COURSE UNIT DESCRIPTION - GENETICS OF MICROORGANISMS

Course unit title	Code
GENETICS OF MICROORGANISMS	

Lecturer(s)	Department(s)
Coordinator: dr. Rimantas ŠAPRANAUSKAS	Thermo Fisher Scientific, Vilnius Division, V. A. Graičiūno Str. 8, LT-02241 Vilnius

Cycle	Level of the course unit	Type of the course unit
Full-time studies (2nd stage)	1 out of 1	Compulsory

Mode of delivery	Period of delivered	Language(s) of instruction
Face to face	1st semester, autumn	Lithuanian

Prerequisites and corequisities	
Prerequisites: Molecular biology, biochemistry, genetics and genetic engineering	**Corequisities (if any):**

Number of credits allocated to the course unit	Student's total workload	Contact hours	Self-study and research hours
4	107	48	59

Purpose of the course unit: programme competences to be developed		
Learning outcomes of the course unit	**Teaching and learning methods**	**Assessment methods**
Describes the basics of microorganism genetics and explains the most popular classical and advanced approaches used in genetics of microorganisms.	Lectures and seminars	Midterm exam; final exam
Explains the logics of experiments using genetic approaches which are described in both older and newest literature, to learn advanced methods, and to implement these approaches in their scientific work in future.	Lectures and seminars	Midterm exam; final exam, topic-related seminar presentation

Content: breakdown of the topics	Contact hours							Self-study work: time and assignments	
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work placement	Contact hours	Self-study hours	Assignments
1. Types of Bacterial and Phage DNA	**10**		**5**				**15**	**22**	Analysis of the topic-related scientific papers; seminar presentation, self-directed learning.
Structure of bacterial chomosome, mechanism of replication regulation.	2		1				3	4	
Types of plasmids, mechanisms of replication and its regulation	4		2				6	9	
Lytic and lysogenic phages, regulation of replication.	4		2				6	9	

2. Regulation of Gene Expression	**8**		**4**				**12**	**18**	Analysis of the topic-related scientific papers; seminar presentation, self-directed learning.
Mechanisms of transcription and translation	4		2				6	9	
Principles of regulation of gene expression, main models	4		2				6	9	
3. Gene Rearrangement in Bacteria	**14**		**7**				**21**	**32**	Analysis of the topic-related scientific papers; seminar presentation, self-directed learning.
Mutations and mutagenesis	4		2				6	9	
DNA reparation and recombination	4		2				6	9	.
Horizontal gene transfer: transfection, transduction and conjugation	6		3				9	14	
Total	**32**		**16**				**48**	**72**	

Assessment strategy	**Weight,%**	**Assessment period**	**Assessment criteria**
Midterm exam	50	9th week of the course	Written Exam, assessment of interpretation ofthe subject.
Exam	50	16th week of the course	Written Exam, assessment of interpretation ofthe subject.
Total	100		Mean of both assessments

Author	**Year of publica-tion**	**Title**	**Issue of a periodical or volume of a publication**	**Publishing place and house or web link**
Compulsory reading				
Larry Snyder and Wendy Champness	2007	Molecular Genetics of Bacteria, 3rd Edition		ASM Press
Jeremy W. Dale, Simon F. Park	2010	Molecular Genetics of Bacteria, 5th Edition		John Wiley & Sons
Papildoma literatūra				
Edward A. Birge	2006	Bacterial and Bacteriophage Genetics		Springer