Annex to the “visiting professors” programme

Proponent from WUT	
Title and degree	DSc PhD Eng
Name and surname	Agnieszka Dąbska
Faculty	Building Services, Hydro and Environmental Engineering
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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@vut.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 60 diploma graduates in BSc and MSc degrees - supervisor of 12 finished PhD students

Code of the course	4606-VP-ES-00019	Name of the course	Polish	**Bezpieczeństwo konstrukcji hydrotechnicznych**
			English	**Safety of hydraulic 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 Physical sciences	

Level of education	Doctoral School	Semester	Summer		
Language of the course	English				
Type of assessment	Pass or Fall	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
- some 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 the definition of safety, reliability, risk and other related terms such as hazard, consequences, exposure, etc.
2. Understand what is "safety factor", advantages and disadvantages of the safety factor approach.
3. Understand what is "limit state method", advantages and disadvantages of the approach.
4. Adopt steps in safety assessment procedure
5. Develop skills to make the safety assessment of engineering structures..

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

Lecture

1. Introduction, definitons, safety of hydraulic structures – brief introduction to traditional methods.
2. Shortage of traditional methods, motivation to the more sophisticated approaches.
3. The assessment using the safety factor approach, advantages, disadvantages, general approaches.
4. The assessment using the limit state method (method of partial reliability coefficients), advantages, disadvantages.
5. Practical cases – global stability – sliding, overturning, uplift.
6. Practical cases – slope stability.
7. Practical cases – local stability.
8. Practical cases – special particular cases in hydraulic engineering (internal erosion, overtopping, scouring).
9. Risk based approaches.

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	Assessment of activity during classes
K02	Acquisition of knowledge about the methods of assessment, their comparison .	SD_W1, SD_W2, SD_W3	Assessment of activity during classes
K03	Acquisition of knowledge about the application of risk analysis in water management.	SD_W1, SD_W2, SD_W3	Assessment of activity 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 safety of 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 apply methods for safety assessment of civil structures.	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] EN 1990 (2002) (English): Eurocode - Basis of structural design [Authority: The European Union Per Regulation 305/2011, Directive 98/34/EC, Directive 2004/18/EC]
[2] EN 1997-1 (2004) (English): Eurocode 7: Geotechnical design - Part 1: General rules [Authority: The European Union Per Regulation 305/2011, Directive 98/34/EC, Directive 2004/18/EC].
[3] BULLETIN 59. 1987. Dam safety guidelines, ICOLD, 1987, 185 p.
[4] DUNCAN, J. M. - WRIGHT, S. G. 2005. Soil Strength and Soil Stability. J. Wiley & Sons, Inc., 2005, 297 p.
[5 FRANK, R. - BAUDUIN, C. - DRISCOLL, R. - KAVVADAS, M. - OVESEN, N. K. - ORR, T. - SCHUPPENER, B. 2004. Designers' Guide to EN 1997-1 Euro-code 7: Geotechnical Design - General Rules, Thomas Telford, 2004, 232 p.
Secondary references:
[1] BOND, A. - SCHUPPENER, B. – SCARPELLI, G. – ORR, T. 2013. Eurocode 7: Geotechnical Design Worked examples. JRC, Luxembourg, 2013, 172 p.
[2 KREUZER, H. - LÉGER, P. 2013. The Adjustable Factor of Safety: A reliability-based approach to assess the factor of safety for concrete dams. The In-ternational Journal on Hydropower & Dams, Issue I, p. 1-24.

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	-