Fire University of Warsaw, Poland
Faculty of Security Engineering and Civil Protection
Syllabus 2018 -

Introduction to electrical safety in the workplace

profile	general academics
degree	first degree
programme	ERASMUS
semester	1
part time / full time	full time
ECTS	5
coordinator	mł. bryg. dr inż. Szymon Ptak

form of the activity: exercise

hours	30
prerequisites	Basic knowledge of the physics of electrical and magnetic phenomena. Basic knowledge of mathematical analysis. Recommended knowledge on practical aspects of power engineering.
objectives	The aim of the course is to provide knowledge in the field of occupational health and safety related to electrical installations and devices. The student will gain knowledge about the basics of safety in the work environment connected with the use of electrical installations and devices, as well as intuition about the risks associated with the occurrence of individual hazards.
methods	Realization of 12 practical exercises in the laboratory. Discussion, observation, measurements, reports
own work	Preparation for short test at the beginning of classes. Preparation of final report after all 12 exercises. Preparation for two independent interim tests.
basic literature	Electrical fires and explosions / Vytenis Babrauskas, Ph.D. / New York / 2021 Guide to OSHA Fire Protection Regulations / Boston
supplementary literature	16th John P.Redmond Symposium on the Occupational Safety and Health of the Fire Service / Phoenix / 2001

contents	hours
Introduction. Basic measurements.	2
Single phase transformer.	2
Rectification. AC/DC conversion.	2
Eddy currents and magnetism.	2
Overcurrent procection.	2
Semiconductors.	2

1st interim test.	2
Electromagnetic field measurements in work environment.	2
Illuminance measurements in work environment and fire protection.	2
Non-linear resistors in work environment.	2
Basic industrial sensors.	2
Quality of electric energy.	2
Short-circuit and electric cables	2
PV systems.	2
2nd interim test.	2

form of the activity: exercise

hours	30
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objectives	The aim of the course is to provide knowledge in the field of occupational health and safety related to electrical installations and devices. The student will gain knowledge about the basics of safety in the work environment connected with the use of electrical installations and devices, as well as intuition about the risks associated with the occurrence of individual hazards.
methods	Lecture, discussion
own work	Literature review.
basic literature	Electrical fires and explosions / Vytenis Babrauskas, Ph.D. / New York / 2021 Guide to OSHA Fire Protection Regulations / Boston
supplementary literature	16th John P.Redmond Symposium on the Occupational Safety and Health of the Fire Service / Phoenix / 2001

contents	hours
Introduction to electric phenomena. Basics of electric field and magnetic field. Basic laws of power engineering and their consequences.	6
Electrical installation. Standard technical means of protection. Overcurrent. Overvoltage. Electric shock prevention.	6
AC systems. Quality of AC power requirements.	4
Basics of semiconductors. Basics of industrial sensors. Electric field. Capacity. Acceleration. MEMS. Resistance. Piezoelectric sensors. Piroelectric sensors. Hall's effect. Thermoelectric sensors. Characteristics of sensors. Catalytic sensors.	6
PV systems. Requirements and safety	2
Requirements of occupational health and safety regarding chosen electric installations and devices in workplace. Illuminance, electric field measurements. Magnetic field measurements.	6