

Managing complexity and innovation in aviation

General Information

Number of ECTS Credits

3

Module code

TSM_CompAvi

Valid for academic year

2020-2021

Last modification

2019-10-06

Responsible of module

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Explanations regarding the language definitions for each location:

- Instruction is given in the language defined below for each location/each time the module is held.
- Documentation is available in the languages defined below. Where documents are in several languages, the percentage distribution is shown (100% = all the documentation).
- The examination is available 100% in the languages shown for each location/each time it is held.

	Winterthur			
Instruction	X E 100%			
Documentation	X E 100%			
Examination	X E 100%			

Module Category

TSM Technical scientific module

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences

Prerequisites, previous knowledge

Modelling methods

Brief course description of module objectives and content

Theory of complex systems and dynamics to understand challenges of markets and chances for new technologies, to identify niches for innovation in aviation and to handle complexity.

Risk management and decision making under uncertainty: Dealing with dilemmata

Methods for simplifying and communicating complexity.

Enhancement of collaboration to unfold interdisciplinary potentials: Develop a culture of learning and growth.

Enabling participation: Integrate multiple interest groups throughout the conception and design process.

Management of an innovation process: Learn from success and failure. Develop a business model for a new product/service. Predict near- and longterm development with modelling and scenario techniques to address uncertainty and risk.

Understand challenges for transformation (market pressures, legal aspects, certification requirements, public acceptance, organisational aspects, resistance to change). Manage change process.

Pitch: Elaboration and presentation of an innovative idea to a group of investors.

Aims, content, methods

Learning objectives and acquired competencies

Understand and enhance performance in complex systems. Cope with interdependence and insecurity. Develop new solutions in a complex market.

Assess potential for innovation: Take advantage of chances, avoid unnecessary risks.

Balance multiple requirements: technical, economic, human, environmental aspects and social acceptance.

Contents of module with emphasis on teaching content

Complex systems and system dynamics

Innovation and Entrepreneurship

Risk management and decision making under uncertainty

Teaching and learning methods

Case Studies

Modelling

Visualization and communication

Leadership and Self-Management

Literature

Assessment

Certification requirements

Module does not use certification requirements

Basic principle for exams

As a rule, all the standard final exams for modules and also all repetition exams are to be in written form

Standard final exam for a module and written repetition exam

Kind of exam

written

Duration of exam

120 minutes

Permissible aids

No aids permitted

Special case: Repetition exam as oral exam

Kind of exam

oral

Duration of exam

30 minutes

Permissible aids

No aids permitted