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:	**ELR043161**
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):	108		108		
Form of crediting:	crediting with grade		crediting with grade		
For group of courses mark (X) final course:					
Number of ECTS points:	4		4		
including number of ECTS points for practical (P) classes :			4		
including number of ECTS points for direct teacher-student contact (BK) classes:	2.80		2.80		

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 solits 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 EDUCATIONAL EFFECTS

relating to knowledge:

PEK_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.

PEK_W02 Student is able to formulate of making details and assembly technical drawings as technical sketch and electronic file using AutoCAD.

relating to skills:

PEK_U01 Student is capable of making technical drawings as sketches and electronic files using AutoCAD system.

PEK_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:

PEK_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 EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation *F – forming (during semester)* *P – concluding (at semester end)*	**Educational effect number**	**Way of evaluating educational effect achievement**
F1(W)	PEK_W01 PEK_W02	Written test
P(W)	P=F1	
F1(L)	PEK_U01 PEK_U02 PEK_K01	Evaluation of technical sketches
F2(L)	PEK_U01 PEK_U02 PEK_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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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
ELR043161 - Engineering Graphics
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering**

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	K1ETK_W12	C.1	Lec1 Lec2 Lec3 Lec4	N.1
PEK_W02	K1ETK_W12	C.2	Lec5 Lec6	N.1
PEK_U01	K1ETK_U09	C.3	Lab1 Lab2 Lab3 Lab4	N.2
PEK_U02	K1ETK_U09	C.4	Lab5 Lab6 Lab7 Lab8 Lab9	N.2
PEK_K01	K1ETK_K05	C.1 C.2 C.3 C.4	Lab1 Lab2 Lab3 Lab4 Lab5 Lab6 Lab7 Lab8 Lab9 Lab10	N.1 N.2