

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Grafika inżynierska**
 Name in English: **Engineering Graphics**
 Main field of study (if applicable): **Electrical Engineering**
 Specialization (if applicable):
 Level and form of studies: **1st level, part-time**
 Kind of subject: **obligatory**
 Subject code: **GFR053161**
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	10		20		
Number of hours of total student workload (CNPS):	60		60		
Form of crediting:	crediting with grade		crediting with grade		
For group of courses mark (X) final course:					
Number of ECTS points:	2		2		
including number of ECTS points for practical (P) classes :			2		
including number of ECTS points for direct teacher-student contact (BK) classes:	1.40		1.40		

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of geometry or technical drawings
2. Skills to work with computer and Windows system

SUBJECT OBJECTIVES

- C1. Knowledge of methods of projection of geometric figures and solids and principles of computer engineering graphics notation in AutoCAD system.
 C2. Knowledge of principles of creating details and assembly drawings of electromechanical constructions.
 C3. Achievement of skills of sketching of elements by multi-view projection, including views, sections and creating drawings by AutoCAD system.
 C4. Achievement of skills creating and reading technical documentation including details and assembly drawings of electromechanical constructions.

SUBJECT LEARNING OUTCOMES*relating to knowledge:*

- PEU_W01 Student is able to determine multi-view projection in European system of geometric objects (figures and solids) by technical sketch and computer drawings in AutoCAD system.
 PEU_W02 Student is able to formulate of making details and assembly technical drawings as technical sketch and electronic file using AutoCAD.

relating to skills:

- PEU_U01 Student is capable of making technical drawings as sketches and electronic files using AutoCAD system.
 PEU_U02 Student is able to make and read details and assembly technical drawings including European system of multi-view projection, sections, dimensioning and standard elements in joints of mechanical constructions.

relating to social competences:

- PEU_K01 Obtaining skills of systematic study and work in team while doing laboratory tasks.

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	Introduction to the course, requirements. Engineering graphic notation, types of drawings, drawing sizes, lines, scales. Principles of computer engineering graphics notation - introduction to AutoCAD system. Methods of projection: axonometric and multi-view projection.	2
Lec 2	European system of multi-view projection. Projection of geometric objects (figures and solids). Sections of solids by planes. Sections of details using straight and complex sections.	2
Lec 3	Dimensioning: principles, symbols and size dimensions, detailed cases.	2
Lec 4	Tolerancing: tolerance of position and shape of elements. Types of mating.	1
Lec 5	Standard elements and joints in mechanical constructions. Technical documentation: detail and assembly drawings.	2
Lec 6	Written test	1
Total hours:		10

Form of classes - laboratory		Number of hours:
Lab 1	Course schedule and requirements. Instruction on a structure and usage of the AutoCAD system.	2
Lab 2	Precise drawing of sheet metal patterns of different geometrical shapes.	2
Lab 3	Multi-view projection of complex solids.	2
Lab 4	Multi-view projection of elements (details) - views and sections.	2
Lab 5	Isometric projection of elements on the base of given multi-view projection.	2
Lab 6	Sketching of working drawing of an individual part (element) - necessary multi-views and sections.	2
Lab 7	Working drawing of an element - views, sections and dimensioning in AutoCAD system.	2
Lab 8	Sketching of screw joints of elements in mechanical constructions: multi-views, sections, details specification and dimensioning.	2
Lab 9	Drawing of screw joints of elements in mechanical constructions in the AutoCAD system.	2
Lab 10	Supplementations and crediting	2
Total hours:		20

TEACHING TOOLS USED
N1. Multimedia and traditional presentation illustrated by numerous examples.
N2. Sketching on sheet of paper by pencil and computer aided technical drawing in AutoCAD system as electronic files.

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT		
Evaluation <i>F - forming (during semester) P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(W)	PEU_W01 PEU_W02	Written test
P(W)	P=F1	
F1(L)	PEU_U01 PEU_U02 PEU_K01	Evaluation of technical sketches
F2(L)	PEU_U01 PEU_U02 PEU_K01	Evaluation of drawings executed in AutoCAD system
P(L)	P=0.5F1+0.5F2	

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE:
[1] Suseł M., Makowski K. Grafika inżynierska z zastosowaniem programu AutoCAD, Oficyna Wydawnicza PWr, 2005.
[2] Suseł M., Komputerowa grafika inżynierska. Zbiór zadań. Oficyna Wydawnicza PWr, 1999.
[3] Dobrzański T., Rysunek techniczny maszynowy. WNT, Warszawa 2002.
[4] Rydzanicz I., Zapis konstrukcji - zadania. WNT, Warszawa, 1999.
[5] Textbook: AutoCAD 2002 LT., Pierwsze kroki, Autodesk, Inc., 2001
SECONDARY LITERATURE:
[1] Zbiór Polskich Norm, Rysunek techniczny maszynowy.
[2] Zbiór Polskich Norm, Rysunek elektryczny.
[3] www.cad.pl/kursy, http://students.autodesk.com

SUBJECT SUPERVISOR
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