly recognizes the cell structures on the electron micrographs and operates the optical microscope, performs these activities with the help of the teacher,

3.5 – the student participates in the classes, his scope of preparation does not allow for a comprehensive presentation of the problem under discussion, draws incorrect conclusions and incorrectly recognizes cell structures on electron micrographs and needs the help of the teacher in the use of an optical microscope,

3.0 – the student participates in the classes, formulates conclusions that require correction on the part of the teacher, making minor mistakes, not fully understanding the dependencies and cause-effect relationships, makes a lot of mistakes when he recognizes cellular structures on the electron micrographs and needs the teacher's help in using the optical microscope,

2.0 – the student passively participates in the classes, the statements are factually incorrect, does not understand the problems, does not correctly recognize the cellular structures on the

electron micrographs and is unable to operate the optical microscope.

EVALUATION OF SKILLS:

5.0 - shows knowledge of each of the content of education at the level of 93–100%,

4.5 - shows knowledge of each of the content of education at the level of 85–92%,

4.0 - shows knowledge of each of the content of education at the level of 77–84%,

3.5 - shows knowledge of each of the content of education at the level of 69–76%,

3.0 - shows knowledge of each of the content of education at the level of 61–68%,

2.0 - shows knowledge of each of the content of education below 60%.

5. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE THE INTENDED LEARNING OUTCOMES IN HOURS AND ECTS CREDITS

Form of activity	Average number of hours required to complete the activity
Contact hours (with the teacher) resulting from the study schedule of classes	14
Contact hours (with the teacher) participation in the consultations, exams	3
Non-contact hours – student's own work (preparation for classes, exam, writing a paper, etc.)	8
SUM OF HOURS	25
TOTAL NUMBER OF ECTS	1

** Please note that 1 ECTS point corresponds to 25–30 hours of total student workload.*

6. TRAINING PRACTICE WITHIN THE SUBJECT

Number of hours	-
Rules and forms of internships	-

7. LITERATURE

Basic literature:

Mescher L. Junqueira's Basic Histology: Text and Atlas, Seventeenth Edition. McGraw-Hill Medical, 2023.

Wawrzyniak A. Histology Exercise notebook for students of Faculty of Medicine, College of Medical Sciences, University of Rzeszów. Publishing Office of the University of Rzeszów, 2021.

Additional literature:

Alberts B., et al. Essential cell biology. Norton&Co W. W., 2023.

Approved by the Head of the Department or an authorised person

