COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
TECHNICAL DRAWINGS	

Anotacija

Lecturer(s)	Department(s) where the course unit (module) is delivered
Coordinator: dr. Paulius Ragulis **Other(s):**	Faculty of Physics, Saulėtekio al. 3, NFTMC, LT-10257, Vilnius.

Study cycle	Type of the course unit (module)
First	Compulsory

Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction
Auditorium	1 (spring) semester	English

Requirements for students	
Prerequisites: None	Additional requirements (if any): None

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5	130	48	82

Purpose of the course unit (module): programme competences to be developed
The purpose of this course is to give an understanding of today's most popular computer-aided design (CAD) and computer-aided engineering (CAE) programs. To have an understanding of the requirements of drawings for scientific and production process. Students will be able to use commercial software SolidWorks and correctly draw mechanical parts in 3D and to assemble them into a gadget or mechanical device. They will be able to prepare drawings and diagrams of the device for technical documentation and manufacturing.

Learning outcomes of the course unit (module)	Teaching and learning methods	Assessment methods
According to the technical requirements know how to read technical documentation and create drawings.	Lectures with visual demonstrations, laboratory work.	Laboratory work, examination.
Understand the main objects of drawing instruments and learn to use the drawing tools. Correctly do drawings, sketches and diagrams using CAD program.	Drawing done by computer.	Laboratory work, Self-study project, report of made parts and drawings.
Using CAD program be able to do the general drawings, diagrams, machine components and assemblies.	Drawing done by computer.	Laboratory work, Self-study project, report of made parts, assemblies and drawings.

Content: breakdown of the topics	Contact hours						Contact hours	Self-study work: time and assignments	
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work	Contact hours	Self-study hours	Assignments
Introduction. The importance of graphic images in engineering and sciences. Presentation of the study program of study and the main purposes. The most important requirements for drawings. Design drawings, formats, tables, notes, computer software and other.	1				1		**2**	**2**	Create a template for a drawing table.
1. **Introduction to SolidWorks.** User interface, functions and features.	1				1		**2**	**4**	Get used to SolidWorks user interface. Draw simple sketch.
2. **2D sketches in SolidWorks**. Introduction to sketch tools, working planes, sketch realations, sketch states, fillet/chamfer tools. Rules to fully define sketches.	2				5		**7**	**15**	Creating sketches of basic shapes.
3. **Creating 3D parts**. SolidWorks features and tools. Basic 3D features: extrude, cut, revolve. Using sketches to create 3D features. Using reference geometry and creating reference planes.	4				8		**12**	**18**	Create simple and advanced 3D parts.
4. **Geometric dimensioning.** The rules of reading and creating technical drawings. Examples	2				1		**3**	**4**	Dimensioning
5. **Drawings**. Create drawings in SolidWorks, dimensioning tools, first and third angles views.	1				4		**5**	**8**	Create drawings of designed parts.
6. **Assemblies**. Assembling created parts into one device. Using assembly mates to fully define assembly. Understanding of standard, advanced and mechanical mates in SolidWorks.	2				8		**10**	**16**	Create fully defined assemblies.
7. **Assembly drawings**. The rules of creating assembly drawings. The views, cuts and geometric dimensioning. Examples.	2				4		**6**	**11**	Assembly drawings
8. **SolidWorks motion** study. Understanding principles of motion study, using motion study and simulation for mechanical parameters testing.	1				0		**1**	**4**	Studying motion study examples.
Total	**16**				**32**		**48**	**82**	

Assessment strategy	Weight,%	Deadline	Assessment criteria
Exam	30	Session time	Exam mode – Create given parts and assemblies in a given time frame using CAD program.
Laboratory work	50	Throughout entire semester	Accumulative mark: laboratory works.
Self-study project	20	Second half of the semester	Present created project.

Author	Year of publication	Title	Issue of a periodical or volume of a publication	Publishing place and house or web link
Compulsory reading				
M. Lombard	2013	SolidWorks 2013 bible		John Wiley & Sons
Optional reading				
Žilinskas P. J.	1996	Techninė grafika		Vilnius: Vilniaus universiteto leidykla
Frolovas V.	1990	Radijo schemų kalba		Kaunas: Šviesa