

COURSE INFORMATION					
Course Title	<i>Code</i>	<i>Semester</i>	<i>L+P Hour</i>	<i>Credits</i>	<i>ECTS</i>
Materials Evaluation by Using Destructive and Nondestructive Testing	CHBE 563	1 or 2	3+0	3	10

Prerequisites	NONE
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Language of Instruction	English
Course Level	Master's Degree (Second Cycle Programmes)
Course Type	Technical Elective
Course Coordinator	
Instructors	-
Assistants	
Goals	To introduce the destructive and nondestructive test methods, deliver information about sample preparation, determination the proper destructive or destructive test method for the materials and to show which properties can be detected by the tests.
Content	Several destructive and non-destructive test methods and their applications (Hardness, tensile strength, compression, bending, impact, liquid penetrant, magnetic particle, ultrasonic and radiographic examination tests)

Course Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
1) to know and classify the application areas of destructive and non-destructive materials inspection methods.	2,4	1,2	A,C
2) to learn how to use destructive and non-destructive material inspection methods	2,5	1,2	A,B
3) to learn the advantages and disadvantages of destructive and non-destructive testing methods.	2,5	1,2,3	A,C
4) Ability to communicate effectively in English	8	1,2	A,C

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Lab, 4: Case-study
Assessment Methods:	A: Testing, B: Experiment, C: Homework, D: Project

COURSE CONTENT		
Week	Topics	Study Materials
1	Testing methods of materials and their importance in the application	Lecture Notes/Web
2	Hardness tests	Lecture Notes/Web
3	Tensile testing of metallic materials	Lecture Notes/Web
4	Compression testing of metallic materials	Lecture Notes/Web
5	Impact test of metallic materials	Lecture Notes/Web
6	Bending test of metallic materials	Lecture Notes/Web
7	Torsion Test	Lecture Notes/Web
8	MIDTERM EXAM	Lecture Notes/Web
9	Liquid penetrant test	Lecture Notes/Web
10	Magnetic Particle Method	Lecture Notes/Web
11	Ultrasonic test	Lecture Notes/Web
12	Radiographic Examination	Lecture Notes/Web
13	Advantages and disadvantages of non-destructive testing methods	Lecture Notes/Web
14	students homework and report presentations	Lecture Notes/Web

RECOMMENDED SOURCES	
Textbook	Lecture Notes
Additional Resources	Web Resources

MATERIAL SHARING	
Documents	
Assignments	
Exams	

ASSESSMENT			
	IN-TERM STUDIES	NUMBER	PERCENTAGE
Mid-term		1	50
Reports		4	30
Homework		1	20
	Total		100
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE			40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE			60
	Total		100

COURSE CATEGORY	Field Courses
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COURSE'S CONTRIBUTION TO PROGRAM						
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Acquire expanded and in-depth information via performing scientific research in the field of Chemical Engineering, evaluate, interpret and implement knowledge.					
2	Be knowledgeable in the contemporary techniques and methods applied in Chemical Engineering and their respective constraints.					+
3	Be cognizant of the novel and developing applications of his/her profession, study and learn them as required.					
4	Formulate Chemical Engineering problems, develop methods to solve them and implement innovative techniques in solutions					+

5	Design and conduct analytical modeling and experimental research, analyze and interpret complex problems encountered in this process.										+		
6	Develop novel and/or original ideas and methods; conceive innovative solutions in systems, component and process design												
7	Complete information via processing limited or incomplete data by the use of scientific methods and implement it; integrate knowledge from different disciplines												
8	Communicate in at least one foreign language at the level of European Language Portfolio B2 orally and in writing.										+		
9	Communicate stages and results of his/her studies in a systematic and clear manner orally or in writing in intra or interdisciplinary national and international settings.												
10	Defines societal and environmental aspects of Chemical Engineering applications												
11	Observe social, scientific and ethical values during collection, interpretation, and dissemination of data and in all professional activities.												
12	Lead multidisciplinary teams, develop solution methodologies for complex problems and take responsibility												

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Including the exam week: 16x Total course hours)	14	3	42
Hours for off-the-classroom study (Pre-study, practice)	14	10	140
Mid-term	1	3	3
Report	4	10	40
Homework	1	25	25
Final examination	1	5	5
Total Work Load			255
Total Work Load / 25 (h)			10.2
ECTS Credit of the Course			10