STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Basics of Machine Design**		Code **1010601131010640394**
Field of study **Aerospace Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 3**
Elective path/specialty **Aircraft Transport**	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: **2** Classes: **1** Laboratory: **-** Project/seminars: **1**		No. of credits **4**
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 %) **4 100%** **4 100%**

Responsible for subject / lecturer:

Assoc. Prof. Eng. Ireneusz Malujda
email: Ireneusz.Malujda@put.poznan.pl
tel. 61 665 2244
Faculty of Transport Engineering
Piotrowo 3 street, 60-965 Poznań

Responsible for subject / lecturer:

MSc Eng. Dominik Wojtkowiak
email: dominik.wojtkowiak@put.poznan.pl
tel. 61-665-2053
Faculty of Transport Engineering
Piotrowo 3 street, 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	knowledge of physics (statics, kinematics and dynamics), mathematics, after completing the program of study
2	**Skills**	problem-solving skills of the basics of machine design based on their knowledge, ability to obtain the information from identified sources
3	**Social competencies**	understanding of the need to broaden their competence, willingness to work together as a team

Assumptions and objectives of the course:

1. Provide students with knowledge of the basics of machine design
2. Develop students' skills:
- calculation and design of components and assemblies of machines,
- making and reading the technical documentation on the basis of the knowledge from the subject of Engineering Drawing
- practical use of the knowledge gained from the course: Mechanics,Strength of materials, Theory of machines, Materials.
3. Development of students' teamwork skills.

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

Knowledge:

1. Has ordered, theoretically founded knowledge in the field of engineering graphics and machine construction: technical drawing, projection of objects, basic principles of engineering graphics, the use of graphic computer programs CAD (Computer Aided Design) in the construction of machines - [K1A_W07]

Skills:

1. Is able to create a circuit diagram, select elements and perform basic calculations of the electrical and electronic system of sets of aircraft machines or devices - [K1A_U06]
2. Is able to organize and substantively manage the design and operation of a simple on-board device, machine or technical flying facility from the group covered by the selected specialty - [K1A_U15]
3. Is able to analyze objects and technical solutions, is able to search in catalogs and on manufacturers' websites ready components of machines and devices, including means and transport and storage devices, assess their suitability for use in their own technical and organizational projects - [K1A_U09]

Social competencies:

1. Understands the need to learn throughout life; can inspire and organize the learning process of other people - [K1A_K01]
2. Is able to properly define the priorities for the implementation of a task set by himself or others - [K1A_K04]

Assessment methods of study outcomes

Forming assessment:

a) in a scope of the project: assessment of current progress of the project

b) in a scope of lectures: assessment of the answers for the questions concerning the knowledge which was presented during previous lectures

c) in a scope of classes: solving tasks by a blackboard

Summarizing assessment:

a) in a scope of project: assessment of the course of work on the project and the final result of the project

b) in a scope of lectures: written exam

c) in a scope of classes: written exam with tasks to solve.

Course description

The basic principles of the design process, elements of the mechanism, the characteristics of workloads, defining loads and appropriate strenght conditions. Connections and their calculation: soldered, welded, glued, riveted joints, fasteners: T-slot nuts, bolt, screw connections. Screw mechanisms: examples and applications, structural calculations. Susceptible elements: springs, rubber components susceptible. Axes, shafts and their bearings. Clutches and brakes. Gearboxes in drive systems.

Basic bibliography:

1. Praca zbiorowa pod red. Z. Osińskiego, Podstawy konstrukcji maszyn, PWN, W-wa, 1999
2. Praca zbiorowa pod red. M. Dietricha: Podstawy konstrukcji maszyn. Tom 3, WNT, Wa-wa, 1999
3. Osiński Zbigniew, Sprzęgła, PWN, Warszawa 1998
4. Dziama A., Michniewicz M., Niedźwiedzki A.: Przekładnie zębate. PWN, Wa-wa, 1989.
5. Ochęduszko K.: Koła zębate, WNT 1985.
6. Dudziak M.: Przekładnie cięgnowe. PWN, Warszawa, 1997.

Additional bibliography:

1. Niemann G., Maschinenelemente t. I, II, III, Springer ? Verlag Berlin, 1965
2. Müller L., Przekładnie obiegowe, PWN, Warszawa, 1983
3. Bahl G., Beitz W., Nauka konstruowania, WNT, Warszawa 1984

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Consultations regarding lectures	2
3. Preparation to pass the exam	4
4. Participation in the exam	2
5. Preparation to exercises	4
6. Participation in exercise classes	15
7. Consultations regarding exercise classes	2
8. Preparation to pass exercises	4
9. Participation in passing exercises	2
10. Preparation to the project classes	8
11. Participation in the project classes	15
12. Consultations about project classes	4
13. Preparing to pass the project	15
14. Passing the project	2

Student's workload

Source of workload	hours	ECTS
Total workload	109	4
Contact hours	74	3
Practical activities	44	2