Program and Course Description

Global Foresight and Technology Management

Master of Science (M. Sc.)

Study and Examination Regulation: WS 2024/25

as per: 05.02.2025

Content

1 Overview

Name of the program	Global Foresight and Technology Management
Study type & degree	Consecutive Master of Science (full time)
First start date	WS 21/22; Start in every semester
Standard period of study	3 semesters (90 ECTS, 48 SWS)
Study location	THI-Campus in Ingolstadt
Language of instruction	English
Cooperation	None
Admission requirement	- Bachelor's degree at a German university with at least 210 ECTS credit points or an equivalent degree of a foreign university - Foreign applicants must submit their bachelor's degree to uni-assist which verifies their eligibility and coverts their grades to the German grade system. For detailed information see: https://www.thi.de/en/studies/application/masterapplication-from-abroad/ - Proof of English proficiency level B2 or higher (approved tests); compare: https://www.thi.de/en/university/university-profile/university-management/legal-department/general-statutes/
Capacity	60 students p.a. (in one winter- and one summer group)
Program director	Prof. Dr.-Ing. Schönmann, Alexander E-Mail: alexander.schoenmann@thi.de Phone: +49 (0) 841 / 9348-3509

2   Introduction

The text describes the current state of the program modules in the Master´s degree "Global Foresight and Technology Management" according to the "Study and Examination Regulation" (German: "Studien- und Prüfungsordnung") as of 19/02/2024.

Especially the "Program and Course Description" gives the objectives and content of the individual compulsory and elective modules and the breakdown of SWS (semester hours per week) per module and semester.

In case of doubt, the higher-ranking "Study and Examination Regulation" (German: "Studien- und Prüfungsordnung") has priority.

The following link leads to the "Study and Examination Regulation" (German: "Studien- und Prüfungsordnung)":

https://www.thi.de/en/university/university-profile/hochschulorganisation/legal-department/stat-utes-for-the-faculty-of-engineering-and-management/master-programmes-wi/statutes-master-global-foresight-technology-management/

2.1　Objectives

Due to the current dynamic changes in economy, technology and society the necessity of future skills increases significantly. Hence, the needed qualifications are on the one hand foresight research, development of strategies, innovation, business development and change management and on the other hand, skills to control these changes like corporate responsibility, technology assessment and business ethics.

The international master's degree „Global Foresight and Technology Management" with its unique position is the perfect answer to this requirement. The program is fully taught in English and welcomes both German and international students. It is designed as an interdisciplinary program at the interface of technology, economy and sociology with a strong focus on foresight.

2.2   Admission requirements

- Proof of Bachelor´s degree in engineering sciences, engineering and management, IT, natural sciences, economics, sociology and business administration or a degree in another related discipline at a German university with at least 210 ECTS credit points or an equivalent degree of a foreign university.

- All foreign applicants must submit their Bachelor's degree to uni-assist, which verifies their eligibility and coverts their grades to the German grade system. Uni-Assist will issue a so-called preliminary inspection documentation (VPD) which you must upload to the application portal (like their other documents).

  For detailed information please see: https://www.thi.de/en/studies/application/masterapplication-from-abroad

- Proof of English proficiency level B2 or higher (approved tests):

  https://www.thi.de/en/university/university-profile/university-management/legal-department/general-statutes/

The binding regulations for this curriculum can be found in:

- "Studien- und Prüfungsordnung (SPO)" for the Master´s degree "Global Foresight and Technology Management" as of 19/02/2024.

  https://www.thi.de/en/university/university-profile/hochschulorganisation/legal-department/statutes-for-the-faculty-of-engineering-and-management/master-programmes-wi/statutes-master-global-foresight-technology-management

- "Rahmenprüfungsordnung" (RaPO) [State Examination Regulations] of Technische Hochschule Ingolstadt.

- "Allgemeine Prüfungsordnung" (APO) [University Examination Regulations] of Technische Hochschule Ingolstadt.

- "Immatrikulationssatzung" [University Enrolment Statutes] of Technische Hochschule Ingolstadt.

The three general statutes/regulations can be found at the following link:

https://www.thi.de/en/university/university-profile/university-management/legal-department/general-statutes/

The sequence of studies is influenced by the regulations of "Studien- und Prüfungsordnung (SPO)".

2.3 Target group

The program addresses to:

- graduates of Bachelor programs or young professionals with a Bachelor´s degree in engineering sciences, engineering and management, IT, natural sciences, economics, sociology and business administration or a degree in another related discipline.

- prospective students with interest in interdisciplinary studies at the interface of technology, economy, and sociology with a strong focus on the current state of foresight research and challenges of the future.

- prospective students that prefer a Master´s program fully taught in English, like to gain intercultural experience, and go for an international career at home and abroad.

2.4   Structure of the programme

The degree program lasts three semesters. The first semester comprises four theoretical courses in combination with a practical project study to consolidate learning progress and the research methods course. The second semester basically has the same structure, but two compulsory elective subjects must be chosen to allow students to set their own individual focus. The Master's thesis is completed in the third semester.

1. **Semester**

   - Strategic Foresight and Trend Analysis
   - Technology Design and Evaluation
   - Transformation Processes and Change Management
   - Future Business Modelling
   - Research Methods
   - Project Future Life Worlds

2. **Semester**

   - Technology Assessment and Business Ethics
   - Innovation Management Methods
   - Project Business Scenarios and Risk Management
   - Scientific Research Seminar
   - Individual Elective 1
   - Individual Elective 2

3. **Semester**

   - Master Thesis

2.5 Prerequisites for advancement

To get the title of Master´s thesis requires that at least 30 ECTS be achieved in the sequence of study (compare "Studien- und Prüfungsordnung" as of 19/02/2024).

3   Qualification profile

The program is fully taught in English and welcomes both German and international students. It is designed as an interdisciplinary program at the interface of technology, economy and sociology with a strong focus on foresight.

Five clusters offer a maximum of interdisciplinarity:

- Cluster 1: Foresight
- Cluster 2: Technology
- Cluster 3: Economics
- Cluster 4: Social Aspects
- Cluster 5: Integrative
- Master's Thesis

The two elective subjects can be freely chosen from the three knowledge areas of Production, Engineering and/or Management or a subject which represents an interface of these knowledge areas.

Considering the specific objectives of the individual modules (see module descriptions in the next chapter), graduates are familiar with the engineering and management methods used in the field of Foresight, Technology Management and Business Development to work adequately.

The graduates can apply foresight methods, manage innovation processes, apply technology trends and assess them regarding the environment and society, form business models and evaluate trend scenarios.

The graduates can compile complex tasks within cross-functional and international teams, speak English fluently, work target-oriented and are able to present results.

Students are especially advised of language training opportunities at Technische Hochschule Ingolstadt.

3.1   Mission statement

The Master´s program integrates the mission statement in the following ways:

We prepare our students for the challenges of the future:

- The Master´s program creates future competence.

- It creates a spirit of innovation and teaches entrepreneurial thinking.

- It is an interdisciplinary program, which enables students to develop future-oriented solutions for interdisciplinary challenges.

- It qualifies students to help shape social changes such as the digital transformation and technological change. It sensitizes students to the sustainable use of the environment and resources, to socially responsible behavior and to social commitment.

We enable our students to develop solutions to problems based on scientific knowledge:

- The Master´s program includes a lot of project work. This enables students to acquire applicable problem-solving skills.

- The lecturers transfer their practical experience and teach academic knowledge. They are professionally competent, are constantly developing in their areas of expertise and contribute their research experience (four research professorships) to teaching.

- Students acquire professional, methodical, social- and self-competences.

We open outstanding regional and international perspectives for our students:

- The Master´s program is fully taught in English, addresses international students and creates intercultural competences.

- In this way, the program contributes to a cosmopolitan, international campus.

- Our numerous cooperations with companies in the region enable our students to start their careers in the best possible way, both regionally and internationally.

We teach and learn through personal exchange:

- Because this is a Master´s program, small groups and seminar-based forms of teaching are set to enable individual exchange with the students.

- The teaching concept offers digitalized courses (e. g. inverted classroom) in combination with many practical project studies to enhance the learning progress.

- The lecturers try out new ways of innovative and experimental teaching. For example, the first half of the semester concentrates on theoretical basics, the second half on practical application.

We help all students discover and realize their individual potential:

- The Master´s program includes a lot of project work. In joint project work, our students gain social skills such as the ability to cooperate and deal with conflict, and leadership skills.

- The Master´s program is international and intercultural. Hence, the program promotes performance in an appreciative cooperation. We meet each other with tolerance and openness and understand diversity as an opportunity to learn from each other and develop further.

3.2 Study objectives

3.2.1 Subject-specific competences of the study program

Professional competences

The graduates:

- can analyze trends and derive future developments.

- are familiar with modern technologies and can develop, evaluate, use and market modern technologies for specific applications.

- can develop forward-looking business models and evaluate them with business plans, calculate the advantages of different scenarios and have a basic understanding of the significance and opportunities of entrepreneurship.

- can identify the opportunities and risks of operational and social transformation processes and know the success factors and the roles of stakeholders in change management projects.

3.2.2 Interdisciplinary competences of the study programme

Methodical competences

The graduates are able to:

- work scientifically.
- plan, compile and lead projects.
- apply methods of foresight and methods of innovation and technology management, develop business models methodically, evaluate business scenarios, apply methods of change management, risk management and technology assessment.
- analyze interdisciplinary problems, recognize comprehensive correlations, transfer learned competences to new tasks and evaluate technical, economic and social impacts of compiled solutions.

Social competences

The graduates are able to:

- compile complex tasks in cross-functional, international teams, solve conflicts, lead teams.
- speak English fluently (incl. technical terms) and react sensitively in intercultural affairs.
- communicate their competences and communicate generally.
- convince and become accepted.

Personal competences

The graduates are able to:

- organize themselves and manage their time.
- have analytical and outcome-oriented intellectual power.
- work target-oriented and autonomously.
- present results and themselves.

3.2.3　Examination concept of the study program

The focus of the selection of examination forms is on the best possible assessment of the achievement of the set learning objectives - accordingly, there is a variety of different examination forms ranging from oral and written examinations, project work and study papers as well as presentations.

Projects are a focus in the program. In the projects, students learn to put theoretical knowledge into practice and to deepen it in a team. The examination form "project" is a group work to which each student must contribute individually and whose results are presented orally or in writing.

An overview of the examination concept is given below.

Module	Examination (German acronym)	Examination (English)
Strategic Foresight and Trend Analysis	mdlP	Oral examination
Technology Design and Evaluation	schrP	Written examination
Project Future Life Worlds	Proj	Project work
Future Business Modelling	schrP	Written examination
Transformation Processes and Change Management	StA	Student research project
Research Methods	mdlP	Oral examination
Technology Assessment and Business Ethics	mdlP	Oral examination
Innovation Management Methods	schrP	Written examination
Project Business Scenarios and Risk Management	Proj	Project work
Scientific Research Seminar	StA	Student research project
Individual Elective 1	LN	Performance certificate
Individual Elective 2	LN	Performance certificate
Master Thesis	MA	Master Thesis

For the form of examinations, please compare "Studien- und Prüfungsordnung", Appendix 1

https://www.thi.de/en/university/university-profile/hochschulorganisation/legal-department/statutes-for-the-faculty-of-engineering-and-management/master-programmes-wi/statutes-master-global-foresight-technology-management

Below is an overview of the different examination formats with German acronym (as used in the "Studien- und Prüfungsordnung"), the English translation and a description.

Acronym	English title	Description
schrP	Written examination	The written examination is a written examination lasting 90 minutes, unless explicitly stated otherwise.
mdlP	Oral examination	The oral examination is an interview lasting 15 minutes per person, unless explicitly stated otherwise.
prP	Practical examination	Based on "real actions" of the student, it should be demonstrated that the student has mastered the practical application of the competences taught. The practical examination lasts 15 minutes unless explicitly stated otherwise.
StA	Student research project	The student research project is a term paper without an oral presentation. A term paper comprises a minimum of 3000 to a maximum of 6000 words (approx. 10 to 20 pages: Word document approx. 8 to 15 pages or Power Point approx. 15 to 20 slides).
SA	Seminar paper	The seminar paper is a term paper with an oral presentation. A term paper comprises a minimum of 3000 to a maximum of 6000 words (approx. 10 to 20 pages: Word document approx. 8 to 15 pages or Power Point approx. 15 to 20 slides). The oral presentation has a total length of 15-20 minutes and can also take place during the semester.
LN	Evidence of academic achievement	The evidence of academic achievement can alternatively be a written examination, an oral examination, a term paper, a seminar paper or a project work. The details are specified by the Faculty Council in the module handbook.
Proj	Project work	The project work is a group assignment in which several students work on a joint task as a team and present the results orally and in writing. Each student must contribute individually to the joint task and deliver an oral presentation lasting 15 minutes. The written part has a length of approx. 5-25 pages.
MA	Master thesis	Written thesis in the master's degree program: Maximum processing time (= period between registration of the Master thesis and submission) of 6 months / length 60-80 pages
Coll	Colloquium	The colloquium is an oral examination lasting 10-15 minutes in which the student defends the results of his or her thesis.

3.2.4   Application of the study programme

Generally, all teachers have a long-standing background in the industry and/or an above-average academic qualification.

The THI founded an institute for foresight and technology research (Bavarian Foresight Institute). The institute is equipped with four research professorships. The institute creates a close link between teaching and research.

Experts from the industry review the concept of the master´s programme "Global Foresight and Technology Management".

During the first two semesters, three theoretical courses are taught in combination with two practical project studies to enhance the learning progress. Theoretical content is also explained in the theory modules using practical examples.

3.2.5   Contribution of individual modules to objectives of the program

Module	Profess. Comp.	Method. Comp.	Social Comp.	Personal Comp.
Strategic Foresight and Trend Analysis	++	++	o	o
Technology Design and Evaluation	++	+	o	+
Project Future Life Worlds	+	+	++	+
Transformation Processes and Change Management	++	++	o	o
Future Business Modelling	++	++	o	+
Research Methods	+	+	++	++
Technology Assessment and Business Ethics	++	+	o	o
Innovation Management Methods	++	++	o	+
Project Business Scenarios and Risk Management	+	+	++	+
Scientific Research Seminar	+	+	++	++
Electives	depends on the elective			
Master Thesis	+	++	++	++

3.3   Possible professional fields

There is a wide field of application in specialist or management roles in national or international companies and organizations.

Graduates are especially well prepared to take on specialist and management roles in the following areas:

- Project Management
- Product and Technology Management
- Customer-Technology-Competitor Foresight and Establishing Future Skills
- Creativity and Innovation Management
- Business Development/ Development of Trendsetting Business Models
- Entrepreneurship
- Sustainability

Graduates are also particularly well qualified for these tasks in an international context. Typical industries for the graduates of this program are:

- Mechanical and Electrical Engineering
- IT
- Mobility Industry
- Services
- Consultancy
- Education
- Cities and Communities

4 Description of Modules

4.1　Compulsory Modules

Strategic Foresight and Trend Analysis

Module abbreviation:	StratFor_M-GFT	SPO-No.:	1
Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)	Compulsory subject	1
Module attributes:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	winter and summer semester

Responsible for module:	Schwarz, Jan
Lecturers:	Schwarz, Jan
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self-study: 78 h Total effort: 125 h
Subjects of the module:	1: Strategic Foresight and Trend Analysis
Lecture types:	SU/Ü-Lecture with integrated exercises
Examinations:	mdlP - oral exam, 15 minutes Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

The students:
- understand the most important foresight methods and can distinguish and explain them.
- can apply the methods learned in case studies.
- can methodically analyse trends and derive future developments.
- are aware of challenges in future thinking and can address these.

Content:

- Customer-, technology-, and competitor-foresight
- Trend analysis and strategic early identification
- Visioning
- Strategic simulation methods
- Prognostic crowdsourcing

- Delphi method
- Scenario technique
- Trend receiver method
- Analysis of Science Fiction

Literature:

- ELLER, E., HOFMANN, R., SCHWARZ, J.O., 2020. The Customer Foresight Territory. In: *Marketing Review St Gallen*. (3), S.888–895.
- HEIJDEN, Kees van der, 2009. *Scenarios: the art of strategic conversation*. Chichester [u.a.]: Wiley. ISBN 0-470-02368-6, 978-0-470-02368-6
- KRUPP, Steven, Paul J. SCHOEMAKER und David J. TEECE, 2014. *Winning the long game: how strategic leaders shape the future*. New York: Public Affairs. ISBN 1-61039-447-X, 978-1-61039-447-5
- LIEBL, Franz, SCHWARZ, Jan Oliver, 2010. Normality of the Future: Trend Diagnosis for Strategic Foresight. In: *Futures*. (42 (4)), S.313-327.
- ORIESEK, Daniel F., SCHWARZ, Jan Oliver, 2021. *Winning the uncertainty game: turning strategic intent into results with wargaming* [online]. London; New York: Routledge PDF E-Book. ISBN 9781000289855, 9780367853594. https://doi.org/10.4324/9780367853594.
- ROHRBECK, René, MENES ETINGUE, Kum, 2018. Corporate Foresight and Its Impact on Firm Performance: A Longitudinal Analysis. In: *Technological Forecasting and Social Change.* Volume 129 (April), S.105-116. ISSN https://doi.org/10.1016/j.techfore.2017.12.013
- ROHRBECK, René, BATTISTELLA, Cinzia, HUIZINGH, Eelko, 2015. Corporate Foresight: An Emerging Field with a Rich Tradition. In: *Technological Forecasting & Social Change*. Volume 101 (December), S.1-9. ISSN https://doi.org/10.1016/j.techfore.2015.11.002
- ROHRBECK, René, SCHWARZ, Jan Oliver, 2013. The Value Contribution of Strategic Foresight: Insights from an Empirical Study of Large European Companies. In: *Technological Forecasting and Social Change*. Volume 80 (8), S.1593–1606. ISSN https://doi.org/http://dx.doi.org/10.1016/j.techfore.2013.01.004
- SCHOEMAKER, Paul J. und Robert E. GUNTHER, May 2013. *Profiting from uncertainty: strategies for succeeding no matter what the future brings*. New York: Atria Books. ISBN 978-1-5011-6175-9
- SCHWARZ, Jan Oliver, 2015. The 'Narrative Turn' in Developing Foresight: Assessing How Cultural Products Can Assist Organisations in Detecting Trends. In: *Technological Forecasting and Social Change*. (90 (Part B)), S.510–513. ISSN https://doi.org/http://dx.doi.org/10.1016/j.techfore.2014.02.024
- SCHWARZ, Jan Oliver, ROHRBECK, René, WACH, Bernhard, 2019. Corporate Foresight as a Microfoundation of Dynamic Capabilities. In: *FUTURES & FORESIGHT SCIENCE*. (e28). https://doi.org/10.1002/ffo2.28

Additional remarks:

No remarks.

Project Future Life Worlds

Module abbreviation:	Proj_FutLifWorld_M-GFT		SPO-No.:	2
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)		Compulsory subject	1
Module attributes:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	English		1 semester	winter and summer semester

Responsible for module:	Schwarz, Jan Oliver
Lecturers:	Schwarz, Jan Oliver
Credit points / SWS:	7 ECTS / 6 SWS
Workload:	Contact hours: 70 h Self-study: 105 h Total effort: 175 h
Subjects of the module:	2: Project Future Life Worlds
Lecture types:	S-Seminar
Examinations:	Proj – Project work (5-25 pages) and oral presentation (15 minutes) Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

The students
- can apply the learned foresight methods and methods of trend analysis in a comprehensive case study.
- know the performance and limits of the methods learned and can name them.
- can structure a foresight project.
- are aware of the challenges of foresight projects and how to address these.
- apply futures thinking in a foresight project.

Content:

- Application of foresight methods and methods of trend analysis within a project study based on examples
- Enhancement of the learning process through practical experiences
- Performance and limitations of different methods

Literature:
- BISHOP, Peter C., HINES, Andy, 2012. *Teaching about the future* [online]. Basingstoke: Palgrave Macmillan PDF E-Book. ISBN 978-1-137-02070-3. https://doi.org/10.1057/9781137020703.   - HINES, Andy und Peter C. BISHOP, 2015. *Thinking about the future: guidelines for strategic foresight*. Washington, DC: Social Technologies. ISBN 978-0-9967734-0-9   - ROHRBECK, René, 2010. *Corporate foresight: towards a maturity model for the future orientation of a firm*. Berlin [u.a.]: Physica Verlag, ISBN 978-3-7908-2827-6, 978-3-7908-2625-8   - ROHRBECK, René, BATTISTELLA, Cinzia, HUIZINGH, Eelko, 2015. Corporate Foresight: An Emerging Field with a Rich Tradition. In: *Technological Forecasting and Social Change 101*. (12), S.1-9. ISSN https://doi.org/10.1016/j.techfore.2015.11.002   - ROHRBECK, René, SCHWARZ, Jan Oliver, 2013. The Value Contribution of Strategic Foresight: Insights from an Empirical Study of Large European Companies. In: *Technological Forecasting and Social Change 80 (8)*. , S.1593-1606. ISSN https://doi.org/http://dx.doi.org/10.1016/j.techfore.2013.01.004   - DE TONI, Alberto F., SIAGRI, Roberto, BATTISTELLA, Cinzia, CREMONESE, Lidia, 2021. *Corporate foresight: anticipating the future* [online]. London and New York: Routledge, Taylor & Francis Group PDF e-Book. ISBN 9781003099239. Link: https://doi.org/10.4324/9781003099239.
Additional remarks:
No remarks.

Technology Design and Evaluation

Module abbreviation:	TechDesEva_M-GFT	SPO-No.:	3
Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)	Compulsory subject	1
Module attributes:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	winter and summer semester

Responsible for module:	Schönmann, Alexander
Lecturers:	Schönmann, Alexander
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self-study: 78 h Total effort: 125 h
Subjects of the module:	3: Technology Design and Evaluation
Lecture types:	SU/Ü-Lecture with integrated exercises
Examinations:	schrP90 - written exam, 90 minutes Requirements: None
Usability for other study programs:	Please see the subject recognition list of the SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

After attending the course, the students will have the following knowledge:
- know modern technologies and technology trends and can name them
- know important methods of technology management and can explain them
- can develop new technologies, evaluate them, use them for specific applications and market them
- know how to manage R&D processes

Content:

- Modern technologies and technology trends
- Organisation and role of Technology Management
- Technology Dynamics (Lifecycle models)
- Technology Intelligence (Technology scanning, Technology monitoring, Technology scouting, Technology identification, search field description)
- Technology information sources (formal, informal sources)

- Technology evaluation (maturity, potential, economic efficiency, Technology portfolio analysis)
- Technology planning (Roadmaps)
- R&D Management
- Technology development (Technology Stage Gate)
- Application-specific selection of adequate technologies
- Linking Technology development and Product development processes
- New Product development: Development strategies and degree of newness; "Valley of death"
- Product Development processes: e.g. V-Model, Spiral model, Lean Start-up, Trends in process design
- Quality Function Deployment
- Product Architecture: functional and physical elements (differential design vs. integral design), Types of modularity
- Role of design in the development process (e.g. DFX)
- Technology exploitation strategies
- Technology protection
- Case studies and Industry examples on latest trends and technologies

Literature:

- TROTT, Paul, 2021. *Innovation management and new product development*. Harlow, England: Pearson. ISBN 978-1-292-25152-3
- SCHUH, Günther, 2011. *Technologiemanagement* [online]. Berlin [u.a.]: Springer PDF E-Book. ISBN 978-3-642-12529-4, 978-3-642-12530-0. https://doi.org/10.1007/978-3-642-12530-0.
- KARAOMERLIOGLU, Dilek Cetindamar, Robert PHAAL und David PROBERT, 2016. *Technology management: activities and tools*. New York, NY: Palgrave Macmillan. ISBN 978-1-137-43185-1
- SAVIOZ, Pascal, 2004. *Technology Intelligence: Concept Design and Implementation in Technology Based SMEs*. Softcover reprint of the original 1. Edition. London: Palgrave Macmillan UK. ISBN 978-1-349-51002-3, 1-349-51002-5
- ULRICH, Karl T., Steven D. EPPINGER und Maria C. YANG, 2020. *Product design and development*. New York, NY: McGraw-Hill. ISBN 978-1-260-56643-7, 1-260-56643-9
- MARITAN, Davide, 2015. *Practical Manual of Quality Function Deployment* [online]. Cham [u.a.]: Springer International Publishing PDF e-Book. ISBN 978-3-319-08521-0, 978-3-319-08520-3. https://doi.org/10.1007/978-3-319-08521-0.
- EVERS, Natasha, James S. CUNNINGHAM und Thomas HOHOLM, 2021. *Technology entrepreneurship: bringing innovation to the marketplace*. London: Red Globe Press. ISBN 978-1-352-01117-3

Additional remarks:

A voluntary bonus system is offered: In the course, topics on methods of technology management are offered for individual processing and presentation, which lead to bonus points for the examination performance for each qualitatively processed task. The creditability as well as maximum crediting of bonus points takes place according to the APO.

Lectures contain digital learning elements for self-study, such as learning videos or meetings via web conferences.

The examination can be held in digital form on a PC at the university campus.

Transformation Processes and Change Management

Module abbreviation:	TrProChanMana_M-GFT	**SPO-No.:**	4
Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)	Compulsory subject	1
Module attributes:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	winter and summer semester

Responsible for module:	Bechthold, Laura
Lecturers:	Bechthold, Laura
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self-study: 78 h Total effort: 125 h
Subjects of the module:	4: Transformation Processes and Change Management
Lecture types:	SU/Ü-Lecture with integrated exercises
Examinations:	StA - student research project, written elaboration 8-15 pages, presentation 15-20 slides Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Center).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

After attending the course, the students:

- know basics of systems thinking and apply this knowledge on different levels (e.g., transformation of sociotechnical systems, organizations, or teams).
- can recognize wicked problems and know how to manage them.
- can define and explain the concept of sociotechnical systems and related transformation pathways.
- know how to design transition processes for sociotechnical systems.
- understand the principles and process of transformation and change processes within organizations.
- know how to approach and orchestrate transformation processes from a managerial perspective.
- understand and can critically reflect current trends in organizational design and related management approaches (e.g., organizational ambidexterity and objective and key results).
- understand the psychological dynamics and cognitive biases in transformation processes.

- understand the relevance of stakeholder inclusion and know how to leverage participatory methods to foster strategic decision-making that is inclusive and aligned with organizational change objectives.
- can anticipate opportunities and risks of operational and social transformation processes.
- know principles and practices of successful leadership in transformation processes.

Content:

The course is structured in two overarching blocks:

Block I: The transformation of socio-technical systems

- Wicked problems
- Fundamentals of systems thinking (including workshop on agent-based models)
- Sociotechnical systems and their transition pathways
- Transition Design

Block II: The transformation of organizations

- Types and processes of organizational transformation processes
- Stakeholder theory and participatory methods
- Current trends in organizational design and how to implement them
- Current trends in organizational leadership and how to implement them
- Leadership in change and transformation processes
- Dealing with conflicting goals and team dynamics during change processes.

The second part of the course is complemented by an in-class simulation game to transform a fictitious company.

Literature:

- BECHTHOLD, L., M. LUDE und R. PRÜGL, 2021. Crisis Favors the Prepared Firm: How Organizational Ambidexterity Relates to Perceptions of Organizational Resilience. In: Glowka, G. ZEHRER, A., Hrsg., *Resiliency Models and Addressing Future Risks for Family Firms in the Tourism Industry*, S. 178-205.
- GEELS, F. W., 2002. Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study. In: *Research Policy*. 31(8), S.1257–1274.
- GEELS, F. W., SCHOT, J., 2007. Typology of sociotechnical transition pathways. In: *Research Policy*. 36(3), S.399–417.
- KOTTER, J. P., 1995. Leading Change: Why Transformation Efforts Fail. In: *Harvard Business Review*.
- O'REILLY, C. A., TUSHMAN, M. L., 2013. Organizational Ambidexterity: Past, Present, and Future. In: *Academy of Management Perspectives*. 27 (4), S.324–338.
- CAMILLUS, John C., 2008. Strategy as a Wicked Problem. In: *Harvard Business Review*, S.99 - 106.
- GEELS, F. W., 2011. The multi-level perspective on sustainability transitions: Responses to seven criticisms. In: *Environmental Innovation and Societal Transitions*. 1(1), S.24–40.
- OSSENBRINK, J., HOPPMANN, J., HOFFMANN, V. H., 2019. Hybrid ambidexterity: How the environment shapes incumbents' use of structural and con-textual approaches. In: *Organization Science*. 30(6)
- HEALY, P. M., 2017. Case study: How much should a new CEO shake things up? In: *Harvard Business Review*. 2017 (January-February), S.2–8.
- MOSS KANTER, Rosabeth, 2012. Ten Reasons People Resist Change. In: *Harvard Business Review*. 2012

Additional remarks:

A voluntary bonus system is offered: In the course, topics on methods and tools of transformation processes are offered for individual processing and presentation, which lead to bonus points for the examination performance for each qualitatively processed task. The creditability as well as maximum crediting of bonus points takes place according to the APO.

Future Business Modelling

Module abbreviation:	FuBuMo_M-GFT		SPO-No.:	5
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)		Compulsory subject	1
Module attributes:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	English		1 Semester	winter and summer semester

Responsible for module:	Wrobel-Wache, Stefanie
Lecturers:	Wrobel-Wache, Stefanie
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self-study: 78 h Total effort: 125 h
Subjects of the module:	5: Future Business Modelling
Lecture types:	SU/Ü-Lecture with integrated exercises
Examinations:	schrP90 - written examination, 90 Minuten Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

The students

- are familiar with entrepreneurship-related theories, models, and ideas, and can reflect on what entrepreneurship is and what it means to develop an entrepreneurial mindset and culture.
- know and can discuss the relationship and meaning of technological, social and environmental trends and scenarios regarding business model development and innovation as well as the meaning of sustainability in the context of business development and risk management.
- are familiar with digital, sustainable, disruptive and forward-looking business models, can explain the special features of each and give examples of successful business models.
- know concepts of organisational resilience and can explain and discuss resilience in the context of entrepreneurship, business success and business modelling.
- know the entrepreneurship process, business modelling tools and key factors of successful business models.
- are able to develop future oriented business models by using different tools and methods.

- know the meaning of uncertainty for corporates and entrepreneurs and approaches and methods to deal with uncertainty in the business context.
- know the requirements for risk management and the four phases of risk management.
- can apply selected risk management tools and methods in the context of future oriented business modelling and develop an enterprise risk management system.
- can evaluate business models qualitatively and quantitively.

Content:

General introduction

- Business Development, sustainability and future orientation of corporates

Introduction into Entrepreneurship

- Development of entrepreneurship as a research discipline
- Types of entrepreneurship
- Entrepreneurial mindset and culture
- Entrepreneurship process
- Business opportunities

Future oriented business modelling and business modelling tools

- Types of different business models (social, sustainable, digital, disruptive business models, business model patterns)
- Sources of business ideas, ideation, ideation tools
- Business modeling, business model innovation
- Business model evaluation
- Business planning
- Aspects of finance and accounting
- Risk management

Business environment and business organization

- Economic systems
- Technical, social and environmental environment
- Traditional and alternative business forms

Trends in entrepreneurship

- Dealing with global challenges, megatrends, VUCA and uncertainty (design thinking, lean startup approach, effectuation)
- Data driven business models
- Disciplined entrepreneurship

Literature:

- GEDEON, S., 2010. What is entrepreneurship? In: *Entrepreneurial Practice Review*. 1(3), S.16-35.
- GASSMANN, Oliver, Karolin FRANKENBERGER und Michaela CHOUDURY, 2020. *The business model navigator: the strategies behind the most successful companies*. Harlow, England: Pearson. ISBN 978-1-292-32712-9, 1-292-32712-X
- OSTERWALDER, Alexander und Yves PIGNEUR, 2010. *Business model generation: a handbook for visionaries, game changers, and challengers*. Hoboken, NJ: Wiley. ISBN 978-0-470-87641-1, 0-470-87641-7
- RIES, Eric, 2019. *The lean startup: how constant innovation creates radically successful businesses*. London [u.a.]: Penguin Business. ISBN 978-0-670-92160-7
- SARASVATHY, Sara, 2001. Causation and effectuation: Toward a theoretical shift from economic in-evitability to entrepreneurial contingency. http://entrepreneurscommunicate.pbworks.com/f/2001_Sarasvathy_Causation+adn+effectuation.pdf. In: *Academy of Management Review*. 26(2), S.243-263.

- HAHN, Rüdiger, 2022. *Sustainability management: global perspectives on concepts, instruments, and stakeholders*. Fellbach: Rüdiger Hahn. ISBN 978-3-9823211-0-3, 3-9823211-0-7
- DUCHNEK, Stephanie, 2020. Organizational resilience: a capability-based conceptualization. In: *Business Research*. (13), S.215-246.
- AULET, Bill, 2013. *Disciplined entrepreneurship: 24 steps to a successful startup*. Hoboken, NJ: Wiley. ISBN 978-1-118-69228-8, 978-1-118-72088-2
- HUNZIKER, Stefan, 2021. *Enterprise Risk Management: Modern Approaches to Balancing Risk and Reward* [online]. Wiesbaden: Springer Gabler PDF e-Book. ISBN 978-3-658-33523-6. https://doi.org/10.1007/978-3-658-33523-6.
- OSTERWALDER, Alexander und andere, 2014. *Value proposition design: how to create products and services customers want*. Hoboken, NJ: Wiley. ISBN 978-1-118-96805-5, 1-118-96805-0
- SCHIRMER, J., R. EBER und I. BOURDON, 2021. 32 ways to innovate business models through data: Emerging data-driven solution business model patterns from a study of 471 late-stage data-driven startups. (https://scholarspace.manoa.hawaii.edu/handle/10125/71226). In: *Proceedings of the 54th Hawaii International Conference on System Sciences*, S. 4996-5005.
- UEBERNICKEL, Falk und andere, 2020. *Design thinking: the handbook*. Singapore: World Scientific. ISBN 978-981-120-214-8, 978-981-12-0350-3
- VANINI, Ute, RIEG, Robert, 2021. *Risikomanagement: Grundlagen - Instrumente - Unternehmenspraxis* [online]. Stuttgart: Schäffer-Poeschel Verlag PDF e-Book. ISBN 978-3-7910-4527-6, 978-3-7910-4526-9. https://doi.org/10.34156/9783791045269.
- BULIGA, Oana, SCHEINER, Christian W., VOIGT, Kai-Ingo, 2016. Business model innovation and organizational resilience: towards an integrated conceptual framework. In: *J Bus Econ (2016) 86*, S.647–670.
- SOLTANIFAR, Mariusz, HUGHES, Matthew, GÖCKE, Lutz, 2021. *Digital entrepreneurship: impact on business and society* [online]. Cham, Switzerland: Springer PDF e-Book. ISBN 978-3-030-53914-6. Link: https://doi.org/10.1007/978-3-030-53914-6.
- ZUCCHELLA, Antonella, URBAN, Sabine, 2019. *Circular Entrepreneurship: Creating Responsible Enterprise* [online]. Cham: Palgrave Macmillan PDF e-Book. ISBN 978-3-030-18999-0. Link: https://doi.org/10.1007/978-3-030-18999-0.

Additional remarks:

Additional literature and self-study resources will be announced and provided throughout the course.

Research Methods

Module abbreviation:	ReMe_M-GFT	SPO-No.:	6
Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)	Compulsory subject	1
Module attributes:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	winter and summer semester

Responsible for module:	Bechthold, Laura
Lecturers:	Kleine, Katharina; Robitschko, Simone
Credit points / SWS:	3 ECTS / 2 SWS
Workload:	Contact hours: 24 h Self-study: 51 h Total effort: 75 h
Subjects of the module:	6: Research Methods
Lecture types:	SU/Ü - Lecture with integrated exercises
Examinations:	mdlP - oral exam, 15 minutes Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

After attending the course, the students

- can perform literature reviews and evaluate scientific articles.
- understand different scientific research designs and can critically assess them.
- understand correct ways to refer to and cite from scientific literature.
- understand selected qualitative research methods, specifically interview studies and qualitative content analysis.
- understand selected quantitative methods, specifically survey and experimental research, as well as related statistical analysis.
- can develop and present research designs in a scientific presentation.
- can organise themselves and manage their time as well as work in a goal-oriented and independent manner.

Content:

- Research design
- Literature search and review
- Scientific presentations
- Critical scientific review
- Data types and data collection techniques
- Overview of best practices and current tools for conducting effective literature reviews (data bases, working with citation programs, literature mapping tools)
- Quantitative and qualitative methods and data analysis
- Research integrity

Literature:

- DENSCOMBE, Martyn, 2021. *The good research guide: research methods for small-scale social research projects*. London: McGraw-Hill Open University Press. ISBN 978-0-335-24983-1, 0-335-24983-3
- OSMOND, Alex, 2016. *Academic writing and grammar for students*. London: Sage Publications Ltd. ISBN 978-1-4739-1935-8, 978-1-4739-1936-5
- SIDDONS, Suzy, 2008. *The complete presentation skills handbook: how to understand and reach your audience for maximum impact and success*. London: Kogan Page. ISBN 978-0-7494-5037-3, 0-7494-5037-1
- GLASMAN-DEAL, Hilary. *Science research writing: for native and non-native speakers of English [online]* [online]. New Jersey; London; Singapore; Beijing; Shanghai; Hong Kong; Taipei; Chennai; Tokyo: World Scientific PDF E-Book. Verfügbar unter: https://doi.org/10.1142/q0232

Additional remarks:

Additional literature and web-based self-study resources will be provided throughout the course.

Technology Assessment and Business Ethics

Module abbreviation:	TechAssBusEth_M-GFT		SPO-No.:	9
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)		Compulsory subject	2
Module attributes:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	English		1 semester	winter and summer semester

Responsible for module:	Bechthold, Laura
Lecturers:	Bechthold, Laura
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self-study: 78 h Total effort: 125 h
Subjects of the module:	9: Technology Assessment and Business Ethics
Lecture types:	SU/Ü-Lecture with integrated exercises
Examinations:	mdlP - oral exam, 15-20 minutes Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

After attending the course, the students are able to:

- define and explain the concept, principles, and process of technology assessment.
- define and explain the concepts of business ethics and technology ethics.
- compare different methods of technology assessment and evaluate their suitability for different purposes.
- know how to incorporate ethical considerations and stakeholder perspectives into strategic decision-making processes.
- apply methods of ethical technology foresight to evaluate societal and environmental risks and opportunities related to emerging technologies.
- critically reflect on and discuss emerging technologies regarding uncertainties, ambiguities, cognitive biases, and controversies based on different schools of moral reasoning.

- apply frameworks for responsible innovation to ensure the ethical development and application of new technologies.
- define and explain the concept of corporate digital responsibility and understand related tasks from a managerial perspective.
- understand the tasks and importance of compliance and integrity leadership to foster ethical behavior in organizations.

Content:

- Concept, history, and relevance of technology assessment
- Concept and relevance of business ethics and technology ethics
- Fundamental principles of technology assessment (e.g., precautionary principle)
- Qualitative, quantitative, and experimental designs for technology assessment
- Methods of ethical foresight for emerging technologies
- The relevance of unconscious biases and noise in the digital world
- Schools of moral reasoning: Universalism, utilitarianism, rights-based approaches, fairness approaches, virtue ethics
- Frameworks for ethical leadership, decision making and responsible innovation (e.g., the Ethical Cycle)
- Frameworks for corporate ethics and digital responsibility, as well as related compliance processes
- The curriculum is supplemented by case studies and in-class debates on controversial emerging technologies (exemplary topics are cryptocurrency, biohacking, deep fakes, geo-engineering, and robot-human-interaction).

Literature:

- FLORIDI, L., STRAIT, A., 2020. Ethical Foresight Analysis: What it is and why it is Needed? In: *Minds and Machines*. 30(11), S.77–97. ISSN 0924-6495
- HALEEM, A., MANNAN, B., LUTHRA, S., KUMAR, S., KHURANA, S., 2019. Technology forecasting (TF) and technology assessment (TA) methodologies: a conceptual review. In: *Benchmarking: An International Journal*. 26(1), S.48–72. ISSN 1463-5771
- HAUGH, T., 2017. The Trouble with Corporate Compliance Programs. In: *MIT Sloan Management Review*. 2017 (Fall Issue)
- NAZARKO, L., 2017. Future-Oriented Technology Assessment. In: *Procedia Engineering*. 182, S.504–509. ISSN 1877-7058
- VAN DE POEL, I., ROYAKKERS, L., 2007. The Ethical Cycle. In: *Journal of Business Ethics*. 71(1), S.1-13.
- KRAEMER, F., VAN OVERVELD, K., PETERSON, M., 2011. Is there an ethics of algorithms? In: *Ethics and Information Technology*. 13(3), S.251–260. ISSN 1572-8439
- DAVIS, F. D., 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. In: *MIS Quarterly*. 13(3), S.319-340. ISSN 0276-7783
- LUCIVERO, F., SWIERSTRA, T., BOENINK, M., 2011. Assessing Expectations: Towards a Toolbox for an Ethics of Emerging Technologies. In: *NanoEthics*. 5(2), S.129-141. ISSN 1871-4765
- VENKATESH, V., BALA, H., 2007. Technology Acceptance Model 3 and a Research Agenda on Interventions. In: *Decision Sciences*. 39(2), S.273–315.
- BOYD, D., CRAWFORD, K., 2012. Critical questions for big data. In: *Information, Communication & Society*. 15(5), S.662–679.
- LOBSCHAT, L., MUELLER, B., EGGERS, F., BRANDIMARTE, L., DIEFENBACH, S., KROSCHKE, M., WIRTZ, J., 2021. Corporate digital responsibility. In: *Journal of Business Research*. 122, S.875-888.
- MARTIN, K., 2019. Ethical Implications and Accountability of Algorithms. In: *Journal of Business Ethics*. 160(4), S.835-850.
- PALM, E., HANSSON, S. O., 2006. The case for ethical technology assessment (eTA). In: *Technological Forecasting and Social Change*. 73(5), S.543-558.
- TADDEO, M., FLORIDI, L., 2018. How AI can be a force for good. In: *Science*. 361(6404), S.751–752.

•   WESSEL, M., 2020. A Crisis of Ethics in Technology Innovation. In: *MIT Sloan Review*. 61(3)
Additional remarks:
An additional selection of readings (articles and case studies) on current emerging technologies will be handed out at the beginning of the semester.
A voluntary bonus system is offered: In the course, topics on methods and tools of transformation processes are offered for individual processing and presentation, which lead to bonus points for the examination performance for each qualitatively processed task. The creditability as well as maximum crediting of bonus points takes place according to the APO.

Innovation Management Methods

Module abbreviation:	InnoMaMeth_M-GFT	**SPO-No.:**	10
Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)	Compulsory subject	2
Module attributes:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	winter and summer semester

Responsible for module:	Schönmann, Alexander
Lecturers:	Schönmann, Alexander
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self-study: 78 h Total effort: 125 h
Subjects of the module:	10: Innovation Management Methods
Lecture types:	SU/Ü-Lecture with exercises
Examinations:	schrP90 - written exam, 90 minutes Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

After attending the course, the students will have the following knowledge:

- know modern methods for the creation, management and marketing of innovations and can explain them.
- can propose appropriate innovation models based on industry and company size.
- can name sources of innovation and know where and how to get inspiration.
- design the implementation of workshops for eliciting requirements for product development.
- know types of innovation processes and know how to design an innovation process.

Content:

- Innovation Management and types of innovation
- Component and architectural innovation
- Sources of discontinuity
- Patterns of innovation and lifecycle models (S-curve, Disruptive innovation, Hype Cycle)

- Traditional and modern models of innovation (Technology Push, Market Pull, dominant design, interactive model, coupling model, networking model, Triple-Helix model, Quad-Helix model)
- Open Innovation
- Frugal Innovation
- Reverse innovation
- Design-driven innovation
- New Service Innovation
- Lean Start-up
- Lean Innovation
- Value Innovation (Value Curve, Strategy Canvas)
- Product-Service-Systems (PSS)
- Market and customer research methods
- Innovation process design (linear Departmental-stage models, phase-review, simultaneous and concurrent process design, Lean Innovation)
- Stage-Gate-Process (Traditional Stage-Gate, Scalable Stage-Gate, next generation agile Stage-Gate)
- Creativity methods and tools for ideation and problem-solving questioning techniques (e.g. 5 Whys), Method of Focal Objects, Brainstorming, Idea Box/Morphological analysis, Six Thinking Hats, Inside-Out process
- Product Concept Generation: Need, Form, Technology, Business model
- Business Model Archetypes
- Sustainable Innovation
- Testing and Validation
- Agile management of innovation processes and projects
- Diffusion and marketing of innovations
- Case studies and industry examples on latest trends and technologies

Literature:

- TROTT, Paul, 2021. *Innovation management and new product development*. Harlow, England: Pearson. ISBN 978-1-292-25152-3
- TIDD, Joseph und John R. BESSANT, 2021. *Managing innovation: integrating technological, market and organizational change*. Hoboken, NJ: Wiley. ISBN 978-1-119-71330-2
- BIAZZO, Stefano, FILIPPINI, Roberto, 2021. *Product Innovation Management: Intelligence, Discovery, Development* [online]. Cham: Springer PDF E-Book. ISBN 978-3-030-75011-4. https://doi.org/10.1007/978-3-030-75011-4.
- KARAOMERLIOGLU, Dilek Cetindamar, Robert PHAAL und David PROBERT, 2016. *Technology management: activities and tools*. New York, NY: Palgrave Macmillan. ISBN 978-1-137-43185-1
- DORF, Richard C., 1999. *The technology management handbook*. Heidelberg: Springer. ISBN 3-540-64814-3
- SCHRAMM, Laurier L., 2018. *Technological innovation: an introduction* [online]. Berlin; Boston: De Gruyter PDF E-Book. ISBN 978-3-11-042919-0. https://doi.org/10.1515/9783110429190.
- BESSANT, John R. und Joseph TIDD, 2015. *Innovation and entrepreneurship*. Chichester: Wiley. ISBN 978-1-118-99309-5, 978-1-119-08943-8
- SCHILLING, Melissa A., 2020. *Strategic management of technological innovation*. New York, NY: McGraw-Hill Education. ISBN 978-1-260-56579-9
- CHEN, Jin, BREM, Alexander, VIARDOT, Eric, WONG, Poh-Kam, 2019. *The Routledge companion to innovation management* [online]. London; New York: Routledge PDF E-Book. ISBN 978-1-315-27667-0. https://routledgehandbooks.com/doi/10.4324/9781315276670.

Additional remarks:
A voluntary bonus system is offered: In the course, topics on methods of innovation management are offered for individual processing, which lead to bonus points for the examination performance for each qualitatively processed task. The creditability as well as maximum crediting of bonus points takes place according to the APO.
Lectures contain digital learning elements for self-study, such as learning videos or meetings via web conferences.
The examination can be held in digital form on a PC at the university campus.

Project Business Szenarios and Risk Management

Module abbreviation:	PjBusSzenRisMana_M-GFT	SPO-No.:	11
Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)	Compulsory subject	2
Module attributes:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	winter and summer semester

Responsible for module:	Wrobel-Wache, Stefanie
Lecturers:	Wrobel-Wache, Stefanie
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self-study: 78 h Total effort: 125 h
Subjects of the module:	11: Project Business Szenarios and Risk Management
Lecture types:	S-Seminar
Examinations:	Proj - project work (5-25 pages) and oral presentation (15 minutes) Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

The students

- can carry out trend analyses, identify business risks and opportunities, risk identification and assessment.
- can set up and evaluate scenarios and business models in a complex case study by using theoretical knowledge (scenario technique, business modeling).
- can qualitatively and quantitively evaluate these different scenarios, risks, business opportunities and business models.
- can make recommendations for strategic risk management and/or business model innovation.
- improve their skills in working autonomously and developing solutions to individual complex problems from business environment.
- can organize and structure themselves and their resources in a complex project.

- improve their communication and presentation skills regarding different stakeholders (e.g. from science, economics, communities).
- learn to work in a team, to organize teamwork and to solve conflicts in the team.

Content:

- Analysis of relevant technological, economic, social and environmental trends and specific challenges
- Scenario and business model development
- Risk identification, assessment and management through risk mitigation strategies, product/service and/or business model innovation
- Quantitative and qualitative evaluation of the results
- Enhancement of the learning process through practical experiences
- Presentation of the results

Literature:

- GASSMANN, Oliver, Karolin FRANKENBERGER und Michaela CHOUDURY, 2020. *The business model navigator: the strategies behind the most successful companies*. Harlow, England: Pearson. ISBN 978-1-292-32712-9, 1-292-32712-X
- HUNZIKER, Stefan, 2021. *Enterprise Risk Management: Modern Approaches to Balancing Risk and Reward* [online]. Wiesbaden: Springer Gabler PDF E-Book. ISBN 978-3-658-33523-6. Link: https://doi.org/10.1007/978-3-658-33523-6.
- HEIJDEN, Kees van der, 2009. *Scenarios: the art of strategic conversation*. Chichester [u.a.]: Wiley. ISBN 0-470-02368-6, 978-0-470-02368-6
- MARTHALER, Florian und andere, 2020. An explorative approach to deriving future scenarios: A first comparison of the consistency matrix-based and the catalogue-based approach to generating future scenarios. In: Mpofu Butala MPOFU BUTALA, Hrsg., *Procedia CIRP - Enhancing design through the 4th Industrial Revolution Thinking*, S. 883-892.
- WILLIAM R., Huss, HONTON, E. J., 1987. Alternative Methods for Developing Business Scenarios. In: *Technological Forecasting and Social Change*. (31), S.219-238.
- CORDOVA-POZO, Kathya, ROUWETTE, Etienne A.J.A., 2023. Types of scenario planning and their effectiveness: A review of reviews. In: *Futures 149*, S.103-153. ISSN 0016-3287
- RANDT, Niclas P., 2015. An approach to product development with scenario planning: The case of aircraft design. In: *Futures*. 71, S.11-28. ISSN 1873-6378
- AMER, Muhammad, DAIM, Tugrul U., JETTER, Antonie, 2013. A review of scenario planning. In: *Futures*. (46), S.23-40.

Additional remarks:

Recommended literature is analogue to the modules Future Business Modeling and Strategic Foresight and Trend Analysis. Additional literature is depending on the specific project and project partner and will be provided throughout the course.

Scientific Research Seminar

Module abbreviation:	SciResSem_M-GFT		SPO-No.:	12
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)		Compulsory subject	2
Module attributes:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	English		1 semester	winter and summer semester

Responsible for module:	Bechthold, Laura
Lecturers:	Jovanovic, Milos; Kleine, Katharina
Credit points / SWS:	5 ECTS / 2.5 SWS
Workload:	Contact hours: 30 h Self-study: 95 h Total effort: 125 h
Subjects of the module:	12: Scientific Research Seminar
Lecture types:	S-Seminar
Examinations:	StA - Student research project, written elaboration 8-15 pages, presentation 15-20 slides Requirements: None
Usability for other study programs:	Please see the subject recognition list of SCS (Study Service Centre).

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

After attending the course, the students

- can plan, implement and manage a research project, including the development of a research question and hypotheses.
- apply selected qualitative research methods, specifically interview studies and qualitative content analysis.
- apply selected quantitative methods, specifically survey and experimental research, as well as related statistical analysis, and can apply them to data evaluation in research projects.
- can analyze interdisciplinary problems, recognize correlations, transfer learned competences to new problems and evaluate developed solutions technically, economically and socially.
- can present work results in a scientific presentation and scientific paper or poster.
- have improved their skills in English writing for scientific purposes.

• can work on complex tasks in cross-functional and international teams, solve conflicts in the team and take over team leadership.

Content:

• Carrying out a complex interdisciplinary research project within small teams regarding technology development, economy, and society
• Research design
• Literature search and review
• Scientific writing and scientific presentations
• Application of quantitative and qualitative methods and data analyses
• Research integrity
• Autonomous processing applying scientific methods and acquired skills
• Discussion, presentation, and documentation of the project results according to scientific standards.

Literature:

• DENSCOMBE, Martyn, 2021. *The good research guide: research methods for small-scale social research projects*. London: McGraw-Hill Open University Press. ISBN 978-0-3352-4983-1
• OSMOND, Alex, 2016. *Academic writing and grammar for students*. London: Sage Publications Ltd. ISBN 978-1-4739-1935-8, 978-1-4739-1936-5
• SIDDONS, Suzy, 2008. *The complete presentation skills handbook: how to understand and reach your audience for maximum impact and success*. London: Kogan Page. ISBN 978-0-7494-5037-3, 0-7494-5037-1
• GLASMAN-DEAL, Hilary, 2021. *Science research writing: for native and non-native speakers of English* [online]. New Jersey; London; Singapore; Beijing; Shanghai; Hong Kong; Taipei; Chennai; Tokyo: World Scientific PDF e-Book. ISBN 978-1-78634-833-3, 978-1-78634-834-0. https://doi.org/10.1142/q0232.

Additional remarks:

Additional literature and self-study resources will be provided throughout the course.

Master Thesis

Module abbreviation:	Ma-Thesis-GFTM	SPO-No.:	13
Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 24/25)	Compulsory subject	3
Module attributes:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	German/English	1 semester	winter and summer semester

Responsible for module:	Schönmann, Alexander
Lecturers:	
Credit points / SWS:	30 ECTS / 0 SWS
Workload:	Contact hours: 0 h Self-study: 750 h Total effort: 750 h
Subjects of the module:	13: Master Thesis
Lecture types:	MA-Master Thesis
Examinations:	Master Thesis Requirements: None
Usability for other study programs:	Please see the subject recognition list of the SCS (Study Service Centre).

Prerequisites according examination regulation:

At least 30 ECTS of compulsory modules must have been successfully completed (§8 SPO).

Recommended prerequisites:

Completion of all compulsory modules.

Objectives:

The students:

- carry out and solve autonomously a complex problem in foresight at the interface of technology, economy and sociology on a high scientific level.
- can manage a research project, including the development of a research question and hypotheses.
- apply selected quantitative and qualitative research methods.
- can apply the acquired skills and scientific methods.
- can integrate the results into a professional context and to present them in a scientific paper.

Content:

Complex problems in foresight at the interface of technology, economy and sociology with integration of results into a professional context.

Literature:
• BUI, Yvonne N., 2020. *How to write a master's thesis*. Los Angeles; London; New Delhi; Singapore; Washington DC: Sage. ISBN 978-1-5063-3609-1
• PARIJA, Subhash Chandra und Vikram KATE, 2018. *Thesis writing for Master's and Ph.D. program*. Singapore: Springer. ISBN 981-13-0889-6, 978-981-13-0889-5
• HIRSCH-WEBER, Andreas, Stefan SCHERER und Beate BORNSCHEIN, 2016. *Wissenschaftliches Schreiben und Abschlussarbeit in Natur- und Ingenieurwissenschaften: Grundlagen - Praxisbeispiele - Übungen*. Stuttgart: Verlag Eugen Ulmer. ISBN 978-3-8252-4450-7
• OEHLRICH, Marcus, 2022. *Wissenschaftliches Arbeiten und Schreiben: Schritt für Schritt zur Bachelor- und Master-Thesis in den Wirtschaftswissenschaften* [online]. Wiesbaden: Springer Fachmedien Wiesbaden PDF e-Book. ISBN 978-3-658-34791-8. https://doi.org/10.1007/978-3-658-34791-8.
Additional remarks:
The student is independently responsible for finding the topic and the supervision by a professor of the Faculty of Engineering and Management.
According to the APO, the master's thesis can be written in German or English language.

4.2 Individual Electives

Starting with winter semester 2024/25, there is a separate module handbook for the descriptions of the elective modules, which is now part of the semester curriculum for the master's degree program "Global Foresight and Technology Management". This can also be found on the Moodle page of your degree program under Curriculum/Module Handbooks.

Note: Please note that not all modules listed in the module handbook for electives can be selected for your degree program. The current list of selectable modules for your degree program can be found on the Moodle page of your degree program under Information on Electives.