EDUCATIONAL EFFECTS IN THE FIELD OF ENVIRONMENTAL ENGINEERING

Faculty: ENVIRONMENTAL ENGINEERING

Field of studies: ENVIRONMENTAL ENGINEERING (EE)

Level II

Educational effects at level II for EE field	DESCRIPTION OF THE EDUCATIONAL EFFECTS IN THE FIELD OF EE After completing II level EE studies, the graduate:	The reference to the educational effects in the area of education in engineering sciences
KNOWLEDGE		
K2IS_W01	possesses expanded and broadened knowledge on certain fields of mathematics including i.a. statistics, essential for the description and analysis of measurement data	T2A_W01
K2IS_W02	possesses detailed knowledge on the construction law, technologies and organisation of works and spatial management	T2A_W02
K2IS_W03	knows and understands the social, economic and environmental conditions of engineering activity	T2A_W08 T2A_W11
K2IS_W04	possesses the knowledge on the necessity to manage intellectual property resources	T2A_W09 T2A_W10
K2IS_W05	possesses expanded and broadened knowledge on automated process control in environmental engineering, useful to formulate and deal with tasks on automation in environmental engineering; possesses knowledge on controllers programming, computer monitor systems, SPC in environmental engineering (SuPervisor Control)	T2A_W03 T2A_W04 T2A_W07
K2IS_W06	possesses basic knowledge on the efficacy and methods of research as well as on assessing the reliability, safety and risk factors in the systems operation processes in environmental engineering	T2A_W02 T2A_W03 T2A_W06 T2A_W07
K2IS_W07	possesses expanded knowledge on key issues and ways of obtaining energy from alternative sources; is aware of the development trends concerning alternative energy sources, possesses basic knowledge on the lifecycle of devices and facilities connected with alternative energy sources	T2A_W03 T2A_W05 T2A_W06

K2IS_W08	possesses knowledge on the development trends and latest achievements in technologies and organisation of installation and construction works	T2A_W04 T2A_W07
K2IS_W09	achieves the effects in the category of KNOWLEDGE for one of the following specialisations: • Air Protection Engineering (APE) – **study in Polish,** • Air Conditioning, Heating and Sanitary Installations (CHS) – **study in Polish,** • Water Supply, Sewage Disposal and Waste Management (WSW) – **study in Polish,** • Environmental Quality Management (EQM) (appendix 1) – **study in English**	
SKILLS		
K2IS_U01	is able to describe collected statistic data, apply the methods of statistical inference in a reference to processes and phenomena in the field of environmental engineering	T2A_U07 T2A_U11
K2IS_U02	is able to use information and communication techniques, proper for developing control algorithms and programmable controllers (PLC) applied in environmental engineering field; uses analysis and simulation methods to solve a task; is able to rate the usefulness and the possibility to apply a device or a computer system in order to control the above processes	T2A_U07 T2A_U09 T2A_U12
K2IS_U03	knows how to prepare a bill of quantities and investment cost estimate	T2A_U08 T2A_U10 T2A_U13
K2IS_U04	understands foreign language texts concerning their field of studies e.g. business and technical document; is able to obtain necessary, foreign language information from different sources; possesses proper linguistic means to communicate effectively in professional environment	T2A_U01 T2A_U02 T2A_U03 T2A_U06
K2IS_U05	quite well comprehends the content and meaning of oral or written statement concerning every day and professional life issues; is able to write a short text on familiar topic, including non-literary text; is able to participate in conversations which concern familiar topics and, to a limited extent, state opinions about their work and studies, with the use of socio cultural knowledge	T2A_U01

K2IS_U06	achieves the effects in the category of SKILLS for one of the following specializations: • Air Protection Engineering – **study in Polish,** • Air Conditioning, Heating and Sanitary Installations – **study in Polish,** • Water Supply, Sewage Disposal and Waste Management – **study in Polish,** • Environmental Quality Management (EQM) (appendix 1) – **study in English**	
SOCIAL COMPETENCES		
K2IS_K01	is able to act and think in a creative and enterprising way, is able to set priorities in order to complete a given task	T2A_K04 T2A_K06 T2A_K07
K2IS_K02	is aware of the social effects of engineering activities and liability for the decisions made; understands the necessity to keep the society updated, regarding information and opinions concerning technological achievements and other activities performed by a technical university graduate; understands the role of mass media	T2A_K02 T2A_K05 T2A_K07
K2IS_K03	understands the necessity of a lifetime learning process	T2A_K01 T2A_K03

Appendix 1

EDUCATIONAL EFFECST FOR A SPECIALIZATION
Faculty: ENVIRONMENTAL ENGINEERING
Field of studies: ENVIRONMENTAL ENGINEERING (EE)
Level II
Specialization: ENVIRONMENTAL QUALITY MANAGEMENT (EQM)

Educational effects at level II for EQM specialization	**DESCRIPTION OF THE EDUCATIONAL EFFECTS FOR SPECIALIZATION After completing II level EE studies, within the specialization the graduate:**	**The reference to the educational effects in the area of education in engineering sciences**
KNOWLEGDE		
S2EQM_W01	possesses expanded and broadened knowledge on environmental chemistry	S2EQM_W01
S2EQM_W02	possesses systematic, supported by theory knowledge on assessing the quality of natural waters as well as on advanced, modern, high performance technologies of water and sewage treatment	S2EQM_W02
S2EQM_W03	possesses expanded and broadened knowledge on mineral and organic resources, their processing and use, considering the by-produced waste	S2EQM_W03
S2EQM_W04	possesses systematic, supported by theory knowledge on the advanced, modern technologies of waste management	S2EQM_W04
S2EQM_W05	possesses detailed, supported by theory knowledge on hazards, especially of microbiological origin, and characteristics of anthropogenic pollution	S2EQM_W05
S2EQM_W06	possesses systematic, supported by theory, detailed knowledge on the advanced, modern technologies of gas treatment	S2EQM_W06
S2EQM_W07	possesses supported by theory knowledge connected with selected issues on water supply and sewage systems	S2EQM_W07
S2EQM_W08	possesses basic knowledge on management, including quality management and running a business	S2EQM_W08
SKILLS		
S2EQM_U01	is able to obtain information from literature, data bases and other sources, on resources and waste management; is able to compile obtained information, interpret and critically evaluate is, draw conclusions, formulate and support opinions	T2A_U01 T2A_U02 T2A_U04

S2EQM_U02	with the use of standardised methods of analysis, is able to plan and conduct experiments, simple research activities on water and sewage treatment, as well as on waste management, with the consideration of biological aspects; is able to interpret the results and draw conclusions	T2A_U08 T2A_U09 T2A_U11 T2A_U13
S2EQM_U03	is able to apply information and communication techniques, essential to prepare compilations and projects	T2A_U07
S2EQM_U04	knows how to perform mass balances of processes and devices used for gas treatment, with the use of proper methods, techniques and instruments	T2A_U10 T2A_U12
S2EQM_U05	knows how to plan and conduct simple computer simulations on water supply and sewage systems, interpret the results and draw conclusions	T2A_U07 T2A_U08 T2A_U09
S2EQM_U06	is able to present and comment on the results of their master's thesis, reason about the ways of achieving the given results; is able to indicate alternative solutions to the issue analysed	T2A_U03 T2A_U05
S2EQM_U07	is able to compose a master's thesis in the field of environmental engineering: - is able to obtain information form Polish and foreign literature, data bases and other sources, compile, interpret and evaluate it - is able to use analytical, simulative and experimental methods to formulate and solve the problems - in capable of interdisciplinary compilation of knowledge, of adopting systematic approach considering also non-technological aspects - is able to assess the usefulness and possibilities of adopting modern technological achievements (techniques and technologies) in the presented discipline - is able to suggest procedures to upgrade/improve existing technological solutions - is able to interpret results of research, draw conclusions and formulate recommendations - is able to compose a master's thesis in accordance to the proper formal register	T2A_U01 T2A_U09 T2A_U14 T2A_U15 T2A_U16 T2A_U17 T2A_U18 T2A_U19