



- The difference between starting points, requirements, wishes
  - The stated purpose
  - The influence of a briefing
  - How practice works
  - Understanding the logic behind design (it is not possible to choose the best solution)
- Packaging materials – an overview of characteristics in making choices for a food packaging design.
- This part elaborates on earlier course units that pay attention to packaging materials like 'Food packaging systems: materials, machines and packaging conditions', and 'Food Safety of Packaging Materials'. The basic knowledge of materials is required to understand this part of the course.
- Common overview of characteristics related to barriers, strength, humidity behaviour etc.
  - Designing in paper and board – how to choose a material and define the technical specification
    - o Paper types: mechanical and chemical (sulphate and sulphite) based paper types, the use of recycled fibers
    - o Board types: corrugated, folding boxboard, solid board
    - o Lay-out drawings, folding patterns
    - o Design rules and using standards (FEFCO and ECMA)
    - o Perspective from viewpoint of sustainability
    - o Costs and key figures of packaging made from paper and board
  - Designing for metal packaging - how to choose a packaging/material/coating
    - o Steel
    - o Aluminium
    - o Design rules and using standardised designs
    - o The sustainability perspective
    - o Costs and key figures for metal packaging
  - Designing in glass - how to choose a design, specifics
    - o Different glass types used for packaging
    - o Blow-blow, press blow, tube forming and pressing
    - o Bottles, jars, syringes, etc.
    - o From design sketch to bottle shape and volume
    - o The sustainability perspective
    - o Costs and key figures for glass packaging
  - Designing in plastic - how to choose a material and technical specification
    - o From extruder to film, injection moulding, thermoforming, blow moulding
    - o Laminates
    - o Design rules for cups, trays, etc.
    - o The sustainability perspective
    - o Costs and key figures for plastic packaging
  - Using tools to compare packaging from sustainability point of view / the difficulty to compare solutions of different packaging materials
- Printing techniques and when to use which technique
- Offset, flexography, gravure, pad printing, screen printing, digital printing
- Packaging design – dealing with complexity of decision making
- Multi-criteria decision making and the role of information
  - Balanced weigh score cards processes
  - Different design methodologies and approaches
- Stage gate models
- Learning to prioritise the choices that have to be made
  - Splitting up the design in functional parts
- Sustainability in packaging design
- The role of packaging in the chain
  - Product-packaging approach, the packaging as serving entity for the product
  - The models that are used based on eco-design approaches, from marketing to packaging solutions
  - The use of sustainability claims on packaging
- Circularity – key players, and methods
- Ellen MacArthur Foundation
  - European circularity plans
  - Pack Forward

- ...  
What is happening in the field

### **Initial competences**

Competences obtained in the previous course units: Food packaging systems: materials, machines and packaging conditions; Food packaging economics & management; Shelf-life of packed foods; Sustainability in food systems; Food safety of packaging materials; End-of-life management of packaging; Quality management in food packaging.

### **Final competences**

- 1 To have knowledge of and insights in methods, developments, trends etc. in the field of sustainable packaging design
- 2 To apply design processes and decision-making as a pro-active partner in sustainable packaging design
- 3 To generate ideas to make the product-packaging-combination more sustainable
- 4 To discuss with different stakeholders sustainable packaging concepts at strategic and tactical level
- 5 To act as a full partner in development teams for sustainable food packaging

### **Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

### **Conditions for exam contract**

This course unit cannot be taken via an exam contract

### **Teaching methods**

Group work, Lecture, Independent work

### **Extra information on the teaching methods**

Lectures: 18 hrs: divided across 6 weeks (some lectures, especially with theoretical background, can also be provided online)

Lectures: plenary exercises: 12 hrs: group exercises and some individual exercises related to the lectures.

Independent work: 7.5 hrs: some assignments will be presented as preparatory work for next time.

Final individual assignment will be worked out in steps (group work (to learn from each other): 8 hrs), guided by the teacher (guided self-study: 4,5 hrs)

### **Study material**

Type: Handouts

Name: Powerpoint presentations

Indicative price: Free or paid by faculty

Optional: no

### **References**

Chapters from book: Packaging Design Decisions, a technical guide (Destech publishment)

Packforward publication of the KIDV (free available pdf)

Sheets of lectures

Scientific articles taken up in lectures

Guides of industry

Tools for sustainable packaging design like recycle guides, PackForward approach, etc.

### **Course content-related study coaching**

The teacher can be contacted by e-mail and by online meetings if needed. Before and after the lectures and

exercises, the student can also ask additional information to the teacher or assistant.

There will be feedback on assignments that are given to the student or to groups of students before the final assignment.

### **Assessment moments**

continuous assessment

### **Examination methods in case of periodic assessment during the first examination period**

### **Examination methods in case of periodic assessment during the second examination period**

**Examination methods in case of permanent assessment**

Participation, Peer and/or self assessment, Assignment

**Possibilities of retake in case of permanent assessment**

examination during the second examination period is possible in modified form

**Extra information on the examination methods**

Students work on an individual assignment. They have to develop a sustainable packaging, if possible related to the work/job/interest. Some parts will be done as group work like making overviews of functions and the description of the packaging process. Active participation is required. The students present their design in small groups and discuss the results. The group dynamics are evaluated by means of peer-assessment. They receive a form to write out their findings in a structured way. This also helps to make sure the students assess the delivered work from the necessary multiple perspectives.

Second chance exam: additional input can be asked related to the individual part of the assignment. If the role of the student in group assignments turned out to be poor, an oral re-exam is possible.

**Calculation of the examination mark**

Final assignment: 75%. The assignment is graded based on several parts. Used methodology 15%, functional specification/requirements/stated purpose/briefing 15%, use of material 25% including production process, packaging process 10%, substantiation of sustainability 20%, convenience and appearance (consumer related issue) 15%.

The assignments students make during the courses are not counted for the final mark but are meant as training for the final assignment.

Active participation and peer assessment (process): 25%: the students are evaluated on how they use the group moments to elaborate their work (way of presenting and discussing with peers) and how the peers experience their team skills by means of a peer-assessment.

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.