1.	Subject	**CELL MORPHOLOGY AND PHYSIOLOGY**		
2.	Code	OM 112		
3.	Study Program	General Medicine		
4.	Institution (Unit, Institute, Chair, Department)	Ss Cyril and Methodius University, Medical Faculty, Department of Anatomy		
5.	Degree of education (first or second cycle)	Integrated 6-year study		
6.	Study year/semester	First (I) / First (I)	7.Number of credits	5
8.	**Responsible teacher**	Prof. Sanja Mancevska, PhD, MD		
9.	Preconditions	None		
10.	Teaching goals: • Gaining knowledge on the building concept of a cell's structural components and structure and function interconnection • Gaining knowledge on evident morphological changes manifested during the process of mitosis, meiosis and cell apoptosis. • To recognize the cell as a functional unit, to study the functions of individual cellular structures and systems, as well as the interaction of the cell with the environment. • To learn about the cellular production processes, cellular information processes and control mechanisms that enable their physiological function.			
11.	Brief content: **Theoretical course:** • Basic structure and function of prokaryotic cells • Eukaryotic cells: • Morphological characteristics of the cell in mitosis, meiosis and apoptosis. • Morpholocical specificities of different cell types			

<table>
<tr><td></td><td colspan="4">• Function of the cell, the cell's environment and its behavior (motility and communication with the environment and with other cells).
• Function of cellular physiological systems.
• Functions of the nucleus and cell organelles.
• Cell information processes and their regulation.
• Cell replication and development.
• Specialized cell systems.

Practical lessons:
• Basic structure and function of prokaryotic cells
• Eukaryotic cells: Plasmaleme, glycocalix, organellae and nucleus morphology;
• Morphological characteristics of the cell in mitosis, meiosis and apoptosis.
• Morpholocical specificities of different cell types
• Transport through cell membrane
• Functions of the nucleus and cell organelles.
• Intercellular communication
• Specialized tissues (muscle and nerve cell)</td></tr>
<tr><td>12.</td><td colspan="4">Methods of studying:

Interactive teaching during lectures and practical trainings, independent study by using textbooks, practical exercises on experimetal animal models and virtual models with computer-assisted learning.</td></tr>
<tr><td>13.</td><td colspan="2">Total available time:</td><td colspan="2">150 classes</td></tr>
<tr><td>14.</td><td colspan="2">Organization of the course</td><td colspan="2">60 classes - theoretical course, practical course, seminars
90 classes - home individual learning</td></tr>
<tr><td rowspan="2">15.</td><td rowspan="2">Forms of teaching activities</td><td>15.1.</td><td>Theoretical course</td><td>34 classes</td></tr>
<tr><td>15.2.</td><td>Practical course,
Seminars</td><td>26 classes</td></tr>
<tr><td rowspan="3">16.</td><td rowspan="3">Other forms of activities</td><td>16.1.</td><td>Practice</td><td></td></tr>
<tr><td>16.2.</td><td>Individual tasks</td><td></td></tr>
<tr><td>16.3.</td><td>Individual (home) learning</td><td>90 classes</td></tr>
<tr><td>17.</td><td colspan="4">Method of assessment</td></tr>
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	17.1	Tests	min – max **Continual assessment - 1 (written)** • Structure of eukaryotic cells; structural characteristics during mitosis, meiosis and apoptosis; structural specificities of different cell types 23-38 points . **Final exam: final test (written) Physiology** Transport through cell membrane, physiology of cell organelles, physiology of nucleus, cell information systems,

			specialized cell systems 25 - 43 points The grade in the final exam is given according to the grading table, and on the basis of the sum of points obtained in all of the activities.
	17.2	Seminar paper/project (oral/written presentation)	min – max
	17.3	Active participation	min – max Theoretical course 1-3 Practical course 4-7 Completed textbook mandatory
18.	Grading criteria (points / grade)		up to 59 points: 5 (five) F from 60 to 68 points: 6 (six) E from 69 to 76 points: 7 (seven) D from 77 to 84 points: 8 (eight) C from 85 to 92 points: 9 (nine) B

		from 93 to 100 points	10 (ten) A

19.	Requirement for signature and taking the final exam	The student is required to actively follow all of the planned activities. **Conditional criteria for assessment of knowledge:** In order to get a signature, the student should obtain minimum points in both theoretical and practical courses, and to present a seminar paper; In order to take the final exam, the student should obtain the minimum points in the three continual assessments; If the student has not obtained the minimum points in the continual assessments, he/she will be obligated to pass them before the final exam.
20.	Language of instruction	Macedonian
21.	Method of monitoring the quality of teaching process	Attendance of students to classes and interactive participation in theoretical and practical lessons and anonymous student's evaluation of the subject, teachers and collaborators involved in the educational activities

22.	Textbooks					
	22.1.	Mandatory				
		1.	Guyton AC, Hall JE.	Textbook of Medical Physiology 12 th edition.	Elsevier, London,	2011
		2.	Milenkova L, Kostovska N.	Structural characteristics of eukaryotic cells.	Skopje	2011
		3.	Cooper GM, Hausman RE.	The Cell: A Molecular Approach.	Sinauer Associates, Boston, USA	2016
	22.2.	Additional				

		1	Widmaier E, Raff H, Strang K.	Vander's Human Physiology: The Mechanisms of Body Function.	McGraw - Hill Education	2013