

Mechanics of Materials: Project Report Guideline

Group Project: Mechanics of Materials

- 20% of course mark
- Group of 3 Students maximum

Last Submission Date: August 28th, 2024 but it may be submitted earlier

Topic Replication is not allowed so you should register your selected standard test, and the material type under study to your TA before starting your analysis.

Group Project

The main purpose of this group project is to apply what the student has studied theoretically throughout the course in real life and to investigate the practical application related to the theoretical concepts studied in the Mechanics of Materials course.

Project Task

This is a self-selected project from different offered topics including:

- A- Prepare a finite element simulation of one of the following tests for different engineering materials and a report of the results using any available software package (SolidWorks, Fusion 360, Ansys [Ansys Student Versions](#) | [Free Student Software Downloads](#) ,).**

Mechanical Test Methods

Test	Example video
1. Torsion Test of different Engineering Materials	(1) ANSYS Tutorial: Torsion Test using Explicit Dynamics - YouTube
2. Bending testing of different Engineering Materials	(1) ANSYS Tutorial Bending Test Simulation (3 Point Bending Test Flexural) - YouTube

- B- Prepare a report about one practical application of the following methods for experimental strain analysis:**
3. Electrical resistance strain gauges. ([\(1\) How STRAIN GAUGE Works | Precision SCALE With Arduino - YouTube](#))

Report Structure

Professional presentation of the Project Report is required and should consist of neat and organized solutions printed on one side of the paper only. Computer-generated plots and printouts give added value for all sample and summary calculations.

The report should include:

1. Title Page and Table of Contents
2. Project Description
4. Project **standard** if available
5. Minimum Assumptions (only if required)
6. Materials and Methods
7. Results.
8. Conclusions.
9. References and Appendices

10. video file illustrating all the performed steps by the team members including voice description instead of a face-to-face presentation

Layout and format:

- a. Use font size 12.
- b. Be written in Arial.
- c. Have page numbers centered on the bottom of each page in the format - Page 1 of 7
- d. Be double-spaced.

Marking Criteria

Marks would be based on:

- Physical prototype or simulation files 30%
- Good quality **video** uploaded to a shared drive 30%
- Report 40%

General Advice

This project should be your own work. You should refer to the literature but the report should contain your own ideas, based on your understanding of the problem and the analysis you have undertaken. **It should be specific not general.**

Do not pass off the work of others as your own. Cite references correctly but do not be over-dependent on them. You should aim for a similarity index of less than 20%.