<table>
<tr><td rowspan="8">Identification</td><td>Subject</td><td colspan="3">ME 453, Non-destructive Testing Methods - 6 ECTS</td></tr>
<tr><td>Department</td><td colspan="3">Mechanical Engineering</td></tr>
<tr><td>Program</td><td colspan="3">Undergraduate</td></tr>
<tr><td>Term</td><td colspan="3">Fall 2025</td></tr>
<tr><td>Instructor</td><td colspan="3">Pusta Jalalova</td></tr>
<tr><td>E-mail:</td><td colspan="3">puste.jalalova@khazar.org</td></tr>
<tr><td>Phone:</td><td colspan="3"></td></tr>
<tr><td>Classroom/hours</td><td colspan="3"></td></tr>
<tr><td></td><td>Office hours</td><td colspan="3"></td></tr>
<tr><td>Prerequisites</td><td colspan="4">-</td></tr>
<tr><td>Language</td><td colspan="4">English</td></tr>
<tr><td>Compulsory/Elective</td><td colspan="4">Elective</td></tr>
<tr><td>Required textbooks and course materials</td><td colspan="4">Textbook:
Mix PE. Introduction to nondestructive testing. 2005.
Fahr A. Aeronautical applications of non-destructive testing. DEStech Publications, Inc; 2013.
Boogaard J, van Dijk GM, editors. Non-destructive testing. Elsevier; 2012.</td></tr>
<tr><td>Course Description</td><td colspan="4">This course offers a comprehensive introduction to Non-Destructive Testing (NDT) techniques with a specific focus on applications within the Oil & Gas industry. NDT is a critical aspect of quality control, maintenance, and safety assurance, allowing engineers to assess the integrity of materials and components without causing any damage. The course covers various NDT techniques, including Visual Testing (VT), Ultrasonic Testing (UT), Radiographic Testing (RT), Magnetic Particle Testing (MT), etc. - with a focus on their application in the Oil & Gas industry.</td></tr>
<tr><td>Course Objective</td><td colspan="4">The primary objective of this course is to provide students with a solid foundation in the principles of Non-Destructive Testing, particularly as they apply to the Oil & Gas industry. The course is designed to:
– Provide students with the technical knowledge required to understand and implement various NDT methods.
– Develop students' ability to critically assess the suitability of different NDT techniques for specific applications, considering factors such as material properties, defect types, and operational conditions.
– Teach students to effectively communicate NDT findings in written reports.</td></tr>
<tr><td>Learning outcomes</td><td colspan="4">Upon successful completion of this course, students will be able to:
– Understand and explain the fundamental principles of Non-Destructive Testing, including the physical concepts underlying each technique.
– Select appropriate NDT methods for various applications in the Oil & Gas industry, considering the specific requirements of different materials and operational environments.
– Communicate NDT results effectively in technical reports to support engineering projects and maintenance operations.</td></tr>
<tr><td rowspan="2">Teaching methods</td><td colspan="3">Lecture</td><td>x</td></tr>
<tr><td colspan="3">Case analysis and assignments</td><td>x</td></tr>
<tr><td rowspan="6">Evaluation</td><td colspan="2">Methods</td><td>Date/deadlines</td><td>Percentage (%)</td></tr>
<tr><td colspan="2">Midterm Exam</td><td></td><td>30</td></tr>
<tr><td colspan="2">Class Activity</td><td>At each lesson</td><td>5</td></tr>
<tr><td colspan="2">Assignment</td><td>During the semester</td><td>10</td></tr>
<tr><td colspan="2">Quiz</td><td>During the semester</td><td>15</td></tr>
<tr><td colspan="2">Final Exam</td><td></td><td>40</td></tr>
<tr><td colspan="2">Total</td><td></td><td>100</td></tr>
<tr><td>Policy</td><td colspan="4">▪ Ethics
Copying of other students’ work is highly discouraged. All assignments must be handled by the student himself. This is a university policy, and violators will be reprimanded accordingly.</td></tr>
</table>

	▪ **Preparation for class** The structure of this course demands your individual effort outside the classroom for extra practice of many problems within the textbook. After each session, every student needs to put sufficient time to practice and finish the assignments by the predetermined date. • **Withdrawal (pass/fail)** This course strictly follows grading policy of the School of Science and Engineering. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year. ▪ **Cheating/plagiarism** Cheating or other plagiarism in handling the assignments, Mid-term and Final Examinations will lead to course failure. In this case, the student will automatically get zero (0), without any considerations. ▪ **Professional behavior guidelines** The students shall behave in a way to create a favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly discouraged. ▪ **Attendance** Students who attend the whole classes will get 5 marks. for three absence student loses 1 mark. ▪ **Quiz** There will be quizzes for checking understanding of content during class. We are not going to give make-up for a missing quiz due to any reason other than a medical report. ▪ **Assignment** Throughout the semester, students will complete assignments on selected NDT methods. These assignments will assess students' understanding of the principles and applications of each method.

Tentative Schedule

Week	Topics	Textbook/Assignments
1	Introduction to Non-Destructive Testing (NDT)	Chap 1
2	Visual Testing (VT)	Chap 2
3	Ultrasonic Testing (UT)	Chap 3
4	Magnetic Particle Testing (MT)	Chap 4
5	Liquid Penetrant Testing (PT)	Chap 5
6	Radiographic Testing (RT)	Chap 6
7	Course Review and Preparation for Midterm Exam	Chap 7

8	Review **Midterms Exam**	

9	Eddy Current Testing (ET)	Chap 8
10	Advanced NDT: PAUT and TOFD	Chap 9
11	Data Interpretation and Reporting in NDT	Chap 10
12	Risk Based Inspection (RBI)/ Inspection Planning and Execution	
13	Emerging Trends	
14	Case Studies (Oil & Gas)	
15	Review and Preparation for Final Exam	
16	Final Exam	

This syllabus is a guide for the course and any modifications to it will be announced in advance.