

General Information:

Name of Course:	DIAGNOSTICS OF STRUCTURES
Course Code:	MSM410AN
Semester:	1 st
Number of Credits:	3
Allotment of Hours per Week:	2 Lectures and 1 lab classes /Week
Evaluation:	Signature (with grade)
Prerequisites:	None

Instructor: **Dr. Zoltan ORBAN, associate professor**
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Introduction, General Course Description:

This course is aimed to provide basic and advanced knowledge on the principles of the inspection, diagnostics and structural analysis for assessment of existing structures. Topics covered by the course include: reliability requirements of existing structures, visual inspections, destructive and non-destructive test methods, combination of test methods, evaluation of test data, reliability assessment of existing structures based on in-situ test results, monitoring methods.

Learning Objectives:

Students will gain from this course:

- Knowledge on the principles of diagnostics, monitoring and structural analysis of existing civil engineering structures,
- Overview on specific destructive and non-destructive methods of structures built from various construction materials.

Methodology:

- **Lectures:** will give the theoretical knowledge on test and analysis methods via case studies.
- **Practical class (in group work):** Groups of 2-3 students each will be created. Each group will be assigned tasks to complete. These tasks may expand on design work and may have “research components” where students need to gather information required to complete a task.
- **Exams:** Accumulated knowledge is tested in two exams: a midterm and a final exam. Both feature multiple-choice, true-false or short essay questions.

Schedule:

Week	Topic of lecture and lab class
Week 1	Course description. Orientation. Introduction.
Week 2	Principles of inspection, analysis and assessment of existing structures.
Week 3	Visual inspections. Case studies.
Week 4	Non-destructive test methods I.
Week 5	Non-destructive test methods II.
Week 6	Non-destructive test methods III.
Week 7	Case studies.
Week 8	Case studies.
Week 9	<i>Break – no class</i>
Week 10	Destructive test methods I.

Week 11	Destructive test methods II.
Week 12	Monitoring methods
Week 13	Case studies. Submit and presentations of assignments.
Week 14	Final exam.
Week 15	Second exam (only if required). Presentations.

Attendance:

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Grading:

10% - Attendance
40% - Assignments
50% - Final Exam

Grade:	5	4	3	2	1
Evaluation in percents:	85%-100%	70%-84.9%	55%-69.9%	40%-54.9%	0-39.9%

Students with Special Needs:

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

Readings and Reference Materials:

M Raupach, Till Büttler: Concrete Repair to EN 1504 - Diagnosis, Design principles and Practice, CRC Press, ISBN-13: 978-1-4665-5746-8

ISO 13822: 2010 „Bases for design of structures — Assessment of existing structures”

ISO 2394: 2015 „General principles on reliability for structures”