STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Clining-up of Ecological Disasters Effects	**1010702321010720064**

Field of study	Profile of study (general academic, practical)	Year /Semester
Technologie ochrony środowiska - stacjonarne	**(brak)**	**1 / 2**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Ecotechnology	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**full-time**

No. of hours	No. of credits
Lecture: **2** Classes: **1** Laboratory: **-** Project/seminars: **-**	**5**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**5 100%**
Technical sciences	**5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student has the general knowledge in the scope of ecology and science (basic program at the middle level).
2	**Skills**	Student is able to handle information acquired from handbooks, Internet and data bases.
3	**Social competencies**	Student has understanding of the problems of the protection of work and natural environment.

Assumptions and objectives of the course:

Effects, causes, courses and effects of ecological disasters, the elimination of their effects and problems of chemical safety and current ecological trends.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student expanded knowledge enabling to recognize and differentiate factors of danger for environment, particularly in the scope of natural and technological disasters. Student has extended knowledge enabling to assessment of the level of threat of environment and has detailed knowledge about development trends in the scope of protection and risks of environment of European area. - [K_W04]
2. Student knows general principles of neutralization compounds in natural environment. - [K_W05]
3. Student knows general principles of neutralization compounds in natural environment. - [K_W05]
4. Student has the knowledge of the threat of natural environment and ways of improvement of the safety. - [K_W10]
5. Student has the knowledge to understand consequences for health, society, economy and law resulting of neglecting of the protection of environment, particularly in the aspect of great failures and ecological disasters. - [K_W14]

Skills:

1. Student has the ability of verbal communication with experts in the area of environmental protection technology, environmental engineering and related domains. - [K_U02]
2. Student is able to outline the directions of further study and to realize the process of self education, renewing of wide interest and of self assessment of trends determining the condition of the environment. - [K_U03]
3. Student has ability of the planning and realization of technological tasks with the analysis of the influence on natural environment and the calculation of parameters guarantying the chemical safety. - [K_U07]
4. Student has ability necessary to work in natural environment; knows and obeys safety rules related to the work performed. - [K_U10]
5. Student has ability allowing to show course of action for neutralization and utilization of untypical industrial wastes and has an ability in the specification of threats and analysis of fundamental factors defining safety. - [K_U17]

Social competencies:

1. Student understands the necessity of permanent self-education and of professional competences. - [K_K01]
2. Student has ability and has awareness of aetics and moral problems in the context of professional activity in relation to student permanent attention to problem of threats in the working place and environment. - [K_K04]
3. Student is capable clearly formulate opinions related to professional issues and appreciate the importance of law aspects, procedures and regulations of the improvement of chemical safety. - [K_K06]
4. Student has awareness of social role of graduate of technical university, particularly in the scope of environmental education. - [K_K08]

Assessment methods of study outcomes

in the scope of classes: on the basis of assessment of progress of current tests.

in the scope of lectures: on the basis of discussion

in the course of current lectures.

in the scope of classes: on the basis of (1) the presentation of the subject suggested by teacher (2) the discussion following presentation (3) the trial.in the scope of lectures: on the basis of the credit in the form of choice test, each question is scored in the range of 0 ? 1.

Course description

Natural ecological disasters (earth takes, landslides, storms, floods, droughts, fires). Industrial ecological disasters with participation of chemicals (examples). Neutralization of aggressive chemicals. Incineration. Global chemical pollution according UNEP. Recent state and trends in natural environment in Europe in EEA assessment (energy, transport, GDS, ODS, resources, dangerous chemicals, air, rainfalls, water, soil, climate, agriculture, tourism, health).

Basic bibliography:

1. Chemical safety: international reference manual (edited by Mervyn Richardson); Weinheim; New York VCH 1994.
2. Safety assessment for chemical processes Jorg Steinbach, Weinheim; New York VCH 1999.
3. Program zapobiegania awariom i system zarządzania bezpieczeństwem Jerzy S. Michalik, Wojciech Domański

Additional bibliography:

1. Tworzenie się niebezpiecznych substancji chemicznych podczas poważnych awarii przemysłowych Jerzy S. Michalik, Agnieszka Gajek

Result of average student's workload

Activity	Time (working hours)
1. Presence in lectures	30
2. Presence of classes	15
3. Consultarions	15
4. Preparation hours for classes	15
5. Preparation hours for credit for classes and lectures	50

Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	75	3
Practical activities	50	2