

Course code	Course group	Volume in ECTS credits	Course hours
BIO 6009		6	

Course type (compulsory or optional)	Optional
Course level (study cycle)	Master
Semester the course is delivered	Spring/Autumn
Study form (face-to-face or distant)	Face-to-face

#### Course title in Lithuanian

**MOLEKULINIAI METODAI TEISMO MEDICINOJE**

#### Course title in English

**MOLECULAR METHODS IN FORENSIC MEDICINE**

#### Short course annotation in Lithuanian

Dalykas skirtas supažindinti su pažangiais molekuliniais metodais taikomais teismo medicinoje šiuolaikinių technologijų kontekste, su naujausių biotechnologijų taikymu, atliekant šiuolaikinės medicininės-biologinės ekspertizės ir tyrimus, taikant specifinius ir kompleksinius tyrimus.

#### Short course annotation in English

The subject matter is intended to introduce with advanced molecular methods applied to forensic medicine in the context of modern technology, to introduce the most recent application of biotechnology in modern medico-biological examinations and investigations, by means of specific and complex investigations.

#### Prerequisites for entering the course

Basic knowledge of biology, genetics and biochemistry.

#### Course aim

The aim of the course is to provide the newest scientific knowledge on the molecular approaches in forensic medicine, medical-biological examinations and investigations.

#### Links between course outcomes and criteria of learning achievement evaluation

Course outcomes	Criteria of learning achievement evaluation
To know the molecular diagnostic testing methods and principles applied in forensic medicine and forensic genetics.	Presents the knowledge about the molecular testing methods used in forensic genetics laboratories and the basic principles of investigation of genetic material and medico-biological examinations and investigations.
To understand the application of molecular techniques and the range of possibilities of modern forensic science level, in order to determine the cause and time of death, the application of the newest methods in the biological evidence traces identification.	Presents the essence of these methods and possibilities to interpret, evaluate the findings, analyse them. Will be able to choose the most appropriate method for the evaluation of the examination performance depending on the object's properties, on examination and survey questions.

To show abilities to collect research material, prepare the samples, select the most appropriate methodology for the stated goals, plan a course of study or carry out research without prejudice to Bioethics and good laboratory practice.	Presents how to collect the study material and to prepare samples for analysis, how to select the most appropriate methodology for the fulfilment of tasks, will be able to plan a course of study or carry out research without prejudice to Bioethics and good laboratory practice, how to follow the course of the investigation raised by quality management principles.
To understand about the forensic genetics laboratory work organizational principles and quality assurance standards need in expertise laboratory work.	Presents the basic principles and requirements of Quality System for Forensic Genetics Laboratory and Laboratory Information Management System (LIMS), examples of good laboratory practice.

### Content (topics)

1. Application of the most recent biotechnologies in the establishment of modern methods of medical-biological expertise.
2. Establishment of causes and time of death by applying specific and complex investigations; search for new methods.
3. Forensic medicine and forensic genetic expertise and analyses.
4. Lab Quality and Information Management System.
5. Databases and data evaluation.
6. Diagnostic systems and methods in forensic genetics and medicine.
7. Examples of good laboratory practice.

### Practical work (contents):

The practical work involve the learning how to collection the study material and to prepare samples for analysis, how to select the most appropriate methodology for the fulfilment of tasks, during practical work students will be able to plan a course of study and carry out research by quality management principles. Individual practical work will be carrying out by studing a scientific material and presenting during workshops and seminars.

### Distribution of workload for students (contact and independent work hours)

Lectures – 45 hours, practical work in lab – 15 hours, individual work – 87 hours.

### Structure of cumulative score and value of its constituent parts

Final assessment sums the assessments of written final examination (50%), written mid-term examination (25%) and assessment of laboratory works (25%).

### Recommended reference materials

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	Self-study rooms	Other libraries
<b>Basic materials</b>						
1.	2005	Forensic DNA typing protocols / edited by Angel Carracedo. (Methods in molecular biology, ISSN 1064-3745 ; vol. 297). - Springer eBooks. - ISBN 978-1-58829-264-3. - ISBN 978-1-59259-867-	- [New York] : Humana Press.			CD LML

		0				
2.	2005	J. M. Butler. Forensic DNA Typing: Biology, Technology, and Genetics of STR Markers. 2nd edition.	ELSEVIER. Academic Press, London.		CD	
3.	2005	Microarrays in clinical diagnostics / edited by Thomas O. Joos, Paolo Fortina. (Methods in molecular medicine ; vol. 114). - Springer eBooks. - ISBN 978-1- 58829-394-7. - ISBN 978-1-59259-923-3	- [New York] : Humana Press.		CD	CD LML
<i>Supplementary materials</i>						
1.	2008	Forensic Medicine in Europe /Burkhard Madea; Pekka Saukko(red.), [M. Čaplinskienė, A. Pauliukevičius]. Forensic Medicine in Lithuania. IDN: 991721667. ISBN 978-3-7950-0334- 0.	Lübeck : Schmidt- Römhild			
2.	2007	Baranovienė R. Serologiniai ir DNR tyrimai. // Mokomasis metodinis leidinys. ISBN: 978-9955-19- 057-8.	Mykolas Romeris University Publishing Centre			

**Course programme designed by**

Prof. dr. Marija Čaplinskienė, State Forensic Medicine Service under the Ministry of Justice of the Republic of Lithuania