

Module name	<b>Cell Biology</b>
Module code	B-B.004.
ISCED code	0511: Biology
Study cycle	I <sup>o</sup>
Semester	summer
Responsible for this module	Joanna Strubińska Department Cell Biology email: j.strubinska@umcs.pl
Language of instruction	English
Website	
Prerequisites	Student has basic knowledge of physics, chemistry and biology at the school level . Student is capable of systematic work
ECTS	7.50
ECTS points hour equivalents	Contact hours (work with an academic teacher) – 90 - lectures: 30 - labs: 60  Non-contact hours (students' own work) – 100 - preparation for the exam: 30 - preparation for labs: 20 - preparation for midterm testes: 40: - literature study: 10  <b>Total number of ECTS points for the module – 7,5</b>
Learning outcomes verification methods	Lectures - written exam (1-3, 5, 7) Labs: - midterm tests (1-3, 5, 7) and continuous evaluation of student's preparation and progress during laboratory work (3-8 )
Course full description	The study of cell biology is fundamental to learning about living organisms. This course will provide students with understanding of internal organization and functions of the eukaryotic cell. Diversity and complexity of cellular structure and functions will be study with special emphasis on:  Lectures: Basic techniques, tools and research models used in cytology. Chemical composition, bounds and their effect on inter- and intra-molecular interactions Selected elements of cell metabolism. Cell formation and evolution of eukaryotic cell. Cell diversity. Membrane structure and function including- fluidity, asymmetry, transport, cell-cell signaling, cell adhesion. Organization and functioning of plant and animal extracellular matrix. Types, structure and functions of cell junctions. Construction of organelles and location of metabolic processes. Structure of the nucleus and organization of genetic material. The course and regulation of the cell cycle and cell division as well as the effects of disorders of the cell proliferation process (cancer). Cell death processes. Laboratories: Organization of safety and work rules during laboratories. Optical Microscopic Techniques - bright field, dark field, contrast phase and fluorescent microscopy. Electron Microscopic Techniques - transmission

	<p>and scanning microscopy Detection of selected chemical components of cells. Similarities and differences in cell size and shape. Analysis of cell membrane properties. Observations of the cytoskeleton and cytoskeleton-dependent cell structures, cells organelles surrounded by one membrane and semi-autonomic organelles: mitochondria and plastids. Study of the structure of the cell nucleus, its divisions and cell death/viability processes.</p>
Bibliography	<p>Recommended literature:</p> <p>Essential Cell Biology by Bruce Alberts, Karen Hopkin, Alexander D Johnson, David Morgan, Martin Raff, Keith Roberts, Peter Walter, New York, NY : Garland Science, 2014 or 2019 (fourth or fifth edition) Open access to fourth edytion in digital library: <a href="https://archive.org/details/ESSENTIALCELLBIOLOGYESSENTIALCELLBI/page/n3/mode/2up">https://archive.org/details/ESSENTIALCELLBIOLOGYESSENTIALCELLBI/page/n3/mode/2up</a></p> <p>Molecular biology of the cell. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., &amp; Walter, P. New York: Garland Science, fifth or later edition Open access to fifth edytion in digital library: <a href="https://archive.org/details/MolecularBiologyOfTheCell5th/mode/2up">https://archive.org/details/MolecularBiologyOfTheCell5th/mode/2up</a></p>
Learning outcomes	<p><b>KNOWLEDGE</b></p> <ol style="list-style-type: none"> <li>1. The student knows and understands at an advanced degree facts, issues and concepts in cell biology and uses the appropriate terminology in this field.</li> <li>2. The student knows and understands at an advanced level the relationship between cell biology and other disciplines such as chemistry and physics, which is necessary to understand the principles of cell functioning.</li> <li>3. The student knows and understands the basic research methods in the field of cell biology including microscopic techniques</li> </ol> <p><b>SKILLS</b></p> <ol style="list-style-type: none"> <li>4. The student is able to use sources related to cell biology and use the acquired knowledge to explain the relationship between the structure and biological function of individual cell structures.</li> <li>5. The student is able to perform simple measurements and biological preparations, carry out microscopic observations and independently analyze microscopic images.</li> <li>6: The student is able to plan and organize his laboratory work and cooperate with others in order to perform assigned tasks.</li> </ol> <p><b>SOCIAL COMPETENCES</b></p> <ol style="list-style-type: none"> <li>7. The student is ready to comply with health and safety regulations and laboratory regulations. his own and the whole team's activities. He is ready to take responsibility for the consequences of his actions.</li> <li>8. The student is ready to recognize the importance of knowledge in solving cognitive and practical problems.</li> </ol>
Practice	-
Teaching methods	<p>Labs: - laboratory exercises</p> <ul style="list-style-type: none"> <li>- demonstration with explanation</li> <li>- discussion</li> </ul>

	Lecture: - informative/ conversational lecture - multimedia presentation/movie - discussion
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