

Module manual

Sustainability Management & Technologies

Master full time

Study and examination regulations: SPO 2024

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[Hier eingeben]

Contents

1 Overview	4
2 Introduction	5
2.1 Overall objective of the programme.....	6
2.2 Admission requirements	7
2.3 Target group.....	8
2.4 Structure of the programme.....	9
2.5 Conception and expert advisory board.....	11
3 Qualification profile.....	12
3.1 Mission statement.....	13
3.2 Study objectives	14
3.3 Competencies developed during the programme	15
3.4 Possible career fields	16
4 Description of Modules	18
4.1 Pflichtmodule.....	19
Sustainability in Business and Economics.....	20
Circular Economy and Life Cycle Management.....	22
Metrics and Analytics for Sustainability	24
Natural Resources Management and Supply Chain Sustainability.....	26
Technology and Society.....	28
Urban Ecology and Sustainable Building Technologies.....	30
Values and Ethics for Sustainable Leadership.....	31
Sustainable Business Strategy and Entrepreneurship	33
Sustainable Materials and Recycling Technologies	35
Artificial Intelligence and Sustainability	37
Sustainable Investments and Finance Policies.....	39
Climate Change, Clean Energy and Decarbonization Technologies	41
Sustainability Project.....	43
Master Thesis	45

1 Overview

This handbook describes the individual modules of the Master's programme in Sustainability Management & Technologies offered at the Neuburg campus of TH Ingolstadt (THI).

The descriptions of the modules contain explanations about the requirements and types of module examinations. In addition to the course content, the objectives of the course, career profiles and opportunities that arise from studying Sustainability Management & Technologies are described.

In addition to the content of the degree program, the module handbook also contains the study guidelines that lead to successful studies at THI.

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2 Introduction

2.1 Overall objective of the programme

Sustainability in a company means more than just printing on recycled paper. Sustainability management and Corporate Social Responsibility (CSR) penetrate all areas and reveal connections between technological and management-orientated aspects of sustainable transformation. As a graduate of the Master's programme, you will develop action plans, design new business models under the maxims of sustainability and circularity, and develop their implementation. You will be able to read the values, cultures and management structures of a company, design them with regard to their ecological, social and economic characteristics and identify potential for improvement. Graduates will have the potential to revolutionise companies and organisations at the interface of sustainability and technology application!

Figure 1 summarizes some of the key elements of the study programme: sustainability management and economics combined with insights into technologies for a sustainable future within a global framework with a focus on practical application in the form of cases and field work. The programme's objective is to train personalities who manage technology-oriented businesses and organisations sustainably and responsibly, to enable a sustainable development for people and the planet.



Figure 1.: Elements of the programme

2.2 Admission requirements

For the Master's degree programme, the general admission requirements for studying at Master level at universities of applied sciences must be met.

The **binding regulations** for this study plan can be found in:

- [Study and examination regulations for the Master's degree program in Sustainability Management and Technologies in the version dated November 18, 2024](#)
- General examination regulations (APO) of the Ingolstadt University of Technology
- Matriculation regulations of the Ingolstadt University of Technology. The relevant provisions of the study and examination regulations influence the course of study.

The **admission criteria** are as follows:

- Proof of English language skills at level B2
- The successful completion of an academic study programme in business/economics, engineering or natural sciences, in each case with a business/economics focus or related fields, at a German university with at least 180 ECTS credit points or an equivalent domestic or foreign degree
- Basic knowledge of management theory or business administration as well as the ability to think abstractly and system-oriented and to formalize approaches and solutions
- Knowledge/experience relevant to the degree program, be it of a scientific or practical nature

For more information about the admission criteria and procedures, please check the [Statutes on the aptitude test for the Master's programme in Sustainability Management and Technologies](#).

2.3 Target group

The course is aimed at

- Bachelor graduates from different backgrounds (engineering, management, sciences) who want to deepen their knowledge in the fields of sustainability, management and (transformative) technologies and who seek an interdisciplinary approach towards these topics
- International students who aim to use their acquired skills in companies in Germany or abroad
- National students who want to get a more international perspective & training on the topics of sustainability, management and technology

2.4 Structure of the programme

The programme covers four semesters, starting in spring (mid-March) and leads to the degree Master of Science. The first three semesters are focusing on course work, the fourth semester focuses on the completion of the Master thesis, which is usually connected to solving a practical problem rather than conducting purely theoretical research.

Figure 2 displays the curriculum of the programme. The programme starts with some foundations, such as in the module *Sustainability in Business and Economics*, which is an important prerequisite for those students who have a background in science or engineering and therefore have only basic knowledge in business administration and economics. It also introduces the students to the various aspects of economic, social and environmental sustainability, such as, for example, represented in the [UN's Sustainable Development Goals](#). The students are further introduced into several aspects of sustainability management, such as *Metrics and Analytics for Sustainability* and *Sustainable Business Strategy and Entrepreneurship*. It also familiarizes students with the principles of *Circular Economy and Life Cycle Management* and raises the students' awareness for the complex interrelationships between *Technology and Society*.

1. Semester		
Circular Economy and Life Cycle Management	Sustainability Business Basics and Economics	Sustainable Business Strategy and Entrepreneurship
Metrics and Analytics for Sustainability	Technology and Society	
2. Semester		
Artificial Intelligence and Sustainability	Sustainable Materials and Recycling- Technologies	Natural Resources Management and Supply Chain Sustainability
Values and Ethics for Sustainable Leadership	Elective I	
3. Semester		
Urban Ecology and Sustainable Building Technologies	Climate Change and De-Carbonization Technologies	Sustainable Investments and Finance Policies
Sustainability Project and Field Trip	Elective II	
4. Semester		
Master-Thesis		Master- Colloquium

Figure 2: Curriculum

The following semesters offer various opportunities to dive deeper into different transformative technologies (such as AI, urban building technologies, energy and decarbonization technologies, sustainable materials and recycling technologies) but also to learn more about sustainable leadership, supply chain sustainability and sustainable investment and finance. The students can further shape their profiles through the selection of two electives in the 2nd and 3rd semesters. A list of possible electives (preliminary, not conclusive) is:

- Environmental Law, Policies and Institutions
- Social Skills (interpersonal skills, intercultural skills)
- Inner Development Goals & Sustainability
- Renewable Energy Efficiency
- Social Entrepreneurship & Sustainable Innovations
- Sustainable Market Communication
- Design Workshop for Sustainable Product Development
- Developing Effective Teams
- Communication Training

The 3rd semester is also marked by a *Sustainability project and field trip* that challenges the students to apply their newly developed knowledge and skills and prepares for the *Master thesis*, which is completed with a presentation in the *Master colloquium*.

2.5 Conception and expert advisory board

The course was designed by THI experts with the involvement of practitioners and is continually being developed further.

3 Qualification profile

3.1 Mission statement

The course of study directly addresses the general mission statement of the THI “Personalities and innovations – for a future worth living.” and its concept is aimed at the individual focal points:

- We develop personalities for the professional world of the future.
- We create innovations and live sustainability – technology and business are our focus.
- We shape the transfer in the economy and society.
- We teach, research and work internationally and in an interdisciplinary manner.
- We act humanely, passionately and open to the world.

3.2 Study objectives

The aim of the study programme is to prepare young professionals for career paths that involve the transformation of (tech-oriented) businesses and organisations for sustainable development - innovatively, creatively and with a high sense of responsibility. The course content is adapted to constantly advancing technical developments. This increases the career prospects of our graduates.

During their studies, students will be trained to become independent personalities with strong analytical, communication and leadership skills.

3.3 Competencies developed during the programme

We expect that graduates will have developed the following competencies after successful completion of the programme:

- Recognise connections between management-oriented and technological aspects of a sustainable transformation and develop action plans for their implementation (and accompany the implementation)
- Conceptualise, design, establish and lead sustainability management in companies as a (strategic) manager or expert
- Understand the requirements of sustainable development for companies in an international context and apply them to company specifics
- Identify the technical and technological levers for realizing transformation needs and estimate their potentials while at the same time classify the economic impact on the company
- Read and shape the values, culture & management structure of a company
- Evaluate value chains regarding their ecological, social and economic properties, identify and realise potential for improvement
- Optimise and transform business processes with a focus on sustainability
- Design new sustainable & circular business models and/or adapt existing business models
- Analyse, understand and integrate data into management processes
- Develop operational functions and make them fit for a sustainable future
- Identify existing and potential requirements for sustainability and translate them in a business context

3.4 Possible career fields

Graduates of the course are prepared for specialist and management positions in the following areas:

- Expert and leadership positions, especially trained to manage the transformation and restructuring of companies and organizations for sustainable development
- Management positions in technology-oriented companies at the interface of business administration and technology application, bringing in the sustainability perspective
- Management positions in public administration or international organisations in the field of sustainability and environmental protection

Graduates are expected to pursue careers in

- Technology companies
- Manufacturing industry
- Public administration/Municipalities
- Management consultancies
- Project management companies and financial service providers related to sustainability and environmental protection
- Public institutions and international sustainability and environmental policy organizations
- Start-ups with a focus on sustainability and the environment

4 Description of Modules

4.1 Compulsory courses

Sustainability in Business and Economics			
Module abbreviation:	SMT_SustBusEco	Reg.no.:	1
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	1
Responsible for module:	Blasch, Julia		
Lecturer:	Blasch, Julia; Hoppe, Holger		
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	1: Sustainability in Business and Economics		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
schrP90 - written exam, 90 minutes			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
<p>The module equips students with the foundation for sustainable corporate management and a basic understanding of the principles of sustainable economics. After completing the module, students will be able to:</p> <ul style="list-style-type: none"> • Understand and critically analyze sustainable development and its entrepreneurial and economic relevance. • Know methods and instruments of corporate sustainability management. • Analyse sustainability problems from an economics point of view and identify appropriate measures to solve them. • Identify and communicate necessary changes for sustainable development, explaining connections and impacts. • Recognize relationships, analyze independently, draw conclusions, and present findings systematically. 			
Content:			
<p>The module covers the following content:</p> <ul style="list-style-type: none"> • Origin and definition of the concept of sustainable development, e.g. Brundtland report • Global challenges of sustainable development (social, ecological, economic) its current status, and interlinkages among sustainability dimensions 			

<ul style="list-style-type: none"> • Introduction to scientific basics of climate change and planetary boundaries, and its implications for economics • Position of companies in relation to sustainable development (ethical principles and theories of integration) • Global framework conditions of sustainable development with relevance for companies based on the structures of the stakeholder model and the extended task environment of companies (e.g. UN sustainability goals) • Overview on methods, standards and instruments of corporate sustainability management: materiality, strategy formulation, performance management, internal and external reporting • Economic instruments and policies for sustainability in the context of climate change, clean energy and conservation of biodiversity. <p>Up to 9 bonus point can be awarded for classroom presentations and discussions.</p>
Literature:
<ul style="list-style-type: none"> • SKENE, Keith and Alan MURRAY, 2015. <i>Sustainable economics: context, challenges and opportunities for the 21st-century practitioner</i>. Sheffield, UK: Greenleaf Publishing. ISBN 978-1-78353-151-6, 1-78353-151-7 • HAHN, Rüdiger, 2022. <i>Sustainability management: global perspectives on concepts, instruments, and stakeholders</i>. Fellbach: Rüdiger Hahn. ISBN 978-3-9823211-0-3, 3-9823211-0-7
Additional remarks:
None

Circular Economy and Life Cycle Management			
Module abbreviation:	SMT_CirEcoLifeCyMgm	Reg.no.:	2
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	1
Responsible for module:	Dirr, Martin		
Lecturer:	Koller, Jan; Steegmann, Natascha		
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	2: Circular Economy and Life Cycle Management		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
<p>PF - Portfolio Exam</p> <p>Additional Explanation:</p> <p>Portfolio examination (PP) consisting of:</p> <ol style="list-style-type: none"> 1. Seminar paper (SA): Presentation of approximately 15–20 pages done in groups, including an oral presentation 2. Written exam (schrP) with a duration of 60 minutes <p>Weighting: 1) 50% and 2) 50%</p> <p>The dates for the individual assessment components will be announced by the lecturers at the beginning of the semester.</p>			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
<p>Understand and explain the fundamental principles and frameworks of the Circular Economy and Life Cycle Management.</p> <p>Analyze and map material flows using process mapping techniques to identify opportunities for circularity and life cycle optimization.</p> <p>Design and evaluate circular business models and products based on sustainability principles, integrating life cycle thinking into innovation processes.</p> <p>Assess product reparability, reuse potential and end-of-life strategies, considering design complexity and closed-loop supply chain requirements.</p>			

<p>Utilize sustainable assessment methodologies (e.g., LCA, SLCA) to evaluate environmental, social, and economic impacts across the product life cycle.</p> <p>Develop and implement Life Cycle Management strategies that address resource efficiency, environmental compliance, and value chain collaboration.</p> <p>Conduct a Life Cycle Assessment using software tools, interpret results critically, and propose actionable sustainability improvements.</p> <p>Integrate life cycle thinking into strategic decision-making, addressing challenges such as multi-stakeholder coordination and regulatory requirements.</p>
<p>Content:</p> <p>This module provides a comprehensive understanding of Circular Economy and Life Cycle Management, focusing on their principles, methodologies, and practical applications in modern business contexts. The content is structured to equip students with the skills needed to design, evaluate, and implement sustainable solutions. Key topics include:</p> <ul style="list-style-type: none"> • Fundamental concepts and principles of Circular Economy. • Circular business models and their integration into sustainable business model innovation. • Principles of circular product design, including eco-design, cradle-to-cradle, and design for disassembly. • An introduction to life cycle concepts and sustainable assessment methodologies such as Life Cycle Assessment, Social Life Cycle Assessment or Life Cycle Costing. • Detailed exploration of Life Cycle Assessment, including methodology, critical evaluation, and practical application using software tools. • Through seminar-style teaching, group work, practical case studies, and interactive discussions, students will gain both theoretical knowledge and hands-on experience.
<p>Literature:</p> <ul style="list-style-type: none"> • GRAEDEL, Thomas and Braden R. ALLENBY, 2010. <i>Industrial ecology and sustainable engineering</i>. Boston, Munich: Prentice Hall. ISBN 978-0-13-600806-4, 0-13-600806-2
<p>Additional remarks:</p> <p>None</p>

Metrics and Analytics for Sustainability			
Module abbreviation:	SMT_MetAnSust	Reg.no.:	3
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	1
Responsible for module:	Hoppe, Holger		
Lecturer:	Hoppe, Holger; Müller, Marvin		
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	3: Metrics and Analytics for Sustainability		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
PF - Portfolio Exam Additional Explanation: The portfolio examination will consist of two parts: 1. a seminar paper (15 pages) 2. an oral exam (15 min),			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
The students <ul style="list-style-type: none"> • understand the coverage and the limits of traditional performance management systems as cost and management accounting • understand the concept of external costs and their relevance for sustainability • know the state-of-the-art of nonfinancial reporting in the EU • understand the concept of ESG and other measurement approaches for sustainability • are able to use different sustainability metrics to assess technologies, products, companies etc. • understand the basic concepts and applications of Business Intelligence. • utilize Excel tools for data analysis and create interactive dashboards to visualize trends and key performance indicators (KPIs). • apply Power Query, Power Pivot, and DAX for data modeling and conduct BI projects based on case studies to support business decisions. 			

Content:

The module covers the following content:

Traditional Performance Management Systems:

- Understand the scope and limitations of cost and management accounting.
- Explore instruments such as balanced scorecards and key performance indicators (KPIs).

External Costs and Sustainability:

- Concept of external costs and their relevance for sustainability.

Nonfinancial Reporting in the EU:

- Familiarize with the EU Non-Financial Reporting Directive (NFRD) and the upcoming Corporate Sustainability Reporting Directive (CSRD) as well as more specific requirements as EU Taxonomy and TCFD.
- Understand frameworks such as the European Standards Sustainability Reporting (ESSR) and Global Reporting Initiative (GRI).

Environment, Social and Governance (ESG) Criteria:

- Explore various measurement approaches for sustainability.
- Analyze instruments like the Dow Jones Sustainability Index (DJSI) and the MSCI ESG Ratings.
- Sustainability Metrics and Evaluation:

Develop skills to use different sustainability metrics to assess technologies, products and companies.

- Introduction to Sustainability Life Cycle Assessment
- Apply methods such as carbon footprint analysis, water footprint analysis and social impact assessment.

Basics of Business Intelligence (BI):

- Understand the basic concepts and applications of Business Intelligence.
- Analyze the role of Excel as a tool in BI.

Data management and analysis in Excel:

- Importing, clearing and structuring data in Excel
- Using tables, pivot tables and pivot charts to analyze data.

Visualization and dashboards:

- Developing interactive dashboards for decision support.
- Visualization of trends, patterns and KPIs with Excel tools.

Data modeling:

- Introduction to Power Query and Power Pivot for data modeling (and automation)
- Use of DAX (Data Analysis Expressions) to create complex calculations.

BI projects and practical applications.

- Implementation of BI projects based on case studies and real-world examples.
- Analyzing and interpreting results to support business decisions.

Literature:

Will be specified at the beginning

Additional remarks:

None

Natural Resources Management and Supply Chain Sustainability			
Module abbreviation:	SMT_NatResMgmSupChSust	Reg.no.:	4
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	2
Responsible for module:	Dirr, Martin		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	4: Natural Resources Management and Supply Chain Sustainability		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
mdIP - oral exam, 15 minutes			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
<p>This module provides an in-depth exploration of two interconnected topics: natural resource management and sustainable supply chain practices. The natural resource management component begins with an overview of natural resources, including their types, distribution, and significance in global sustainability efforts. This foundational knowledge is then used to explore strategies for efficient and responsible resource utilization, aiming to reduce environmental impacts and support long-term sustainability. The sustainable supply chain practices component examines how global supply chains can be designed and managed to minimize ecological and social footprints, addressing challenges such as resource scarcity, climate change, and biodiversity loss.</p> <p>Learning Outcomes: Upon successful completion of this module, students will be able to:</p> <ol style="list-style-type: none"> 3. Know the different types of natural resources, their distribution and significance. 4. Explain the principles of natural resource management and analyze their role in sustainable development. 5. Evaluate the environmental and social implications of supply chain decisions. 6. Develop strategies to improve resource efficiency and circularity in supply chains. 7. Synthesize interdisciplinary knowledge to propose innovative solutions for sustainable resource use and supply chain transformation. 			

Content:
<ul style="list-style-type: none">• Introduction to Natural Resources theory, types of natural resources, their distribution, and their importance• Sustainable Resource Management & management of renewable and non-renewable resources• Resource efficiency, and resource productivity.• Global supply chains and transportation• Supply chain disruptions• Supply chain resilience and recovery• Sustainable practices in supply chains• Act on corporate due diligence obligations in supply chains / Corporate Sustainability Due Diligence Directive
Literature:
Will be specified at the beginning
Additional remarks:
None

Technology and Society			
Module abbreviation:	SMT_TechSoc	Reg.no.:	5
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	1
Responsible for module:	Blasch, Julia		
Lecturer:	Schwertel, Tamara		
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	5: Technology and Society		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
Additional Explanation: None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
<p>The module equips students with a comprehensive understanding of the interrelationships between societal change and technological developments.</p> <p>After active participation in this module, students will be able to:</p> <ul style="list-style-type: none"> • reflect and discuss the role of technology in society and the mutual impacts of science, technology, and society. • describe key theories on the relationship between technology and society. • understand and critically assess why in past technology development certain technologies have been prioritised over others, and how these insights can be predictive for future technology development. • assess ongoing societal developments and debate preconditions for a supportive role of technology in sustainable development. 			
Content:			
<p>The module covers the following aspects related to the role of technology in society and the mutual impacts of science, technology, and society:</p> <ul style="list-style-type: none"> • The foundations of human and scientific knowledge, and the history of technological advances • Humanity-technology relationships 			

<ul style="list-style-type: none">• Technological determinism and solutism• Social construction of knowledge and technology• Human and social values and their embeddedness in technological choices• Impact of technological advances on humans and society• Role of technology for a sustainable transformation
Literature:
Will be specified at the beginning
Additional remarks:
None

Urban Ecology and Sustainable Building Technologies			
Module abbreviation:	SMT_UrbEcoSustBuTech	Reg.no.:	6
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	3
Responsible for module:	Reiter, Thomas		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	6: Urban Ecology and Sustainable Building Technologies		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
PF - Portfolio Exam			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
Understanding of urban ecosystems			
<ul style="list-style-type: none"> • Recognising and analysing the interactions between the built environment and natural systems. • Evaluation of ecosystem services in cities and their significance for sustainability. 			
Sustainable building technologies and construction methods			
<ul style="list-style-type: none"> • Knowledge of energy-efficient and resource-saving construction methods. • Application of sustainable materials and circular economy in the construction industry. • Understanding of smart building and neighbourhood concepts for reducing CO₂ emissions. 			
Climate protection and adaptation in cities			
<ul style="list-style-type: none"> • Analysis and development of strategies for reducing the Urban Heat Island (UHI) effect. • Implementation of sustainable water management solutions such as rainwater seepage and the sponge city principle. 			

Content:
<p>Contents include:</p> <ul style="list-style-type: none">• Introduction to Urban Ecology and green infrastructures• Sustainable Building Design, including the design of energy-efficient buildings, the use of renewable energy sources, and the integration of green spaces.• Urban Agriculture, including the design of community gardens, rooftop gardens, and vertical farms.• Sustainable Transportation as a means to further urban ecology <p>The focus will be placed on:</p> <ul style="list-style-type: none">• Practical, scientific approach<ul style="list-style-type: none">• Independent research on urban ecology and sustainable technologies.• Application of scientific methods for data collection and analysis (e.g. life cycle assessments).• Project-based and interdisciplinary work<ul style="list-style-type: none">• Development and implementation of small research and practical projects in interdisciplinary teams.• Analysis of case studies of real construction projects in the context of urban sustainability.• Critical reflection and systemic thinking<ul style="list-style-type: none">• Evaluation of sustainable technologies from an ecological, economic and social perspective.• Recognising conflicting goals and developing integrated solutions.
Literature:
Will be specified at the beginning
Additional remarks:
None

Values and Ethics for Sustainable Leadership			
Module abbreviation:	SMT_ValEthSustLeadersh	Reg.no.:	7
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	2
Responsible for module:	Blasch, Julia		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	7: Values and Ethics for Sustainable Leadership		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
Project report and oral presentation 15 min.			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
<p>This module introduces leadership values and ethics and sustainable business strategies. It encourages students to follow ethically-guided strategies that promote economic prosperity, social equity, and environmental preservation. The course provides a comprehensive exploration of ethical theories and their application in critical business decisions. Students will be equipped to make sustainability a cornerstone of organizational culture in their professional environments.</p>			
Content:			
<ul style="list-style-type: none"> • Introduction to ethics, its philosophical roots, current state and application for management and technology • Principles of ethical leadership, including the characteristics of ethical leaders, the importance of ethical leadership, and the impact of ethical leadership on organizations • Transformational and servant leadership • Values und Purpose-Driven Organizations • Relationship between sustainability, ethics and leadership • Linking ethics and leadership to ESG and CSR • Engaging employees in sustainability efforts 			

<ul style="list-style-type: none">• Setting up ethical and sustainable frameworks for business operations
Literature:
<ul style="list-style-type: none">• MURPHY, Clarke, 2022. <i>Sustainable leadership: lessons of vision, courage, and grit from the CEOs who dared to build a better world</i>. Newark: Wiley. ISBN 9781119872160• FLOWER, Lorraine, 2023. <i>Heartful Business: Leading with the World in Mind</i>. Chicago: Austin Macauley Publishers. ISBN 978-1-398-48726-0
Additional remarks:
None

Sustainable Business Strategy and Entrepreneurship			
Module abbreviation:	SMT_BusStrEntrprsh	Reg.no.:	8
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	1
Responsible for module:	Risi, Annette		
Lecturer:	Risi, Annette		
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	8: Sustainable Business Strategy and Entrepreneurship		
Lecture types:	eventually digital inverted, based on number of students at the campus		
Availability of the module:	None		
Examinations:			
PF - Portfolio Exam			
Additional Explanation:			
Portfolio consisting of Proj and SA			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
<ul style="list-style-type: none"> • Comprehend and apply key concepts of strategy, entrepreneurship and sustainability • Develop and evaluate sustainable, purpose-driven business models, business plans and strategies • Successfully coordinate in an assigned team, integrate multiple perspectives and solve complex challenges 			
Content:			
Among other topics, the following will be covered through presentations, discussions and practical exercises:			
<ul style="list-style-type: none"> • Brief history and development of sustainability theory and reporting frameworks, e.g.,GRI,ESG • Strategic tools along the strategy cycle • Introduction to sustainable business strategies • Scope, characteristics, values and skills of entrepreneurship • Innovation typologies, traps, management and protection, e.g.,patents • Creativity techniques, e.g.,design thinking, mindfulness and lego • Building new business ideas with social impact • Analysis of sustainable business ideas and scaling, e.g., fair labor practices and mental health 			

<ul style="list-style-type: none"> The role of sustainable entrepreneurship and businesses for society
Literature:
<ul style="list-style-type: none"> POLMAN, Paul and Andrew S. WINSTON, 2021. <i>Net positive: how courageous companies thrive by giving more than they take</i>. Boston, Massachusetts: Harvard Business Review Press. ISBN 978-1-64782-130-2, 978-1-64782-473-0 OSTERWALDER, Alexander and others, 2014. <i>Value proposition design: how to create products and services customers want : get started with</i>. Hoboken, New Jersey: John Wiley & Sons. ISBN 978-1-118-96807-9, 978-1-118-96806-2 ANKERSEN, Christopher, SIDHU, Waheguru Pal Singh, 2021. <i>The future of global affairs: managing discontinuity, disruption and destruction</i> [online]. Cham, Switzerland: Palgrave Macmillan PDF e-Book. ISBN 978-3-030-56470-4. Available via: https://doi.org/10.1007/978-3-030-56470-4. ADAMS, Richard, GRICHNIK, Dietmar, PUNDZIENE, Asta, VOLKMANN, Christine K., 2023. <i>Artificiality and sustainability in entrepreneurship: exploring the unforeseen, and paving the way to a sustainable future</i> [online]. Cham, Switzerland: Springer PDF e-Book. ISBN 978-3-031-11371-0. Available via: https://doi.org/10.1007/978-3-031-11371-0. FREITAG, Philipp Michael, 2019. <i>Digital disruption: conceptualization, strategy, and transformation</i>. [Aachen]: Apprimus.
Additional remarks:
None

Sustainable Materials and Recycling Technologies			
Module abbreviation:	SMT_SustMatRecTech	Reg.no.:	9
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	2
Responsible for module:	Blask, Oliver		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	9: Sustainable Materials and Recycling Technologies		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
PF - Portfolio Exam			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
<ul style="list-style-type: none"> • The students know some sustainable building materials and can use them optimally. • The students can decide which building materials are best suited in terms of their performance and sustainability. • The students can select the ecologically and economically appropriate recycling process for many building materials. • The students can choose a construction method that is well suited in terms of economic recycling. 			
Content:			
<ul style="list-style-type: none"> • Concepts of sustainable materials, including the principles of sustainable material selection. • principles of material criticality, including the types of critical materials, their sources, and their importance to society. • principles of material substitution, material efficiency, and material innovation. • material production, including the types of material production, their environmental impacts, and their social impacts • sustainable material production, including eco-design, green chemistry, and sustainable manufacturing • waste management, including the types of waste, their sources 			

<ul style="list-style-type: none">• Waste hierarchy reduction, reuse, and recycling• Overview of recycling technologies, including the types of recycling technologies, their advantages and disadvantages, and their applications in different industries.
Literature:
<ul style="list-style-type: none">• BLAß, Hans Joachim and Carmen SANDHAAS, 2017. <i>Timber Engineering</i>. Karlsruhe: KIT Scientific Publishing. ISBN ISBN 978-3-7315-0673-7• SCHROEDER, Horst, 2016. <i>Sustainable Building with Earth</i> [online]. Cham: Springer International Publishing PDF e-Book. ISBN 978-3-319-19491-2. Available via: https://doi.org/10.1007/978-3-319-19491-2.
Additional remarks:
None

Artificial Intelligence and Sustainability			
Module abbreviation:	SMT_ArtIntSust	Reg.no.:	10
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	2
Responsible for module:	Blasch, Julia		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	10: Artificial Intelligence and Sustainability		
Lecture types:	Student presentations, student discussion, case studies		
Availability of the module:	None		
Examinations:			
schrP90-120 written examination 90-120 minutes			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
none			
Recommended prerequisites:			
none			
Objectives:			
<p>AI technologies are reshaping our society and several dimensions of sustainability. In this module, students explore the current and potential uses of AI to further a sustainable development. They discuss the impact of artificial intelligence on sustainability aspects and reflect on ethical aspects related to the use of AI and other digital applications. This will give students a thorough understanding of the potentials and limitations of AI technologies for promoting sustainable development. At the same time, it challenges students to critically evaluate the ethical, social and environmental implications of AI.</p>			
Content:			
<p>The module will cover topics such as:</p> <ul style="list-style-type: none"> • Fundamental principles of machine learning, deep learning and big data analytics • AI's role in the ability of businesses to address sustainability issues • Applications of AI in context such as renewable energy, waste management, sustainable cities, natural disaster prediction and biodiversity conservation • Applications of AI algorithms to real-world sustainability issues in case studies 			

<ul style="list-style-type: none">• Sustainability concerns related to AI, such as energy consumption of large AI models, impacts on social sustainability (e.g. through impacts on employment, privacy, and global inequality), inclusivity of AI development• AI governance (e.g. managing risks, ensuring transparency)
Literature:
<ul style="list-style-type: none">• CROWTHER, David and Shahla SEIFI, 2024. <i>Social Responsibility, Technology and AI..</i> Leeds: Emerald Publishing Limited. ISBN 978-1-83608-497-6
Additional remarks:
None

Sustainable Investments and Finance Policies			
Module abbreviation:	SMT_SustInvFinPol	Reg.no.:	11
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	3
Responsible for module:	Blasch, Julia		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	11: Sustainable Investments and Finance Policies		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
schrP90-120 written examination 90-120 minutes			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
Students will build competencies for green finance solutions and social impact investing. They will learn to interpret and utilise environmental, social and corporate governance data to drive sustainable investment decisions. They will explore the elements of a global financial architecture that are suited to establish economic, social and environmental sustainability across the globe.			
Content:			
The module covers topics such as:			
<ul style="list-style-type: none"> • Introduction to Sustainable Finance, including the history of sustainable finance, types of sustainable finance, and the current state of sustainable finance • The crucial role of sustainable finance for a sustainable development • Sustainable finance policies around the globe: • Principles and types of sustainable investment strategies, their advantages and disadvantages • Environmental, Social, and Governance (ESG) Investing • Impact Investing 			
Up to 9 bonus point can be awarded for classroom presentations and discussions.			

Literature:

- NAIFAR, Nader and Ahmed ELSAYED, 2023. *Green Finance Instruments, FinTech, and Investment Strategies: Sustainable Portfolio Management in the Post-COVID Era*. Cham: Springer International Publishing AG. ISBN 978-3-031-29031-2
- SCHOENMAKER, Dirk and Willem SCHRAMADE, 2022. *Principles of Sustainable Finance*. Oxford: Oxford University Press. ISBN 978-0198869818
- THOMPSON, Simon, 2023. *Green and sustainable finance: principles and practice in banking, investment and insurance*. London ; New York, NY ; New Delhi: Kogan Page. ISBN 978-1-3986-0924-2, 978-1-3986-0926-6

Additional remarks:

None

Climate Change, Clean Energy and Decarbonization Technologies			
Module abbreviation:	SMT_ClimChangeClnEnDecztTech	Reg.no.:	12
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	3
Responsible for module:	Hoppe, Holger		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	12: Climate Change, Clean Energy and Decarbonization Technologies		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
PF - Portfolio Exam			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
The module aims to equip students with the knowledge and skills to evaluate and implement various technologies for reducing greenhouse gas emissions. It focuses on understanding the science of climate change, the role of clean energy solutions, and the pathways to achieve deep decarbonization.			
Content:			
<ul style="list-style-type: none"> • Introduction to Climate Change: Physics, history, drivers, etc. • Renewable Energy - their advantages and disadvantages, and their applications in different industries • Decarbonization Technologies (natural and industrial) - their advantages and disadvantages, and their applications in different industries • Carbon Capture and Storage technologies – their advantages and disadvantages, and their applications in different industries • Sustainable Transportation, means for decarbonisation and different approaches like design of bike lanes, pedestrian walkways, and public transportation systems. 			
Literature:			
Will be specified at the beginning			

Additional remarks:

None

Sustainability Project			
Module abbreviation:	SMT_SustProj	Reg.no.:	13
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Compulsory Subject	3
Responsible for module:	Blasch, Julia		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	6 ECTS / 4 SWS		
Workload:	Contact hours:		47 h
	Self-study:		103 h
	Total:		150 h
Subjects of the module:	13: Sustainability Project		
Lecture types:	SU/Ü - lecture with integrated exercises		
Availability of the module:	None		
Examinations:			
Project report and oral presentation 15 min.			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
The sustainability project aims to provide students with the opportunity to gain a comprehensive understanding of sustainability and environmental stewardship based on a practical experience. Students will apply the knowledge and methods they acquired throughout the programme in a practical case study.			
Content:			
<ul style="list-style-type: none"> • Educational program combining classroom learning with hands-on experience in the field. • designed to teach students about sustainability and environmental stewardship by engaging them in real-world projects • students work on in the classroom, followed by a field trip where they can apply what they have learned in a real-world setting. • may involve visiting a sustainable building, a community garden, a waste management facility, etc. • students will have the opportunity to interact with experts in the field, learn about sustainable practices, and gain a deeper understanding of the importance of sustainability. 			
Literature:			
Will be specified at the beginning			

Additional remarks:

None

Master Thesis			
Module abbreviation:	SMT_MA	Reg.no.:	15
Curriculum:	Programme	Module type	Semester
	Sustainability Management and Technologies (SPO SS 25)	Einsetzungstext ist leer!	4
Responsible for module:	Blasch, Julia		
Lecturer:			
Language of instruction:	English	Language of exam:	English
Credit points / SWS:	30 ECTS / 0 SWS		
Workload:	Contact hours:		0 h
	Self-study:		750 h
	Total:		750 h
Subjects of the module:	15: Master Thesis 15.1: Master Thesis 15.2: Master Thesis Colloquium		
Lecture types:	Master Thesis: MA - Master Thesis Master Thesis: MA - Master Thesis Master Thesis Colloquium: MA - Master Thesis		
Availability of the module:	None		
Examinations:			
Master			Thesis:
Master			Thesis:
Master Thesis Colloquium: Master-Thesis			
Additional Explanation:			
None			
Prerequisites according examination regulation:			
None			
Recommended prerequisites:			
None			
Objectives:			
The students demonstrate that they can independently create insights and solutions for complex problems in a comprehensive, applied, and scientifically sound manner within a specified period. The students prove that they can analyze and process complex problems, communicate professionally with partners and collaborators, and find convincing solutions. Students demonstrate the ability to independently understand, apply, and create scientific theory. They work on the research design, methods, and resulting implications, ideally in collaboration with an external partner.			
Content:			
Working on the Master thesis includes the following steps: Individual definition of the topic of the master thesis			

<p>Planning of the master thesis</p> <p>Project realization by applying the acquired scientific skills and methods</p> <p>Project controlling and interaction with the primary supervisor</p> <p>Presentation of results in the form of a scientific paper and colloquium</p> <p>The Master thesis will be supervised and evaluated by a professor. Students choose their topics individually.</p>
Literature:
Will be specified at the beginning
Additional remarks:
If students seek to graduate in the respective term, the deadlines for the official hand-in of the thesis are January 15 (winter semester) and July 15 (summer semester). Please note that the master colloquium has to be completed at least two weeks before the end of the semester (i.e., September 15 for the summer semester, February 28 for the winter semester).