ENGINEERING
Spring 2021

Course title	ECTS	Degree	Course code	Prerequisites	Subject area
Mechanics of structural elements	3	Bachelor	T210B111	Applied mathematic, Statics and kinematics, Dynamics, Mechanics of material	Mechanical Engineering
Computer-aided Design 1	6	Bachelor	T210B104	Engineering Graphics, Physics, Computerised Drawing	Mechanical Engineering
Fundamentals of Electronics and Circuits	5	Bachelor	T170B013	Physics	Electronics
Basics of Electronics Equipment Design	6	Bachelor	T125B125	Electronics, Analogue and Digital Devices	Electronics

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Subject area: **Mechanical Engineering**

Status	Course code: T210B111 Course title: **MECHANICS OF STRUCTURAL ELEMENTS** Taught by: Assoc. Prof. Dr. Artūras Sabaliauskas		
Semester	**ECTS credits**	**Languages**	**Duration**
Spring	3	English	1 semester
Study hours	**Assessment**	**Prerequisites**	**Examination**
Lectures – 16 h Practical work – 32h Self-study – 32 h Total – 80 h	10-point scale	Applied mathematic, Statics and kinematics, Dynamics, Mechanics of material	Homework – 40% Mid-term examination – 30% Final examination – 30%

Subject content	The aim of the model is introduce the engineering stress and strain calculation methodology for the application of the constructional elements. The analysis of stress and strain state, complex deformation, beam buckling, the effect of the dynamic load and the cyclic resistance and the durability are represented in the theoretical and practical parts.
Learning Outcomes	To be able to analyze the square and flat bars of three-dimensional, their stress and strain. Be able to assess the stress caused by impact. To be able to calculate cyclic load. To know about behaviour of fatigue. Knowledge and understanding of the critical stress, Euler formula. To be able to establish a link between stress, temperature, time and rate of creep or relaxation. To able to perform calculations according to the strength limit state of yielding under tension-compression, bending and torsion.
Literature	1. Vitor Dias da Silva. Mechanics and strength of materials. Springer Berlin Heidelberg New York, 2006. – 531p..

Subject area: **Mechanical Engineering**

Status	Course code: T210B104 Course title: **COMPUTER-AIDED DESIGN 1** Taught by: Assoc. Prof. Dr. Sergėjus Rimovskis		
Semester	**ECTS credits**	**Languages**	**Duration**
Spring	6	English	1 semester
Study hours	**Assessment**	**Prerequisites**	**Examination**
Lectures – 16 h Laboratory work – 64 h Self-study – 80 h Total – 160 h	10-point scale	Engineering Graphics, Physics, Computerised Drawing	Homework – 20% Laboratory work – 20% Homework – 10% Final examination – 50%

Subject content	The systems of computer aided design of mechanical objects. Sketch drawings and their fixing by geometrical constraints and dimensions. The main means for part designing: extruding, revolving, shells and others. Work planes, lines and points. Placed features and their application. Layout and printing of drawing views, detail views, broken

	views and sections.Assembly drawing, their contraints, part lists and baloons. Basics of parametric design. Solution of engineering tasks using SolidWorks means.
Learning Outcomes	Knowledge about designing, modeling, manufacturing methods and ways. Information about technical means used and their management methods. Abilities to apply professional knowledge when solving tasks of known and unknown profile, having limited and contradictory information only. Skills of using information technologies, base software, abilities to apply and use digital computer means to solve specific problems, use computers to get and process the data of problems solution, to operate processes and computer aided design. Ability to apply the motion laws of mechanical systems, the principles of stability and reliability to create the technical means, improve and correct. Skills of information technologies use, for example, using information sites and data bases, preparing computerized textual and graphic information.
Literature	SolidWorks. Getting started Exercises. SplidWorks. User's Guide.

Subject area: **Electronics**

Status	Course code: T125B125 Course title: **BASICS OF ELECTRONICS EQUIPMENT DESIGN** Taught by: Assoc. Prof. Dr. Donatas Dervinis		
Semester	**ECTS credits**	**Languages**	**Duration**
Autumn	6	English	1 semester
Study hours	**Assessment**	**Prerequisites**	**Examination**
Lectures – *32 h* Laboratory – *32 h* Self-study – *96 h*	10-point scale	Electronics, Analogue and Digital Devices	Laboratory – 20% Course work – 50% Final examination – 30%

Subject content	CAD Systems, Electronics Components, Electronic Schematics Diagrams, Printed Circuit Board Design, Parametric Analyzes and Synthesis, Design of Structures and Algorithms, Schematics Modeling, Preparing of Project Documentation.
Learning Outcomes	Knowledge of electronic equipment design. Give a practical skill to computer-aided design
Literature	1. Simon Monk . Make Your Own PCBs with EAGLE: From Schematic Designs to Finished Board, 2014. 2. Andy Artes . PCB Design in EAGLE - Part 1: Learn about EAGLE's user interface, adding parts, schematics, and more, 2015. 3. Kerwin Mathew . Electronics and Circuit Design Made Easy, 2014. 4. Ralph Remsburg .Advanced Thermal Design of Electronic Equipment, 2013.

Subject area Electronics

Status	Course code: T170B013 Course title: **FUNDAMENTALS OF ELECTRONICS AND CIRCUITS** Taught by: dr. Dainius Balbonas		
Semester	**ECTS credits**	**Languages**	**Duration**
Spring	5	English	1 semester
Study hours	**Assessment**	**Prerequisites**	**Examination**
Lectures – 32 h Laboratory class –32 h Consultation 8 h Self-study – 61 h	10-point scale	-	Mid-term examination – 25% Homework – 15 % Laboratory work – 20% Final examination – 40%

Subject content	Introduction to electronics. Electric circuits. Passive circuit elements Main laws of circuit therory. DC and AC circuits Circuit analysis methods Transient analisys Smiconductors and PN junction Diodes Bipolar transistors (NPN, PNP) Field efect transistors (JFET, MOSFET) Thyristors Optoelectronic devices

	Application of electronic components and circuits
Learning Outcomes	Knowledge and application of mathematical apparatus required for electronic circuit analysis. Knowledge and application of the laws of circuit theory. Is able to calculate the circuit parameters using mathematical knowledge, laws and analysis methods of circuit theory. Understanding of electronic circuits and knowledge how to draw electronic circuits. According to circuit parameters is able to choose circuit elements. Ability to use laboratory equipment. Ability to monitor and evaluate the electrical phenomena in the circuits. Theoretical knowledge effectively applied in practice, for selection circuit elements and calculation parameters of circuits. Knowledge about passive circuits elements, semiconductors and PN junction and abilities to use them in practice Knowledge about semiconductor diodes, bipolar and field efect transistors and their parameters and abilities to use them in practice. Knowledge about optoelectronic devices
Literature	Štaras S. Semiconductor electronic devices : study book. Vilnius: Technika, 2010. Brindley K. Starting electronics. Oxford ; Waltham, MA : Elsevier/Newnes, 2011. (*electronic book)* Wilson, P. The circuit designer's companion. Oxford : Newnes, 2011. (*electronic book)* Kwok K. Complete guide to semiconductor devices. IEEE Press, 2002. AspenCore, Inc. Internet source https://www.electronics-tutorials.ws/