Modelling of mechanical systems 101 Field of study Profile of study (general academic, practical) (brak) Mechanical Engineering Subject offered in: Polish Elective path/specialty - Cycle of study: Form of study (full-time, part-time) Second-cycle studies full-time No. of hours Lecture: Lecture: 1 Classes: 2 Laboratory: - Project/seminars: - Status of the course in the study program (Basic, major, other) (university-wide, from another field) (brak) (brak) Education areas and fields of science and art tecchnical sciences Technical sciences Technical sciences Technical sciences rinz. Maciej Obst email: janusz.mielniczuk @put.poznan.pl dr inż. Maciej Obst tel. 61 665 2035 Working Machines and Transportation University wide, for subject / university of machines and Transportation ul. Piotrowo 3, 60-965 Poznań Ul. Piotrowo 3, 60-965 Poznań Ul. Piotrowo 3, 60-965 Poznań 1 Knowledge Basic knowledge of mathematics, materials science, mechanics, ba theory of machines and strength of materials acquired during the fire </th <th>obligatory No. of credits 2 k) ECTS distribution (number and %) 2 100% 2 100% 2 100% lecturer: pl ortation</th>	obligatory No. of credits 2 k) ECTS distribution (number and %) 2 100% 2 100% 2 100% lecturer: pl ortation	
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Assumptions and objectives of the sources	sks has autonomy to solve	
Assumptions and objectives of the course.		
-Learning a new mathematical apparatus necessary in the process of modeling materials and mac the basics of physical and mathematical modeling of construction materials, machinery and equip processes.		
Study outcomes and reference to the educational results for a fi	eld of study	
Knowledge:		
1. Has a basic knowledge of the mechanics of solids and discrete systems with many degrees of freedom - [K2A_W02]		
2. Mathematical modeling of physical and mechanical systems based on the principle of d - [K2A_	W02]	
Skills:		
 He can use the assimilated knowledge of the mechanics of materials of construction for the sim systems, mechanisms and machines [K2A_U05] 	ulation of mechanical	
 Is able to assess potential negative impacts for the natural environment and humans, originating machine or a vehicle from the selected equipment group [K2A_U14] 	g from the designed	
Social competencies:		
1. Understands the need for lifelong learning; is able to inspire and organize the learning process 2. Is aware of and understands the importance and impact of non-technical aspects of mechanica		
its impact on the environment, is aware of responsibility for decisions - [K2A_K02] 3. Is aware of social role of mechanical engineer, understands the need for and is able to deliver of	pinions and knowledge in	
the field of machine design, particularly through the media - [K2A_K06]		
Assessment methods of study outcomes		

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-Written test, written tests on exercises.

Course description

-Notes on modeling - a goal of modeling entities. The modeling process - stages of modeling scheme. Physical modeling? simplifying assumptions, the physical parameters, examples of physical models. Mathematical modeling? basics model, the size of tensor, coordinate systems, principles for the formulation of constitutive relationships, formulate and solve the equations of motion of mechanical systems. Mathematical models of construction materials? one-parameter models, complex models, some models nonclassical. Mechanical systems one and two-parameter? equations of motion, vibration, undamped and damped, resonance, self-excited oscillations, vibrations of beams and shafts. Mathematical models of selected processes? thermal systems, hydrodynamic systems. The parallels between the worlds of physical.

Basic bibliography:

1. M. Feld: Technologia budowy maszyn, PWN, Warszawa, 2002.

2. M. Feld: Podstawy projektowania procesów technologicznych typowych części maszyn, WNT, Warszawa, 2000.

3. R. Wołk: Normowanie czasu pracy na obrabiarkach skrawających do metali, WNT, Warszawa, 1972.

4. Ostrowska-Maciejewska; Podstawy mechaniki ośrodków ciągłych, PWN, Warszawa 1982

5. W. Flügge; Tensor analysis and continuum mechanics, Springer-Verlag, Berlin 1972

6. R. H. Cannon jr.; Dynamika układów fizycznych, WNT, Warszawa 1973

Additional bibliography:

1. M. Feld: Uchwyty obróbkowe, WNT, Warszawa, 2002.

2. K. Pastwa, K. Wieczorowski: Materiały pomocnicze do projektowania uchwytów i przyrządów, Wyd. Politechniki Poznańskiej, Poznań, 1977, skrypt nr 721.

3. Poradnik inżyniera. Obróbka skrawaniem ? tom II i III, WNT, Warszawa, 1993 i 1994.

4. Z. Parszewski; Drgania i dynamika maszyn, WNT, Warszawa 1982

5. R. Scanlan, R. Rosenbaum; Drgania i flatter samolotów, PWN, Warszawa 1964

6. W. Tarnowski; Modelowanie systemów, Wyd. Politechniki Koszalińskiej, Koszalin 2004

Result of average student's workload

Activity		Time (working hours)
1. Participation in the lecture		15
2. Consultations		2
3. Preparation for the test		4
4. Exam		2
5. Participation in exercises		30
6. Consultations		2
7. Preparation for the test		4
8. Test		2
Student's workload		
Source of workload	hours	ECTS

Total workload

Contact hours

Practical activities