STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Mechanics and Mechatronics		**1010321221010214775**
Field of study: **Electrical Engineering**	Profile of study (general academic, practical): **(brak)**	Year /Semester: **1 / 2**
Elective path/specialty: **-**	Subject offered in: **polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time): **full-time**	
No. of hours: Lecture: **1** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits: **1**
Status of the course in the study program (Basic, major, other): **(brak)**	(university-wide, from another field): **(brak)**	
Education areas and fields of science and art: **technical sciences** **Technical sciences**		ECTS distribution (number and %): **1 100%** **1 100%**

Responsible for subject / lecturer:

prof. Bogdan Maruszewski
email: bogdan.maruszewski@put.poznan.pl
tel. 2719
of Mechanical Engineering and Management
ul. Piotrowo 3, PL-60-965 Poznan, Poland

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of physics and mathematics on high school level.
2	**Skills**	Ability of solving elementary mathematical and physical problems basing on indicated sources.
3	**Social competencies**	Understanding necessity of self development. Ability of working within a group.

Assumptions and objectives of the course:

-Basic knowledge about mechanics.

-Description of equilibrium and motion of complex mechanical systems.

-Design of complex material systems.

-Working within groups.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. K_W03 Knowledge on: classical mechanics, electricity, thermodynamics, solid state physics, optics, nuclear physics, general relativity. - [T1A_W01]

2. K_W12 Determination of forces, moments and sresses in simple mechanical systems, equations of motion and elementary knowledge on mechatronics. - [T1A_W02, T1A_W05, T1A_W06]

Skills:

1. K_U05 Ability to use printed and electronic references, compile received information with their interpretation, draw suitable conclusions. - [T1A_U01]

2. K_U08 Preparation of short presentation on an electical problem. - [T1A_U03, T1A_U04]

3. K_U22 Ability to assess fundamental methods and tools to solve simple engineering electrical problems. - [T1A_u15]

Social competencies:

1. K_K02 Consousness on importance of various aspects results comin from electrical engineer activity and its influence on environment; responsibility on drown decisions. - [T1A_K02]

Assessment methods of study outcomes

-W03 lecture test 3 50.1%-70.0%
4 70.1%-90.0%
5 from 90.1%

Course description

- 1. Statics

- statics principles
- equilibrium equations of the convergent planar force system
- moment, couple
- reduction of an arbitrary planar force system
- spatial convergent and paralell force system
- reduction of an arbitrary spatial force system
- equilibrium equations of the arbitrary spatial force system
- trusses

-2. Kinematics

- kinematics of material point
- velocity, acceleration
- tangent and normal accelerations
- translational motion of a rigid body
- rotational motion of a rigid body
- planar motion of a rigid body
- spherical motion of a rigid body
- arbitrary motion of a rigid body
- complex motion of a material point

-3. Dynamics

- Newton's principles
- d'Alembert's law
- momentum, moment of momentum
- dynamical equations of motion with integration
- free, damped and forced vibrations of a material point
- mass geometry: mass center, moments of inertia
- work,energu, power, elements of field theory
- mathematical and physical pendulums
- dynamical reactions

Basic bibliography:

1. Mechanika ogólna, tom I i II, J. Leyko, PWN, Warszawa, 1996
2. Mechanika techniczna, tom I i II, J. Misiak, WNT, Warszawa, 1996
3. Engineering Mechanics, D.J. McGill, PWS Publishers, Boston, 1985
4. Analytical Mechanics for Engineers, F.B. Seely, N.E. Ensign P.G. Jones, Wiley, New York, 1958

Additional bibliography:

1. Zadania z mechaniki ogólnej tom I i II, J. Misiak, WNT, Warszawa, 2009
2. Metodyka rozwiązywania zadań z mechaniki, J. Nizioł, WNT, Warszawa, 2007
3. Zbiór zadań z mechaniki ogólnej, M. T. Niezgodzińscy, Wydawnictwo Naukowe PWN, Warszawa, 2009

Result of average student's workload

Activity	Time (working hours)
1. attending lectures	15

Student’s workload

Source of workload	hours	ECTS
Total workload	15	1
Contact hours	0	0
Practical activities	0	0