SYLLABUS

1. Course title:

BIOLOGY WITH HUMAN GENETICS

2. Code:

3. Cycle of study:

1

4. ECTS credits:

8

5. Type of course:

(●) Mandatory ( ) Elective

6. Prerequisites:

None

7. Class restrictions:

None

8. Duration / semester:

1 1

9. Weekly contact hours:

9.1. Lectures:	3
9.2. Seminars:	1
9.3. Laboratory/Practice classes:	2

10. Faculty:

Faculty of Pharmacy

11. Department/study program:

Pharmacy (integrated first and second cycle of study)

12. Lecturer:

dr.sc. Vesna Hadžiavdić, full professor

13. Lecturer's e-mail:

vesna.hadziavdic@untz.ba

14. Web site:

www.untz.ba

15. Course aims:

The acquisition of basic knowledge in the field of molecular biology, and cell genetics. Introducing students to the basic principles of: inheritance in human and molecular genetics, human genome analysis, hereditary disorders caused by chromosome and gene mutations, basic concepts of immunogenetics, tumor genetics; pharmacogenetics and pharmacogenomics, genetic engineering, and basics of biotechnology.

16. Learning outcomes:

Getting to know the molecular structure and function of the cell to explain many natural phenomena and laws that rule the living world. Methods and types of research in molecular biology and genetics. Acquaintance of students with genetic material and the processes of inheritance in the cell, with basic processes and concepts from the field of molecular human genetics.

17. Course content:

Course content: Eukaryotic cell. Differences between prokaryotic and eukaryotic cells. Difference between plant and animal cells. Physical properties of protoplasm and chemical composition of the cell. Nucleic acids. DNA. RNA. Cell membrane system. Organization of membranes. Transport through the plasma membrane and its mechanisms. Glycocalyx. Cell signaling. Structure of cytoplasm. Cytosol. Cytoskeleton. Cell nucleus. mtDNA. Nuclear matrix. rRNA genes. Cytoplasmic organelles. DNA replication. DNA repair. DNA genome recombination. Cloning. Protein biosynthesis; transcription; post-transcriptional processing of mRNA. Translation. Regulation of protein synthesis at the level of transcription and translation. Genes. Mutations. Chromosomal aberrations. Mitosis. Meiosis. Gametogenesis. Apoptosis. Embryogenesis. Immunogenetics. Antigen and antibodies. Tumor genetics. Carcinogenesis. Oncogenes and tumor suppressor genes. Pharmacogenetics. Pharmacogenomics. Role of the genome in drug response. Smart drugs. Recombinant proteins. Gene therapy.

18. Learning methods:

Preferred learning styles are:
visual style, auditory, verbal, kinesthetic, logical-mathematical, social and independent. The most important learning methods in the subject are: lectures with the use of multimedia tools, active learning techniques with active participation and discussions of students, laboratory exercises.
Preparation and presentation of group and individual seminar papers.

19. Assessment methods:

Knowledge verification will be done through tests (test 1, test 2), colloquia, the final exam, and activities in class. After five weeks of the course, students take written test 1, which includes the material from the lectures covered up to that point. The test consists of multiple-choice, simple guessing, or essay questions. A student can score a maximum of 16 points on test 1. After ten weeks of the course, students take written test 2, which covers the teaching material after test 1. The test consists of multiple-choice questions, simple guessing, or essay questions. A student can obtain a maximum of 16 points on the second test. Both tests are taken by all students in the subject at the same time, which achieves the uniformity of the level of knowledge being tested, as well as the conditions under which the student takes the exam. The seminar paper is submitted in written form to the subject teacher for review and evaluation, and then it is presented orally. A student can earn from 0 to 4 points for the completed and presented seminar work. Also, for continuous activity in lectures and exercises throughout the semester. In the last week of the semester, students take a practical exam (colloquium) that includes the material from the exercises. A student can obtain a maximum of 10 points on this exam. A student can earn from 0 to 4 points for continuous activity in lectures and exercises throughout the semester. The final exam is written and covers the entire material. To pass the course, the student must obtain a minimum of 55 cumulative points. If the student with the final exam does not achieve the appropriate number of points that are added to the points of pre-exam activities and enables a passing grade, the student attends a remedial or additional remedial exam.

20. Assessment components:

The exam grade is based on the total number of points a student has earned by completing pre-exam obligations and taking the final exam, according to the quality of acquired knowledge and skills. Pre-exam obligations account for 50 points, with a maximum total of 100 points, and are determined according to the following scale:
Attendance at lectures and exercises: 4
Test I: 16
Test II: 16
Colloquium: 10
Seminar work: 4
Final exam: 50

21. Required reading list:

1. Geoffrey M. Cooper i sar (2004): Stanica. Medicinska naklada, Zagreb
2. Jasminka H.H. i sar (2012): Citologija. Grin, Gračanica
3. Rifet Terzić i sar (2005): Biologija sa humanom genetikom, Medicinski fakultet u Sarajevu

22. Web sources:

Genomic databases: http:// wehih.wehi.edu.au;
http.//www. ebi.ac.uk;
htpp.// www.ncbi.nlm.nih.gov

23. Applicable starting from the academic year:

2023/2024.

24. Adopted in the Faculty/Academy session:

17.11.2025.