**LECTURE COURSE DESCRIPTION**

During the lectures, methods of solving the problems of modelling dynamics of materials, vehicles and their elements are examined. Different software packages are offered to solve these tasks: AutoCad software package is used to model the interaction of solid bodies; MathCad package – for solving elementary dynamics problems; Universal Mechanism (UM) software package – for solving more complex mechanical problems of vehicles; MSC.Marc package – for solving contact strength of materials problems. The series of lectures is intended to acquire engineering decision-making knowledge and abilities to solve the problems of mechanical systems using alternative software packages. To solve these tasks, a certain chain of specialized programs is used, each of which performs a certain function. The packages discussed in this series of lectures are simpler and cheaper compared to the largest manufacturers (SolidWorks, SolidEdge , Catia , AutoCad ) Inventor, etc.) CAD/CAM/CAE software packages. The lecture cycle consists of a theoretical part (10 h) and an explanation of practical tasks (10 h). Classes are held in English.

**SCHEDULE OF LECTURES**

**Subject "CAD – Computer Aided Engineering"**

Prof. Aleksander Sladkowski, Silesian University of Technology (Poland)

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| **Subjects of classes** | **Date** | **Premises** | **Time** | **Notes** |
| 1. Numerical methods for solving mathematical physics problems and their use in vehicle modelling. Analysis of numerical simulation results. | 28 Nov, 2022 | TR-I I-310 (T) | 14.30-16.05 |  |
| TR-I I-305 (P) | 16.20-17.55 |  |
| 1. Modelling the interaction of object contacting surfaces. Static tasks. Examples of detail calculation using the BEM method. | 29 Nov, 2022 | TR-I I-312 (T) | 14.30-16.05 |  |
| TR-I I-201 (P) | 16.20-17.55 |  |
| 1. Application of the Universal Mechanism (UM) software package to solve problems of transport engineering. Examples of using the UM user interface " Simulation " of the software package . | 30 Nov, 2022 | TR-I I-310 (T) | 14.30-16.05 |  |
| TR-I I-305 (P) | 16.20-17.55 |  |
| 1. Application of the finite element method (FEM) for the calculation of the strength of parts (aggregates) of transport machines. Examples of stress calculation for an active load object. | 1 Dec, 2022 | TR-I I-310 (T) | 14.30-16.05 |  |
| TR-I I-305 (P) | 16.20-17.55 |  |
| 1. A graphical user interface package for the MCM.MARC software package. Geometric modelling. Interaction with external graphical modelling tools. Summary. Final settlement . | 2 Dec, 2022 | TR-I I-310 (T) | 14.30-16.05 |  |
| TR-I I-201 (P) | 16.20-17.55 |  |
|  |  |  | **Total : 20 h** | |

Department of Mobile Machinery and Railway Transport

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