1.	**Subject**	**BASICS IN HUMAN GENETICS**			
2.	**Code**	OM 124			
3.	**Study Program**	General medicine			
4.	**Organizing Institution (Unit, Institute, Chair, Department)**	UKIM-Faculty of Medicine Cathedra of himan genetics			
5.	**Educational degree (first or second cycle)**	Integrated cycle			
6.	**Study year /semester**	first/second	7.	Number of credits	5
8.	**Responsible teacher**	Chief of the cathedrae - Prof d-r Elena Shukarova-Angelovska * the course is conducted by all members of the Cathedra of human genetics			
9.	**Preconditions:**	Obtained the signature of the morphology and physiology of the cell			
10.	**Teaching goals of the study program (competencies):** • Training the students about the basic genetic principles that influence medical practice • Training the students regarding basic principles of cytogenetics, molecular genetics, biochemical genetics, population genetics, reproductive genetics and genetics in forensic medicine • Educating the students on basic principles in communication with families with genetic disorders and malformations • Training the students about basic ethical principles in genetics				

<table>
<tr><td>11.</td><td colspan="4">Contents of the study program:
Theoretical course:
• Basics of human genetics - organization of prokaryotic and eukaryotic DNA, nuclear and non-nuclear DNA, basic processes of replication, transcription and translation, regulation of gene expression and signaling, gene mapping in prokaryotes and eukaryotes, recombinant DNA cloning, basics of cytogenetics, chromosome organization, frequent chromosomal aberrations, cell cycle and mitotic and meiotic division, and errors in their behavior, cellular and molecular basis of heredity, Mendelian genetics, nonmendelian inheritance - complex and multifactorial inheritance genetic factors in common diseases. Mapping and identification of genes for monogenetic diseases. Developmental genetics and processes that disrupt embryonic development. Mutations- types, ways of occurrence and systems for repair of the DNA. Molecular and biochemical basis of genetic diseases. Basics of onkogenetics and immunogenetics. New technologies and future possibilities for gene therapy. Prenatal and postnatal genetic testing of inherited and genetic conditions, ethical aspects of genetic examinations. Practical course:
• Methods of genetic analysis - DNA extraction, methodts for detecting of known and unknown mutations and polymorphisms. Methods of writing and interpretation of the results. Basics in cytogenetics - performing karyotype, staining methods, FISH, detection of chromosomal aberrations. Interpretation of the mendelian and nonmendelian inheritance, interpretation of the types of the mutations, oncogene changes. Screening methods in the population-methods and organisation.
• Basics in dysmorphology and clinical recognition of the syndrome and multimalformations, methods for prenatal and postnatal detection of malformations, genetic counseling.</td></tr>
<tr><td>12.</td><td colspan="4">Methods of studying: Integrated lecturers, practical tutorials/seminars</td></tr>
<tr><td>13.</td><td colspan="2">Total no. of hours:</td><td colspan="2">150 hours: 30 theoretical lecturers, 30 practical tutorials, 90 hours home learning and seminar work</td></tr>
<tr><td>14.</td><td colspan="2">Distribution of the available time</td><td colspan="2"></td></tr>
<tr><td rowspan="2">15.</td><td rowspan="2">Type of educational activity</td><td>15.1</td><td>Lectures-theoretical course</td><td>30 hours</td></tr>
<tr><td>15.2</td><td>Practicals (laboratory, clinical), seminars, team work</td><td>30hours</td></tr>
<tr><td rowspan="2">16.</td><td rowspan="2">Other types of activities</td><td>16.1</td><td>Project assignments</td><td>depending on the interest of student /hours</td></tr>
<tr><td>16.2</td><td>Individual tasks</td><td>depending on the interest of student /hours</td></tr>
</table>

		16.3	Home studying	90 hours
17.	**Assessment of knowledge:** points			
	17.1	Tests	3 Continuous tests total... points	

	min	max
Colloquium 1	5	15
Colloquium 2	5	15
Colloquium 3	7	20

Final exam		

	min	maks
Theoretical test	30	50
Oral exam	21	36

If the student passes all 3 continuous tests with minimal points (min 60% of the sum of all 3 tests), he can pass directly on the oral exam

17.2 Seminar work/project min.- max. (presentation: written and oral) points Seminar works …

17.3 Active participation min.- max.

Theoretical course points 1-3
Practical course points 4-7

18.	Knowledge assessment (points/grade)	up to 59 points	5 (five) F
	criteria: 60 to 68 points 6 (six) E	69 to 76 points	7 (seven) D
		77 to 84 points	8 (eight) C
		85 to 92 points	9 (nine) B
		93 to 100 points	10 (ten) A
19.	Criteria for obtaining a signature and taking the final exam	**Conditional criteria for assessment of knowledge:** For gaining the signiture student s are oblidged to attend practical teaching with minimal points. To access to the oral exam the student should pass predicted continuous check-ups or gain minimum 60% of points from the written exam.	

The evaluation of the subject is formed according to the above mentioned scoring, based on the sum of the points of all activities.

20. Language of the course Macedonian, English

21. Method for evaluation of Anonymous student's evaluation of the subject, teachers the quality of education and collaborators involved in the educational activities

22. Literature

Mandatory textbooks

	Author	Title	Publisher	Year
1	Prof d-r M. Kocova and Doz d-r A. Petlickovski	Medical genetics and Authorized lecturers	University 'Curil and Methodius' associates	2013 2014
2	Prof d-r M. Spiroski	Practicum of human genetics 1	University 'Curil and Methodius' Madical faculty, Skopje	2009
3	Проф Др М. Кочова и соработници	Practicum of human genetics 2	University 'Curil and Methodius' Madical faculty, Skopje	2009
4				
5				

Additional literature

	Author	Title	Publisher	Year
22.1	1 Mueller, R.F. and Young, I.D.	Emery's Elements of Medical Genetics. 10th ed.	Elsiever	1998
22.2	2 Strachan T, Read A	Human Molecular Genetics 4	th ed. Oxford journals	2007
	3 Gardner RM, Sutherland GR	Chromosome abnormalities and genetic counseling,	Oxford University Press	1996

		4	Nussbaum, McInnes, Willard	Thomson&Thomson Genetics in medicine	Elsiever	2007
		5	Peter Russel	I Genetics 3rd ed.	Benjamin Cummings	2011