



## DISCIPLINE SHEET

### 1.-Info about the program

<b>FOUNDATION FOR DEVELOPMENT AND MANAGEMENT</b>		
1.2-Faculty	<b>FACULTY OF MEDICINE</b>	
1.3-Departament	Preclinical/Fundamental Disciplines	
1.4-Study domain	Health	
1.5-Study cycle	Bachelor	
1.6-Study program/ Calification	Medicine-English	

### 2.-Info about discipline

2.1- Name of the discipline					<b>GENETICS</b>			
2.2-Course lecturer					Lect.Dr. <b>STREBA (AGROSOAIE) Irina</b> , MD, PhD			
2.3-Seminary lecturer					Lect.Dr. <b>STREBA (AGROSOAIE) Irina</b> , MD, PhD			
2.4-Year of study	II	2.5 Semester	II	2.6 Evaluation type	Exam	2.7. Discipline regime	Content	<b>DF</b>
							Mandatory	<b>DOB</b>

### 3. -Total time (hours of didactic activity per semester)

3.1-Number of hours per week	4	3.2 -course	2	3.3- laboratory	2
3.4-Total hours of the curriculum	56	3.5 -course	28	3.6 -laboratory	28
Distribution of time					Hours
Study after manual, course support, bibliography and notes					10
Additional documentatin in the library, on the specialized electronic platforms and on the field					4
Training seminars/laboratories/projects, themes, papers,portofolios and essays					2
Tutoring					1
Examination					2
Other activities					-
3.7-Individual study hours	19				
3.8-Total hours per semester	75				
3.9-Credit number	3				

### 4.-Preconditions (if applicable)

4.1.-Curriculum	Cellular biology, biochemistry
4.2.-Learning Outcomes	-

### 5.-Conditions (where applicable)



5.1. -Course Conduct	Amphitheatre
5.2.-conducting the seminar/laboratory	The practical exam will be held in the last week, from the subject of the practical works/laboratories/internships previously displayed

6. Learning outcomes

<b>Knowledge</b>	Identifies, describes, explains and classifies the mechanisms of disease production, risk factors, pathogens (bacteria, viruses, parasites) and types of immunological response, as well as the development of pharmacological and genetic approaches.
<b>Skills</b>	Correctly interpret and apply fundamental concepts regarding disease mechanisms and methods for investigating biological functions.
<b>Responsibilities and autonomy</b>	Integrates fundamental notions and methods of investigating biological functions, formulates and assumes reasoned conclusions regarding the general mechanisms of disease production and general principles of treatment.

7.-Objectives of the discipline (resulting from the grid of specific skills accumulated)

7.1 -General objective of the discipline	To acquire the fundamental notions of genetics and to understand the structure and functioning of genetic material.
7.2- Specific objectives	<ul style="list-style-type: none"><li>▪Knowledge of inheritance patterns and interpretation of pedigrees.</li><li>▪Explanation of some notions of clinical genetics and medical indications for genetic testing.</li><li>▪Knowledge and understanding of the main categories of genetic risk.</li><li>▪Knowledge of the main methods used in the clinic, molecular cytogenetics and DNA diagnostic methods and implementation of applications using the acquired genetic concepts.</li><li>▪Acquire the skills to carry out specific laboratory preparations.</li></ul>



	▪Application of the general principles of bioethics in genetics.
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8.-Contents

8.1-Course (homework, number of hours, bibliography)	hours / week	Teaching methods
1.-The role of genetics in medicine. A brief history of medical genetics. Classification of genetic disorders. Levels of study in medical genetics. Nucleic acids: the molecular basis of inheritance. The topology of DNA structure. DNA replication.	2	Active and Interactive Video Projection
2.-Genes – fundamental elements of heredity. Structure of the gene in eukaryotes. Chromosomal theory of heredity. Organization of genomic DNA. Molecular pathway of gene expression. RNA structure topology. Transcription. Translation. Genetic code. The central dogma of molecular biology.	2	
3.-Multiple alleys. Types of eyelashes. Epigenetic mechanisms involved in gene expression.	2	
4.-Organization of the human genome. Genetic and extragenic DNA. The genetic basis of protein synthesis. Gene-protein relationship.	2	
5.-The map of human genes. Chromosomal base of inheritance. Mechanisms for controlling gene expression and differentiation.	2	
6.-Genetic recombinations. Mutations: definition, classification, molecular bases, mutagens. Mechanisms for repairing DNA damage.	2	
7.-Mendel's laws. The Mendelian Legacy. Mechanisms of gene expression in single-gene inheritance. Genetic heterogeneity. Autosomal inheritance. The legacy linked to X. The Dutch legacy.	2	
8.-Non-classical models of inheritance. Peculiarities of single gene inheritance. Multifactorial inheritance. Genetics of multifactorial inheritance disorders. Gemini and twinning.	2	
9.-Chromosomal base of inheritance. Structure of human chromosomes. Clinical cytogenetics. Cytogenetic abnormalities of autosomes.	2	



10.-Cytogenetic abnormalities of sex chromosomes. Syndromes with microdeletions and microduplications. Chromosomal basis for sex determination. Disorders of sexual development. Genetic causes of reproductive failure.	2	
11.-Molecular basis of genetic diseases. Nutrigenetics. Pharmacogenetics.	2	
12.-Genetics of the major human histocompatibility complex. Genetics of the immune system. The genetic basis of cancer. Chromosomal abnormalities in malignant hematological diseases.	2	
13.-Genetics of the human population. Elements of epigenetics. A Clinical Approach to Dysmorphology: Elements of Teratology.	2	
14.-Strategies for the treatment of genetic disorders. Genetics and rare diseases. Bioethics in genetics.	2	
<p>Mandatory bibliography:</p> <p>1.-Thompson &amp; Thompson Genetics in Medicine, Nussbaum, McInnes, Willard Ed. a 8-a. Elsevier, 2016.</p> <p>2.-Turnpenny PD &amp; Ellard S Emery's Elements of Medical Genetics. Ed. a 15-a. Elsevier Limited, 2017.</p> <p>3.-CURTICĂPEAN, Manuela, Molecular biology and genetics techniques. Tg. Mureș: University Press, 2016.</p> <p>Optional bibliography:</p> <p>1.-NUSSBAUM, Robert L. and others. MEDICAL GENETICS, 8th ed. – Bucharest: Hippocrates, 2018.</p> <p>2.-NUSSBAUM, Robert L.; McINNES, Roderick; WILLARD, Huntington, GENETICS IN MEDICINE, 8th ed., Elsevier, 2016.</p> <p>3.-STRACHAN, Tom; HI, Judith; CHINNERY, Patrick / GENETICS and GENOMICS in MEDICINE. – USA: Garland Science, 2020.</p> <p>ISCN 2016: An International System for Human Cytogenomic Nomenclature (2016) Reprint of: Cytogenetic and Genome Research 2016, Vol. 149, No. 1-2 Edition I</p>		
8. 2- Seminar (themes, number of hours, bibliography	hours /week	Teaching methods
1.-Levels of study in medical genetics. Glossary of genetic terms. Genetic engineering techniques.	2	Oral presentation - Power Point support
2.-Mutation detection methods. Interpretation of molecular analysis bulletins.	2	
3.-Chromosomal level of inheritance. Morphology of human chromosomes. Principles and technology for cytogenetic analysis.	2	
4.-Chromosomal nomenclature. Chromosomal bands. Chromosomal polymorphisms. Classification of human chromosomes	2	



5.-Karyotyping. Interpretation of karyograms. Assessment. Chromosomes during mitotic division.	2
6.-Chromosomes during meiotic division. Gametogenesis. Fertilization. Non-disjunction exercises.	2
7.-Dysmorphic aspects suggestive of genetic disorders. Syndromes with microdeletions and microduplications.	2
8.-Karyotype and phenotype in chromosomal disorders. Cytogenetic formulas-exercises.	2
9.-Evaluation-recognition of several chromosomal disorders.	2
10.-Cytogenetic and molecular aspects in cancers.	2
11.-Inheritance of physiological traits. Inheritance of morphological traits.	2
12.-Dermatoglyphs. Genetic counseling: Methodology. Drawing and interpreting human pedigrees.	2
13.-The Hardy-Weinberg principle. Recurrence risk assessment and genetic counseling.	2
14.-Genetic screening. Prenatal diagnosis.	2

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ISCN 2016: An International System for Human Cytogenomic Nomenclature (2016)  
 Reprint of: Cytogenetic and Genome Research 2016, Vol. 149, No. 1-2 Edition I

9.-Corroborating/validating the contents of the discipline with the expectations of the representatives of the epistemic community, professional associations and employers representative of the field related to the program

The contents of the discipline are in accordance with the RNCIS standards.



10.-Evaluation

Activity Type	10.1 -Evaluation criteria	10.2-Evaluation methods	10.3-Weight of the final grade



10.4-Course	<p>▪For grade 5, students must prove knowledge of the basis of the structure and function of hereditary material and their involvement in pathology, list the main signs in some monogenic and chromosomal disorders.</p> <p>▪For grade 10, students must have thorough knowledge about the structure and function of genetic material, to know the patterns of hereditary inheritance, genetic disorders, the essential categories of genetic risk and the notions of bioethics.</p>	<p>Continuous evaluation: (appreciation of students' activities during the semester, with emphasis on aspects of knowledge and synthesis of information)</p> <p>Final evaluation: Exam: multiple-choice written test (50 questions, one hour).</p>	<p>10%</p> <p>50%</p>
10.5-Laboratory	<p>▪For grade 5, students must demonstrate theoretical knowledge of the protocols of the techniques they have learned, to know the normal data regarding the chromosomal analysis bulletin, to draw a family tree.</p> <p>▪For 10 students need to know the normal values and recognize pathological changes in cytogenetic investigations, recognize certain pathological phenotypes, draw and interpret family trees, prepare a plan for the genetic evaluation of a patient.</p>	<p>Final evaluation: practical exam</p>	<p>40%</p>
10.6-Minimum Performance Standard			
Interpretation of ways to apply a healthy lifestyle for disease prevention.			



Date: 15.05.2025	Signature of the discipline coordinator:	Holder of the seminar activities:
	Lect.Dr. <b>STREBA (AGROSOAIE) Irina</b> , MD, PhD 	Lect.Dr. <b>STREBA (AGROSOAIE) Irina</b> , MD, PhD 
Date of approval in the Department		
Signature of the Director of Department		

**Reprezentant legal F.D.M.**  
Presedinte  
Prof. Univ. Dr. POSTĂVARU Nicolae

