

SYLLABUS

Subject:	Biology 2		
Study Programme:	<i>General Medicine</i>	Study Period:	<i>2. semester</i>
Evaluation:	exam	Subject Type:	<i>mandatory(compulsory)</i>
Content:	<i>2 lecture and 3 exercise hours /week</i>		<i>Total 70 hours</i>

Department: Department of Medical Biology

<i>Week</i>	<i>Lectures</i>	<i>Practical Lessons</i>
1.	Mutations I - classification of mutations, mechanisms of mutagenesis, gene (point) mutations	Gene expression – gene structure and function, transcription, translation, genetic code
2.	Mutations II - structural and numerical chromosome mutations	Mutations I – gene mutations and chromosome aberrations, consequences of mutations
3.	Mendelian inheritance - historical overview, general characteristics, Mendel's laws of inheritance	Mutations II – nomenclature and karyotype explanation
4.	Gene linkage Heredity and sex Quantitative genetics - polygenic inheritance, heritability, multifactorial diseases	Mendel's laws of inheritance – genotype and phenotype, gene, allele, locus, laws of segregation and independent assortment, Mendelian inheritance in humans
5.	Inheritance of blood group systems I. – ABO, H, Rh, MNS	Gene linkage – linkage group, crossing over and power of linkage
6.	Inheritance of blood group systems II. – Lewis, Secretor, Kell, Duffy. MHC (HLA)	Heredity and sex - chromosomal determination of sex, sex-linked inheritance, sex-limited and sex-influenced traits
7.	Genetics of cancer 1st written test	Inheritance of blood group systems I – ABO system, Rh system, MNS, Lewis, haemolytic disease of the newborns
8.	Population genetics – Hardy-Weinberg law, panmixis, population equilibrium, inbreeding, genetic drift, eugenics, euphenics	Inheritance of blood group systems II – HLA antigens, gene interactions, epistasis and hypostasis

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9.	Genealogy and genetic counselling	Population genetics – Hardy-Weinberg equilibrium, influence of mutations, migration, selection and genetic drift
10.	Molecular biology methods in human genetics – basic principles and techniques	Genealogy – pedigree analysis, construction of pedigree, autosomal and sex-linked inherited traits in pedigree, dominant and recessive inheritance
11.	Molecular biology methods in clinical practice	Genetic counselling I – purpose, aim and general characteristics of genetic counselling, prenatal diagnosis of genetic diseases
12.	Cell signaling	Genetic counselling II – solving model problems
13.	Mutations and their role in pathogenesis of human diseases – selected disorders 2nd written test	Molecular biology methods – PCR, electrophoresis, restriction endonucleases, DNA sequencing, hybridization of nucleic acids
14.	Ethical issues in human genetics	Evaluation of prerequisites and compensations