University of Nicosia, Cyprus

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS Credits</th>
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<tbody>
<tr>
<td>BIOL-201</td>
<td>Cell Biology</td>
<td>6</td>
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<table>
<thead>
<tr>
<th>Department</th>
<th>Semester</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>Life and Health Sciences</td>
<td>Spring/Fall</td>
<td>BIOL-102 General Biology II</td>
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<tr>
<th>Type of Course</th>
<th>Field</th>
<th>Language of Instruction</th>
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<tr>
<td>Required</td>
<td>Biology</td>
<td>English</td>
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<tr>
<th>Level of Course</th>
<th>Year of Study</th>
<th>Lecturer</th>
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<tbody>
<tr>
<td>Undergraduate</td>
<td>2\textsuperscript{nd}</td>
<td>Dr. Evi Farazi Dr. Kyriakos Felekkis</td>
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<tr>
<th>Mode of Delivery</th>
<th>Work Placement</th>
<th>Co-requisites</th>
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<tbody>
<tr>
<td>Face to Face</td>
<td>N/A</td>
<td>None</td>
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### Objectives of the Course:

This course aims to provide a thorough introduction to cell biology. The main objectives of this course are to:

- Provide students with knowledge regarding the composition and function of the various sub-cellular structures and organelles of the cells.
- Develop students’ awareness of the way information is relayed within cells and between cells.
- Provide students with a conceptual framework of the identity and function of cellular macromolecules in various cell processes, cell growth, and cell apoptosis.
- Develop students’ understanding of the processes and pathways that control gene expression at the DNA and protein level.
- Provide an overview of the role of mitochondria and bioenergetics in cellular processes.
- Encourage individual and interactive life-long learning skills.

### Learning Outcomes:

After completion of the course, students are expected to be able to:

1. Discuss and compare the composition and functions of sub-cellular structures and organelles inside eukaryotic cells and explain the relevance of their function to cell physiology.
2. Identify the ways that proteins are synthesized, transported, and degraded.
3. Differentiate the type of receptors and signal transduction mechanisms used to
communicate information inside cells and between cells and identify the major players involved.
4. Explain the basic events of the cell cycle, how it is regulated and related to apoptosis.
5. Discuss the mechanisms used for control of gene expression and gene silencing.
6. Underline the major differences regarding the function and characteristics of cell types
7. Discuss the molecular basis of various cellular processes such as migration, apoptosis, cell proliferation, adhesion.
8. Describe principles of aerobic respiration with respect to cellular function

Course Contents:
1. The cytoskeleton and the cell surface
2. Protein synthesis, sorting and transport
3. Protein functions (signals, structural, Ab, Enzymes: proteases, kinases, lipases etc.)
4. Microtubules, Intermediate filaments, Actin/Myosin
5. Cell contraction, locomotion,
6. Cell junctions, cell adhesion, cell migration and extracellular matrix
7. Receptors and Signal transduction mechanisms (GPCR, kinase receptors, other)
8. Regulation/regulators of transcription
9. Regulation/regulators of translation
10. The Cell Cycle
11. Cell growth, cell proliferation regulation
12. Cell death/apoptosis
13. Types of cells and their function
14. Stem cells
15. Mitochondria and bioenergetics

Learning Activities and Teaching Methods:
Lectures; discussions session, independent study and review sessions

Assessment Methods:
Assignments, Tests and Mid-term Exam; Final Exam

Required Textbooks/Reading:

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
<th>ISBN</th>
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<tbody>
<tr>
<td>Jeff Hardin,</td>
<td>Becker’s World of the Cell</td>
<td>Pearson</td>
<td>2012</td>
<td>ISBN-10: 0321709780</td>
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### Recommended Textbooks/Reading:

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