

DE2 – Sustainable Design Engineering

Tutorial Week 9 – Thursday 13:00-15:00

The work described in this tutorial sheet is to be undertaken within the tutorial time and your personal study time.

The tutorial involves the following activities.

Detailing concepts for your whole system, systems and product and packaging (120 min)

You have now entered the convergent phase of your project. From this week till the end of term you are expected to focus on detailed design. The objective of this activity is to detail your project concept and plan your slides for the final submission. Your intervention has to specify:

- Problem and users.
- Future scenario and time horizon.
- Whole system design
- Systems design (i.e. infrastructure, data & actors, value, principles)
- Product and packaging design (i.e. resource)
- Solution innovation and feasibility.

Please note that this is a list of content and you do not have to follow this structure in your slides for Submission 4.

Refer to Appendix 1 at the end of this document for more information about all these aspects in line with the content suggested for Submission 4.

Appendix 1

- **Problem and users:** Problems in the system and product and users.
- **Future scenario and time horizon:** Statement of the future scenario and time horizon in which the proposed intervention is deployed.
- **Whole system design:** System boundary; overview of your intervention on the system to decrease environmental impact and increase circularity; overview of the resource flow and states, system processes and system elements (visualised using a system diagram); description of any product-service system adopted to increase the environmental impact and circularity; and why and how the intervention improves environmental impact and circularity including the causation between the problems and the system intervention.
- **Systems design:** Detailing of the infrastructure system, data system, actor system, value system and principles system. Description of how the infrastructure system is organised and works. Description of how the data system is structured and works. Description of how the actors are organised and work (visualised using tools such as experience maps, customer journey maps, and storyboards). Description of how the value system is arranged and works. Description of how the principles system is organised and works.
- **Product and packaging design:** Product and packaging conceptual and detailed design covering product structure (in the form of high quality sketches and solid models in different views), functions, materials, assembly and disassembly processes, manufacturing processes, services, lifetime and utility level specified to lower environmental impact and achieve circularity; product environmental impact (assessed using the Eco Audit tool and Material Circularity indicator); product and packaging ergonomics and experience; description of the degree of sustainability awareness and intentionality of targeted users and why the product connects with their needs; and why and how the intervention improves environmental impact and circularity including the causation between the problems and the product intervention.
- **Solution innovation and feasibility:** Why the intervention is innovative; and how feasible it is to introduce the proposed intervention by assessing its practicality and value.