SYLLABUS

1. COURSE DESCRIPTION

Degree:	**Biotechnology**
Course:	**Cell Biology**
Module:	**Foundations of Biology, Microbiology and Genetics**
Department:	**Physiology, Anatomy and Cell Biology**
Academic Year:	**2017-18**
Term:	**First**
ECTS credits:	**6**
Year:	**1st year**
Type:	**Basic and Compulsory**
Language:	**Spanish**

Course Model:	**B1**
a. Basic learning (EB):	**60 %**
b. Practical learning (EPD):	**40 %**

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2. LECTURERS

Coordinator	
Name:	**Gloria Brea Calvo**
School:	**School of Experimental Sciences**
Department:	**Physiology, Anatomy and Cell Biology**
Area:	**Cell Biology**
Office Hours:	**Wednesdays and Thursdays: 11.00-13.00 (please, ask previously through e-mail)**
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3. TOPICS

1. CELL COMPARTMENTS. Structure of membranes, properties and functions. The fluid mosaic model. Cell membranes build up separate compartments. Cell surface carbohydrates. Alternatives for selective transport across cellular membranes, simple diffusion vs. passive and active transport.

2. CELLULAR INFORMATION MANAGEMENT. Nucleus keeps DNA secure. Nuclear envelope and nuclear pores enable two-way communication with the cytosol.

3. INTRACELLULAR TRAFFIC. Protein and lipid traffic through the endomembrane system. From protein quality control at endoplasmic reticulum to selective protein delivery at Golgi apparatus. Protein tagging and turnover. Control of secretory and endocytic vesicles movement, membrane recycling.

4. FUELING THE CELL. Mitochondrial membranes are designed to use of oxygen safely. Main bioenergetics processes take place inside mitochondrial compartments. Oxygen under control to produce energy: respiratory chain, ATP synthesis and also heat production. Oxygen out of control generates free radicals and cell damage.

5. CELLULAR MOVEMENTS. The cytoskeleton supports cellular structures with three different components: actin, tubulin and filaments. Polymerization and depolymerization control enable cell movement (cilia and flagella) and cell crawling.

6. CELL SIGNALLING. Cell signaling basic principles. Intracellular receptors vs. cell surface receptors, signal transduction. Cellular responses to external stimuli.

7. CELL RENEWAL. Cellular proliferation is a strictly controlled process: cell cycle control and checkpoints. Distribution of the cellular information (mitosis) and its control. Distribution of the cellular resources: cytokinesis. Cell survival and cell death: apoptosis.