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

Department: Department of Medical Biology

Week	***Lectures***	***Practical Lessons***
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**	**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.	**Quantitative genetics** - polygenic inheritance, heritability, multifactorial diseases **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
9.	**Genealogy and genetic counselling**	**Population genetics –** Hardy-Weinberg equilibrium, influence of mutations, migration, selection and genetic drift
10.	**Genetics of cancer**	**Genealogy** – pedigree analysis, construction of pedigree, autosomal and sex-linked inherited traits in pedigree, dominant and recessive inheritance
11.	**Mutations and their role in pathogenesis of human diseases – selected disorders**	**Genetic counselling I –** purpose, aim and general characteristics of genetic counselling, prenatal diagnosis of genetic diseases
12.	**Molecular biology methods in human genetics – basic principles and techniques**	**Genetic counselling II –** solving model problems
13.	**Molecular biology methods in clinical practice** **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**