

**Module Description, available in: EN**

## *Market Analysis and Forecasting*

### General Information

**Number of ECTS Credits**

3

**Module code**

TSM\_MarkFor

**Valid for academic year**

2023-24

**Last modification**

2022-01-05

**Coordinator of the 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.

	Lausanne			Lugano	Zurich		
<b>Instruction</b>					X E 100%		
<b>Documentation</b>					X E 100%		
<b>Examination</b>					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**

Good knowledge of English.

Bachelor degree in Business Administration or Engineering.

### Brief course description of module objectives and content

A proper understanding of the current state and probable future development of a market is key to any successful business development. The module Market Analysis and Forecasting provides the foundations of analysis of complex socio-economic systems. It puts students in place to autonomously plan, design and execute their own qualitative and quantitative analysis. Development of well-founded forecasts and scenarios completes the understanding of customer data, markets and the socio-economic environment. Tools for the definition and the analysis of company reactions to potential future market scenarios will complete the module, allowing for transformation of market inputs into strategic choices.

## Aims, content, methods

### Learning objectives and acquired competencies

Students have the knowledge and the ability to understand and analyze a market as a complex socio-economic system. They are able to identify the most relevant factors determining the market behavior, to identify the causal relation between these factors and to describe socio-economic systems by means of qualitative modelling. Students understand and apply key concepts of the theory of complex systems such as observability, controllability, time variance or invariance, randomness or determinacy of factors, linear or nonlinear, static or dynamic behavior and their impacts on the overall system behavior. Students apply qualitative and quantitative methods for model validation, including basic behavior analysis and statistics. In practical examples they learn to analyze, predict and steer such systems. Finally students are able to present the analysis results in terms of descriptive scenarios using different visualization techniques.

### Contents of module with emphasis on teaching content

The module includes the following topics:

#### 1. Market modelling

- Understanding the market as a complex, socio-economic system
- Outlook: system modelling in a broader context
- Identification of key factors determining the dynamic, time variant and stochastic behavior of a market
- Systemic market analysis
- Experiencing complex market behavior, steering complex systems
- Model validation
- Developing scenarios describing the market future
- From qualitative to quantitative models
- Prospects and limits of modelling

#### 2. Case studies on quantitative statistical market modelling

- Data structuring and cleaning
- k-Means clustering for customer feedback analysis
- rfm segmentation for customer segmentation
- Linear-multiple and non-linear regression for demand forecasting
- Time series analysis for demand forecasting

The use and benefits of each discussed topic will be explained, methods for solving the analysis tasks will be presented in an accessible and non-technical manner. The focus will be on the validity and generalizability of the results/conclusions and how they will be included in decision making.

### Teaching and learning methods

The module is taught by theory inputs, case studies and a software tool.

### Literature

[1] Sterman, J. D. (2000). Business Dynamics. Systems Thinking and Modeling for a Complex World. Boston: McGraw-Hill. ISBN 978-0071241076. (Recommended.)

[2] Rob J. Hyndman, George Athanasopoulos, Forecasting: principles and practice, OTexts, 2013. The book is freely available as an online book at [www.otexts.org/fpp](http://www.otexts.org/fpp). Alternatively, a print version is available: ISBN # 0987507109. (Required.)

## Assessment

### Certification requirements

Module uses certification requirements

### Certification requirements for final examinations (conditions for attestation)

A project ('case study') to be compiled through independent study.

The case study report accounts for 1/3 of the final assessment.

## Basic principle for exams

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

## Standard final exam for a module and written resit exam

Kind of exam

written

Duration of exam

120 minutes

Permissible aids

*Aids permitted as specified below:*

Permissible electronic aids

No electronic aids permitted

Other permissible aids

Self-written summary of 4 pages A4.

## Special case: Resit exam as oral exam

Kind of exam

oral

Duration of exam

30 minutes

Permissible aids

No aids permitted