

Designing in a Cybernetical and System-Oriented Way (E630058)

Course size (nominal values; actual values may depend on programme)

Credits 6.0 Study time 180 h Contact hrs 48.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	Dutch, English	guided self-study	6.0 h
		lecture	6.0 h
		project	36.0 h

Lecturers in academic year 2018-2019

Ostuzzi, Francesca	TW18	lecturer-in-charge
Octavia, Johanna Renny	TW18	co-lecturer

Offered in the following programmes in 2018-2019

	crdts	offering
Bachelor of Science in Industrial Design Engineering Technology	6	A
Linking Course Master of Science in Industrial Design Engineering Technology	6	A
Preparatory Course Master of Science in Industrial Design Engineering Technology	6	A

Teaching languages

Dutch, English

Keywords

Cybernetics.
Agent-system interaction

Position of the course

The course is the continuation of the course "methodical design" so that students also learn to design dynamical systems. Interacting processes show emergent aspects that can be understood only at the very level of interaction. This requires the skill to model and design change.

Contents

Learning to recognize each other's interests and skills in a team, learning to accept and methodically develop these interests and skills.
Integration of entrepreneurship (realizing, materializing, many kinds of stakeholders with many kinds of images of what reality is), manageability (information and meaning, management understood as the creation of meaning in joint operations), change (dynamics, time, sustainability), prototyping (its stigmergic interpretation, open for the unexpected but observable, in order not to hide uncertainty but to give it a manageable place), ergonomic experience (something that can not be experienced by a stakeholder does not exist). Emphasis is put both on the design of a human-product interaction system as a new innovative and sustainable product-context system.

Initial competences

Designing methodically

Final competences

- 1 Can design a product in a project team using a manageable process.
- 2 Can integrate technological developments, human-social and environmental aspects into a system design.
- 3 Can select and monitor system boundaries using tools from the first order cybernetics, can question system boundaries using tools from the second order cybernetics.

- 4 Can design the dynamics of a human-product-context interaction, both in production and in use, regardless of whether those dynamics are caused by changing material flows, energy flows, information flows, change of meaning, social evolution, cultural differences, market needs, ecological developments, safety aspects, emotional aspects
- 5 Can design (double blind) experiments and research methodologies, can measure and evaluate based on existing and newly developed quality systems for both technical aspects and aspects of individual and group interaction.
- 6 Can develop a sustainable product vision on system level, vision that can be realized starting from the current market demand, including value creation at the end of the life cycle.
- 7 Can apply the current accepted lifecycle analyzes in a critical way.
- 8 Can weigh the potential realizations taking account yet unknown requirements and wishes of not yet known stakeholders or poorly respected demands and requirements of already known stakeholders.
- 9 Can motivate all stakeholders to commitment and action.

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

Guided self-study, lecture, project

Extra information on the teaching methods

This is applied by means of an integrated design project in which the team must develop and follow its own methodology.

- Lecture in English
- Guided self-study: guidance in English or Dutch according to the preference of the students, reporting of the results in English
- Project: coaching in English or Dutch according to the preference of the students, assignment and reporting in English
- Oral exam in English or Dutch according to the preference of the students

Learning materials and price

The course material is freely available using the URI of the nodes. The relationship between the nodes is available as a directed acyclic graph on the learning platform using the open source software "FreeMind."

References

Course content-related study coaching

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Oral examination

Examination methods in case of periodic evaluation during the second examination period

Oral examination

Examination methods in case of permanent evaluation

Participation

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

The lesson attendance and active participation is required. The interaction and documentation on the learning platform is monitored daily.

Calculation of the examination mark

NPE: 50%
 PE project: 20%
 PE sustainability: 15%
 PE human-product-context interaction: 15%