Annex to the “visiting professors” programme

Proponent from WUT	
Title and degree	DSc PhD Eng
Name and surname	Agnieszka Dąbska
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The person proposed as a visiting professor	
Title and degree	Prof., Ing., CSc.
Name and surname	Jaromir Riha
Exact affiliation	Brno University of Technology, Faculty of Civil Engineering, Czech Republic
E-mail address	Jaromir.Riha@vutbr.cz
Description of achievements (1/2-1 page)	PUBLICATIONS: author or co-author of: - more than 70 professional and scientific papers in journals, 44 indexed in Scopus (h index = 12), 38 in WOS (h index = 10) - 26 monographs, textbooks and guidelines - more than 200 conference papers and contributions PROJECTS author or co-author of: - more than 150 research (basic and applied) reports - about 60 technical studies and designs EXPERT ASSESSMENTS author or co-author of: - more than 600 expert assessments - 51 forensic judgements MEMBERSHIPS - International Association for Hydro-Environment Engineering and Research (IAHR) - International Committee on Large Dams (ICOLD) - Czech Committee on Large Dams (ICOLD) FACULTY POSTS - member of scientific committee (since 2005) - member of curriculum committee (2004 - 2010) - member of faculty scientific board (2004 - 2008) - member of committee for Ph.D. (since 2002, in 2004-2014 chairperson) TEACHING (since 1987) - more than 60 diploma graduates in BSc and MSc degrees - supervisor of 12 finished PhD students

Code of the course	4606-VP-ES-00018	Name of the course	Polish	**Analiza ryzyka obiektów inżynierskich**
			English	**Risk analysis of engineering structures**
Type of the course	Speciality subject			
Course coordinator	Prof. Jaromir Riha	Course teacher	Prof. Jaromir Riha	
Implementing unit	Faculty of Building Services, Hydro and Environmental Engineering	Scientific discipline / disciplines*	Architecture and urban planning Civil engineering and transport Environmental engineering, mining and energy	
Level of education	Doctoral School	Semester	Summer (online) 27-30.V.2025 and 3-6.VI.2025	
Language of the course	English			
Type of assessment	Pass or Fail	Number of hours in a semester	30	ECTS credits: 2
Minimum number of participants	12	Maximum number of participants	100	Available for students (BSc, MSc): Yes

Type of classes		Lecture	Auditory classes	Project classes	Laboratory	Seminar
Number of hours	in a week	-	-	-	-	-
	in a semester	30	-	-	-	-

* does not apply to the Researcher's Workshop

1. Prerequisites

1. Knowledge:
- in mathematics, statistics
- basic knowledge in water management and urban planning.
2. Skills:
- good command of English in speaking and understanding,
- use of computers.

2. Course objectives

1. Provide the students with knowledge of the definition of safety, reliability, risk and other related terms such as hazard, consequences, exposure, etc.
2. Understand the basics of risk analysis in engineering and engineering structures.
3. Adopt critical steps in various risk analysis techniques of engineering structures and flood protection of urbanised areas.
4. Understand the risk based approaches according to DIRECTIVE 2007/60/EC on the assessment and management of flood risks (Floods directive).
5. Develop skills to make the risk based safety assessment of engineering structures.

3. Course content (separate for each type of classes)

Lecture

1. Introduction, definitions, safety of hydraulic structures – a brief introduction to traditional methods.
2. Shortage of traditional methods, motivation to the more sophisticated approaches.
3. Definition of risk, various approaches to the risk analysis.
4. Qualitative risk analysis, elements, examples.
5. Semi-quantitative risk analysis, examples.

6. Quantitative risk analysis, material losses.
7. Risk analysis related to losses of human lives.
8. Risk based cost benefit analysis.
9. Risk analysis in flood protection, DIRECTIVE 2007/60/EC on the assessment and management of flood risks (Floods directive).
10. Demonstration of individual methods, practical examples.

Laboratory
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4. Learning outcomes

Type of learning outcomes	Learning outcomes description	Reference to the learning outcomes of the WUT DS	Learning outcomes verification methods*
Knowledge			
K01	Acquisition of knowledge about the safety assessment of civil structures, namely hydraulic structures.	SD_W1, SD_W2, SD_W3	Active participation during classes
K02	Acquisition of knowledge about the risk based approaches.	SD_W1, SD_W2, SD_W3	Active participation during classes
K03	Acquisition of knowledge about the application of risk analysis in water management.	SD_W1, SD_W2, SD_W3	Active participation during classes
Skills			
S01	Ability of formulating safety criteria for civil structures.	SD_U1, SD_U2, SD_U3, SD_U4	Active participation during classes
S02	Ability of application risk based methods in flood protection and on hydraulic structures.	SD_U1, SD_U2, SD_U3, SD_U4	Active participation during classes
Social competences			
SC01	Ability to work in a team and international collaboration. Ready to think and act in a creative and entrepreneurial way to identify the risk factors and assess the risk analysis.	SD_K2, SD_K4	Active participation during classes

*Allowed learning outcomes verification methods: exam; oral exam; oral test; project evaluation; report evaluation; presentation evaluation; active participation during classes; homework; tests

5. Assessment criteria

Grading (pass or not) based upon presence on the classes and oral examination (interview).

6. Literature

Primary references:

[1] Dráb, A. - Říha, J. An approach to the implementation of European Directive 2007/60/EC on flood risk management in the Czech Republic. Nat. Hazards Earth Syst. Sci., 10, 1977–1987, 2010.

[2] BULLETIN 130. 2005. Risk Assessment in Dam Safety Management, A reconnai-sance of benefits, methods and current applications, ICOLD 2005.

[3] BROWN, AJ. - GOSDEN, JD. 2002. Interim guide to quantitative risk assessment for UK reservoirs. Thomas Telford, London.

[4] FELL, R. - BOWLES, DS. - ANDERSON, LR. - BELL, G. 2000. The Status of Es-timation of the Probability of Failure of Dams for Use in Quantitative Risk Assessment. In Proceedings of the 20th International Commission on Large Dams (ICOLD) Congress, Beijing, China.

[5] DIRECTIVE 2007/60/EC on the assessment and management of flood risks (Floods directive)

Secondary references:

[1] Risk Management for Dam Safety. https://damtoolbox.org/wiki/Risk_Management_for_Dam_Safety

[2] Federal Guidelines for Dam Safety Risk Management. https://www.ferc.gov/sites/default/files/2020-04/draft-guidelines.pdf.

7. PhD student's workload necessary to achieve the learning outcomes**		
No.	Description	Number of hours
1	Hours of scheduled instruction given by the academic teacher in the classroom	30
2	Hours of consultations with the academic teacher, exams, tests, etc.	10
3	Amount of time devoted to the preparation for classes, preparation of presentations, reports, projects, homework	15
4	Amount of time devoted to the preparation for exams, test, assessments	5
	Total number of hours	**60**
	ECTS credits	**2**

** 1 ECTS = 25-30 hours of the PhD students work (2 ECTS = 60 hours; 4 ECTS = 110 hours, etc.)

8. Additional information	
Number of ECTS credits for classes requiring direct participation of academic teachers	2
Number of ECTS credits earned by a student in a practical course	-