

ASSIGNMENT 1: Problems and solutions from your own field of study

During this course, you will write about solutions related to your own field of study. Every field of science and engineering is constantly developing solutions to problems arising from real-life situations and needs. These solutions can be, for example, **technologies, methods, devices, approaches, or strategies**, which usually aim to achieve one of the following goals:

- to improve the efficiency of an existing technology or method
- to implement a more effective strategy
- to enhance methods to organize a process

To get started, your first task is to do some research to find a suitable topic and contents for a **short written report** (800-1200 words). Look for **topics that you find interesting** yourself and motivating to explain in more detail to a **general academic audience** (*i.e., intelligent and educated but not experts in your specific field of study*). Perhaps you have noticed an item of news (YLE, HS, BBC, Discovery) that is closely related to your field? Or maybe you have some expert knowledge of current developments in your field based on your experience in working life, your bachelor's or master's thesis or a project in which you have participated.

Instructions

For this task, you will need to fill in the *Assignment 1: outline* with the following information:

1. Find a **real-life need/problem** that can be solved or alleviated using a **particular solution** from **your own field of study**.
 - **The solution** can be a **method, device, technology, material, or strategy**.
 - **The problem** can be a need to develop a new technology, or improve on an existing method or process. For example:

Metal screws are currently used for treating bone fractures. **However, they have to be removed in a later operation, which increases costs and prolongs the recovery period. Such complications can be avoided by using biodegradable materials.**

To identify such **problems** and **solutions**, browse the web for current developments in your field, e.g., search Google with key words, check your school and department homepages, or Aalto University Learning Centre's [Resources Guides](#)). See also the examples below (Table 1) to see what earlier students have chosen as topics in past courses.

2. In the *Assignment 1: outline*, briefly describe a technical **solution** for each of the potential **problems** that you identified.
3. Identify the **main client or audience** for your problem. In other words, who will need/use this information?
 - a. Scientific community or field
 - b. Industry
 - c. A specific company or organization
4. Copy the links to the **sources** of your information and paste these into the *Assignment 1: outline*.

Ionic liquids in cellulose processing	Computer programs for the simulation of antennas	Sustainable alternatives for energy production	Fractal geometry (for creating lightweight structures)
Methods in forest fire evaluation	Improving accuracy of milling machines	Microfluidic chips for neuron culture	Styling language for websites
Software in self-driving cars	Oscillating heat pipes	Nanoscale imaging	Lighting automation
CLT beams	Robotic surgery	e-health applications	3D-GeoVisualizer
3D printing Deposition Modeling and Stereolithography	Intelligent transportation system	Linear programming	Quantum computing

Table 1. Examples of topic areas chosen by earlier students.