

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

SUPERVISOR/TEAM/ DECLARING/CONDUCTING COURSE: Prof. Ryszard Kacprzyk
DEPARTMENT: Faculty of Electrical Engineering W5
SCIENTIFIC DISCIPLINE: Automation, Electronics and Electrical Engineering

COURSE CARD

Course name in Polish: Elektrostatyka stosowana
Course name in English: Applied Electrostatics
Course language: Polish/~~English~~
University-wide general course type*:
The course is intended for all PhD students: YES / NO

- ~~1) BASIC COURSE~~
- 2) SPECIALIST COURSE**
- ~~3) SEMINAR~~
- ~~4) HUMANISTIC COURSE~~
- ~~5) LANGUAGE~~

Subject code: AEQ100012W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30	-	-	-
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes
Number of ECTS points	0			

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Has knowledge of General Physics
2. Has knowledge of Materials Engineering Fundamentals
3. Knows basic concepts of Electrical Engineering, necessary for understanding of processes occurring in electrical fields.

COURSE OBJECTIVES

- C1 Acquisition of knowledge in the sphere of Electrostatics, necessary for understanding basic processes used in Electrostatic Modern Technologies, causing the specific Electrostatic Hazards, and in a sphere of the specific Electrostatic Measurements, necessary for their rational rating.
- C2 Acquisition of social competence associated mainly with cooperation in a student group, responsibility, honesty and proceeding reliability, obligatory in the academic environment.

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PROGRAM CONTENTS

Form of classes – lecture (Lec)		Number of hours
Lec1	Introduction: information on enter and credit requirements. Basic concepts in Electrostatics.	2
Lec2	Electrification processes in liquids and solids.	2
Lec3	Discharges in gases. ESD protection fundamentals.	2
Lec4	Basic concepts of ignition and explosion theories. ESD Hazards analysis with examples.	2
Lec5	Electrical charge dispersion. Grounding, antistatics and antistatization, neutralizers and neutralization.	2
Lec6	ESD protection in electronic industry	2
Lec7	Standards applied in ESD protection	2
Lec8	Electrostatic properties of materials and wares	2
Lec9	Electrostatic measurements and measuring devices. Interpretation of measurement results.	2
Lec10	Electro-filters (principle of operation, construction, properties and application)	2
Lec11	Electrostatic surface covering processes	2
Lec12	Electrostatic separators	2
Lec13	Electrets. Production, properties and application	2
Lec14	Electro-spinning (fundamentals, fibers properties, application)	2
Lec15	Other applications of Electrostatics	2
Total hours:		30

Form of classes – foreign language course (Lng)		Number of hours
Lng1		
Lng2		
Lng3		
..		
Total hours:		

Form of classes – seminar (Sem)		Number of hours
Sem1		
Sem2		
Sem3		
...		
Total hours:		

Form of classes – mixed forms (mix)		Number of hours
Mix1		
Mix2		
Mix3		
...		
Total hours:		

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TEACHING TOOLS USED

N1. Lectures with application of slides.
N2. Individual study
N3. Consultations

ACHIEVED SUBJECT LEARNING OUTCOMES

Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	P8S_WG	Exam
Skills	P8U_U	Exam
Social competence	P8U_K	Exam

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] A. D. Moore (Ed.), Electrostatics and its application, J. Wiley & Sons, New York, 1973.
[2] G. Luttigens, M. Glor, Understanding and Controlling Static Electricity, Springer Ver. Bubligen, 1989.
[3] J. F. Hughes, Electrostatic Particle Charging. J. Wiley, NY. 1997.
[4] A. G. Bailey, Electrostatic Spraying of Liquids, J. Wiley, NY. 1998.
[5] B. Hilczer, J. Małeckki, Elektry i piezopolimery, PWN, Warszawa, 1992.
[6] O. J. McAteer, Electrostatic Discharge Control, McGraw-Hill Publ. Comp. N.Y, 1989.
[7] J. M. Crowley, Fundamentals of Applied Electrostatics, J. Wiley & Sons, New York, 1986

SECONDARY LITERATURE:

- [1] G. M. Sessler (Ed.) Electrets, Springer Ver. Berlin, 1980/1989.
[2] J. Lutyński, Elektrostatyczne odpylanie gazów, WNT, Warszawa, 1965.
[3] J. Simoroda, J. Staroba, Elektryczność statyczna w przemyśle, WNT, Warszawa, 1965.
[4] W. Lindmanowski, Zarys teorii wyładowań w dielektrykach, WNT, Warszawa, 1988.
[5] A. Gajewski, Procesy i technologie Elektrostatyczne. PWN Warszawa-Kraków, 2000.
[6] Z. Flisowski. Technika Wysokich Napięć. WNT, Warszawa, 2005.

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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