COURSE INFORMATON							
Course TitleCodeSemesterL+P HourCredits							
Nondestructive Testing	CHBE 569		3+0	3	10		

Prerequisites	NONE
Language of Instruction	English
Course Level	Master's Degree (Second Cycle Programmes)
Course Type	Technical Elective
Course Coordinator	
Instructors	-
Assistants	
Goals	To introduce the control test methods which can be applied without damaging the structure depending on the material, production and usage and to show the test methods that can detect the damage.
Content	Basic principles. Visual inspection, magnetic particle testing. Penetrating test. Ultrasonic testing. Radiographic testing. Surface control with micro control, neutron radiography. Acoustic emission method. Thermography method. Advantages and disadvantages of non-destructive testing methods

Course Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
<ol> <li>to know and classify the application areas of non-destructive materials inspection methods.</li> </ol>	2,4	1,2	A,C
2) to learn how to use non-destructive material inspection methods.	2,5	1,2	A,B
3) to learn the advantages and disadvantages of 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	Week Topics	
1	Non-destructive testing methods, principles and application areas	Lecture Notes/Web
2	Visual Inspection Method	Lecture Notes/Web
3	Microscope Examination Method	Lecture Notes/Web
4	Radiographic Examination	Lecture Notes/Web
5	Radiographic Examination	Lecture Notes/Web
6	Liquid Penetrating Method	Lecture Notes/Web
7	Ultrasonic Inspection Method	Lecture Notes/Web
8	MIDTERM EXAM	Lecture Notes/Web
9	Magnetic Particle Method	Lecture Notes/Web
10	Magnetic Particle Method	Lecture Notes/Web
11	Thermography method	Lecture Notes/Web
12	Acoustic Emission Method	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	PERCENTAGE				
Mid-term	1	60			
Reports	3	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

	COURSE'S CONTRIBUTION TO PROGRAM						
No Program Learning Outcomes		Contribution					
			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 knowledgable 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	3	10	10			
Homework	1	25	25			
Final examination	1	5	5			
Total Work Load			245			
Total Work Load / 25 (h)			9.8			
ECTS Credit of the Course			10			