

COURSE DESCRIPTION

Course Name	Structures for hydraulic facilities and for water storage				
Year of study	1	Semester	2	Final Examination Form (E-exam; Co-Colloquy); P-project	E
Course Category (CC-Core Course/Compulsory; EC-Elective Course; FC-Facultative Course)			EC	Number of ECTS credits (CR)	3
Contact hours	56	Individual study	14	Total hours per semester	42
Course Code	(AC-Advance Course; SC- Specific Course)				SC
Academic Staff Member in charge	(Full name, Academic position and Department) <i>Prof. Tudor BUGNARIU, Hydraulic Engineering Department</i>				

Faculty	Engineering in Foreign Languages	Number of contact hours per semester				
Domain of studies	Civil Engineering	Total	C	S	L	P
Specialisation	Structural engineering	28	28			

Course objectives: Description of main competences	The course provides information concerning the peculiarities of hydraulic structures: concept, structural make-up, design principles, modeling procedures. Main competences: basic professional knowledge concerning the design requirements for hydraulic facilities and complex developments; solution principles within the natural and built environment; familiarization with factual information related to structural hydraulic engineering; improved level of creativity; ability to use appropriate engineering software packages; presenting written technical reports and making oral presentations.																						
Content description: Course Seminar	<p>Course – 28 hours</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-left: 20px;">1. Overview of applied hydraulics and hydraulic structures.</td> <td style="text-align: right;">2 hours</td> </tr> <tr> <td style="padding-left: 20px;">2. Structural analysis of massive structures. Finite Element Method.</td> <td style="text-align: right;">2 hours</td> </tr> <tr> <td style="padding-left: 20px;">3. Dam engineering. Gravity concrete dams.</td> <td style="text-align: right;">3 hours</td> </tr> <tr> <td style="padding-left: 20px;">4. Buttress dams</td> <td style="text-align: right;">1 hour</td> </tr> <tr> <td style="padding-left: 20px;">5. Arch dams</td> <td style="text-align: right;">4 hours</td> </tr> <tr> <td style="padding-left: 20px;">6. Water tanks. Specific reinforced concrete design.</td> <td style="text-align: right;">3 hours</td> </tr> <tr> <td style="padding-left: 20px;">5. Pre-stressed water tanks. Earthquake design of water tanks</td> <td style="text-align: right;">3 hours</td> </tr> <tr> <td style="padding-left: 20px;">6. Water towers (elevated water tanks)</td> <td style="text-align: right;">2 hours</td> </tr> <tr> <td style="padding-left: 20px;">7. Navigation locks. The structural make-up and design principles.</td> <td style="text-align: right;">4 hours</td> </tr> <tr> <td style="padding-left: 20px;">8. Harbor developments. Quays' design.</td> <td style="text-align: right;">2 hours</td> </tr> <tr> <td style="padding-left: 20px;">9. Students' reports presentation and comments</td> <td style="text-align: right;">2 hours</td> </tr> </table>	1. Overview of applied hydraulics and hydraulic structures.	2 hours	2. Structural analysis of massive structures. Finite Element Method.	2 hours	3. Dam engineering. Gravity concrete dams.	3 hours	4. Buttress dams	1 hour	5. Arch dams	4 hours	6. Water tanks. Specific reinforced concrete design.	3 hours	5. Pre-stressed water tanks. Earthquake design of water tanks	3 hours	6. Water towers (elevated water tanks)	2 hours	7. Navigation locks. The structural make-up and design principles.	4 hours	8. Harbor developments. Quays' design.	2 hours	9. Students' reports presentation and comments	2 hours
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<i>Bibliography</i>	<ul style="list-style-type: none"> - T. Bugnariu, 2015 - Structures for Hydraulic Facilities and Water Storage – Lecture Notes, pdf. - P. Novak, 2007 – Hydraulic Structures, pdf - T. Bugnariu, 2007 – Basics of the Finite Element Method Applied in Civil Engineering, Ed. Conspress
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Criteria to be considered for the final mark	Weight of each criterion in the final mark (%)
1. Exam defence (final examination)	75
2. Appreciation during the entirely semester	
2.1 Seminar activity	
2.1 Laboratory activity	
2.2 Project activity (Only if the project has not a distinct final mark)	
3. Periodical examinations	
3.1 Written / oral examination	
3.2 Home works, reports, essays etc.	25
4. Other criteria (to be specified)	
Short description of the final evaluation procedure: The exam consists of two parts: (a) a public presentation (powerpoint defence) of the submitted report and (b) a written examination of the theoretical knowledge acquired (followed, if necessary, by a professor-student discussion on the delivered answers).	

Estimation of the total number of hours per semester requested for the individual study			
Type of individual activity	Number of hours	Type of individual activity	Number of hours
1. Study of the course notes	2	8. Preparation of the final examination	10
2. Study of the compulsory bibliography		9. Advisory class participation	
3. Study of the supplementary bibliography	2	10. Practical documentation on site	
4. Preparation of specific activities (seminar, laboratory, project etc.)		11. Additional documentation on library	
5. Preparation of home works, reports, essays etc.		12. INTERNET documentation	
6. Preparation of periodical written examinations		13. Others (to be specified)	
7. Preparation of periodical oral examinations		TOTAL number of hours	14

Done on: 28 September 2017

Academic Staff Member in charge

PhD. Prof. Tudor BUGNARIU