

## COURSE DESCRIPTION

<b>Name of the Course:</b>		<b>Technology for hydrotechnical constructions</b>						
<b>Specialization Code:</b>		<b>U02.07.ICV.IZ.M26</b>		<b>Course Code:</b>		<b>3.DS.OP15</b>		
<b>Year of study:</b>	<b>2</b>	<b>Semester:</b>	<b>3</b>	<b>Examination form:</b> (E-Exam; Co- Colloquy; P-Project; P/F-Passed/Failed)		<b>ECTS credits granted (CR):</b>	<b>E (Co)</b>	<b>4</b>
					<b>Co</b>		<b>P (P/F)</b>	
<b>Course Category:</b> (DF- Fundamental; DD- General engineering; DS-Specialty engineering; DC-Complementary; PR-Practical stage)								<b>DS</b>
<b>Course Type:</b> (OB-Compulsory; OP-Elective; FC-Facultative)								<b>OP</b>
<b>Number of hours per semester:</b> Total of hours per week (TH) x Number of weeks per semester								
<b>TOTAL :</b>	<b>84</b>	<b>Individual study (IS):</b>			<b>28</b>	<b>Contact hours (C + S;L;P):</b>		<b>56</b>
<b>Academic staff member in charge:</b> (Full name, Academic position and Department)				<i>Prof. dr. ing. Radu Sarghiuta</i> <i>Conf. dr. ing. Dan Păunescu</i>				

Faculty	Engineering in foreign languages Master study programme	Number of contact hours per semester				
		Total	Course	Seminar	Laboratory	Project
Field	Civil Engineering					
Specialization	Structural Engineering	56	28		28	

### Course objectives - Description of the main competences:

#### Content description:

<b>1. COURSE</b>	<p>1. Special technologies to allow the execution of hydrotechnical works under water level. Execution of river dams and locks under water using prefabricated elements. 4 hours</p> <p>2. River banks scour protection technologies. River banks protection using INCOMAT blanket. 2 hours</p> <p>3. Technologies for waterproof enclosures. Sheet piling cofferdams. Waterproof barriers using the jet-grouting process. 4 hours</p> <p>4. Execution of underground hydrotechnical works. Technologies for hydropower tunnels. Excavations using explosives and TBM. Supporting and concrete pouring for tunnels. Excavation and concrete pouring for hydrotechnical wells and caverns. Filling and consolidating groutings. 6 hours</p> <p>5. Anchoring underground hydrotechnical tunnels and caverns. Technologies for anchorages. Execution of passive and prestressed anchorages. Split anchors, Swellex anchors and drywall anchors. Anchors made from bar and wires, also made from special materials ( fiber glass and resin enriched cements) 6 hours</p> <p>6. Technologies for drainage works. Executing draining trenches, radial drains, needle drainages and systems for collecting and evacuating water. 2 hours</p> <p>7. Horizontal directional drilling. Undercrossing works through horizontal directional drilling. Municipal infrastructures under special conditions. Drainage using horizontal directional drilling. 2 hours</p> <p>8. Technical temporary solutions regarding hydrotechnical works in river beds. Complex solutions regarding water deviations through wide river beds. Technologies for water deviation through narrow river beds. 2 hours.</p>
<b>2. Seminar / Laboratory / Project / Practical stage</b>	<p>1. Complex technology design for water deviation, regarding the execution of a river dam, containing a lock. 8 hours</p> <p>2. Technology design of an urban deep underwater enclosure, beneath subterranean water level, with and without aquifer depressurization. 8 hours</p> <p>3. Technology design for the execution of an underground cavern. 6 hours</p> <p>4. Technology design for executing a hydrotechnical structure cased in a river, placed in a gorge. 6 hours</p>
<b>3. Bibliography</b>	

Criteria to be considered for the final mark	Weight of each criterion in the final mark (%)
1. Exam defence (final examination)	50
2. Appreciation during the entire semester	50
2.1 Seminar activity	
2.1 Laboratory activity	
2.2 Project activity (the project has not a distinct final mark)	
3. Periodical examinations	
3.1 Written / oral examination	
3.2 Home works, reports, essays etc.	
4. Other criteria (to be specified)	
Short description of the final evaluation procedure:	

Estimation of the total number of hours per semester requested for the individual study (IS)			
Type of individual activity	No. of hours	Type of individual activity	No. of hours
1. Study of the course notes	10	8. Preparation of the final examination	0
2. Study of the compulsory bibliography		9. Advisory class participation	
3. Study of the supplementary bibliography		10. Practical documentation on site	
4. Preparation of specific activities	8	11. Additional documentation on library	
5. Preparation of home works		12. Internet network documentation	
6. Preparation of periodical written examinations		13. Others (to be specified)	
7. Preparation of periodical oral examinations		<b>TOTAL number of hours</b>	<b>28</b>

**Signature of the Academic Staff member in charge:**

*Prof. dr. ing. Radu Sarghiuta*

Conf. dr. ing. Dan Păunescu

**Date:** septembrie 2017