Theory of mechanisms and manipulators MMM031323

Mechanics and Machine Construction I degree, 2017/18 summer semester

Project	Subject	h
1	Introduction to modeling mechanisms in the SAM program (Simulation and Analysis of Mechanisms) – examples of simulation.	2
2	Structure of mechanisms: principles of schematization, structural analysis, classification of kinematic pairs, determination of mobility (quiz, project).	2
3	Modeling in SAM, independent creation of simple models, simulation of motion, presentation of results.	2
4	Modeling of mechanisms with dimensions, definition of drives, masses, loads.	2
5	Kinematic analysis - new position determination (SAM project).	2
6	Kinematic analysis - determination of velocity and acceleration - vector methods (quiz, project).	2
7	Kinematic analysis - determination of velocity and acceleration in the SAM program (SAM project).	2
8	Kinematic analysis with analytical methods: contour equations, vectors, projections, derivatives (project).	2
9	Planar manipulators - matrix description of kinematics (project).	2
10	Modeling of manipulators in the SAM program: direct and inverse task (project).	2
11	Determination of reaction forces and balancing parameters (quiz, project).	2
12	Determination of reaction forces while taking friction into account (quiz, project).	2
13	Analysis of planetary gear mechanisms, determination of gear ratios (quiz, project).	2
14	Modeling of planetary gears and lever-gear mechanisms in the SAM program (SAM project).	2
15	Assessment and supplementation.	2

The condition for passing the course is obtaining a positive grade from:

- *All projects,*
- *All quizzes.*

Making up the arrear is possible only on consultations or a final project.
The deadline for completing the course is on the last classes.

BASIC LITERATURE

- *Gronowicz A.: Podstawy analizy układów kinematycznych. Oficyna Wydawnicza PWr., Wrocław 2003;*
- *Morecki A., Knapczyk J., Kędzior K.: Teoria mechanizmów i manipulatorów. WNT 2002;*
- *Miller S.: Teoria maszyn i mechanizmów. Analiza układów mechanicznych. Oficyna Wydawnicza PWr. Wrocław 1996;*
- *Gronowicz A. i inni: Teoria maszyn i mechanizmów. Zestaw problemów analizy i projektowania. Oficyna Wydawnicza PWr. Wrocław 2002*

SUPPLEMENTARY LITERATURE

- *Olędzki A.: Podstawy teorii maszyn i mechanizmów. WNT 1987;*
- *Morecki A., Oderfeld J.: Teoria maszyn i mechanizmów. PWN 1987;*
- *Waldron K., Kinzel G.: Kinematics, Dynamics and Design of Machinery. John Wiley & Sons, Inc. 1999*