Univerza v Mariboru
University of Maribor

Fakulteta za naravoslovje in matematiko
Faculty of Natural Sciences and Mathematics

OPIS PREDMETA / SUBJECT SPECIFICATION	
Predmet:	**Biologija celice**
Subject Title:	**Biology of the Cell**

Študijski program **Study programme**	**Študijska smer** **Study field**	**Letnik** **Year**	**Semester** **Semester**
Biologija / Biology	Biologija / Biology	1	zimski

Univerzitetna koda predmeta / University subject code:	

Predavanja **Lectures**	**Seminar** **Seminar**	**Sem. vaje** **Tutorial**	**Lab. vaje** **Lab. work**	**Teren. vaje** **Field work**	**Samost. delo** **Individ. work**	**ECTS**
30			30		120	**6**

Nosilec predmeta / Lecturer:	Saška LIPOVŠEK

Jeziki / Languages:	**Predavanja / Lecture:**	slovenski/Slovenian
	Vaje / Tutorial:	slovenski/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Jih ni.	No.
Vsebina:	**Contents (Syllabus outline):**

Razumevanje biologije celice je temeljno za razumevanje drugih področij biologije. Pri predmetu se študenti seznanijo z metodami, ki se uporabljajo v moderni biologiji celice in s kemijsko sestavo celic. Študentje spoznajo celične strukture in njihove funkcije.

Povzetek vsebin:

- Izvor celic, organizacija evkariotske in prokariotske celice; modelni organizmi v biologiji celice
- Molekularna sestava celic
- Metode proučevanja celic
- Celične membrane
- Transport snovi skozi membrano
- Mitohondriji in mehanizem oksidativne fosforilacije
- Endoplazemski retikulum
- Golgijev aparat
- Lizosomi in peroksisomi
- Citoskelet in gibanje celice (aktinski filamenti, intermediatni filamenti in mikrotubuli)
- Jedro, jedrna ovojnica in transport snovi med jedrom in citoplazmo
- Kromatin in kromosomi
- Celični ciklus
- Mitoza in mejoza
- Medcelične povezave
- Apoptoza in nekroza

Understanding the biology of the cell is an fundamental research area to all biological sciences.

This subject provides an introduction to the methods for studying cells and the chemical structure of cells. It focuses on cell structures and their functions.

Abstract of contents:

- The origin of cells, organisation of eucariotic and procariotic cell; cells as experimental models
- The molecular composition of cells
- Tools of cell biology
- Cell membranes
- Membrane transport
- Mitochondria and the mechanism of oxidative phosphorylation
- The endoplasmic reticulum
- The Golgi apparatus
- Lysosomes and peroxisomes
- The cytoskeleton and cell movement (actin filaments, intermediate filaments and microtubules)
- The nucleus, nuclear envelope and traffic between the nucleus and cytoplasm
- Chromatin and chromosomes
- Cell cycle
- Mitosis and meiosis
- Cell-cell interactions
- Apoptosis and necrosis

Temeljni študijski viri / Textbooks:

- Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter, P., 2004: Molecular Biology of the Cell (5th Ed.). Garland Science, Taylor & Francis Group, New York.
- Becker, M. W., Kleinsmith, L. J., Hardin, J., 2004: The World of the Cell (5th Ed.). The Benjamin/Cummings Publishing Company, San Francisco.
- Cooper, G. M., R. F. Hausman, 2004: The Cell: a molecular approach (3rd Ed.). ASM Press, Washington, D. C.
- Lodish, H., Berk, A., Matsudaira, P., Kaiser, C. A., Krieger, M., Scott, M. P., Zipursky, S. L., Darnell, J., 2004: Molecular Cell Biology (5th Ed.). W. H. Freeman and Company, New York.
- Mauseth, J. D., 2003: Botany: an introduction to plant biology (3rd Ed.).
- Raven, P. H., Evert, R. F. , Eichhorn, S. E., 1999: Biology of plants (6th Ed.). W. H. Freeman and Company, New York.

Cilji:

Objectives:

• Razumevanje metod, ki se uporabljajo v moderni biologiji celice • Poznavanje struktur in razumevanje osnovnih procesov v celicah • spoznajo področja, na katerih se uporabljajo znanja biologije celice (npr. ekologija, kmetijstvo, biotehnologija in medicina)	• Understanding of basic methods used in modern cell biological research • Knowledge of cell structures and understanding of basic cell processes • In addition, students get to know the areas in which cell biology is applied (e. g. ecology, agriculture, biotechnology and medicine)
Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: • Študenti razumejo metode, ki se uporabljajo v moderni biologiji celice • Študenti pridobijo znanja o biologiji celice, ki so nujno potrebna na drugih področjih biologije • Študenti se seznanijo, na katerih področjih se aplicirajo znanja biologije celice (npr. ekologija, kmetijstvo, biotehnologija in medicina) Prenesljive/ključne spretnosti in drugi atributi: • Študenti se usposobijo za delo v biološkem laboratoriju pri zahtevnejših bioloških eksperimentih • Študenti pridobijo izkušnje in spretnosti, ki so nujno potrebne pri samostojnem laboratorijskem delu	Knowledge and Understanding: • Students understand methods used in modern cell biology research • Students capture knowledge of cell biology that is essential to other subjects in the field of biology Students get knowladge of areas in which cell biology is applied (e. g. ecology, agriculture, biotechnology and medicine) Transferable/Key Skills and other attributes: • Students qualify for work in the biological laboratory at advanced biological experiments • Students acquire experience and skills that are essential for individual laboratory work
Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Laboratorijske vaje	• Lectures • Laboratory excersises

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
• Pisni in praktični kolokviji	40	Written and practical examinations
• Pisni izpit	60	Written examination

Materialni pogoji za izvedbo predmeta :	***Material conditions for subject realization***
• *Multimedijska predavalnica* • *Laboratorij z mikroskopi in binokularnimi lupami*	• *Lecture hall for multimedia presentations* • *Laboratory with microscopes and binoculars*
Obveznosti študentov:	***Students' commitments:***
(pisni, ustni izpit, naloge, projekti)	*(written, oral examination, coursework, projects):*

• Izvedene laboratorijske vaje in pisna poročila o eksperimentih • Pisni praktični kolokviji • Pisni izpit	• Performed laboratory exercises and written experimental reports • Written practical examinations • Written examination