



DISCIPLINE GRID

1. Schedule data

1.1.	CAROL DAVILA UNIVERSITY OF MEDICINE AND PHARMACY
1.2.	GENERAL MEDICINE FACULTY / 2nd PRECLINIC DPT - MORPHOLOGICAL SCIENCES
1.3.	DISCIPLINE Cell Biology, Molecular Biology and Histology
1.4.	STUDY DOMAIN: Cell Biology
1.5.	STUDY LEVEL: Licence
1.6.	WORK PROGRAMME: Day School

2. General information

2.1.	Name: Cell Biology						
2.2.	Lecture holders: 1.						
2.3.	Practical activity holder: 1.						
2.4. Study year	I	2.5. Semester	One semester	2.6. Evaluation	Written and Oral	2.7. Type of discipline	Fundamental (FD)

3. Estimated total time (hours/semester)

Nr hours per week	5	out of which : Lecture	2	Laboratory Session	3
Total hours out of learning schedule	70	out of which: Lectures	28	Laboratory Sessions	42
Time distribution	14 weeks				hours
Textbook study, lecture support, bibliography and notes					
Supplementary documentation activity in the library, on online platforms					
Practical activity support material, homework, portfolio and essays					
Tutorial activity					
Examinations					
Other activities					
Total hours of individual study					
Total hours per semester			70		
Numărul de credite			5		

4. Preconditions

4.1. curriculum	Not required
4.2. proficiencies	Not required

5. Conditions

5.1. for tutorial activity	Not required
5.2. for laboratory activity	Not required

6. Accumulated proficiencies

6.1. Proficiencies	<ul style="list-style-type: none"> To understand how a normal cell is organized and is functioning
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(knowledge and abilities)	<ul style="list-style-type: none"> To understand the fact that all pathologies come from alterations in cell physiology Abilities in determining cell physiology and pathology in various experimental approaches
6.2. Transversal skills (role, professional, personal development)	<ul style="list-style-type: none"> To identify target objectives, available resources, the good way to accomplish them, working stages, deadlines, risks To identify roles and responsibility for working in a team, improve the collaboration in a team, for its effectiveness Effective use of professional informatics resources by appropriate accessing (Internet portals, software, data resources, on-line education) autonomy and responsibility social interactivity permanent personal development in profession

7. Objectives (based on the grid of acquired specific skills)

7.1. General Objective	<p>Objectives:</p> <p>Lectures target well understanding of the cell organization and functioning until the molecular level of mechanisms of cellular events, with emphasis on the good balance assuring best cell function and understanding that any imbalance could induce pathologies. Convincing the students that a cell is an integrative system proving a high ability to control, modulate and regulate any event as responses to environmental signals in order to assure survival.</p> <p>Tutorials (practical activities) deal with familiarizing the students with the most useful methods, techniques and equipment necessary in the cell's investigation for both normal and pathological cases.</p>
7.2. Specific Objective	The gains of a student after the study of Cell biology have to assure: understanding of the cellular and molecular mechanisms of human organism, effective skills for communication of the future physician with the other professionals in the field. To do this, the future physician needs basic knowledge (notions and concepts) to be deepened in the next stages of professional education.

8. Content

8.1. Lectures (1st or 2nd semester)	Teaching method	Observations
1. Introduction on cell biology. General organization of a eukaryotic cell 2. Molecular organization of the cell membrane (I). Heterogeneity and asymmetry in membrane molecular organization and their biological significance 3. Molecular organization of the cell membrane (II). Membrane fluidity and its biological significance 4. Membrane transport. Transport through a membrane and transport with membrane 5. Cell signaling. Pathways and mechanisms in cell signaling 6. Organelles without membrane. Ribosome, proteasome, cell inclusions 7. The cytoskeleton 8. Specialized structures of the cell membrane and their relationships with the cytoskeleton 9. Endoplasmic reticulum 10. The Golgi apparatus. Biogenesis and intracellular membrane traffic. Cell secretion 12. Mitochondria and cell energetics 13. Nucleus and nucleolus. Organization and functions 14. Cell cycle and cell division	Lectures using Power-Point files and projector Permanently updated presentations for both courses and tutorials according to the cell biology knowledge development as shown in current textbooks, papers published in the field, verified information on the internet.	Lectures in auditorium.
8.2. Laboratory Session (1st or 2nd semester)	Teaching method	Observations
1. Introduction to Cell Biology. Organizing the eukaryotic cell. 2. Introduction to fundamental research.	Debates on the methods and	Activity in destined rooms

<ol style="list-style-type: none"> 3. Light microscopy. 4. Electron microscopy. 5. Cell membrane and membrane bounded organelles: structure, ultrastructure, specific methods of study. 6. Non-membrane bounded organelles: structure, ultrastructure, specific methods of study. 7. Nucleus, cell cycle and programmed cell death. 8. Evaluation test 9. Biochemistry and molecular biology methods used in cell study - general principles. 10. Methods of Study of Nucleic Acids. 11. Methods of study of proteins. 12. Methods of study using antibodies - practical applications. 13. Methods of study of living cells, animal models, applications in medical practice 14. Recapitulation of the practical work material and preparation of the practical examination 	<p>techniques presented with Q&A sessions .</p>	<p>with appropriate equipment.</p>
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Bibliography

1. Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter. **Molecular Biology of the Cell**. 4th Edition. Garland Science, Taylor & Francis Group, New York, 2002.
2. Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter. **Molecular Biology of the Cell**. 5th Edition. Garland Science, Taylor& Francis Group, New York, 2007.
3. Harvey Lodish, Arnold Berk, Chris A. Kaiser, Monty Krieger, Matthew P. Scott, Anthony Bretscher, Hidde Ploegh and Paul Matsudaira. **Molecular Cell Biology**. 6th Edition. H.W. Freeman & Co., New York, 2008.
4. Harvey Lodish, Arnold Berk, Paul Matsudaira, Chris A. Kaiser, Monty Krieger, Matthew P. Scott, Lawrence Zipursky, and James Darnell. **Molecular Cell Biology**. 8th Edition. H.W. Freeman & Co., New York, 2016.
5. **Medical Cell Biology**. Edited by Steven R. Goodman, Academic Press (Elsevier Inc.), 2008.

N.B. For positions 1 and 3, free internet access.

9. Corroborating the contents of the discipline with the expectations of epistemic community representatives, professional associations and employers in the fields representative for the program

The first year student's training at the Department of Cell Biology aimed at developing students' ability to understand cellular and molecular mechanisms of functioning of the body, preparing the future physician for good / appropriate professional communication. For this purpose, the future physician should have notions in the field, notions that will be deepened in the next stages of professional training.

10. Evaluation

Activity type	Evaluation Criteria	Methods of evaluation	% out of final grade
Lectures	<p>A. Knowledge for mark 5:</p> <ol style="list-style-type: none"> To know basal organization of a eukaryotic cell (structural and ultrastructural level) Essential knowledge of organelle's functions (enumeration) <p>B. Additional knowledge for mark 10:</p> <ol style="list-style-type: none"> To know details on the molecular organization of structural and ultrastructural elements of a cell (membrane, organelles) To know details on the molecular mechanisms occurring in a cell (at membrane level, and organelles), and how these mechanisms are integrated as biological events. 	Written and oral exam	70%
Laboratory Session	<p>A. Knowledge for mark 5:</p> <ol style="list-style-type: none"> Efficient use of the light microscope To know different microscope types and their usefulness in cell investigation To know the results of hematoxylin-eosin staining To identify the cell nuclei in various standard staining methods and to know the significance of nucleus shape and location in a slide <p>B. Additional knowledge for mark 10</p> <ol style="list-style-type: none"> To recognize results of histochemical and cytochemical staining To point out the rational and usefulness of various methods and techniques used in the cell investigation To recognize various cellular ultrastructure in electron micrographs 	Oral examination	5% - test 25% - practical exam

Minimum performance standards

The pass mark is note 5. Practical exam is eliminatory. Attendance is mandatory in order to make the final exam

Abilities gained by students:

1. Abilities gained by lectures:

- The ability to understand and present the organization and functioning of a cell;
- The ability to understand the cellular events in physiological terms and to take the conviction that any pathological event results in various defects in cell physiology;
- To understand that any therapeutic act needs understanding molecular mechanisms at the cellular level (to protect or to rebalance it)

2. Abilities gained during tutorials:

- Optimal use of light microscopes;
- Abilities to recognize cell structures critical for the activity in the next year occurring in our discipline;
- Abilities to identify ultrastructural elements of cells, in electron micrographs;
- Abilities in deciding what equipment and how have to be used for cell studies in different experiments.

Date 24.09.2018

Signature lecture holder

Signature practical holder

**Date of the approval in
Department Board:**

Signature of the department director