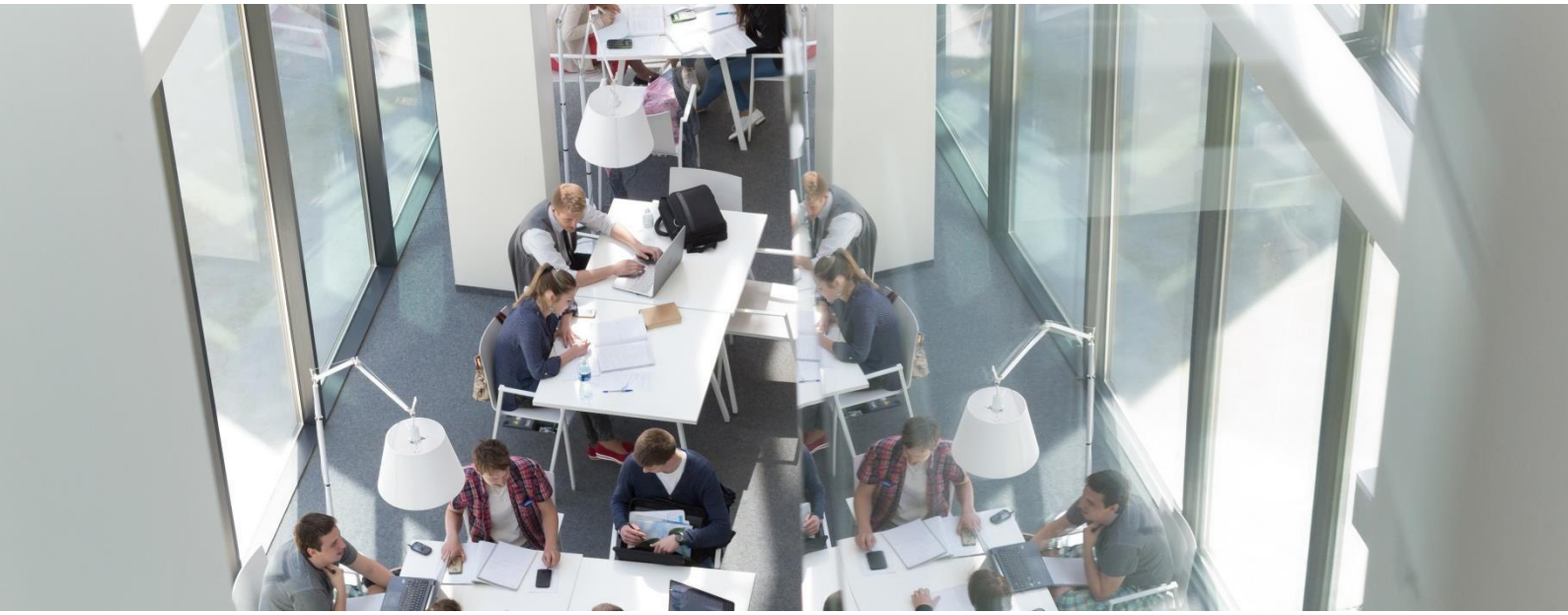

LIGHT ENGINEERING

Programme type	Bachelor's studies (university)
Field of study	Light Engineering
Study area	Technology Sciences
Degree	Bachelor in Materials Technologies
Duration	3.5 years (7 semesters)
Workload	210
Language of instruction	English
Location	Vilnius, Lithuania
Starting date	1st of September
Tuition fee	3500 EUR/ per year

PROGRAMME DESCRIPTION

- *The objective of Light Engineering* studies is to achieve the fundamental knowledge of physics, chemistry, and mathematics, the applied understanding of material synthesis and characterization, operation principles of lasers, photovoltaic and light emitting devices, and, finally, to develop and train the practical technological and engineering skills needed for work in lasers, laser technology, modern lighting, photovoltaics, photonics and semiconductor industries enterprises.
  The study program is designed for developing of skills to carry out standard laboratory procedures, to synthesize materials and to apply chemical knowledge for the processes to development, or to the deeper understanding of the principles of operation of modern lasers, laser beams and how to characterize and manipulate them. This will be achieved through training in the laboratory, practices in experiments based on group and individual work.

  The studies include a balanced set of theoretical lectures, practical seminars and laboratory training, based on group and individual work.

- *Career opportunities*

The graduates will acquire knowledge and competences allowing them to pursue a carrier in light technology industry in Lithuania or abroad.

- *Access to further studies*
  The graduates will be able to continue their studies at Masters and PhD levels. The nearest postgraduate directions - laser physics and optical technology, laser technology, material science and semiconductor physics, Optoelectronic Materials and Technologies.

KEY LEARNING OUTCOMES

Having completed *Light Engineering* programme a graduate acquires professional competence to carry out complex work which requires the fundamental knowledge of physics, chemistry, and mathematics, as well as applied understanding of material synthesis and characterization, operation principles of lasers, photovoltaic and light emitting devices, and the practical skills of programming, general lighting design, and standard laboratory procedures. The graduates will gain the technological skills and engineering competences in the following fields of high-tech: understanding of optical systems operation, analysis and development; knowledge of semiconductor electronic and optoelectronic devices operating principles; material synthesis and knowledge of technological processes; understanding of the principles of operation of modern lasers; modern digital modelling techniques, the software for the process automation and control.

COURSE INFORMATION

The programme has the following structure:

Course Type	1st Semester	2nd Semester	3rd Semester	4th Semester
Compulsory Courses	General Physics I (5 ECTS)	General Physics II (5 ECTS)	General Physics III (5 ECTS)	General Physics IV (5 ECTS)
	Higher Mathematics I (5 ECTS)	Higher Mathematics II (10 ECTS)	Solid State Physics (10 ECTS)	Computerized Physical and Technological Measurements (5 ECTS)
	English for Specific Purposes (5 ECTS)	Research and Innovation Management (5 ECTS)	Visual Programming (5 ECTS)	Lasers (5 ECTS)
	Study Skills and Computer Literacy for Physicists (5 ECTS)	Numerical Methods I (5 ECTS)	Applied Electronics I (5 ECTS)	Optoelectronics (5 ECTS)
	Basic Concepts in Chemistry (5 ECTS)	General Education Electives I (5 ECTS)	General Education Electives II (5 ECTS)	Numerical Methods II (5 ECTS)
	Technical Drawings (5 ECTS)			
Elective Courses				Functional and Smart Materials (5 ECTS)
				Applied Electronics II (5 ECTS)

Course Type	5th Semester	6th Semester	7th Semester

Compulsory Courses	Semiconductors Growth Technologies (5 ECTS)	Optoelectronic and Lasers Engineering (5 ECTS)	Practice (15 ECTS)
	Laser Technology (5 ECTS)	Metrology of Light Sources and Components (5 ECTS)	
	Organic Optoelectronics (5 ECTS)	Optical System Design (5 ECTS)	Final Thesis (15 ECTS)
	Solar Energy and Photovoltaics (5 ECTS)	Materials Characterization Techniques (5 ECTS)	
	General Education Electives III (5 ECTS)	Course Project (5 ECTS)	
Elective Courses	Optical Spectroscopy (5 ECTS)	Fiber Technology (5 ECTS)	
	Modern Illumination Technologies and Light Design (5 ECTS)	Nano- and Microstructure Technologies (5 ECTS)	

GRADUATION REQUIREMENTS

The students are expected to have formed comprehensive both theoretical knowledge and practical skills in the fields of lasers, organic and inorganic semiconductor light emitters, intelligent lighting solutions, solar cells and other technologies dealing with visible, ultraviolet, and infrared light.

Light Engineering undergraduate studies are completed with public defence of Bachelor Final Thesis.

EXAMINATION AND ASSESSMENT REGULATIONS

The main form of assessment is an examination. Every course unit is concluded with either a written or written-oral examination or pass/fail assessment. Student's knowledge and general performance during the examination are assessed by using the grading scale from 1 (very poor) to 10 (excellent).

APPLICATION AND SELECTION REQUIREMENTS

Each applicant is required to have a secondary school diploma or its equivalent:

- The selection criteria are based on the weighted average of relevant grades recorded in the transcript of the student's academic record;
- All applicants have to prove their English proficiency (IELTS 5.5+, iBT TOEFL 65+);
- Application process is described in website of Vilnius University. Follow the steps to apply for the programme.

Academic contact	Admission contact
Assoc. Prof. dr. Renata Butkutė renata.butkute@ftmc.lt	Admission Office admissions@cr.vu.lt www.ef.vu.lt/en