



COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Cell Structure	

Lecturer(s)	Department(s) where the course unit (module) is delivered
Coordinator: Dr. Kristina Daniūnaitė	Institute of Biosciences, Life Sciences Center

Study cycle	Type of the course unit (module)
1 st or 2 nd cycle	

Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction
Face-to-face, virtual learning environment, individual learning; Lectures, seminars, laboratory activities	Autumn and spring semesters	English

Requirements for students	
Prerequisites: Basics of Cytology and Genetics, Biochemistry	Additional requirements (if any):

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5 ECTS	133 hours	14 hours: • Lectures – 4 hours; • Seminars – 4 hours; • Laboratory work – 6 hours	119 hours

Purpose of the course unit (module): program competences to be developed
- Knowledge about cell structure and extracellular matrix - Competence to discuss and evaluate scientific arguments in the field of structural cell biology

Learning outcomes of the course unit (module)	Teaching and learning methods	Assessment methods
Knowledge of the cell's structural elements and understanding of their functions	Lectures (including problem-based teaching), group discussions, interactive exercises, and individual study assignments	Completion of practical assignments (3 written colloquiums/tests, completion of exercises), completion of laboratory works, performance in group discussions, and a written examination
Comprehension of the issues assessed in scientific publications and the ability to propose solutions to the analyzed problems	Group discussions, interactive exercises, and individual study assignments	Completion of exercises, performance in group discussions, and a written examination

Content: breakdown of the topics	Contact hours							Self-study work: time and assignments	
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work placement	Contact hours	Self-study hours	Assignments
1. History of structural cell biology as a discipline, major breakthroughs							0	3	Individual study of the major and most recent achievements in the field of structural cell biology
2. Structural differences of prokaryotic and eukaryotic cells; variety of cell morphology, types of cells in tissues	1				1		2	8	Individual study of the related topics, analysis of the recent scientific publications, interactive exercises, preparation for the 1 st test
3. Plasma membrane, its structure, features, and functions; principles of membrane transport; cell wall			1				1	14	Individual study of the related topics, a critical review of scientific publications on particular topics (to be discussed during the seminar); preparation for the 1 st test
4. Major and minor intracellular compartments and their functions in cells (nucleus, mitochondria, chloroplasts, endoplasmic reticulum, Golgi apparatus, lysosomes, peroxisomes, secretory vesicles, etc.)	1				1		2	18	Individual study of the related topics, analysis of the recent scientific publications, interactive exercises, preparation for the 2 nd test
5. Overview of fundamental cellular processes (cell cycle, cell death, differentiation, tissue renewal, development of multicellular organisms) and related pathologies (cancer, infection, inflammation, metabolic disorders)			1				1	18	Individual study of the related topics, analysis of the recent scientific publications, individual exercises, preparation for seminar topics and the 2 nd test
6. Cytoskeleton, its structural elements and function; cell polarization and migration	1				1		2	18	Individual study of the related topics, analysis of the recent scientific publications, individual exercises, preparation for the 3 rd test
7. Cell-cell interactions; cell junctions, cell adhesion, cell wall, extracellular matrix; comparison of animal and plant cells in the context			1		1		2	18	Individual study of the related topics, analysis of the recent scientific publications, individual exercises, preparation for seminar topics and the 3 rd test
8. Cell analysis techniques: introduction to cellular imaging, and functional cell analysis methods	1				2		3	20	Individual study of experimental and analysis methodologies, interactive exercises, preparation for the 3 rd test and the final examination
9. Guest lecture and/ or excursion to a Lithuanian science institution			1				1	2	Individual study of the related topics, analysis of the recent scientific publications
Total	4		4		6		14	119	

Assessment strategy	Weight, %	Deadline	Assessment criteria
Written colloquiums/tests (compulsory)	3 x 25%	During the semester	Cumulative score. A test is passed if a student receives at least half of the maximum points.
Completion of exercises (compulsory)	15%	During the semester	Cumulative score.
Laboratory work (compulsory)	10%	During the semester	Cumulative score. Attendance and active participation in laboratory work is compulsory.
Additional exercises (optional)	Extra points	During the semester	Cumulative score.
Written examination	100%	During the exam session	If a student achieves $\geq 50.0\%$ of the cumulative score and completes all compulsory activities: - The cumulative score is recalculated proportionally into a 10-point system as a preliminary mark; - a student is allowed not to take the exam; in that case, the preliminary mark is considered the final mark; - if a student chooses to take the exam, the latter's evaluation is considered the final mark. If a student achieves $< 50.0\%$ of the cumulative score or fails two or three tests but completes laboratory activities and exercises, he/she must take the exam. The exam score is then considered the final grade. If a student fails laboratory activities or does not complete the exercises, he/she does not receive a preliminary mark and is ineligible to take the exam. The examination consists of 3-6 complex questions covering all topics discussed throughout the course. All details of the assessment criteria are presented to students in the slides during the first class.

Author	Year of publication	Title	Issue of a periodical or volume of a publication	Publishing place and house or weblink
Compulsory reading				
Alberts B, Heald R, Johnson A, Morgan D, Raff M, Roberts K, Walter P	2022 (or 2014)	Molecular Biology of the Cell (selected chapters)	7 th edition (or 6 th edition)	WW Norton & Co
Selected research papers and reviews	During the last 5 years	Various	–	Various peer-reviewed journals
Optional reading				
Lodish H, Berk A, Kaiser C, Krieger M, Bretscher A, Ploegh H, Martin K, Yaffe M, Amon A	2021 (or newer)	Molecular Cell Biology	9 th edition (or newer)	WH Freeman
Pollard TD, Earnshaw WC, Lippincott-Schwartz J, Johnson G	2023	Cell Biology	4 th edition	Elsevier