Faculty of Mechanical Engineering

SUBJECT CARD

Name in Polish: **Synteza układów mechanicznych**
Name in English: **SYNTHESIS OF MECHANICAL SYSTEMS**
Main field of study (if applicable): **Mechanical Engineering and Machine Building**
Specialization (if applicable): **Machine Design and Operation**
Level and form of studies: **II level, full-time**
Kind of subject: **obligatory**
Subject code: **MMM041106**
Group of courses: **no**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15			15	
Number of hours of total student workload (CNPS)	60			30	
Form of crediting	Examination			Crediting with grade	
Group of courses					
Number of ECTS points	2			1	
including number of ECTS points for practical (P) classes				1	
including number of ECTS points for direct teacher-student contact (BK) classes	1.2				

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge in mathematical analysis and classical mechanics.
2. Knowledge of fundamental the theory of mechanisms and machines.

SUBJECT OBJECTIVES

C1. Acquisition of knowledge allowed to choice of the optimal kinematic scheme of a mechanism - designed to fulfill the specified requirements.
C2. Skill in geometrical synthesis ofchosen linkages and cam mechanisms.

SUBJECT EDUCATIONAL EFFECTS

I. Relating to knowledge:

PEK_W01 - Knowledge of forms of mechanisms' structure notation.
PEK_W02 - Knowledge of fundamental methods of type synthesis of kinematic systems.
PEK_W03 - Knowledge of fundamental methods of gepmetrical synthesis of kinematic systems.

II. Relating to skills:

PEK_U01 - Student is able to create set of mechanism schemes.
PEK_U02 - Student is able to carry out geometrical synthesis of linkage mechanism.
PEK_U03 - Student is able to design cam mechanisms and planetary gears.

III. Relating to social competences:

PEK_K01 - Purchasing care about the aesthetics of the work, including projects and reports.

PROGRAMME CONTENT

Form of classes – Lecture		Number of hours
Lec1	Forms of mechanisms' structure notation.	2
Lec2	Methods of type synthesis, set of possible solutions creation.	2
Lec3	Criteria and selection of optimal structure solution.	2
Lec4	Criteria and selection of optimal structure solution.	2
Lec5	Methods of dimensional synthesis of linkages mechanisms.	3
Lec6	Methods of dimensional synthesis of adjustable mechanisms.	2
Lec7	Synthesis of mechanisms with higher pairs.	2
		Total hours: 15
Form of classes – Project		Number of hours
Proj1	Analysis of topology of kinematics systems. Rattionality of mechanism topology (test and project).	2
Proj2	Methods of notation of topology (test and project).	2
Proj3	Type synthesis. Making of possible sets of the solutions (test).	2
Proj4	Type synthesis cont. Selection for optimal solution (project).	2
Proj5	Dimensional synthesis of linkages mechanisms (test and project).	3
Proj6	Synthesis of mechanisms with higher pairs.	2
Proj7	Synthesis of planetary gears (project).	2
		Total hours: 15

TEACHING TOOLS USED

N1. problem lecture
N2. traditional lecture with the use of transparencies and slides
N3. problem exercises
N4. project presentation

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT (Lecture)

Evaluation (F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_W01, PEK_W01, PEK_W01	exam
P = ocena z egzaminu		

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT (Project)

Evaluation (F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_U01 - PEK_U03	tests, project discussion
P = średnia ocen z kartkówek i projektów		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE

SECONDARY LITERATURE

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
SYNTHESIS OF MECHANICAL SYSTEMS
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
Mechanical Engineering and Machine Building

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)	Subject objectives	Programme content	Teaching tool number

PEK_W01 - PEK_W03	K2MBM_KE_W04	C1-C2	L1-L7	N1-N2
PEK_U01- PEK_U03	K2MBM_KE_U04	C1-C2	Pr1-Pr7	N3-N4
PEK_K01	K2MBM_K03	C1-C2	L1-Wy7, L1-Pr7	N1-N4

SUBJECT SUPERVISOR

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