



## RTU Course "Construction of Machines and Mechanisms"

15325 Teorēt.mehānikas un materiālu pretestības katedra

### General data

Code	MTH306
Course title	Construction of Machines and Mechanisms
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Mechanics, Mechanical Engineering, Machine Building
Responsible instructor	Januševskis Aleksandrs
Academic staff	Beresņevičs Vitālijs Meļņikovs Anatolijs Cēders Egils
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Maximum auditorium capacity	24
Maximum number of students per semester	50
Abstract	Analysis and synthesis of mechanisms. Dynamics, models of dynamic calculation of machines and mechanisms. Principles of projection, planing and desing documentation, technology of assembling. Standartization in machine building. Exploitation reliability, life.
Goals and objectives of the course in terms of competences and skills	The student must know the basics of machines and mechanisms, its classification and components, types of actuators, machine tools (benches), materials of mechanical engineering, tolerances, as well as other problems concerning technical field.
Structure and tasks of independent studies	Student answers on the assessment test questions and the quality of individual report (essay).
Recommended literature	1. Marks' Standard Handbook for Mechanical Engineering. 1999. 2. Mechanical Engineering Handbook. Ed. Frank Kreith. Boca Raton: CRC Press LLC, 1999. - 2466. 3. I.Artoļevskis. Mehānismu un mašīnu teorija. Rīga, 1954. 4. П.Г.Гузенков. Детали машин. М. 1982. -352. 5. V.Dirba, J. Uiska, V.Zars. Hidraulika un hidrauliskās mašīnas. Rīga.1980. -456. 6. Вибрационные машины в строительстве и производстве строительных материалов. Справочник. Под ред. В.А.Баумана, И.И.Быховского, Б.Г.Гольдштейна. М. 1970. -547. 7. Е.В.Герц, Г.В.Крейнин. Расчет пневмоприводов. М.1975. -272.
Course prerequisites	Physics, mathematics

### Course outline

Theme	Hours
Structure of mechanisms and kinematics. Kinematic pairs and chains.	3
Classification and components of machines. Types of actuators (electric, hydro, pneumatics, combustion engines). Energy	3
Machine elements. Types of fasteners (wedges, dowels, bolts, rivets, weldments)	3
Transmitting devices (friction drives, gears, worm gears, belts, chains etc.)	3
Shafts, axes, rolling and sliding bearings, clutches, springs	3
Lifting machinery and transferring equipment (cables, welded and leaf chains, pulley blocks, retaining devices, brakes	3
Reciprocators (combustion engines, piston pumps, hydraulic machines)	3
Rotary machines (turbines, pumps)	3
Metal cutting machines, its mechanisms and motions. Lathes and drills.	3
Milling, grinding, hewing, drawing and planing machines.	3
Vibromachines. Robotics, significance of microprocessors.	3
Machine calculation types (Kinematics, dynamics, statics etc.). CAD software.	3
Materials (steel, iron, nonferrous metal, plastics, polymers, composites etc.) of mechanical engineering	3
Interchanging, surface roughness, tolerances and parts fittings.	3
Metal-working, woodworking and cutting tools.	3
Manufacturability of machine parts.	3

### Learning outcomes and assessment

Learning outcomes	Assessment methods
The student must know the basics of machines and mechanisms, their classification and components, types of actuators, machine tools (benches), materials of mechanical engineering, tolerances, as well as other problems concerning technical field.	Student's answers to the assessment test questions and the quality of individual report (essay).

The student must be familiar with the main problems of mechanical engineering, basics of construction of machines and mechanisms.

Student's answers to the exam questions. Regularity of attendance of the lectures and practical works, quality of the individual report, as well as participation in students' scientific conference are considered additionally.

***Study subject structure***

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	4.5	2.0	1.0	0.0		*	