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|  | **UNIVERSITY OF BANJA LUKA**  Faculty of Medicine  Deparmtent of Human genetics |  |

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| **School year** | **Course** | **Study program** | **Cycle study** | **Year of study** | **Semester** | **Number of students** | **Number of practical groups** |
| 2024/2025. | Biology of cell and human genetics | Medicine | First | First | II |  | 3 |

**PLAN AND PROGRAM OF LECTURES**

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| **Week I** | **Lecture** | **Tematic unit** | **Day** | **Date** | **Time** | **Place** | **No.of classes** | **Professor** |
| I | 1 | The organization of the human genome. The genetic basis of reproduction and fertilization. | Wednesday | 19.2.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| II | 2 | Chromosomes, chromatin, DNA and RNA. DNA replication | Wednesday | 26.2.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović. assisstant professor |
| III | 3 | Function of genetic information (transcription, genetic code and translation). | Wednesday | 5.3.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| IV | 4 | Mechanisms of DNA recombination. Reparation of DNA molecule. | Wednesday | 12.3.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| V | 5 | Numerical and structural chromosomal aberrations. Genetic syndroms. | Wednesday | 19.3.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| VI | 6 | Gene mutations. Mutagenic factors. | Wednesday | 26.3.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| VII | 7 | Regulation of gene expression | Wednesday | 2.4.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| VIII | 8 | Molecular basis of human diseases (Mendelian and non-Mendelian patterns of inheritance). | Wednesday | 9.4.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| IX | 9 | Genetic counseling and prevention of hereditary disorders. Basic methods of molecular genetics. | Wednesday | 16.4.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| X | 10 | Genetic basis of sexual determination and differentiation in humans. | Wednesday | 23.4.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| XI | 11 | Oncogenetics: proto-oncogenes and tumor-suppressor genes. | Wednesday | 30.4.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| XII | 12 | Genetic basis of the immune response: genes for immunoglobulins, HLA, MHC. | Wednesday | 7.5.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| XIII | 13 | Personalized medicine, genetic markers. | Wednesday | 14.5.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| XIV | 14 | Genetic structure of human populations. | Wednesday | 21.5.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |
| XV | 15 | Test II | Wednesday | 28.5.2025. | 13:15-14:45 | Amphitheater | 2 | Dr. Vanja Vidović, assisstant professor |

**PLAN OF EXERCISES**

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| **Week** | **Exercise** | **Thematic unit** |
| I | E1 | Human karyotype, Inactive X-chromosome |
| II | E2 | Cytogenetic tests - banding techniques, FISH, micronucleus test |
| III | E3 | Numerical and structural chromosomal aberrations |
| IV | E4 | Monohybrid and dihybrid crossing, X-linked inheritance |
| V | E5 | Multiple alleles, polygeny and linked genes |
| VI | E6 | Genetic Engineering, Recombinant DNA Technology |
| VII | E7 | Methods of DNA isolation |
| VIII | E8 | Methods of polymerase chain reaction - PCR, RT-PCR |
| IX | E9 | Electrophoresis - gel and capillary |
| X | E10 | Hybridization tests, sequencing |
| XI | E11 | General principles of inheritance I |
| XII | E12 | General principles of inheritance II |
| XIII | E13 | Genetics of human populations |
| XIV | E14 | Genealogical trees |
| XV | E15 | Colloquium 2 |

**Exercises will be held Monday, Wednesday, Friday for groups II, I and III, respectively from 8-9:30 am at seminar hall on the first floor.**