COURSE DESCRIPTION CARD - SYLLABUS

Course name

Modelling the impact of crisis incidents

Course

Field of study

Safety Engineering

Area of study (specialization)

Security and Crisis Management

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

10

Laboratory classes

10

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Ph.D., Eng. Grzegorz Dahlke

Mail to: grzegorz.dahlke@put.poznan.pl

Phone: +48 616653379

Faculty of Engineering Management

ul. J. Rychlewskiego 2, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

The student should have the knowledge to classify security threats, which are characterized, among others, by the first degree of studies in the Security Threat Monitoring classes.

Course objective

The aim of this course is to teach methods and tools for analysing the effects of crisis events with a significant impact on critical infrastructure and large groups of people.

Course-related learning outcomes

Knowledge

1. has knowledge of the determination of fire, explosion, chemical and natural hazard zones [P7S_WG_07];

2. is familiar with formal models of calculating selected parameters of fire, explosion, chemical and natural hazards [P7S_WK_02];

3. knows computer programs and tools for simulation modeling of fire, explosion, chemical and natural hazards [P7S_WK_03].

Skills

1. is able to apply knowledge of the impact of fire, explosion, chemical and natural hazards to determine hazard maps and risk maps [P7S_UW_03];

2. is able to calculate the range of impact of fire, explosion, chemical and selected natural hazards using computer applications and tools [P7S_UW_04].

3. is able to collect data necessary for the application of methods and tools for determining fire, explosion, chemical and selected natural hazards [P7S_UO_01];

4. be able to review methods and tools for determining fire, explosion, chemical and selected natural hazards [P7S_UUO_01];

Social competences

1. is aware of the impact of the investment on the immediate and further environment through risk generation [P7S_KK_01]

2. is aware of the need to use formal models for threat analysis to support security management decisions [P7S_KK_02];

3. is aware that decisions made by people with low competence in threat analysis require detailed supervision and support by specialists [P7S_KK_03];

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:
Formal evaluation:

a) for laboratory classes: on the basis of two written colloquia and reports;

b) for lectures: on the basis of a colloquium in the last lecture class.

Summary evaluation:

a) in laboratory classes: on the basis of the arithmetic mean of grades from two written colloquia, where 5 tasks have to be solved in each of them; these tasks are scored on a scale from 0 to 1; a positive grade is given to the Student after solving 50% of the tasks; the condition of passing is a positive grade in the reports from all laboratory classes.

b) in the scope of lectures: assessment of the credit colloquium on a scale from 2 to 5.

Programme content

Formal models in internal fire analysis. Modelling the effects of chemical contamination in establishments with an increased or high risk of a major industrial accident. Formal modelling of evacuation conditions with special emphasis on mass events. Modelling of evacuation conditions in transport. Modelling of the effects of flood events. Modelling of the effects of critical infrastructure failures.

Teaching methods

Lecture supported by a multimedia presentation. During laboratory classes, students solve individually prepared problem tasks requiring work with a computer and specialized computer software. During part of the classes they carry out tasks using computer applications.

Bibliography

Basic

Dahlke G., Modelowanie skutków zdarzeń kryzysowych, Materiały niepublikowane (w trakcie przygotowania do druku)

Additional

Łukasik Z. Nowakowski W. Kuśmińska-Fijałkowska A., 2014, Zarządzanie bezpieczeństwem infrastruktury krytycznej, Logistyka, nr 14

H. Martin and L. Ludek, Conceptual design of the resilience evaluation system of critical infrastructure elements and networks in selected areas in Czech republic, 2012 IEEE Conference on Technologies for Homeland Security (HST), Waltham, MA, 2012, pp. 353-358

Yi-Ping Fang, 2015, Critical Infrastructure Protection by Advanced Modelling, Simulation and Optimizattion for Cascading Failure Mitigation and Resilience. Electric power. Ecole Centrale Paris

Jonkeren, O., Azzini, I., Galbusera, L. et al., 2015, Analysis of Critical Infrastructure Network Failure in the European Union: A Combined Systems Engineering and Economic Model. Netw Spat Econ 15, 253–270

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	20	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests, project preparation) [1]	55	2,0

[1] delete or add other activities as appropriate