

Composite Technology MSE 440

Project

veronique.michaud@epfl.ch

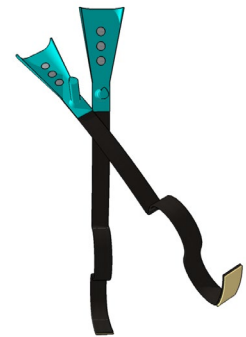
pierre-etienne.bourban@epfl.ch

martyn.wakeman@epfl.ch

Institut des matériaux (IMX)
Ecole Polytechnique Fédérale de Lausanne (EPFL),
CH-1015 Lausanne

Group Project

- You (group of 6 students) as project leader in the company 'Composites Solutions S.A.'
- Imagine you are proposing a new composite product to the board to convince them to invest funds in the proposal
- Pitch and **convince** us and the class at the end of the course



Group project

Transversal skills

- **Team work**, project over the duration of the course
- Form diverse groups
- Must include mix of materials science and mechanical engineering students
 - Will make the project more effective
- Aims to help you transfer knowledge into real life situations
- Improve soft-skills
 - Team work, project planning, innovation process / ideation, time keeping, written communication, reflective listening, inclusivity, presentation skills

Group Project Process

- Define i) topic, ii) names, iii) Roles vs your background Materials, MechEng, ...to us by 1st October

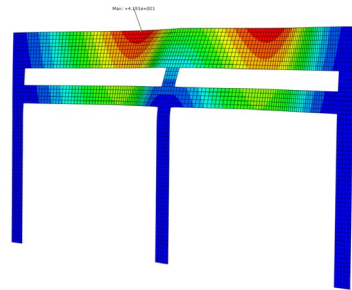
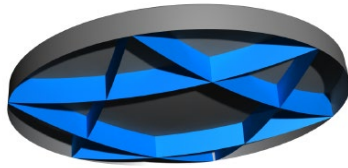
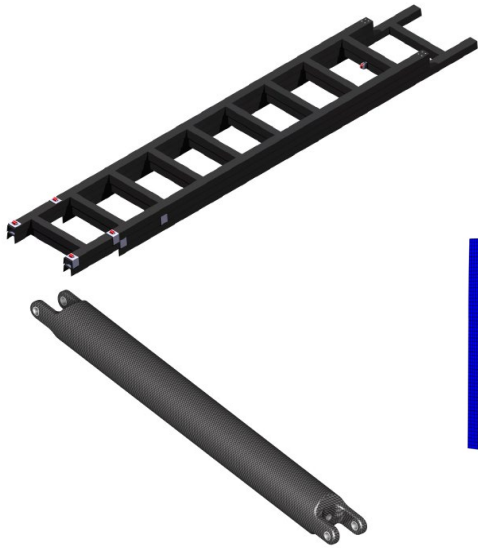
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- In your team, discuss how you will approach the project: planning, task allocation, time keeping, ensure everyone contributes and is heard, allocate roles, etc ...
- Two intermedidate feedback sessions: **14th Oct, 25th Nov**
15 minutes per team, with course instructors
- Report (10 pages, no longer), due date: **3rd December**
- Presentations (15 minutes sharp), due date: **9th December** everyone needs to present

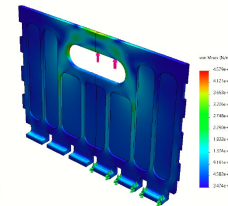
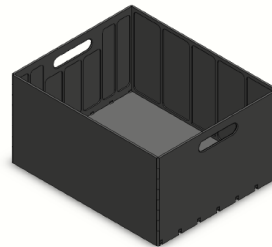
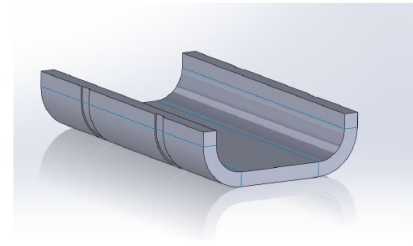
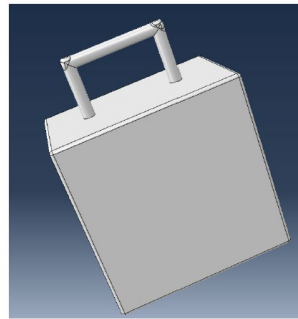
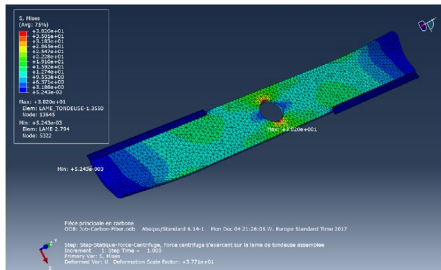
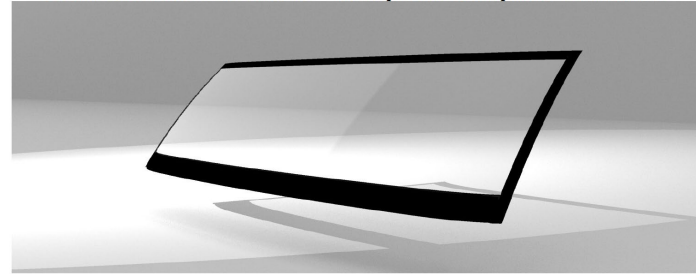
Project topics examples

1. Tailored composite leg prosthesis produced by additive manufacturing
2. Composites for cartilage replacement
3. Artificial muscles
4. Applications of nanotubes for damage control
5. Automotive integrated electric vehicle composite battery tray
6. Automotive carbon-fiber body-in-white structures in a circular economy
7. Composites for Hydrogen storage in automotive fuel cell applications
8. Civilian eVTOL passenger drones
9. Composites for safe space-structure re-entry
10. Additive manufacturing of composites for civil surveillance drone structures
11. Recovering and recycling composites: next generation wind turbine blades
12. Composites for Tidal power
13. Rehabilitation solutions for civil engineering structures
14. Composite structures for disaster remediation

Past group project examples



COMPOSITE SOLUTIONS® Transparent Composite Windshield



Group Project: Content

- 1. Composite material selection**
 - Justify why you have selected particular fibers / textiles / resins
- 2. Design and structural feasibility established**
 - Identify load case, generate design (CAD), structural analysis (of key elements, FEA ideal, 3D printed demo interesting (but not required))
- 3. Clear value proposition (incl. performance, cost, ...)**
 - Understand how the problem is solved today
 - How your idea will meet customer needs
 - Why should a customer “get out of bed” for your product
- 4. Composites manufacturing process identified**
 - How will you convert your composite constituents into parts?
 - How many part will you make per year?
 - Will process change with time (scale-up)?
- 5. Cost per part modelled**
 - Investments required in equipment and tooling, cost/part calculated
 - Extrapolation to price interesting (but not required)
 - Scaling and industrialization: discussion of next steps/strategy
- 6. Sustainability positioning**
 - Give a sustainability statement regarding your product
 - Give 3 SMART initiatives to reduce impact (short, medium, long term)

2/3 of
the
grade