Programme and Course Description

Global Foresight and Technology Management

Master of Science (M. Sc.)

Study regulation: WS 2021/22

as per: 31.07.2023

Content

1 Overview

Name of the programme	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 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/fileadmin/daten/forschung/Foresight/2016_12_22_Anerkannte_Englischtests_B2.pdf
Capacity	60 students p.a. (in one winter- and one summer group)
Programme director	Prof. Dr. Schönmann, Alexander E-Mail: alexander.schoenmann@thi.de Phone: +49 (0) 841 / 9348-3509

2   Introduction

The text describes the current state of the programme modules in the Master´s degree "Global Foresight and Technology Management" according to the "Study Regulation" (German: "Studien- und Prüfungsordnung") as of 22/02/2021.

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

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

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

https://www.thi.de/hochschule/ueber-uns/hochschulorganisation/stabsstelle-recht/satzungen-fakultaet-wirtschaftsingenieurwesen/masterstudiengaenge-wi/spo-master-global-foresight-and-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 programme is fully taught in English and welcomes both German and international students. It is designed as an interdisciplinary programme 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 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/fileadmin/daten/forschung/Foresight/2016_12_22_Anerkannte_Englischtests_B2.pdf

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 22/02/2021

  https://www.thi.de/hochschule/ueber-uns/hochschulorganisation/stabsstelle-recht/satzungen-fakultaet-wirtschaftsingenieurwesen/masterstudiengaenge-wi/spo-master-global-foresight-and-technology-management/

- "Rahmenprüfungsordnung" (RaPO) of Technische Hochschule Ingolstadt

- „Allgemeine Prüfungsordnung" (APO) of Technische Hochschule Ingolstadt

- „Immatrikulationssatzung" of Technische Hochschule Ingolstadt

The three 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 programme addresses to:

- graduates of Bachelor programmes 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 programme 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 programme lasts three semesters. The first semester contains three theoretical courses in combination with two practical project studies to enhance the learning progress. The second semester has the same structure. The Master´s thesis is placed in the third semester.

The following table shows the curriculum:

1. **Semester**

   - Strategic Foresight and Trend Analysis
   - Innovation Management Methods
   - Technology Design and Evaluation
   - Project Future Life Worlds
   - Project Technology Application

2. **Semester**

   - Future Business Modelling
   - Transformation Processes and Change Management
   - Technology Assessment and Business Ethics
   - Project Business Scenarios and Risk Management
   - Project Research Seminar

3. **Semester**

   - Master's 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 22/02/21).

3   Qualification profile

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

Five clusters offer a maximum of interdisciplinarity:

- Cluster foresight
- Cluster technology
- Cluster economics
- Cluster social aspects
- Cluster integrative

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.

3.1   Mission statement

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

We prepare our students for the challenges of the future:

- The Master´s programme creates future competence.

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

- It is an interdisciplinary programme, 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 behaviour and to social commitment.

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

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

- In this way, the programme 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 programme, 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 realise their individual potential:

- The Master´s programme 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 programme is international and intercultural. Hence, the programme 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 programme

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 des innovation and technology management. To develop business models methodically, to evaluate business scenarios, to apply methods of change management, risk management and technology assessment
- analyse interdisciplinary problems, to recognize comprehensive correlations, to transfer learned competences to new tasks and to evaluate the technical, economic and social impact of compiled solutions

Social competences

The graduates are able to:

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

Personal competences

The graduates are able to:

- organize themselves and to 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 programme

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 programme. 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
Strategic Foresight and Trend Analysis Innovation Management Methods Technology Design and Evaluation Project Future Life Worlds Project Technology Application	mdlP schrP schrP Proj. Proj.
Future Business Modelling Transformation Processes and Change Management Technology Assessment and Business Ethics Project Business Scenarios and Risk Management Project Research Seminar	schrP StA SA mit Koll. Proj. Proj.
Master's Thesis	MA

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

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

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 programme

Module	Profess. Comp.	Method. Comp.	Social Comp.	Personal Comp.
Strategic Foresight and Trend Analysis	++	++	o	o
Innovation Management Methods	++	++	o	+
Technology Design and Evaluation	++	+	o	+
Project Future Life Worlds	+	+	++	+
Project Technology Application	+	+	++	+
Future Business Modelling	++	++	o	+
Transformation Processes and Change Management	++	++	o	o
Technology Assessment and Business Ethics	++	+	o	o
Project Business Scenarios and Risk Management	+	+	++	+
Project Research Seminar	+	+	++	++
Master's 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 programme are:

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

4   Description of Modules

5 Description of Modules

5.1 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 21/22)	Pflichtfach		1
Modulattribute:	**Language of instruction**	**Duration of module**		**Frequency of offer**
	Englisch	1 semester		winter and summer term

Responsible for module:	Schwarz, Jan Oliver
Lecturers:	Schwarz, Jan Oliver
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Kontaktstunden: 47 h Selbststudium: 78 h Gesamtaufwand: 125 h
Subjects of the module:	Strategic Foresight and Trend Analysis
Lecture types:	SU/Ü-Lecture with integrated exercises.
Examinations:	mdlP - mündliche Prüfung 15 Minuten
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:

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.

Content:

- Customer-, technology-, and competitor-foresight
- Trend analysis and strategic early identification
- Visioning
- Strategic simulation methods
- Prognostic crowdsourcing
- Delphi method
- Scenario technique
- Trendreceiver 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*. 2. Auflage. 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*. f. Auflage. 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. Verfügbar unter: 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*. f. Auflage. 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)ISSN https://doi.org/10.1002/ffo2.28
Additional remarks:
No remarks.

Innovation Management Methods

Module abbreviation:	InnoMaMeth_M-GFT		SPO-No.:	2
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)		Pflichtfach	1
Modulattribute:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	Englisch		1 semester	winter and summer term

Responsible for module:	Schönmann, Alexander
Lecturers:	Schönmann, Alexander; Schropp, Theresa
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Kontaktstunden: 47 h Selbststudium: 78 h Gesamtaufwand: 125 h
Subjects of the module:	Innovation Management Methods
Lecture types:	SU/Ü-Lecture with integrated exercises.
Examinations:	schrP90 - schriftliche Prüfung, 90 Minuten
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 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. Verfügbar unter: 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. Verfügbar unter: 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. Verfügbar unter: https://routledgehandbooks.com/doi/10.4324/9781315276670.

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.
Bei Bedarf kann die Prüfung in digitaler Form an einem PC an der Universität abgelegt werden.

Technology Design and Evaluation

Module abbreviation:	TechDesEva_M-GFT		SPO-No.:	3
Curriculum:	**Programme**	**Module type**	**Semester**	
	Global Foresight and Technology Management (SPO WS 21/22)	Pflichtfach	1	
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**	
	Englisch	1 semester	winter and summer term	

Responsible for module:	Schönmann, Alexander
Lecturers:	Schönmann, Alexander; Schropp, Theresa
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Kontaktstunden: 47 h Selbststudium: 78 h Gesamtaufwand: 125 h
Subjects of the module:	Technology Design and Evaluation
Lecture types:	SU/Ü-Lecture with integrated exercises.
Examinations:	schrP90 - schriftliche Prüfung, 90 Minuten
Usability for other study programs:	Please see the subject recognition list of the SCS (Study Service Center)

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

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

- know and apply important methods of technology management and can explain them;
- can propose appropriate technology development process models based on use case and company size;
- evaluate technological solutions in a team and represent advantages and disadvantages for this;
- design the implementation of workshops for eliciting requirements for development process models;
- know the tasks of technology development and 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)
- Digital Technologies #svhs#amp## Digital Ecosystems
- Biomimetics (learning from nature)
- 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 und Sascha KLAPPERT, 2011. *Technologiemanagement - Handbuch Produktion und Management*
- 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*.
- ULRICH, Karl T. und Steven D. EPPINGER, 2015. *Product Design and Development*.
- 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. Verfügbar unter: 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.
Bei Bedarf kann die Prüfung in digitaler Form an einem PC an der Universität abgelegt werden.

Project Future Life Worlds

Module abbreviation:	Proj_FutLifWorld_M-GFT		SPO-No.:	4
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)		Pflichtfach	1
Modulattribute:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	Englisch		1 semester	winter and summer term

Responsible for module:	Schwarz, Jan Oliver
Lecturers:	Schwarz, Jan Oliver
Credit points / SWS:	7 ECTS / 6 SWS
Workload:	Kontaktstunden: 70 h Selbststudium: 105 h Gesamtaufwand: 175 h
Subjects of the module:	Project Future Life Worlds
Lecture types:	S-Seminar
Examinations:	Projektarbeit mit mdl. Präsentation (15 min) und schriftlicher Ausarbeitung (5 - 25 Seiten)
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:

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

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. und Andy HINES, 2012. *Teaching about the future*. Basingstoke: Palgrave Macmillan. ISBN 978-0-230-36349-6, 0-230-36349-0
- HINES, Andy, 2006. *Thinking about the future: guidelines for strategic foresight*. Washington, DC: Social Technologies. ISBN 978-0-9789317-0-4, 0-9789317-0-X

- ROHRBECK, René, 2010. *Corporate foresight: towards a maturity model for the future orientation of a firm*.
- 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. und andere, 2021. *Corporate foresight: anticipating the future*. London and New York: Routledge, Taylor & Francis Group. ISBN 978-0-367-61646-5, 978-0-367-56746-0

Additional remarks:

No remarks.

Project Technology Application

Module abbreviation:	Proj_TechApp_M-GFT		SPO-No.:	5
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)		Pflichtfach	1
Modulattribute:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	Englisch		1 semester	winter and summer term

Responsible for module:	Schönmann, Alexander
Lecturers:	John, Marcus; Martini, Melanie; Moser, Christina; Schönmann, Alexander
Credit points / SWS:	8 ECTS / 6 SWS
Workload:	Kontaktstunden: 70 h Selbststudium: 130 h Gesamtaufwand: 200 h
Subjects of the module:	Project Technology Application
Lecture types:	S-Seminar
Examinations:	Projektarbeit mit mdl. Präsentation (15 min) und schriftlicher Ausarbeitung (5 - 25 Seiten)
Usability for other study programs:	Please see the subject recognition list of the SCS (Study Service Center)

Prerequisites according examination regulation:

None

Recommended prerequisites:

None

Objectives:

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

- know different modern technologies and can use them in a comprehensive case study
- select solutions and weigh up the advantages and disadvantages for this
- apply methods to determine the performance and limits of the technologies .

Content:

Content:

- Application of several technologies within a project study based on examples;
- Enhancement of the learning process through practical experiences;
- Performance and limitations of different technologies.

Literature:

- KERZNER, Harold, 2019. *Innovation Project Management: Methods, Case Studies, and Tools for Managing Innovation Projects*. Newark: John Wiley & Sons, Incorporated. ISBN 978-1-119-58729-3, 1-119-58729-8

- DUENING, Thomas N., Robert A. HISRICH und Michael A. LECHTER, 2020. *Technology Entrepreneurship: Taking Innovation to the Marketplace*. 3. Auflage. San Diego: Elsevier Science & Technology. ISBN 978-0-12-822325-3
- RASTOGI, P. N., 2009. *Management of technology and innovation: competing through technological excellence*. 2. Auflage. New Delhi ; Thousand Oaks, Calif.: Response Books. ISBN 978-81-321-0408-7, 81-321-0408-0

Additional remarks:

Recommendation: The course "Technology design and evaluation" should be attended in parallel.

Lectures contain digital learning elements like meetings via web conferences.

Future Business Modelling

Module abbreviation:	FuBuMo_M-GFT		SPO-No.:	6
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)		Pflichtfach	2
Modulattribute:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	Englisch		1 semester	winter and summer term

Responsible for module:	Wrobel, Stefanie
Lecturers:	Wrobel, Stefanie
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Kontaktstunden: 47 h Selbststudium: 78 h Gesamtaufwand: 125 h
Subjects of the module:	Future Business Modelling
Lecture types:	SU/Ü-Lecture with integrated exercises.
Examinations:	schrP90 - schriftliche Prüfung, 90 Minuten
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:

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 techonological, social and environmental trends and scenarios with regard to 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 the entrepreneurship process, business modeling 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 uncertaintiy 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 modeling and develop an enterprise risk management system
- can evaluate business models qualitatively and quantitively

Content:

General introduction
- Business Development, sustainability and future orientation of coporates

Introduction into Entrepreneurship
- development of entrepreneurship as a research discipline
- types of entrepreneurship
- entrepreneurial mindset and culture
- entrepreneurship process
- business opportunities

Future oriented business modeling and business modeling 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*. S. Auflage. Harlow, England: Pearson. ISBN 978-1-292-32712-9
- 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*. F. Auflage. Fellbach: Rüdiger Hahn. ISBN 978-3-9823211-0-3, 3-9823211-0-7
- 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*. 2. Auflage. Wiesbaden: Springer Gabler. ISBN 978-3-658-33522-9, 3-658-33522-X
- OSTERWALDER, Alexander und andere, 2014. *Value proposition design: how to create products and services customers want*. Hoboken: John Wiley & Sons. ISBN 978-1-118-96806-2, 1-118-96806-9

- 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: *roceedings 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. Verfügbar unter: https://doi.org/10.34156/9783791045269.

Additional remarks:

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

Transformation Processes and Change Management

Module abbreviation:	TrProChanMana_M-GFT		SPO-No.:	7
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)		Pflichtfach	2
Modulattribute:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	Englisch		1 semester	winter and summer term

Responsible for module:	Bechthold, Laura
Lecturers:	Bechthold, Laura
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Kontaktstunden: 47 h Selbststudium: 78 h Gesamtaufwand: 125 h
Subjects of the module:	Transformation Processes and Change Management
Lecture types:	SU/Ü-Lecture with integrated exercises
Examinations:	LN - Studienarbeit 8-15 Seiten ohne mündliche Präsentation
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 the 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 in transformation processes;
- understand the relevance of stakeholder inclusion and can apply participatory methods to design multi-stakeholder processes;
- 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

- Enterprise Transformation Cycle;
- 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 perspec-tive 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.
- 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.
- 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.
- LALOUX, Frédéric, 2014. *Reinventing organizations: a guide to creating organizations inspired by the next stage of human consciousness*. F. Auflage. Brussels: Nelson Parker. ISBN 978-2-960133-50-9, 2-9601335-0-1
- FRAEDRICH, E., BEIKER, S., LENZ, B., 2015. Transition pathways to fully automated driving and its implications for the sociotechnical system of automobility. In: *European Journal of Futures Research*. **3**(1)
- 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)

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.

Technology Assessment and Business Ethics

Module abbreviation:	TechAssBusEth_M-GFT		SPO-No.:	8

Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)	Pflichtfach	2

Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	Englisch	1 semester	winter and summer term

Responsible for module:	Bechthold, Laura
Lecturers:	Bechthold, Laura
Credit points / SWS:	5 ECTS / 4 SWS

Workload:	Kontaktstunden:	47 h
	Selbststudium:	78 h
	Gesamtaufwand:	125 h

Subjects of the module:	Technology Assessment and Business Ethics
Lecture types:	SU/Ü-Lecture with integrated exercises.
Examinations:	SA - Seminararbeit mit mündlicher Prüfung (15 Min.) und schriftlicher Ausarbeitung (8-15 Seiten)
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 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 and contrast different methods of technology assessment and evaluate their suitability for different purposes;
- 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, 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:

- BOYD, D., CRAWFORD, K., 2012. Critical questions for big data. In: *Information, Communication & Society*. **15**(5), S.662–679.
- 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: *MITSloan Management Review*. **2017**(Fall Issue)
- 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.
- NAZARKO, L., 2017. Future-Oriented Technology Assessment. In: *Procedia Engineering*. **182**, S.504–509. ISSN 1877-7058
- 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.
- VAN DE POEL, I., ROYAKKERS, L., 2007. The Ethical Cycle. In: *Journal of Business Ethics*. **71**(1), S.1-13.
- WESSEL, M., 2020. A Crisis of Ethics in Technology Innovation. In: *MIT Sloan Review*. **61**(3)
- 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.

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.

Project Business Scenarios and Risk Management

Module abbreviation:	PjBusSzenRisMana_M-GFT		SPO-No.:	9
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)		Pflichtfach	2
Modulattribute:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	Englisch		1 semester	winter and summer term

Responsible for module:	Wrobel, Stefanie
Lecturers:	Moser, Christina; Wrobel, Stefanie
Credit points / SWS:	8 ECTS / 6 SWS
Workload:	Kontaktstunden: 70 h Selbststudium: 130 h Gesamtaufwand: 200 h
Subjects of the module:	Project Business Scenarios and Risk Management
Lecture types:	S-Seminar
Examinations:	Projektarbeit mit mdl. Präsentation (15 min) und schriftlicher Ausarbeitung (5 - 25 Seiten)
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:

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;
- and, on this basis, 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;
- are able to organise and structure themselves and their resources in a complex project.
- improve their communication and presentation skills with regard to different stakeholders (e.g. from science, economics, communities)
- students learn to work in a team, to organise 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:
Will be specified at the beginning
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.:**	10
Curriculum:	**Programme**	**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)	Pflichtfach	2
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	Englisch	1 semester	winter and summer term

Responsible for module:	Bechthold, Laura
Lecturers:	Bechthold, Laura; Moser, Christina
Credit points / SWS:	7 ECTS / 6 SWS
Workload:	Kontaktstunden: 70 h Selbststudium: 105 h Gesamtaufwand: 175 h
Subjects of the module:	Scientific Research Seminar
Lecture types:	S-Seminar
Examinations:	Projektarbeit mit mdl. Präsentation (15 min) und schriftlicher Ausarbeitung (5 - 25 Seiten)
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

- can plan, implement and manage a research project, including the development of a research question and hypotheses;
- 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 and apply selected qualitative research methods, specifically interview studies and qualitative content analysis;
- understand and 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.
- can organise themselves and manage their time as well as work in a goal-oriented and independent manner

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
- 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 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*. S. Auflage. London: McGraw-Hill Open University Press. ISBN 978-0-3352-4983-1
- OSMOND, Alex, 2013. *Academic writing and grammar for students*. London: Sage. ISBN 978-1-4462-1090-1, 978-1-4462-1091-8
- 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. Verfügbar unter: 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.:	11
Curriculum:	**Programme**		**Module type**	**Semester**
	Global Foresight and Technology Management (SPO WS 21/22)		Pflichtfach	3
Modulattribute:	**Language of instruction**		**Duration of module**	**Frequency of offer**
	Englisch		1 semester	winter and summer term

Responsible for module:	Schönmann, Alexander
Lecturers:	
Credit points / SWS:	30 ECTS / 0 SWS
Workload:	Kontaktstunden: 0 h Selbststudium: 750 h Gesamtaufwand: 750 h
Subjects of the module:	Master Thesis
Lecture types:	MA
Examinations:	Master-Abschlussarbeit
Usability for other study programs:	Please see the subject recognition list of the SCS (Study Service Center).

Prerequisites according examination regulation:

At least 30 ECTS of compulsory modules must have been successfully completed.

Recommended prerequisites:

Completion of all compulsory modules.

Objectives:

The students

- are able to carry out autonomously a complex problem in the area of foresight at the interface of technology, economy and sociology on a high scientific level;
- are able to apply the acquired skills and scientific methods;
- are able to integrate the results into a professional context and to present them in a scientific paper.

Content:

- Complex problems in the area of 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*. T. Auflage. 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. Verfügbar unter: 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 Industrial Engineering and Management.

According to the APO, the master thesis can be written in German or English language.