

Project Study
Chair of Corporate Sustainability
Technical University of Munich

-TUM School of Management Going Sustainable-

Examiner: Univ.-Prof. Dr. Frank-Martin Belz
Person in Support: Esther Salvi, M.Sc.
Submitted by: Liudmyla Kytaygora (03702540)
Abdullah Kamran Sheikh (03737069)
Vaisakh Vishukumar (03732525)
Falgun Patel (03730924)

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Executive summary

This report provides an analysis and evaluation of the current status quo of sustainability in teaching activities TUM School of Management. It assesses the sustainability level in teaching modules and courses of two degree programmes the Master in Consumer Science and the Master in Management. The report describes the method of assessing sustainability, how we developed the tool for evaluating sustainability and also the codebook for better understanding each course's evaluation. In the results of the analysis part there is a brief information on selective courses and their evaluation. The report also compares two degree programmes based on the level of sustainability in the courses. The report also adds a few suggestions to further enhance sustainability in teaching at TUM SOM.

1. PRME

"The PRME initiative was launched to nurture responsible leaders of the future. Never has this task been more important. Bold leadership and innovative thinking are needed to achieve the Sustainable Development Goals."

- Antonio Guterres, United Nations Secretary-General

The Principles for Responsible Management Education (PRME) is a United Nations-supported initiative founded at 2007 UN Global Compact Leaders' Summit in Geneva, as a platform to raise the profile of sustainability in schools around the world, to encourage and inspire responsible management education by creating dialogue, and to empower today's business students with the understanding and ability to deliver change tomorrow (Wrocław University of Economics, n.d.).

As a voluntary initiative with over 850 signatories worldwide (Principles for Responsible Management Education, 2020), PRME has developed the largest organised relationship between the United Nations and management-related higher education institutions. In 2013 TUM School of Management signed PRME. Retrospectively, "membership of the UN-backed initiative was an essential trigger for integrating sustainability into research and teaching at TUM School of Management" (*TUM Sharing Information on Progress*, 2020). Working through Six Principles, PRME engages business and management schools to ensure they provide future responsible leaders with the skills needed to balance economic and sustainability goals, while drawing attention to the Sustainable Development Goals (SDGs) and aligning academic institutions with the work of the UN Global Compact.

TUM employs a 6 pronged approach to fulfil PRME (*TUM Sharing Information on Progress*, 2020).



Principle 1| Purpose: To develop the capabilities of students to be future generators of sustainable value for business and society at large and to work for an inclusive and sustainable global economy (*PRME*, 2020). Building on the school's areas of excellence, TUM SoM aims to become one of Europe's leading management schools at the interface to engineering and science, contributing to solutions for the grand societal challenges.



Principle 2| Values: To incorporate into our academic activities, curricula, and organisational practices the values of global social responsibility as portrayed in international initiatives such as the United Nations Global Compact (*PRME*, 2020). In accordance with its mission, vision and

strategy, TUM School of Management is committed to ensuring the highest ethical standards of personal and collective behavior. This covers areas such as honesty, fairness, trust, respect, integrity, diversity and equality.



Principle 3| Methods: To create educational frameworks, materials, processes and environments that enable effective learning experiences for responsible leadership (*PRME*, 2020). In 2020/21 the school started evaluating how its teaching modules relate to sustainability and sustainable development in a qualitative way. One of TUM SoM's main objectives for 2021/22 is to assess sustainability-related content in all their teaching modules both qualitatively and quantitatively, and to develop specific strategies to increase the focus on sustainability in all our modules.



Principle 4| Research: To engage in conceptual and empirical research that advances our understanding about the role, dynamics, and impact of corporations in the creation of sustainable social, environmental and economic value (*PRME*, 2020). School conducts research with impact. Sustainability and sustainable development are central aspects and lie at the core of many research centers, scientific publications and research projects.



Principle 5| Partnership: To interact with managers of business corporations to extend our knowledge of their challenges in meeting social and environmental responsibilities and to explore jointly effective approaches to meeting these challenges (*PRME*, 2020). To achieve the Sustainable Development Goals, TUM School of Management actively engages with stakeholders and builds partnerships with communities, businesses and governments. These institutional networks allow the School to join forces with different stakeholders in achieving a more sustainable future.



Principle 6| Dialogue: To facilitate and support dialog and debate among educators, students, business, government, consumers, media, civil society organisations and other interested groups and stakeholders on critical issues related to global social responsibility and sustainability (*PRME*, 2020). The School's Equal Opportunity Commission involved two committees that target faculty members and female junior academics at the doctorate and postdoctoral levels. The Equal Opportunity, Women and Diversity Committee of TUM School of Management is headed by Prof. Dr. Nicola Breugst and has 11 further members. Its aim is to implement the TUM Diversity Code of Conduct.

2. Assessing the level of Sustainability in Teaching Modules at TUM SOM

TUM School of Management stands as the leading public institution within the finest of the world's business schools. With its hard work, passion, and dedication to the institution's mission and vision that have made Technical University of Munich the bastion of progressive thinking and fertile land for sustainable entrepreneurship. Its culture of educating business leaders on socially impacting work dates back over 100 years.

TUM SoM strives to use research competencies to overcome societal challenges and to tackle the UN Sustainable Development Goals. It is the institution's mission (*TUM SIP*, 2020) to emphasize on raising the level of awareness regarding responsible management, ethics and sustainability among our students and faculty. On this front the institution has been reporting to PRME, which expands commitment to work on Sustainable Development Goals. TUM SEED Centre is at the core amongst the institutions endeavour in addressing the Global Goals.

The TUM SEED Center was founded in February 2020. It aims at contributing to Sustainable Development Goal 7, i.e. affordable and clean energy for all by 2030. The acronym SEED stands for "Sustainable Energies, Entrepreneurship and Development in the Global South". Along with SEED Center, The Center for Energy Markets shares the university's mission of fulfilling Sustainable Development Goals. Energy markets are at the heart of one of the biggest societal challenges of our time - creating a sustainable, reliable and affordable energy provision. The Center for Energy Markets brings together economics, finance and engineering approaches to offer applied research contributions to topical real-world energy sector questions. (TUM Center for Energy Markets, n.d.).

TUM School of Management is equally committed to working globally to ensure equality, justice for all, accessibility to clean energy and other fundamental Sustainable Development Goals. In line to this, some of the teaching modules have sustainability at their core, referring to the SDGs explicitly and tackling the grand societal challenges. While, their courses refer to sustainability and integrate it to a greater or lesser degree (*TUM SIP*, 2020).

We used the SDGs as an interactive tool to assess the sustainability of teaching modules at TUM SoM. More information on how we proceed will be discussed in the sustainability assessment chapter of this report.

3. Sustainable Development Goals

The Sustainable Developments Goals (SDGs) provide an aspirational but intricate framework for enhancing sustainability by 2030. At TUM School of Management, the integration of the SDGs is the driving imperative in it's endeavour of further embedding responsible management education to empower business students of today to be future generators of sustainable value for business and society at large and to work for an inclusive and sustainable global economy.

To tackle SDGs, TUM School of Management offers interdisciplinary research projects involving different departments within the schools and/or departments from other TUM schools (*TUM SIP*, 2020). This collaborative approach in developing responsible management education includes working with other organisations in this space.



Picture 3.1 – UN Sustainable Development Goals (Conard N. Hilton Foundation, n.d.)

The icons for the SDGs (United Nations, 2021) are used throughout this report to indicate and visualise the teaching modules with Global Goals.

4. Methods

4.1. Evaluation tool and Coding

The project study aims at assessing the extent to which sustainability is addressed in teaching modules at TUM SoM. In particular we analyse the courses belonging to the study programs Master in Consumer Science (MCS) and Master in Management (MiM). The study focuses on the primary data in which we used the materials in the form of lecture slides, introductory lectures, content description of the courses and syllabus provided by Campus Management System TUMOnline, research assistants, lecture assistants, professors, course websites and fellow students who have taken the courses. All the materials analysed are available per e-mail and at the folder “PRME – Material MCS MiM (Esther Salvi)”.

We measured the level of sustainability through a coding process. We coded the data in a deductive way following DeCur-Gunby et al (2011) to assess the level of sustainability of each course in two different study programs Master in Consumer Science (MCS) and Master in Management (MiM). The data needed for this project study is qualitative in nature and the core focus is on the level of sustainability each module tackles while discussing sustainability goals and issues during the lectures and the content which supports a better sustainable environment, providing guidance related to sustainability issues and equipping students with a better understanding of issues pertaining sustainability globally and how to tackle them. Coding in this project study is based on the content of the courses which provides information and addresses sustainability in any way during the course. We as a group of four members in this project coded the data individually and reached a high level of intercoder agreement (Campbell et al, 2013). While coding we collected exact sentences from the lecture slides, introductory lectures, websites and other data collection sources and put them as codes in the project evaluation report (Microsoft Excel), not paraphrased (Excel file available for review).

Our codebook consists out of two indicators: indicator 1, which measures how many lectures within a course address sustainability and tackle the sustainability issues and the Sustainable Development Goals (SDGs) index of seventeen goals as indicator 2, which measures in particular which goals are tackled specifically within a course (as shown in table 4.1). Below we explain the two indicators and the codes more in-depth.

Table 4.1 – Indicators and code descriptions

Indicator 1	Description of the indicator	Scale (values)	Scale (values description)
Degree of sustainability of the course	This indicator represents how many lectures and topics within a course address sustainability and tackle the sustainability issues	1-5	1 = sustainability highly addressed (>90%)
			2 = sustainability moderately addressed (51-89%)
			3 = sustainability sufficiently addressed (21-50 %)
			4 = sustainability poorly addressed (1-20 %)
			5 = sustainability not addressed at all (0%)
Indicator 2	Description of the indicator	Scale (values)	Scale (values description)
Main SDG addressed	The indicator measures in particular which goals are tackled specifically within a course	1-20	1 = No Poverty
			2 = Zero Hunger
			3 = Good Health and Well-being
			4 = Quality Education
			5 = Gender Equality
			6 = Clean Water and Sanitation
			7 = Affordable and Clean Energy
			8 = Decent Work and Economic Growth
			9 = Industry, Innovation and Infrastructure
			10 = Reduced Inequalities
			11 = Sustainable Cities and Communities
			12 = Responsible Consumption and Production
			13 = Climate Action
			14 = Life Below Water
			15 = Life on Land
			16 = Peace, Justice and Strong Institutions
			17 = Partnerships for the Goals
			18 = several SDGs tackled
			19 = all the SDGs tackled
			20 = no SDGs tackled

4.2. Indicators and Codes (Values Description)

There are two indicators: a) degree of sustainability assessed through 5 codes following a 5 point Likert scale with 5 values and b) Sustainable Development Goals (SDG's) Index which consists of seventeen goals as codes and three supplementary codes.

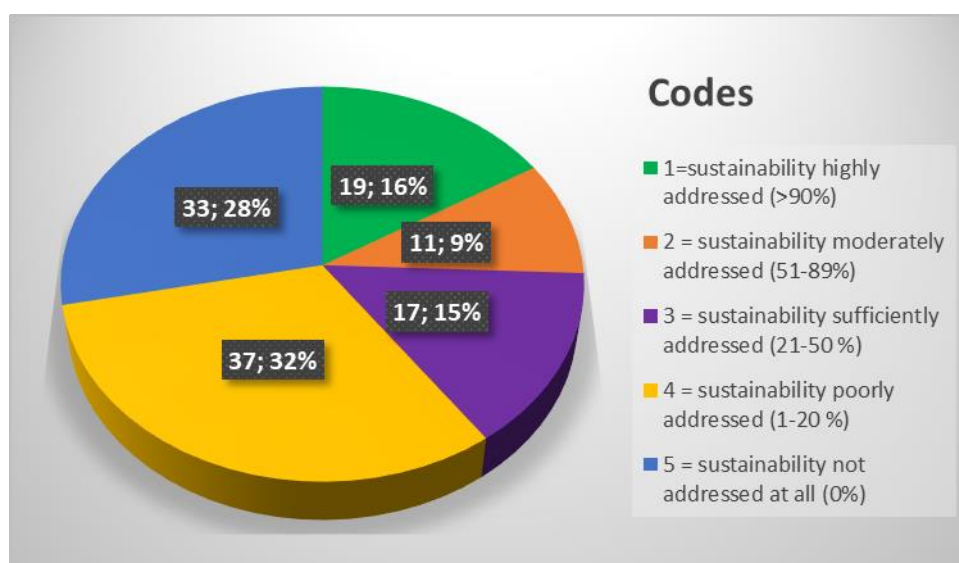
Indicator 1 consists of 5 codes from “Sustainability highly addressed more than ninety percent (>90%)” as code 1, “Sustainability moderately addressed between fifty one to eighty percent (51-89%)” as code 2, “Sustainability sufficiently addressed between twenty one percent’s to fifty percent (21-50 %)” as code 3, “Sustainability poorly addressed between one percent to twenty percent’s (1-20 %)” as code 4 and “Sustainability not addressed at all which is zero percent (0%)” as code 5. Here the percentages (>90%, 51 – 89%, 21 – 50%, 1 – 20% and 0%) refer to the topics that addressed sustainability within the lectures during the semester. For example, more than ninety percent (>90%) refers to the course in which nine out of ten lectures (9/10) have a discussion of sustainability issues and addressed solutions.

Indicator 2 consists of seventeen sustainable development goals (SDG's) with additional three custom made ratings for better evaluation on a scale of one to twenty (1-20). The codes are: 1=No Poverty as SDG 1; 2=Zero Hunger as SDG 2; 3=Good Health and Well-being as SDG 3; 4=Quality Education as SDG 4; 5=Gender Equality as SDG 5; 6=Clean Water and Sanitation as SDG 6; 7=Affordable and Clean Energy as SDG 7; 8= Decent Work and Economic Growth as SDG 8; 9=Industry, Innovation and Infrastructure as SDG 9; 10=Reducing Inequality as SDG 10; 11=Sustainable Cities and Communities as SDG 11; 12=Responsible Consumption and Production as SDG 12; 13=Climate Action as SDG 13; 14=Life Below Water as SDG 14; 15=Life On Land as SDG 15; 16=Peace, Justice, and Strong Institutions as SDG 16; 17=Partnerships for the Goals as SDG 17 (United Nations, 2021). Three additional codes are: 18=Several SDGs tackled, 19=All the SDGs tackled and 20= No SDGs tackled.

5. Results of the Analysis

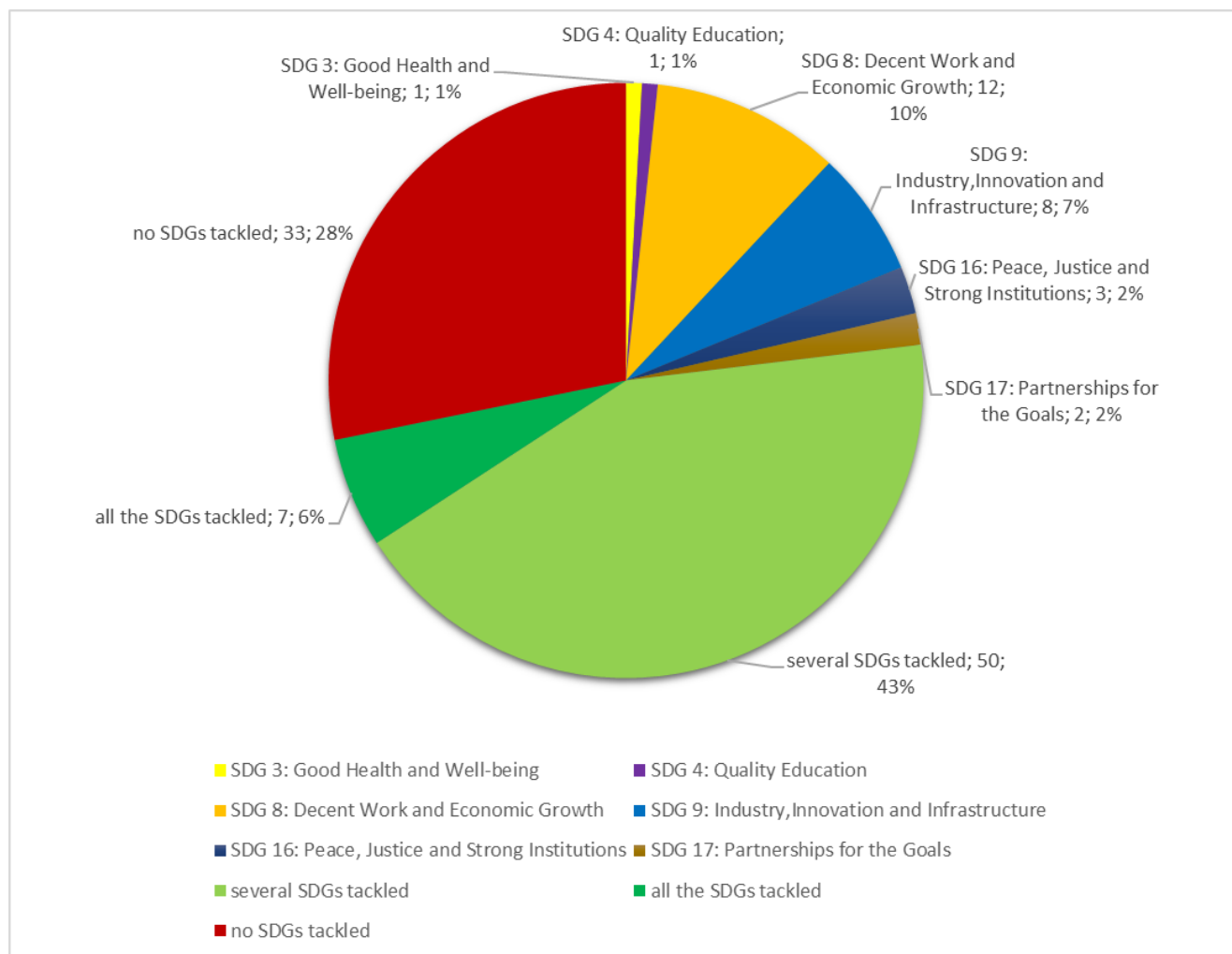
We have thoroughly analysed 50 courses of Master in Consumer Science (MCS) study program and 67 courses in Master in Management (MiM) study program, which is in total 117. However, 42 courses are overlapping for both study programs, which means that in total 75 courses were analysed using our intersubjective approach. We compare two study programs in the discussion part of our report. Below we present our sustainability assessment of both study programs. 133 courses for which we did not have and did not obtain enough materials for the analysis were excluded from the analysis.

The pie chart on picture 5.1 indicates the amount and percentage of all courses in both study programs related to the 5 sustainability codes of indicator 1. It can be seen from the chart that 19 out of 117 courses which is 16% were given code 1 which reveals that sustainability is highly addressed in teaching those courses. Similarly, 11 courses and 9% respectively were given code 2 and illustrates that sustainability is moderately addressed. 17 courses (15%) received code 3 which indicates that sustainability is sufficiently addressed. More than twice 37 courses (32%) received code 4 and demonstrate that sustainability is poorly addressed in teaching. Finally, 33 courses (28%) do not address sustainability at all and received code 5. It can be concluded that 60% of all courses were labelled with codes 4 and 5 whereas only 25% received codes 1 and 2. Thus, in the majority of courses when we analyse Master in Consumer Science and Master in Management study programs sustainability is not or poorly addressed which indicates a room for improvement. We will present individual results for each study program in Chapter 6 “Discussion” and compare those results.



Picture 5.1 – Percentage of all analysed courses for both study programs related to each code

In relation to indicator 2, below on picture 5.2 distribution of all SDGs covered by modules for both study programs can be observed. SDGs 1,2,5,6,7,10,11,12,13,14,15 are not presented individually on the pie chart because they fall into “several SDGs tackled” or “all SDGs tackled” categories which is also a limitation of our research. It can be concluded that SDG 8 and 9 were addressed in 17% of the modules by themselves and also they are presented in “several SDGs tackled” or “all SDGs tackled” categories which is expected for a technical university.



Picture 5.2 – Distribution of all SDGs covered by modules for both study programs

All the SDGs were tackled by 7 courses or 6% of the total number of courses, several SDGs were covered by 43% of all modules (50 courses respectively) and no SDGs by 28% which is 33 courses. By itself only 1 course (1%) covers SDG 3, which is the same for SDG 4. Besides, SDG 16 was tackled by 3 courses (2%) and SDG 17 was tackled by 2 courses (2%). We have to mention that it is complicated to estimate the exact percentage of courses for each SDG, because categories “several SDGs tackled” and “all SDGs tackled” are presented and limit the estimation of each SDG covered by modules. As well as for indicator 1, for indicator 2 we will present individual results for each study

program in Chapter 6 “Discussion” and compare those results. Below we describe the most representative courses and related assessment using our two indicators. For the reasons of limited space, we cannot present all the analysed courses. For a complete list of all such courses, please refer to the Appendix 1 and Excel file and use the provided filter option.

Key Modules: sustainability highly addressed (>90%)

Lecture Series Renewable Energy Systems in the Global South (WI001255) and What Future of Mobility? Engaging Technologies, Politics, Economic Scenarios, and Practices (WI001147) received the highest code 1 and represent that sustainability was highly addressed in 90% or more of all discussed topics of the course.

Lecture Series Renewable Energy Systems in the Global South (WI001255)

Master in Consumer Science

Master in Management

Associate Professorship of Corporate Sustainability – Brewery and Food Industry Management (Prof. Belz)

Prof. Dr. Frank-Martin Belz

Dipl.-Ing. Johannes Winklmaier

Code for Indicator 1: “Overview of renewable energy technologies including their functionality, their technological and economical assessment, their integration in decentralized energy systems, and business concepts for their utilization in the Global South: - Renewable energy systems in the Global South - Why and how?; - Small-scale solar thermals and photovoltaics; - Small-scale hydro-power; - Small-scale wind-power; - Small-scale biogas systems; - Battery storages; - Electrical components of mini-grids; - Rural electrification planning through Geo Information Systems; - System sizing through least-cost modelling; - Sustainable energies and entrepreneurship in the Global South; - Sustainable enterprises for Renewable Energies in the Global South; - Rural electrification projects in the Global South.” (Content description).

Indicator 2: code 18 “Several SDGs tackled” – SDGs from 1 to 8, from 11 to 13 (Introduction lecture, slide 31, November 2020) are addressed.



Lecture Series Renewable Energy Systems in the Global South (WI001255) discusses the topic of Energy-Water-Food systems and its proper representation, harvesting and better agricultural surroundings and provides an overview of renewable energy technologies including their functionality, their technological and economical assessment, their integration in decentralized energy systems, and business concepts for their utilization in the Global South. Topics of the course are: “- Renewable energy systems in the Global South - Why and how?; - Small-scale solar thermals and photovoltaics; - Small-scale hydro-power; - Small-scale wind-power; - Small-scale biogas systems; - Battery storages; - Electrical components of mini-grids; - Rural electrification planning through Geo Information Systems; - System sizing through least-cost modelling; - Sustainable energies and entrepreneurship in the Global South; - Sustainable enterprises for Renewable Energies in the Global South; - Rural electrification projects in the Global South” (content description, TUM Online). The course is tackling poverty, zero hunger, providing opportunities to local people for employment and using the resources at hand to foster better communities and societies. Furthermore, the content illustrates the importance of clean energy, clean water and better climate conditions and promotes sustainability at the core. The course promotes sustainability starting from utilizing resources locally to creating economic opportunities, more sustainable production, and consumption patterns to better environmental effects.

What Future of Mobility? Engaging Technologies, Politics, Economic Scenarios, and Practices (WI001147)

Master in Consumer Science

Master in Management

Associate Professorship of Innovation Research (Prof. Pfothenauer)

Prof. Dr. rer. nat. Sebastian Pfothenauer

Dr. phil. Alexander Wentland

Code 1 for Indicator 1 (sustainability highly addressed (>90%): “This course introduces the participants to key questions and issues facing engineers, policy-makers, and societies writ-large when trying to understand, anticipate, and organize the future of mobility. In order to comprehend current developments and visions around mobility, students engage with the history of transportation as well as past and present predictions about the future. Changes in infrastructural arrangements and mobility practices have often influenced economic and cultural development. Over the course of the semester, students tackle a host of mobility-related phenomena not as isolated cases but as a constitutive part of modern technologized societies and their visions of the future.” (Syllabus, p.1)

Indicator 2: code 18 “Several SDGs tackled”. “Mobility is one of the key economic, political, and cultural issues of today.”(Introduction lecture, Session 1, slide 9) “This course will be about ...

Notions of the future (or futures) mobilized by actors in the present; Analyzing past and present predictions about the future; The dominant culture of automobility, its history and current environmental concerns related to it; Transformation of urban and rural infrastructures and life worlds; Relationship between mobility and modernity; Seeing different phenomena not as isolated cases as a constitutive part of technologized societies and their visions of the future.” (Introduction lecture, Session 1, slide 16).



Mobility is one of the key economic, political, and cultural issues of today. This course introduces the participants to key questions and issues facing engineers, policymakers, and societies writ-large when trying to understand, anticipate, and organize the future of mobility. In order to comprehend current developments and visions around mobility, students engage with the history of transportation as well as past and present predictions about the future. Changes in infrastructural arrangements and mobility practices have often influenced economic and cultural development. Over the course of the semester, students tackle a host of mobility-related phenomena not as isolated cases but as a constitutive part of modern technologized societies and their visions of the future. This course will be about: - Notions of the future (or futures) mobilized by actors in the present; - Analysing past and present predictions about the future; - The dominant culture of automobility, its history and current environmental concerns related to it; - Transformation of urban and rural infrastructures and life worlds; - Relationship between mobility and modernity; - Seeing different phenomena not as isolated cases as a constitutive part of technologized societies and their visions of the future. SDGs 8,9,11,12,13 and 15 are addressed in this course. The course provides insights into the industrial revolution in terms of transportation, gives creative and innovative structure to follow future growth and advancement and provides access to the benefits of responsibly consumed and produced products. This also enhances incremental changes in how industry contributes into it and how more sustainable societies are formed.

Key Modules: sustainability moderately addressed (51-89%)

Choice Architecture Applications in Consumer Behavior (WI001167) and *Advanced Seminar in Economics & Policy (WIV05001): Economics of Innovation* received the code 2 and represent that sustainability was moderately addressed in ca. 51-89% of all discussed topics and lectures of the course.

Choice Architecture Applications in Consumer Behavior (WI001167)

Master in Consumer Science

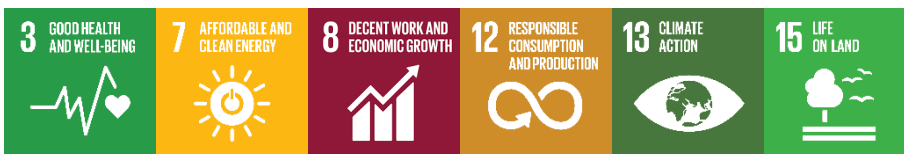
Master in Management

Assistant Professorship of Marketing (Prof. Ungemach)

Prof. Dr. Ph.D. Christoph Ungemach

Code 2 for Indicator 1 (sustainability moderately addressed (51-89%)): “Technology & Environmental Choices; Social Influence on Environmental decision making; Social influence approaches to encourage resource conservation; Application of social nudges in electricity consumption; Choice architecture as means to tackle environmental issues; Energy labels address challenges in energy consumption awareness; SCORE principles for designing energy labels; attributes and type of translated attributes influence people’s preference for fuel-efficient cars; Attribute translation for food carbon emission; Health Choices; Food Choices. This seminar introduces students to the choice architecture principles and their applications in marketing, management and public policy.” “Constructed Preferences, Randomized Control Trials, Nudging, Choice Architecture beyond Nudges, Ethical Concerns for the application of Choice Architecture, Applications of Choice Architecture in Financial Decision Making and Consumer Choice and Choice Architecture aided by technology.” (Introduction slides, p.37, Lecture 2, Environmental Decision Making Scaling and Translation)

Indicator 2: code 18 “Several SDGs tackled”. In introduction slides, p.37 and Lecture 2, Environmental Decision Making Scaling and Translation can be found following codes: “Technology & Environmental Choices; Social Influence on Environmental decision making; Social influence approaches to encourage resource conservation; Application of social nudges in electricity consumption; Choice architecture as means to tackle environmental issues; Energy labels address challenges in energy consumption awareness (Lecture 2, Environmental Decision Making Scaling and Translation, p. 4); SCORE principles for designing energy labels (p.8); attributes and type of translated attributes influence people’s preference for fuel-efficient cars (Environmental Decision Making Scaling and Translation, p.7); Attribute translation for food carbon emission; Health Choices; Food Choices”.



This seminar introduces students to the choice architecture principles and their applications in marketing, management, and public policy. The seminar covers the following topics: - Constructed Preferences, - Randomized Control Trials, - Nudging, - Choice Architecture beyond Nudges, - Ethical

Concerns for the application of Choice Architecture, - Applications of Choice Architecture in Financial Decision Making and Consumer Choice and Choice Architecture aided by technology. The seminar tackles SDGs 3,7,8,12,13 and 15 and provides implication on more sustainable choices which maintain the environment in terms of climatic conditions, and it states information regarding more sustainable energy usage and provides insights into responsible consumption and production. The module discusses: - Technology & Environmental Choices; - Social Influence on Environmental decision making; - Social influence approaches to encourage resource conservation; - Application of social nudges in electricity consumption; - Choice architecture as means to tackle environmental issues; - Energy labels address challenges in energy consumption awareness; - SCORE principles for designing energy labels; - Attributes and type of translated attributes influence people's preference for fuel-efficient cars; - Attribute translation for food carbon emission; - Health Choices; - Food Choices (Introduction slides and Lecture 2, Environmental Decision Making Scaling and Translation).

Advanced Seminar in Economics & Policy (WIV05001): Economics of Innovation

Master in Consumer Science

Master in Management

Assistant Professorship of Economics of Innovation (Prof. Hottenrott)

Prof. Dr. Hanna Hottenrott

Mr. Pu, Zhaoxin

Code 2 for Indicator 1 (sustainability moderately addressed (51-89%)): "This seminar introduces the students to the main issues in the economics of innovation and advances their understanding of the core concepts and principles in the field. The ultimate objective to enhance both theoretical as well as an applied view on the topic enabling students to understand academic as well as public debate on questions related to the economics behind innovation and technological progress. The seminar will discuss some of the prevailing models in the field of Industrial Organization dedicated to the analysis of the incentives and constraints to innovative activities (R&D activities) as well their relation with imitation, spillovers, firm size and market structure. Seminar Topics: A. Ideas, Innovation and Economic Growth; B. The Supply of Inventors: Who innovates?; C. Production of Ideas & Organization of Innovation; D. Financing Innovation; E. The Role of IP; F. Market Structure and Innovation; G. Economic Consequences of Innovation". (Content description)

Indicator 2: code 18 "Several SDGs tackled": "Innovation as the engine of Economic Growth"(p.8); "Covid-19: Innovation to the help" (p.10) (Introduction to the „Economics of Innovation“ slides).



This seminar introduces the students to the main issues in the economics of innovation and advances their understanding of the core concepts and principles in the field. The ultimate objective is to enhance both theoretical as well as an applied view on the topic enabling students to understand academic as well as public debate on questions related to the economics behind innovation and technological progress. The seminar will discuss some of the prevailing models in the field of Industrial Organization dedicated to the analysis of the incentives and constraints to innovative activities (R&D activities) as well their relation with imitation, spillovers, firm size and market structure. Seminar Topics: A. Ideas, Innovation and Economic Growth; B. The Supply of Inventors: Who innovates?; C. Production of Ideas & Organization of Innovation; D. Financing Innovation; E. The Role of IP; F. Market Structure and Innovation; G. Economic Consequences of Innovation. The seminar tackles SDGs 3,8,9 - "Innovation as the engine of Economic Growth"; "Covid-19: Innovation to the help"(Introduction to the „Economics of Innovation“ slides).

Key Modules: sustainability sufficiently addressed (21-50%)

Advanced International Experience (WI001181, WIHN1181) and Advanced Seminar Innovation & Entrepreneurship (WIB18812_1): Ideation & Venture Creation received the code 3 and represent that sustainability was sufficiently addressed in ca. 21-50% of all discussed topics and lectures of the course.

Advanced International Experience (WI001181, WIHN1181)

Master in Consumer Science

Master in Management

Chair of Forest Economics (Prof. Moog)

Prof. Dr. Martin Moog

Ms. Marina Lehmann

Code 3 for Indicator 1 (sustainability sufficiently addressed (21-50%): “Students will bear integrity, ethics and responsibility in mind when making management decisions in a multicultural business environment. After taking the course students are also able to reflect their experience abroad with scientific intercultural knowledge and develop an open-mindedness and sensitivity with respect to cultural differences. Structure of the content. Part 1: Culture and the international environment: 1. Definition of culture; 2. Different cultural models; 3. The determinants of culture; 4. The international

economic environment. Part 2: Intercultural communication: 1. Introduction and definitions; 2. The Models of communication; 3. Barriers to Intercultural Communication; 4. Types of Communication. Part 3: Intercultural management: 1. Introduction; 2. Intercultural Management Skills; 3. Patterns of Cross Cultural Business Behavior; 4. International Negotiator Profiles.” (Content description)

Indicator 2: code 18 “Several SDGs tackled”: The international economic environment, Intercultural communication, Intercultural Management Skills (8 Decent Work and Economic Growth; 10 Reduced Inequalities; 16 Peace, Justice and Strong Institutions).



Students will bear integrity, ethics and responsibility in mind when making management decisions in a multicultural business environment. After taking the course students are also able to reflect their experience abroad with scientific intercultural knowledge and develop an open-mindedness and sensitivity with respect to cultural differences. Structure of the content. Part 1: Culture and the international environment: 1. Definition of culture; 2. Different cultural models; 3. The determinants of culture; 4. The international economic environment. Part 2: Intercultural communication: 1. Introduction and definitions; 2. The Models of communication; 3. Barriers to Intercultural Communication; 4. Types of Communication. Part 3: Intercultural management: 1. Introduction; 2. Intercultural Management Skills; 3. Patterns of Cross Cultural Business Behavior; 4. International Negotiator Profiles. The international economic environment, Intercultural communication, Intercultural Management Skills topics address SDGs 8,10 and 16 and assists in promoting tolerance and multiculturalism in today's increasingly globalised world.

Advanced Seminar Innovation & Entrepreneurship (WIB18812_1): Ideation & Venture Creation

Master in Consumer Science

Master in Management

Chair of Entrepreneurship (Prof. Patzelt)

Prof. Dr. rer. pol. Holger Patzelt

Dr. rer. pol. M.Sc. Rebecca Preller

Dr. phil. Ding Zhao

Code 3 for Indicator 1 (sustainability sufficiently addressed (21-50%)): How do social media entrepreneurs build businesses around their lives? A lot of entrepreneurial activities are triggered by technological change. New technologies (such as AI, Blockchain, AR/VR, and other technologies that enable platforms/ecosystems) create varying possibilities for entrepreneurial opportunities,

giving birth to new products, new ventures and new markets. This seminar is designed as a platform to familiarize students with some of the core concepts and primary theoretical underpinnings of entrepreneurship research and subfields, such as, social or sustainable entrepreneurship, to gain deep insights into one specific, predefined research topic. Preliminary topics and readings: The role of knowledge & learning in EOD; The role of information processing & coordination in EOD; The role of prototyping in EOD; The role of networks in EOD; Market and customer orientation in EOD; Stakeholder involvement in EOD; The role of mentoring in EOD; Work-Life Balance; Entrepreneurial Wellbeing; Community of Inquires. (Syllabus).

Indicator 2: code 18 “Several SDGs tackled”: The role of mentoring in EOD, Social sources of information in opportunity recognition: Effects of mentors, industry networks, and professional forums (8 Decent Work and Economic Growth; 9 Industry, Innovation and Infrastructure; 17 Partnerships for the Goals); Entrepreneurial Wellbeing; Work-Life Balance (3 Good Health and Well-being).



How do social media entrepreneurs build businesses around their lives? A lot of entrepreneurial activities are triggered by technological change. New technologies (such as AI, Blockchain, AR/VR, and other technologies that enable platforms/ecosystems) create varying possibilities for entrepreneurial opportunities, giving birth to new products, new ventures, and new markets. This seminar is designed as a platform to familiarize students with some of the core concepts and primary theoretical underpinnings of entrepreneurship research and subfields, such as, social, or sustainable entrepreneurship, to gain deep insights into one specific, predefined research topic. Preliminary topics and readings: The role of knowledge & learning in EOD; The role of information processing & coordination in EOD; The role of prototyping in EOD; The role of networks in EOD; Market and customer orientation in EOD; Stakeholder involvement in EOD; The role of mentoring in EOD; Work-Life Balance; Entrepreneurial Wellbeing; Community of Inquires. The role of mentoring in EOD, Social sources of information in opportunity recognition: Effects of mentors, industry networks, and professional forums; Entrepreneurial Wellbeing; Work-Life Balance address SDGs 3, 8, 9 and 17.

Key Modules: sustainability poorly addressed (1-20%)

Qualitative Research Methods (WI000376, WI000727, WI001174) and Advanced Topics in Marketing, Strategy & Leadership (WIB21952): Performance Measurement: The better you measure

the better you manage received the code 4 and represent that sustainability was poorly addressed in ca. 1-20% of all discussed topics and lectures of the course.

Qualitative Research Methods (WI000376, WI000727, WI001174)

Master in Consumer Science

Associate Professorship of Corporate Sustainability

Prof. Dr. Frank-Martin Belz

Ms. Esther Salvi

Code 4 for Indicator 1 (sustainability poorly addressed (1-20%): “variance and process studies, interviews, coding, case study etc. At the end of the seminar on Qualitative Research you will be able to: 1. Understand what theory is and why we need it. 2. Reflect the basic assumptions of research. 3. Define and differentiate variance and process studies. 4. Develop qualitative research designs. 5. Collect qualitative data for consumer research. 6. Code and analyse qualitative data for consumer research.” (Content description)

Indicator 2: 4=Quality Education „Africa Green Tech” project (introduction slides, p. 8)



The course is about variance and process studies, interviews, coding, case study etc. At the end of the seminar on Qualitative Research students will be able to: 1. Understand what theory is and why we need it. 2. Reflect the basic assumptions of research. 3. Define and differentiate variance and process studies. 4. Develop qualitative research designs. 5. Collect qualitative data for consumer research. 6. Code and analyse qualitative data for consumer research. During the course, some sustainable projects and research were discussed (e.g., Africa Green Tech). The course addresses SDG 4 and specifically 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture’s contribution to sustainable development (United Nations, 2021, SDG 4, targets 4.7). This course tackles SDG 4 because it mentions sustainable project such as Africa Green Tech and makes students aware of sustainability issues and goals such as 6 Clean Water and Sanitation and 7 Affordable and Clean Energy but the course does not tackle these SDGs directly.

Advanced Topics in Marketing, Strategy & Leadership (WIB21952): Performance Measurement: The better you measure the better you manage

Master in Consumer Science

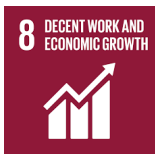
Master in Management

Chair of Research and Science Management (Prof. Peus)

Mr. Ulf Steinberg

Code 4 for Indicator 1 (sustainability poorly addressed (1-20%)): This seminar focuses on the questions if and how abilities and performance of employees can be measured and evaluated correctly. From this question we will move on to analyze general problems of measurements and discuss these in the context of different tasks of managers, e.g., customer surveys, definition of key performance indicators, etc. This seminar aims to raise awareness to the problem of measurement on the individual level (Content description). Topics: Introduction to the problem of measuring individual performance; Different methods of measuring individual performance; Measurement theories; Generalization to other areas of economics (KPI's etc.); Problematic cases (assigning grades, customer satisfaction). (Introduction lecture, p.7)

Indicator 2: 8=Decent Work and Economic Growth “Introduction to the problem of measuring individual performance; Different methods of measuring individual performance” (Introduction lecture, p.7)



This seminar focuses on the questions if and how abilities and performance of employees can be measured and evaluated correctly. From this question we will move on to analyse general problems of measurements and discuss these in the context of different tasks of managers, e.g., customer surveys, definition of key performance indicators, etc. This seminar aims to raise awareness to the problem of measurement on the individual level. Topics: Introduction to the problem of measuring individual performance; Different methods of measuring individual performance; Measurement theories; Generalization to other areas of economics (KPI's etc.); Problematic cases (assigning grades, customer satisfaction). The course tackles SDG 8.

Key Modules: sustainability not addressed at all (0%)

Introduction to Statistics Using R (WI001243) and *Financial Accounting (WI001139) (MiM)* received the code 5 and represent that sustainability was not addressed at all (0%) in discussed topics and lectures of the course.

Introduction to Statistics Using R (WI001243)

Master in Consumer Science

Master in Management

Chair of Psychology (Prof. Kehr)

M.Sc. Cafer Bakac

Code 5 for Indicator 1 (sustainability not addressed at all (0%)) and code 20 “No SDGstackled” for Indicator 2:

Introduction to Statistics Using R topics: Replication crisis in psychological science; Open Science Framework; Reproducibility of in psychological science; Fundamentals of the R language and R environment: variables and assignment, data structures, operators, functions, etc; R Markdown; Data wrangling; Data visualization; Exploratory data analysis; Correlation; Simple and Multiple Linear Regression. At the end of the module students are able to describe, interpret, explain and apply the following concepts of Introductory Statistics, R programming and Psychological Science: - How replication in psychological science work and what the current results show us; - What kinds of developments there are to find a solution to the replicability crisis in psychological science; - What R language and the environment offer to address this issue; - Fundamentals of R language and environment; - R Markdown as a reproducibility tool; - What common practices in data wrangling are; - Why we should visualize our data and what common practices are; - How exploratory data analysis gives us a 'sense' for the data; - What correlations are and how they can be used; - What simple and multiple regressions are and how they can be used (Content description).

Financial Accounting (WI001139) (MiM)

Master in Management

Chair of Financial Accounting (Prof. Ernstberger)

Prof. Dr. rer. pol. habil. Jürgen Ernstberger

Hon.-Prof. Dr. Bernd Grottel

M.Sc. Mario Keiling

Code 5 for Indicator 1 (sustainability not addressed at all (0%)) and code 20 “No SDGstackled” for Indicator 2:

The first part of the module teaches the technique of double-entry bookkeeping and of constructing financial statements at the end of the fiscal year. The second part introduces important standards under IFRS. The third part explains financial statement analysis. Upon successful completion of this module, students are able to record business transactions or (re-)valuations using double-entry bookkeeping and to construct individual and consolidated financial statements according to

International Financial Reporting Standards (IFRS). They can critically discuss the impact of new or revised accounting standards on financial statements and on managerial behaviour. Students can evaluate important accounting theories. Moreover, they are able to identify leeway for earnings management, to evaluate its level in financial statements and its impact on current and future performance. Finally, they are able to analyse the financial position, the performance and the financial stability of firms using data from financial statements (Content description).

Above we mentioned all SDGs addressed by different modules except SDG 14: Life below water. The course *Who is responsible for food and health? Social and cultural perspective on food, health, and technology (WI001194)* tackles this SDG and many others.

Who is responsible for food and health? Social and cultural perspective on food, health, and technology (WI001194)

Master in Consumer Science

Master in Management

Associate Professorship of Science and Technology Policy (Prof. Müller)

Dr. phil. Sarah Schönbauer

Dr. Lucas Brunet, M.A. Georgia Samaras, M.A. Sophia Rossmann



How to live a healthy life within a healthy environment are important topics and central values within contemporary societies. The course raises questions about environmental pollution or the possibility of medical interventions into the body. These issues will be discussed in relation to specific contemporary topics, such as microplastic pollution, agricultural farming and honeybees or epigenetics. The course will enable them to think critically about the social and cultural aspects of environment, health, innovation, and technology (Content description). Specifically, the article of Dr. Liboiron “Redefining pollution and action: The matter of plastics” (Liboiron, 2016) presented within the course raises and addresses plastic pollution issues under the water. Now we turn to the discussion of the analysis part and compare two study programs.

6. Discussion

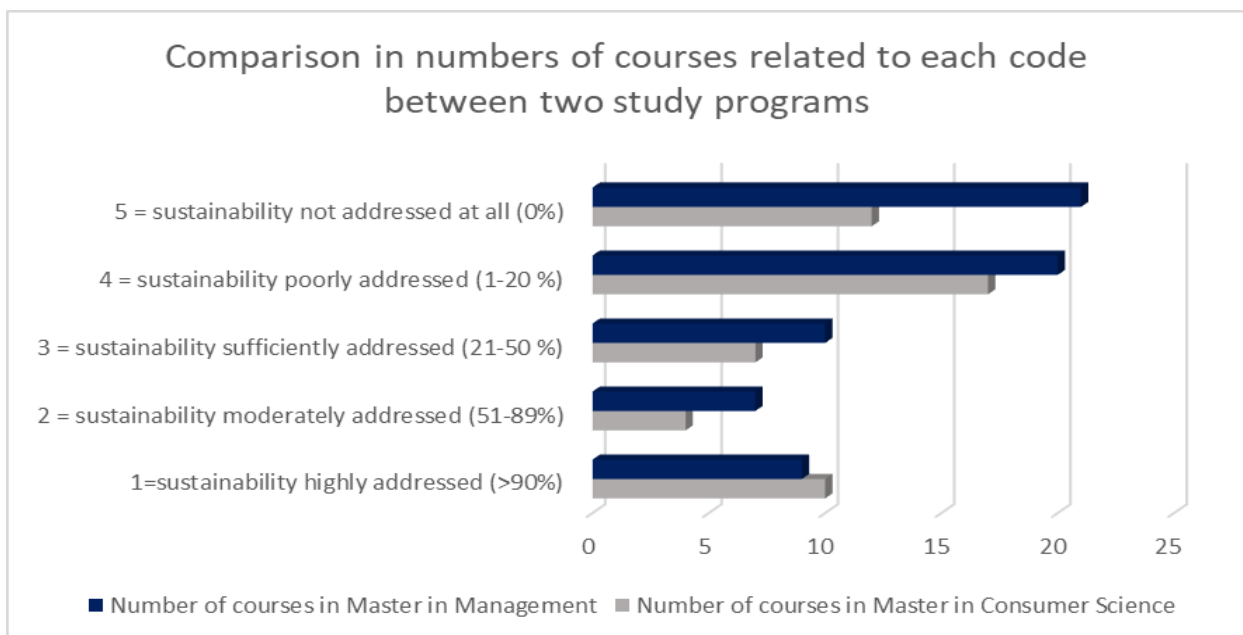
6.1. Comparison of two study programs

Below we compare two analysed study programs: Master in Consumer Science and Master in Management in relation to the extent to which sustainability is addressed in the teaching modules. Table 6.1 represents the total number of analysed courses related to each code of indicator 1 for each study program.

Codes	Number of courses in Master in Consumer Science	Number of courses in Master in Management
1=sustainability highly addressed (>90%)	10	9
2 = sustainability moderately addressed (51-80%)	4	7
3 = sustainability sufficiently addressed (21-50 %)	7	10
4 = sustainability poorly addressed (1-20 %)	17	20
5 = sustainability not addressed at all (0%)	12	21
Total	50	67

Table 6.1 - Total number of analysed courses related to each code on indicator 1 for each study program

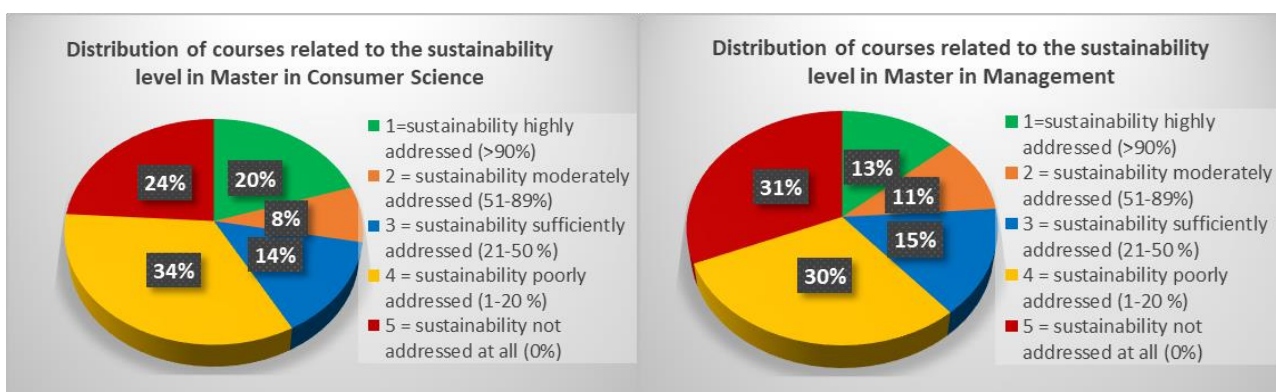
When it comes to the degree of sustainability both Master in Management and Master in Consumer Science have their fair share of sustainable courses. However, it can be seen from the pie chart below (picture 6.2) that 21 courses in Master in Management address no sustainability at all which is almost double compared to Master in Consumer Science (12 courses). On the contrary both degree programs have almost similar number of courses which are highly sustainable, which is 9 and 10 for Master in Management and Master in Consumer Science respectively.



Picture 6.2 – Comparison in number of courses related to each code between two study programs

In Master of Consumer Science 4 courses are moderately sustainable, 7 courses are sufficiently sustainable and 17 courses are poorly sustainable. In Master in Management these numbers are 7,10 and 20 respectively and are a bit higher in comparison to MCS program but MiM program also has more courses analysed than MCS. It can be derived from the data that Master in Consumer Science program (grey bars on the chart 6.2) offers less courses that tackle sustainability issues (except for code 1 where the difference is not significant) than courses in Master in Management and at the same time Master in Management program has more courses which are not or poorly sustainable. To sum up, the Master in Management offers more courses which received codes 2,3,4 and 5 and the Master in Consumer Science program offers on only 1 course more courses with code 1 which are highly sustainable (see table 6.1).

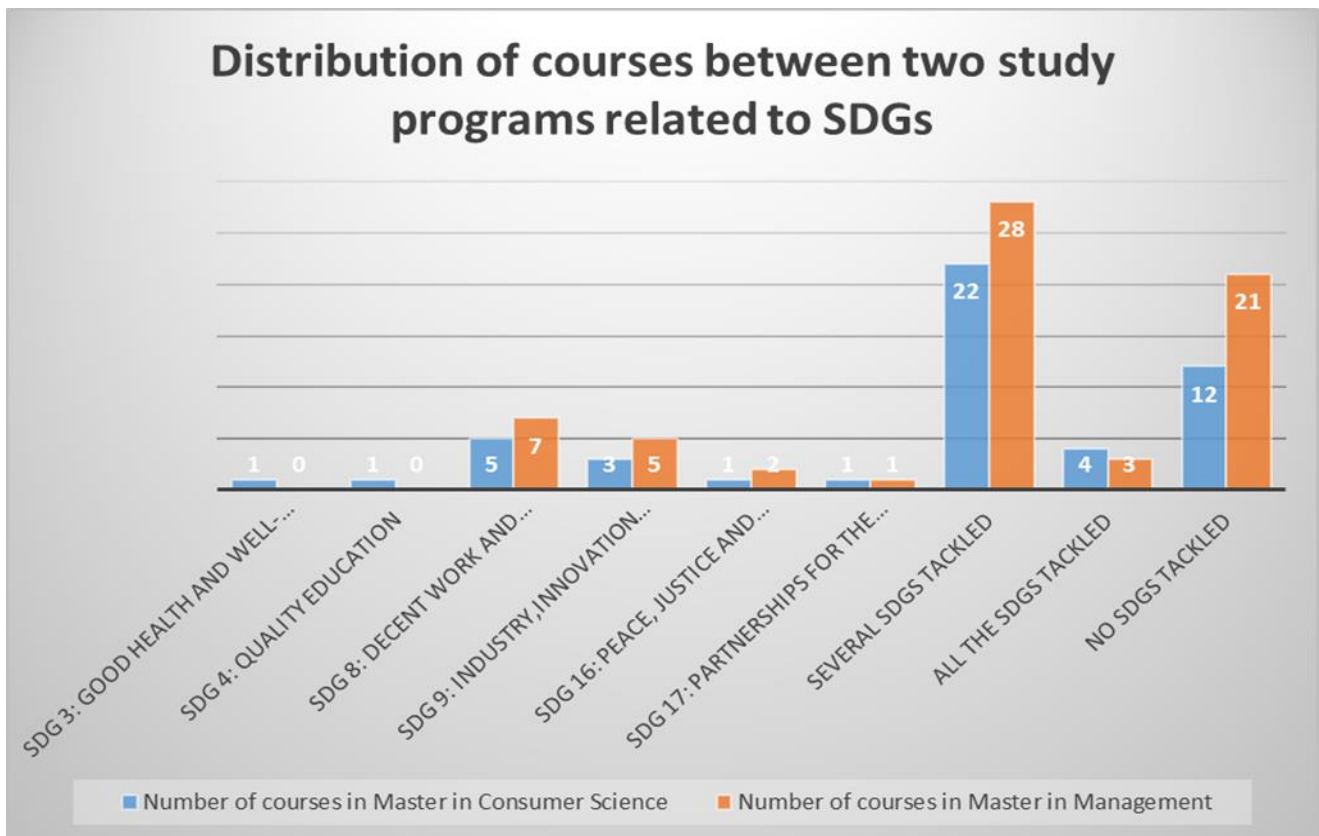
If we compare both the degree programs in relation to the distribution of courses regarding the sustainability level within the programmes (picture 6.3), Master of Consumer Science has 20% share of highly sustainable courses of its total courses compared to 13% in Master in Management. While the courses with no sustainability addressed have 31% in Master in Management and 24 % in Master in Consumer Science. Moreover, in Consumer Science 8%,14% and 34 % of courses are moderately sustainable, sufficiently sustainable and poorly sustainable respectively. In Master in Management these percentages are a bit higher for moderately sustainable and sufficiently sustainable courses – 11% and 15% respectively and a bit less 30% for poorly sustainable courses. It can be seen that there are ¼ of unsustainable courses in MCS and 1/3 of them in MiM, which creates a room for improvement.



Picture 6.3 – Distribution of courses related to the sustainability level **within** each program and between two study programs

Both Master in Management and Master in Consumer Science degree programs offer courses that address and tackle many SDGs. There are 4 and 3 courses in Master in Consumer Science and Master in Management respectively that tackle all SDGs. While 12 courses in Master in Consumer Science

compared to 21 courses in Master in Management tackle no SDGs. It indicates that MiM has more courses that do not address sustainability issues. Master in Consumer Science offers 22 courses which tackle several SDGs and Master in Management offers 28 of such courses which represents potential improvements. Both Master in Consumer Science and Master in Management offer a few courses that deal with SDG 16: Peace, Justice and Strong Institution and SDG 17: Partnerships for the Goals. Two courses in the Master of Consumer Science tackle SDG 3 and 4 respectively. And no courses in Master in Management tackle SDG 3 and 4 itself, only with other SDGs together. In Master in Consumer Science 5 courses tackle SDG 8: Decent work & Economic Growth and 3 courses tackle SDG 9: Industry, Innovation and Infrastructure. These figures for Master in Management for SDG 8 and 9 are 7 and 5 courses respectively and a bit higher in comparison to MCS. There are few courses which are particularly not focused only on SDGs 1 or 2 or 5 or 6 or 7 or 10 to 15 and hence not included in the chart. Although there are many courses that have these SDGs addressed but they are **included** under "several SDGs tackled" and "all SDGs tackled" categories which limits our research.



Picture 6.3 – Distribution of courses between two study programs related to SDGs

To collect all the data on courses of Master in Management and Master in Consumer Science study programs we have reached out to assistants, professors and research students. We gathered as much material on each subject to better evaluate sustainability in these degree programs. The limitation of our research is that for some courses which we excluded from the analysis we did not get sufficient materials to fully evaluate

sustainability in each subject. Initially we had 250 courses for both study programs and we could analyse only 117. For other 133 courses we have to rely on content description given or not in Campus Management System TUMOnline which is also not sufficient to understand the course content related to sustainability and to evaluate it. Our suggestion for this would be if the courses are sustainable and addressing sustainability issues it should be properly mentioned in the course description in such a way that anyone can fully understand the course objectives and which sustainability issues it tackles.

6.2. How to enhance sustainability in teaching modules at TUM SOM?

Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). The concept of needs goes beyond simply material needs and includes values, relationships, freedom to think, act, and participate, all amounting to sustainable living, morally, and spiritually. To enhance sustainability, TUM School of Management is already taking a few steps in order to tackle the SDGs. The school has launched various initiatives to strengthen ethics, responsibility and sustainability as a core part of its identity:

- UN Principles for Responsible Management Education
- Peter Löscher Chair of Business Ethics
- Munich Lecture in Business Ethics
- The Munich Center for Technology in Society
- CO2 Footprint Measurement

To further enhance sustainability, students must be encouraged to take the courses that are more related to ethics, sustainability and social responsibility. To check awareness among students regarding knowledge of sustainability, they can be assessed via a sustainability test. Based on those results, institutions can change topics related to sustainability or improve teaching methods in the courses (University of Gothenburg, 2020). Few courses can be designed specifically to address sustainability issues and can be introduced and make it compulsory as a part of curriculum for students. The introduction of short courses on topics like climate change, biodiversity, carbon management, energy management, water management and waste management. The awareness about those topics can be learned through various aspects of the topics such as understanding of cause and impacts, politics, and action to remedy the problem. Faculties of School of Management can integrate responsible management topics with other related topics (University of Winchester, 2018). To assess if steps taken by management affect students regarding Responsible Management, a data collection project can be initiated. Here, students can answer a few questionnaires, their answers can be analyzed over the years to assess their change in behaviour, attitude, norms, intention and social-efficacy towards responsible management.

Besides enhancing sustainability in teaching, TUM SoM can make a commitment to reduce its water consumption, energy consumption and waste reduction across their premises and encourage their students,

faculties and other staff to do the same and make sustainable consumption a regular habit in their lives. TUM SoM can initiate a programme where it can give their students and staff an option to travel more sustainably with green transport (Copenhagen Business school, 2019). The university can create more intercultural programmes to create diversity within the campus and also it can give students a platform to create a dialogue between multiple cultures. These types of programmes can help students to build strong communities, and also enhance social equality and gender equality. TUM SEED Center offers various courses to achieve sustainability and create real impact on a global level. TUM Unternehmer is the other project of TUM School of Management to encourage students to become entrepreneurs. Both TUM Unternehmer and TUM SEED Center can collaborate to encourage students to become sustainable entrepreneurs to create such firms that can deliver sustainable products that can impact the real world.

7. Conclusion

Sustainable development is largely about people, their well-being, and equality in their relationships with each other. In context, nature-society imbalances can threaten economic, environmental and social stability. This project study investigated the degree of sustainability in teaching modules amongst two master's study programs, Master in Management and Master in Consumer Science, of TUM School of Management under the domain Principles for Responsible Management Education (PRME). The study evaluates the courses with respect to the issues of sustainability they tackle and how teaching content and materials are provided during our study period.

From our analysis emerges that the distribution of courses from both the programs are skewed towards outcome where courses either cover multiple Global Goals or are insignificant in terms of sustainability. The real numbers worth our attention are amongst the courses which do not cover any SDGs. Studying cumulatively for both programs they stand taller than a quarter of courses analysed i.e. 28% or 33 courses out of all analysed 117 courses. The limitations factored for this study are access to materials along with its course contents, shortcomings in information available on Campus Management System TUM Online and biases of the researchers.

Going forward, we recommend bringing down the share of courses from the grip of insignificant sustainable content. We do recognize that not the entirety of 28% of courses can be enhanced with varying degrees of Global Goals. Although, any improvement in that sphere would be a step in the right direction. Furthermore, the Campus Management System TUMOnline, should highlight information on sustainability issues and Global Goals covered by individual courses to empower students in selecting academic courses which are better aligned in educating young minds about the sustainable outcomes. We envisage the future where we as responsible citizens align our needs and aspirations without exhausting the resources from the future generations. This fundamental idea can be sown at university, a melting pot of innovative ideas to assist students to visualize their professional aspirations while factoring elements of sustainability.

References

United Nations. (2021). Sustainable Development Goals. Retrieved from <https://www.un.org/sustainabledevelopment/>

DeCuir-Gunby, J.T., Marshall, P.L. and McCulloch, A.W. (2011). Developing and Using a Codebook for the Analysis of Interview Data: An Example from a Professional Development Research Project. *Field Methods* 23(2) 136-155. Retrieved from <http://fm.sagepub.com>

Campbell, J.L., Quincy C., Osserman J., Pedersen, O.K. (2013). Coding In-depth Semistructured Interviews: Problems of Unitization and Intercoder Reliability and Agreement. *Sociological Methods & Research* 42(3) 294-320. Retrieved from smr.sagepub.com

Liboiron, M. (2016). Redefining pollution and action: The matter of plastics. *Journal of material culture*, 21(1), 87-110

Brundtland Commission. (1987). Report of the World Commission on Environment and Development: Our common Future. Retrieved from https://www.google.com/url?sa=t&source=web&rct=j&url=https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf&ved=2ahUKEwjijf_qgtjwAhUN6RoKHSM-AKEQFjABegQIBBAC&usg=AOvVaw293_rr5E8NxDhKDKPVja0e

Principles of Responsible Management Education. (2020, November 30). PRME working group on sustainability mindset. Retrieved from <https://www.unprme.org/prme-working-group-on-sustainability-mindset>

School of Business, University and Law, University of Gothenburg. (2020). PRME Sustainability Report 2020. Retrieved from https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.gu.se/sites/default/files/2020-10/PRME_report2020_School_of_Business_Economics_and_Law.pdf&ved=2ahUKEwj6xojK79fwAhXQDuwKHROjAucQFjABegQICBAC&usg=AOvVaw0cbC_izuyJMwP6WoSvtTlm

University of Winchester. (2018). An early adopter of the Principles of Responsible Management Education (PRME). Retrieved from

https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.winchester.ac.uk/media/content-assets/documents/PRME-Champion-School-Report-2019-28-Jul-2020-16-15-25.pdf&ved=2ahUKEwjD7a_g7tfwAhUZPOwKHeMnM8QFjAAegQIAxAC&usg=AOvVaw2ipG8sObEWsl8b0VUWDt2k

Copenhagen Business School. (2019). Responsible Management Report. Retrieved from

<https://www.google.com/url?sa=t&source=web&rct=j&url=https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/CBSPRMESIPReport2019.pdf&ved=2ahUKEwiJr5zM7NfwAhXGnKQKHb9CB-cQFjAAegQIBBAC&usg=AOvVaw06qs8lijRDRwCgywhq-YIX>

TUM School of Management. (2021, May 19). Our Journey Towards Sustainability at TUM School of Management. Retrieved from

<https://www.wi.tum.de/about/ethics-responsibility-sustainability/principles-for-responsible-management-education/>

TUM School of Management.(n.d.). Responsible education and research. Retrieved from

<https://www.wi.tum.de/about/ethics-responsibility-sustainability/>

The Wrocław University of Economics. (n.d.). Retrieved from

https://www.ue.wroc.pl/university/19507/prme_principles_for_responsible_management_education.html#:~:text=The%20Principles%20for%20Responsible%20Management,ability%20to%20deliver%20change%20tomorrow.

Principles for Responsible Management Education. (2020, November 30). *Signatory Model*.

Retrieved from <https://www.unprme.org/signatory-model>

TUM School of Management. (2019). *Sharing Information on Progress*, pp 4. Retrieved from

https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/PRMESIPTUMSoM_2020_2021-04-21-135232.pdf

Chair of Corporate Sustainability, Brewery and Food Industry, TUM School of Management. (2020, February). Retrieved from <https://www.professors.wi.tum.de/en/sustainability/research/new-tum-seed-center-founded/>

TUM School of Management. (2019). *Sharing Information on Progress*, pp 10-16. Retrieved from https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/PRMESIPTUMSoM_2020_2021-04-21-135232.pdf

TUM Center for Energy Market. (n.d). Retrieved from <https://www.professors.wi.tum.de/cem/home/>

United Nations. (2017). *2017 Global Forum for Responsible Management Education 10 Years of PRME*, pp 3. Retrieved from https://sustainabledevelopment.un.org/content/documents/169492017_PRME_Global_Forum_OutcomeDeclaration.pdf

Conard N. Hilton Foundation. (n.d.). [Illustration]. Retrieved from <https://www.hiltonfoundation.org/sdgs>

Appendix 1 - Codebook

Courses of relevant study Program	Code for Indicator 1	Indicator 1 (value)	Code for Indicator 2	Indicator 2 (main SDG addressed)
0000004120Advanced International Experience (WI001181, WIHN1181)	Students will bear integrity, ethics and responsibility in mind when making management decisions in a multicultural business environment. After taking the course students are also able to reflect their experience abroad with scientific intercultural knowledge and develop an open-mindedness and sensitivity with respect to cultural differences. Structure of the content. Part 1: Culture and the international environment: 1. Definition of culture; 2. Different cultural models; 3. The determinants of culture; 4. The international economic environment. Part 2: Intercultural communication: 1. Introduction and definitions; 2. The Models of communication; 3. Barriers to Intercultural Communication; 4. Types of Communication. Part 3: Intercultural management: 1. Introduction; 2. Intercultural Management Skills; 3. Patterns of Cross Cultural Business Behavior; 4. International Negotiator Profiles.	3	The international economic environment, Intercultural communication, Intercultural Management Skills (8 Decent Work and Economic Growth; 10 Reduced Inequalities; 16 Peace, Justice and Strong Institutions)	18
a0000002097Advanced Seminar in Economics & Policy (WIV05001): Economics of Innovation	This seminar introduces the students to the main issues in the economics of innovation and advances their understanding of the core concepts and principles in the field. The ultimate objective to enhance both theoretical as well as an applied view on the topic enabling students to understand academic as well as public debate on questions related to the economics behind innovation and technological progress. The seminar will discuss some of the prevailing models in the field of Industrial Organization dedicated to the analysis of the incentives and constraints to innovative activities (R&D activities) as well their relation with imitation, spillovers, firm size and market structure. Seminar Topics: A. Ideas, Innovation and Economic Growth; B. The Supply of Inventors: Who innovates?; C. Production of Ideas & Organization of Innovation; D. Financing Innovation; E. The Role of IP; F. Market Structure and Innovation; G. Economic Consequences of Innovation.	2	"Innovation as the engine of Economic Growth"; "Covid-19: Innovation to the help" (SDGs 3, 8, 9)	18

<p>0000002784Advanced Seminar Innovation & Entrepreneurship (WIB18812_1): Ideation & Venture Creation</p>	<p>How do social media entrepreneurs build businesses around their lives? A lot of entrepreneurial activities are triggered by technological change. New technologies (such as AI, Blockchain, AR/VR, and other technologies that enable platforms/ecosystems) create varying possibilities for entrepreneurial opportunities, giving birth to new products, new ventures and new markets. This seminar is designed as a platform to familiarize students with some of the core concepts and primary theoretical underpinnings of entrepreneurship research and subfields, such as, social or sustainable entrepreneurship, to gain deep insights into one specific, predefined research topic. Preliminary topics and readings: The role of knowledge & learning in EOD; The role of information processing & coordination in EOD; The role of prototyping in EOD; The role of networks in EOD; Market and customer orientation in EOD; Stakeholder involvement in EOD; The role of mentoring in EOD; Work-Life Balance; Entrepreneurial Wellbeing; Community of Inquires.</p>	<p>3</p>	<p>The role of mentoring in EOD, Social sources of information in opportunity recognition: Effects of mentors, industry networks, and professional forums (8 Decent Work and Economic Growth; 9 Industry, Innovation and Infrastructure; 17 Partnerships for the Goals); Entrepreneurial Wellbeing; Work-Life Balance (3 Good Health and Well-being).</p>	<p>18</p>
<p>0000004129Advanced Seminar Innovation & Entrepreneurship (WIB25001_1): (Psychology of Entrepreneurship)</p>	<p>The course exposes students to the people side of entrepreneurship. Students will learn to understand and explain entrepreneurial psychology and behavior through qualitative or quantitative research. In addition, the course prepares students for their Master's Theses by introducing them to the search, understanding, and analysis of academic literature, methods for data collection and data analysis, the structuring and writing of an academic paper. Intended learning outcomes of this course are: (1) to know and understand important theories of entrepreneurial psychology and behavior, (2) to apply theories in the analyses of entrepreneurs and entrepreneurial teams, (3) to reflect the theories in academic discussions, (4) to generate new theoretical insights, (5) to communicate the results to an academic audience in written and oral form.</p>	<p>4</p>	<p>Decent Work and Economic Growth</p>	<p>8</p>
<p>0000001882Advanced Seminar Innovation & Entrepreneurship (WIB26995): Strategic Entrepreneurship</p>	<p>Successful strategies in entrepreneurial settings lie in-between traditional approaches such as planning and abandoning it entirely. While vital for most new venture formation, insights from this course are central to large firms alike. That is, actors of any business venture operating in increasingly high-velocity environments (e.g., new markets), will suffer from a significant lack of reliable knowledge to strategize – but they will strive for attaining it. From an academic perspective, we will look at two broad questions: how do actors search for (new) strategies? How does organizational structure</p>	<p>4</p>	<p>8 Decent Work and Economic Growth; 9 Industry, Innovation and Infrastructure</p>	<p>18</p>

	<p>impact, and / or emerge from this process? The course focuses on the development of new and established businesses, the strategies that managers devise and execute. This also highlights the importance of innovation and promotes entrepreneurship.</p>			
0000002868Advanced Seminar Innovation & Entrepreneurship (WIB271011): Venture Growth and Internationalization	<p>The seminar follows the entrepreneurial process with a specific focus on understanding how entrepreneurs and new ventures obtain legitimacy, build reputation, use their networks, communication, and secure vital resources for survival and growth. New venture legitimacy. Preliminary list of Topics: Entrepreneurial networks; New venture reputation; New venture financing; Business angels; Venture Capital; New venture growth; New venture internationalization; Crowdfunding</p>	4	Decent Work and Economic Growth	8
0000001667Advanced Seminar Life Sciences & Management (WIB14002): Sustainable Entrepreneurship - Theoretical Foundations	<p>Sustainable development has emerged as a prominent concept for business and society, and there is increasing recognition that a fundamental transformation is needed to tackle major environmental and social problems. Entrepreneurship has the potential to play a key role in achieving sustainable development, and the United Nations Sustainable Development Goals 2030. In this seminar, we will provide and discuss recent research on sustainable entrepreneurship.</p>	1	all the SDGs tackled	19
0000004871Advanced Seminar Operations & Supply Chain Management (CS0090): Advances in Retail Management	<p>"Main topics for the semester will be: Food Waste in Retail Operations; Agriculture Optimization; Warehouse Automation" E-mail from Mr. Lorson. The advanced seminar focuses on recent research progress on varying topics in service operations, e.g. omni-channel retailing, online retail management, empirical research methods (such as regression models) are applied as well as mathematical optimization and simulation models (such as mixed-integer programming or discrete event simulation) to identify best practice relationships.</p>	3	8 Decent Work and Economic Growth, 12 Responsible Consumption and Production	18
0000004904Advanced Topic in Marketing, Strategy & Leadership: Negotiations, micro politics and power	<p>The course provides a general framework and opportunities for practice on negotiation strategies and micropolitic behavior and offers a toolbox for successful practical application. Students will know and understand the most important theories about negotiations as well as power and micropolitics from various perspectives and strategies. / Courses on business and management teach that important decisions are governed by business-related criteria such as Discounted Cashflow Analyses. However, practice</p>	5	No SDGs tackled	20

	shows that in reality a variety of other factors have a (predominant) role. Micropolitics, negotiation skills and power dynamics. These issues will be covered in this seminar in order to sharpen students' skills to negotiate and understand everyday power and micropolitical behavior in an organizational setting.			
0000004317Advanced Topics in Innovation & Entrepreneurship (WIB26001): Social Entrepreneurship Lab	"social enterprises seek to create economic and societal value". Social entrepreneurship leads to the establishment of such social enterprises by identifying a social problem, recognizing an opportunity for a corresponding solution, and creating an enterprise for implementing the solution and effecting transformative change.	1	all the SDGs tackled	19
0000001819Advanced Topics in Innovation & Entrepreneurship (WI001166): Entrepreneurial Prototyping	"Unfortunately, you will not find much information on sustainability in the seminar content – since we exclude this topic in class. Content related to sustainability would be too much content for a seminar like this. We are more concerned with critical thinking, debunking wrong assumptions and paradigms – trying to make “thinkers/makers out of students”. Further, in the practical part of the seminar, we are constantly having trouble with sustainability projects (even though we supervise one sustainability project every semester)." The seminar covers the following topics: Opportunity recognition and creativity; Ideation; Design thinking; Business Model Canvas; Learn startup approach; Rapid prototyping; Market research and customer interviews	3	SDGs 4; 17. Partnerships for the Goals ("we supervise one sustainability project every semester"). SDG 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.	18
0000004508Advanced Topics in Marketing, Strategy & Leadership (Exercise) (WIB05005): (New Product	This course covers topics that are theoretically grounded in the marketing, innovation, psychology, and management literature. Product innovation is consistently found to be (one of) the most important characteristic of a firm's success.the course starts with elaborating why product innovation matters in today's business environment and discuss basic concepts in innovation management and new product development (e.g., models of innovation and high tech marketing, S-curves, psychology of product adoption, etc.). Special	4	innovation and new product development (9 Industry, Innovation and Infrastructure); 8 Decent Work and Economic Growth	18

Development and Marketing)	<p>focus is placed on strategic issues in the management and marketing of innovations (e.g., managing discontinuous and disruptive innovations). We will discuss, for example, when (and when not) it is bet to to enter a new product markets, or when (and when not) the innovator (vs. the follower) is more likely to be successful in the market. We will concentrate on the so called “fuzzy” front-end of the new product development (NPD) process. Specifically, we will focus on (a) how companies can best identify consumer needs for new products, (b) how companies can best generate and select valuable new product ideas. In this regard, we will will focus on novel ways to identify new customer needs and opportunities (e.g., market research through communities, market research through lead users).</p>			
0000000916Advanced Topics in Marketing, Strategy & Leadership (WIB05005): New Product Development and Marketing	<p>This course covers topics that are theoretically grounded in the marketing, innovation, psychology, and management literature. Product innovation is consistently found to be (one of) the most important characteristic of a firm’s success.the course starts with elaborating why product innovation matters in today’s business environment and discuss basic concepts in innovation management and new product development (e.g., models of innovation and high tech marketing, S-curves, psychology of product adoption, etc.). Special focus is placed on strategic issues in the management and marketing of innovations (e.g., managing discontinuous and disruptive innovations). We will discuss, for example, when (and when not) it is bet to to enter a new product markets, or when (and when not) the innovator (vs. the follower) is more likely to be successful in the market. We will concentrate on the so called “fuzzy” front-end of the new product development (NPD) process. Specifically, we will focus on (a) how companies can best identify consumer needs for new products, (b) how companies can best generate and select valuable new product ideas. In this regard, we will will focus on novel ways to identify new customer needs and opportunities (e.g., market research through communities, market research through lead users).</p>	4	<p>innovation and new product development (9 Industry,Innovation and Infrastructure); 8 Decent Work and Economic Growth</p>	18

<p>0000003379Advanced Topics in Marketing, Strategy & Leadership (WIB21952): Performance Measurement: The better you measure the better you manage</p>	<p>This seminar focuses on the questions if and how abilities and performance of employees can be measured and evaluated correctly. From this question we will move on to analyze general problems of measurements and discuss these in the context of different tasks of managers, e.g., customer surveys, definition of key performance indicators, etc. This seminar aims to raise awareness to the problem of measurement on the individual level. Topics: Introduction to the problem of measuring individual performance; Different methods of measuring individual performance; Measurement theories; Generalization to other areas of economics (KPI's etc.); Problematic cases (assigning grades, customer satisfaction).</p>	<p>4</p>	<p>Decent Work and Economic Growth</p>	<p>8</p>
<p>0000003937Advanced Topics (MSc) Marketing, Strategy & Leadership (WI001231): Leadership and Strategy in the 21st Century</p>	<p>The seminar focuses on successful leadership and strategy in the 21st century – the age of digitalization. Students will be introduced to current topics in research on leadership and organizations (strategic leadership and new work) as well as their application in practice. Sessions: Leading (Managing) Disruption; Leading (Managing) Change; Leading (Managing) People.</p>	<p>5</p>	<p>no SDGs tackled</p>	<p>20</p>
<p>0000002116Behavioral Pricing: Insights, Methods and Strategy (WI001090)</p>	<p>Theory: 1. Classic pricing theory; 2. Price differentiation (incl. non-linear, dynamic pricing & yield management); 3. Innovations in Pricing; 4. Behavioral Economics (Heuristics & Biases, Habit, Context and Behavioral Architecture); Application: 5. Behavioral Pricing Strategy (vs. Value-based Pricing); 6. Behavioral Pricing Execution (vs. Value-based Selling); 7. Deep Dive: Pricing in the Subscription Economy; Tools: 8. Gabor Granger, PSM/vanWestendorp & Neuropricing; 9. BPTO & Maximum Difference Scaling; 10. Conjoint Analysis; 11. Transaction data analysis, test markets and experimentsTopics; 12. Pricing Organization (Structure & Process); 13. Legal and Ethical Aspects in Pricing. The course focuses on pricing strategies: customer-based, behavioral pricing etc and conceptual and practical implications that BE has for pricing. Behavioral pricing is a use of economics and psychology. Pricing for a product is determined based on the behavior of potential customers to maximize willingness-to-pay by differentiating pricing based on customer value perception.</p>	<p>4</p>	<p>Legal and Ethical Aspects in Pricing (Decent Work and Economic Growth)</p>	<p>8</p>

220518994Business Plan - Advanced Course (Business Models, Sales and Finance)	Content of the Seminar: Full-day "Gründer-Workshop", topics: Team, Vision, Project Plan; Overview of the Seminar, pitch of the business ideas, hypothesis tests; Business Plan, Business Design, Positioning Statement; Start-up formalities, legal issues; Presenting results of the hypothesis tests (4x); Marketing; Strategy, Business model, metrics, financial assumptions; Distribution; Sales competence; Financing, Venture Capital, Bootstrapping. / TOPICS: Hypothesis Tests, Product, Service, MVP; First Customers, Marketing, Sales; Business Model, Monetization; Financials, Bootstrapping, Venture Capital, Business Angels	4	"LOEWI is an eHealth startup that enables athletes to optimize their health and achieve their full potential through evidence-based personalization rooted in science. We launched the startup in February 2019, starting off with 100 customers and growing continuously from there – largely thanks to the active UnternehmerTUM ecosystem". - Partnership for the Goals	17
0000004988Challenges in Energy Markets (WI001223)	Students gain a profound knowledge of the key aspects of global energy markets and their most important developments today and in the future. The module covers the following topics: general expectations for the energy market up to 2030; mix of power generation technologies; execution of energy projects into themes of project management; case studies for individual stages of project execution, challenges and project risks; financing models of energy projects; supply chain management - exemplified by various power plant technologies; methods to implement innovation.	1	SDGs 7, 9, 12, 13, 17. Students can also explain the competitive environment and the various business models of a manufacturer of energy technologies and how successful large-scale power plant projects are executed.	18
0000001017Choice Architecture Applications in Consumer Behavior (WI001167)	Technology & Environmental Choices; Social Influence on Environmental decision making; Social influence approaches to encourage resource conservation; Application of social nudges in electricity consumption; Choice architecture as means to tackle environmental issues; Energy labels address challenges in energy consumption awareness; SCORE principles for designing energy labels; attributes and type of translated attributes influence people's preference for fuel-efficient cars; Attribute translation for food carbon emission; Health Choices; Food Choices. This seminar introduces students to the choice architecture principles and their applications in marketing, management and public policy. The seminar covers the following topics: Constructed Preferences, Randomized Control Trials, Nudging, Choice Architecture beyond Nudges, Ethical Concerns for the application of Choice Architecture, Applications of Choice Architecture in Financial Decision Making and Consumer Choice and Choice Architecture aided by technology.	2	Technology & Environmental Choices; Social Influence on Environmental decision making; Social influence approaches to encourage resource conservation; Application of social nudges in electricity consumption; Choice architecture as means to tackle environmental issues; Energy labels address challenges in energy consumption awareness; SCORE principles for designing energy labels; attributes and type of translated attributes influence people's preference for	18

			fuel-efficient cars; Attribute translation for food carbon emission; Health Choices; Food Choices	
0000003910Confli ct Management	<p>Conflict Management is one module with International Environmental Governance. Conflicts have become common in resource management. Moreover, actors, discourses, institutions and instruments of international environmental governance may play an important role in the emergence, escalation and/or management of these conflicts. The module embeds the local level of conflictive issues in resource management in the broader setting of international environmental governance. The course International Environmental Governance covers the emergence, development and impact of international environmental regimes. The focus is on actors, discourses and the effects of international policy regimes and mechanisms, ranging from traditional top-down instruments used by governments to market- and information based instruments that presuppose active participation of non-state actors ("from government to governance").</p> <p>Conflict Management addresses conflicts that emerge from (over-)use of natural resources, like timber, water and mineral resources. The module's bottom line is that developments in international environmental governance, consumption, production and trade affect management decisions over the use and/or protection of natural resources, yet solutions for conflictive issues have to be found at the local level and with involvement of multiple actors. Therefore, an important trend in international environmental governance is addressed, namely that multi-stakeholder dialogues and arrangements are pertinent for successful conflict management.</p>	1	Conflict Management addresses conflicts that emerge from (over-)use of natural resources, like timber, water and mineral resources. The module's bottom line is that developments in international environmental policy affect management decisions over the use and/or protection of natural resources, yet solutions for conflictive issues have to be found at the local level and with involvement of multiple actors. In doing so, an important trend in international environmental policy is addressed, namely that multi-stakeholder dialogues and arrangements are pertinent for successful conflict management.	18
0000002258Confli ct Management [Part 2 of the module „Sex and	In the "Conflict Management" course, students gain insights into the following topics: Interpersonal communication; conflict models; Conflict Dynamics;	4	Peace, Justice and Strong Institutions	16

Conflict at Work“ (WI001160)]	Conflicts in companies (bilateral, within teams, between organizational units).			
0000004127Consumer Behavior - Exercise (WI000739)	This course gives an introduction to the theories of consumer behaviour, how consumers think, feel, reason, and select between different alternatives (e.g., brands, products), and how they are influenced by his or her environment (e.g., culture, family, technology, media). The course considers current consumer trends: sustainability, healthy and ethical living, social shopping, diversity etc	3	The course considers current consumer trends: sustainability, healthy and ethical living, social shopping, diversity etc (12 Responsible Consumption and Production; 17 Partnerships for the Goals)	18
0000004062Consumer Behavior Research Methods - Exercise (WI001175)	Designing of questionnaires; Introduction to SPSS; Selected statistical approaches (e.g. univariate and bivariate statistics, factor analysis, cluster analysis)	5	no SDGs tackled	20
0000002402Consumer Behavior Research Methods (WI001175)	Designing of questionnaires; Introduction to SPSS; Selected statistical approaches (e.g. univariate and bivariate statistics, factor analysis, cluster analysis)	5	no SDGs tackled	20
0000001171Consumer Behavior (WI000739)	This course gives an introduction to the theories of consumer behaviour, how consumers think, feel, reason, and select between different alternatives (e.g., brands, products), and how they are influenced by his or her environment (e.g., culture, family, technology, media). The course considers current consumer trends: sustainability, healthy and ethical living, social shopping, diversity etc	3	The course considers current consumer trends: sustainability, healthy and ethical living, social shopping, diversity etc (12 Responsible Consumption and Production; 17 Partnerships for the Goals)	18
0000001173Consumer Economics and Policy (WI000740)	Consumer Economics provides tools to analyze policy issues: Taxes (e.g. on meat, carbon dioxide, plastic, sugar-sweetened beverages ...); Quotas, minimum quality standards; Price ceilings/floors (rent, wages, ...); Regulation of market power	4	Good Health and Well-being	3
0820547880International Environmental Governance	"... addresses conflicts that emerge from (over-)use of natural resources, like timber, water and mineral resources." The module's bottom line is that developments in international environmental policy affect management decisions over the use and/or protection of natural resources, yet solutions for conflictive issues have to be found at the local level and	1	3 Good Health and Well-being, 13 Climate Action, 15 Life on Land. 'Healthy Planet, Healthy People'? On the complexity of global environmental change	18

	with involvement of multiple actors. 'Healthy Planet, Healthy People'? On the complexity of global environmental change			
0000003698Intro duction to Statistics Using R (WI001243)	Replication crisis in psychological science; Open Science Framework; Reproducibility of in psychological science; Fundamentals of the R language and R environment: variables and assignment, data structures, operators, functions, etc; R Markdown; Data wrangling; Data visualization; Exploratory data analysis; Correlation; Simple and Multiple Linear Regression.	5	no SDGs tackled	20
0000001035Lectu re Series Renewable Energy Systems in the Global South (WI001255)	Energy-Water-Food Systems. Overview of renewable energy technologies including their functionality, their technological and economical assessment, their integration in decentralized energy systems, and business concepts for their utilization in the Global South: - Renewable energy systems in the Global South - Why and how?; - Small-scale solar thermals and photovoltaics; - Small-scale hydro-power; - Small-scale wind-power; - Small-scale biogas systems; - Battery storages; - Electrical components of mini-grids; - Rural electrification planning through Geo Information Systems; - System sizing through least-cost modelling; - Sustainable energies and entrepreneurship in the Global South; - Sustainable enterprises for Renewable Energies in the Global South; - Rural electrification projects in the Global South. The course is tackling poverty issue, zero hunger, providing opportunities to local people for employment and using the resources at hand to foster better communities and societies. Furthermore, the content illustrates the importance of clean energy, clean water and better climate conditions and promotes sustainability at the core.	1	SDGs from 1 to 8, from 11 to 13 (slide 31, introductory lecture). The course promotes sustainability starting from utilizing resources locally to creating economic opportunities, more sustainable production and consumptions patterns to better environmental effects. The content also highly addressed the need and proper representation of energy water food systems, harvesting and better agricultural surroundings.	18
0000002468Onlin e Marketing (WI001219)	Web page development and optimization; Search engine optimization and search engine marketing; Email marketing and affiliate marketing; Social media marketing and advertising; Web analytics; Online reputation management; Online privacy and ethics	4	Online privacy and ethics (Decent Work and Economic Growth)	8

<p>0000003862(POL 40100) Introduction to Politics, Technology & Sustainability</p>	<p>This module is offered in the form of two back to back seminars, each dealing with different, but complementary thematic areas. One focuses on big questions for politics in a world of rapidly changing technologies, globalization, migration, and challenges to democracy. The other looks at major policy problems (e.g, development, the Energiewende, Resource depletion, and sustainable development) and how they are being addressed by governments, industrial actors, and civil society. The module is intended as an introduction to the questions and research being addressed in the main thematic areas of the master's program: big transformations and their environmental, technological, and social dimensions; sustainability and democracy in a digital age; and global governance, ethics and technology. The links between these areas and research areas found in the TUM, such as economics and policy, digital technologies, social responsibility and corporate governance, and urbanization, mobility, and energy will be explained.</p>	<p>1</p>	<p>all the SDGs tackled</p>	<p>19</p>
<p>0000005397Principles of Economics - Exercise (Campus Heilbronn)</p>	<p>This course provides an introduction to the basic concepts of economics. Microeconomics: analysis of individual choices and their interaction on markets. Macroeconomics: analysis of the economy as a whole. Scarce Resources: Human wants exceed the resources available to satisfy them.</p>	<p>5</p>	<p>no SDGs tackled</p>	<p>20</p>
<p>0000005396Principles of Economics (Campus Heilbronn)</p>	<p>This course provides an introduction to the basic concepts of economics. Microeconomics: analysis of individual choices and their interaction on markets. Macroeconomics: analysis of the economy as a whole. Scarce Resources: Human wants exceed the resources available to satisfy them.</p>	<p>5</p>	<p>no SDGs tackled</p>	<p>20</p>
<p>0000002165Principles of Economics (WI001056_1)</p>	<p>This course provides an introduction to the basic concepts of economics. Microeconomics: analysis of individual choices and their interaction on markets. Macroeconomics: analysis of the economy as a whole. Scarce Resources: Human wants exceed the resources available to satisfy them.</p>	<p>5</p>	<p>no SDGs tackled</p>	<p>20</p>
<p>240401607Qualitative Research Methods (WI000376, WI000727, WI001174)</p>	<p>variance and process studies, interviews, coding, case study etc. At the end of the seminar on Qualitative Research you will be able to: 1. Understand what theory is and why we need it. 2. Reflect the basic assumptions of research. 3. Define and differentiate variance and process studies. 4. Develop qualitative research designs. 5. Collect qualitative data for consumer research. 6.</p>	<p>4</p>	<p>Quality Education</p>	<p>4</p>

	Code and analyse qualitative data for consumer research.			
240616616Quantitative Research Methods (WI000727,WI001174)	The theoretical background of quantitative research methods necessary for conducting statistical analyses in the behavioural sciences is provided. In the beginning of the lecture, basic descriptive methods to study and describe data (e.g. graphically and by means of statistical parameters) are presented. Afterwards, inductive methods are discussed that can be used to draw significant conclusions from sample data, e.g., hypothesis testing, and multivariate methods up to multiple regression analysis. The theory is applied in the second part of the course by handling sample data sets and by applying various statistical tests using the statistical software SPSS. 1. Why do we need statistics? 2. Descriptive statistics and graphs 3. Linear regression 4. Anova and t-test 5. Logistic regression	5	no SDGs tackled	20
0000003417Services Marketing (WI001196)	The module will cover the following topics: Introduction to services and service marketing; GAPS model; Service quality (SERVQUAL and eSERVQUAL); Service research; Service design; Balancing demand and capacity; Service relationships; Service technology; Service innovation. Topics: What is service? How do customers evaluate service quality? How can service companies built meaningful relationships with their customers? What is the role of the service environment? How can service companies balance supply and demand? What is the role of technology in services? What makes a service innovation?	4	12 Responsible Consumption and Production, 9 Industry, Innovation and Infrastructure	18
0000003583Sex and Gender at the Workplace [Part 1 of the module „Sex and Conflict at Work“ (WI001160)]	Topics: Scientific findings on the role of sex and gender in the work context; Sexual harassment in the workplace; Popular concepts of sex in the workplace; Ethical aspects of sex and conflict in the workplace; Traditional and novel partnership models; Religious perspectives on sex in the office; Success, gender and sex; LGBT (Lesbian / Gay / Bisexual / Transgender) aspects in the work context; old (e.g. marriage of convenience) and new forms of prostitution.	2	5 Gender Equality; 8 Decent Work and Economic Growth; 10 Reduced Inequalities; 16 Peace, Justice and Strong Institutions	18
0000003972Strategies in MNEs (WI001128)	Multinational Enterprises are confronted with challenges of increased competition, digitization, and (anti-)globalization forces, to name just a few. The	5	no SDGs tackled	20

	course 'Strategies in MNEs' discusses such management challenges and how to cope with them.			
0000003565Strategies in MNEs (WI001128) - Case Seminar Groups A-L	In course of the case seminar, students will work on four cases which focus on the aspects of (1) strategic redirection, (2) portfolio management and product diversification, (3) growth programs and internationalization, and (4) corporate growth modes and acquisitions. Students will deepen their knowledge about important elements of strategy as well as major concepts and instruments needed for the successful management of multinational enterprises (MNEs).	5	no SDGs tackled	20
0000005541Structured Planning and Creativity Methods (HACKtheCity - The HomeOffice Urbanism LAB)	The module is based on topics related to the built environment, for the interdisciplinary approaches are needed and a collaboration of engineering, IT, business management and architectural disciplines are important. The topics vary semester by semester and are presented in appropriate formats such as Design Sprint, Business Game or design thinking workshop carried out. Methodologically, they include the following steps: - Context analysis for a given issue with techniques from the fields of design, architecture, Business Management and IT, - Generation of ideas with creativity techniques from the areas of design, architecture, business management and IT, - Idea selection with evaluation methods from the areas of design, architecture, business management and IT, - Prototyping with tools and methods from the fields of design, architecture, business management and IT, - Presentation techniques from the fields of design, architecture, business management and IT.	4	Industry, Innovation and Infrastructure	9
0000004402Sustainable Entrepreneurship - Getting Started (Life Sciences) (WI001165)	We introduce students to the theory and practice of sustainable entrepreneurship, pursuing the triple bottom line of economic, ecological and social goals.	1	all the SDGs tackled	19
0000005185The next chapter of the finance and insure tech industry (WI001246)	Building understanding of the current problems of the financial industry (finance and insurance); 2. Building understanding of new developments, trends and technical innovations (especially AI, Blockchain); Transfer of the knowledge built up to solve problems in the financial industry (finance and insurance). Events of the century ("Black Swan") occur at increasingly shorter intervals, such as natural disasters caused by climate change or pandemics, and lead to increased and uncalculated financial outflows. At the same time, technologies are on the horizon that could make	4	new developments, trends and technical innovations (especially AI, Blockchain) (Industry, Innovation and Infrastructure)	9

	<p>elementary value-added steps in the financial and insurance industry superfluous. Artificial Intelligence (AI) and blockchain technology in particular are enabling new applications, such as De-centralized Finance (DeFi) applications, which could have a lasting impact on the industry.</p>			
000000509Think .Make.Start.	<p>"Okay to be honest we don't have a classical introduction lecture as it is a practical course. Nevertheless, we push the people to design products which are related to human-centred design. In addition, we push the students to think if society needs such product (sustainability)".</p>	3	8,9,12 SDGs tackled	18
000003466Value Chain Economics	<p>A value chain is a "chain of activities" that firms (active in a given industry) perform in order to deliver valuable products/services. The course covers economic models and conceptual frameworks required to analyse the economic effects of various challenges posed by globalization, climate change, growing consumer demand for quality and sustainable products, market power and the imbalance of power within the supply chain. The course introduces students to the EU industrial policy for the agro-food sector and discusses market-based and non-market based solutions to improve the functioning and performance of the agro-food sector, including food labelling and production, processing, and distribution standards, formal and informal coordination and alignment of incentives among different actors of the supply chain.</p>	4	8, 12,13 SDGs. The course covers economic models and conceptual frameworks required to analyse the economic effects of various challenges posed by globalization, climate change, growing consumer demand for quality and sustainable products, market power and the imbalance of power within the supply chain	18
000002696Value -based business strategy & innovation (WI001195)	<p>Topics (high-level): Non-cooperative game theory, Cooperative game theory, Value Capture, Theory, Conceptual approaches (PFI, RBV, TEC), Negotiations. The course provides material on profiting from innovation, theories to incorporate innovation and creativity in the product creating value based products.</p>	4	Industry, Innovation and Infrastructure	9
000005197What Future of Mobility? Engaging Technologies, Politics, Economic Scenarios, and Practices (WI001147)	<p>This course introduces the participants to key questions and issues facing engineers, policy-makers, and societies writ-large when trying to understand, anticipate, and organize the future of mobility. In order to comprehend current developments and visions around mobility, students engage with the history of transportation as well as past and present predictions about the future. Changes in infrastructural arrangements and mobility practices have often influenced economic and cultural development. Over</p>	1	Mobility is one of the key economic, political, and cultural issues of today. This course will be about ... Notions of the future (or futures) mobilized by actors in the present; Analyzing past and present predictions about the future; The dominant	18

	the course of the semester, students tackle a host of mobility-related phenomena not as isolated cases but as a constitutive part of modern technologized societies and their visions of the future.		culture of automobility, its history and current environmental concerns related to it; Transformation of urban and rural infrastructures and life worlds; Relationship between mobility and modernity; Seeing different phenomena not as isolated cases as a constitutive part of technologized societies and their visions of the future	
0000005163What's hot, new, and true in Management: Journals, blogs, podcasts (WI001244)	After students have taken this course, they understand the emergence and evidence of current trends in different topics and methods, are able to conduct structured, systematic information search, are able to critically evaluate information, are able to develop research ideas for current trends.	5	no SDGs tackled	20
0000000237Who is responsible for food and health? Social and cultural perspective on food, health, and technology (WI001194)	How to live a healthy life within a healthily environment are important topics and central values within contemporary societies. The course raises questions about environmental pollution or the possibility of medical interventions into the body. Plastics issue. These issues will be discussed in relation to specific contemporary topics, such as the microplastic pollution, agricultural farming and honeybees or epigenetics. The course will enable them to think critically about the social and cultural aspects of environment, health, innovation and technology.	1	3, 6, 9, 10, 12, 13, 14, 15 SDGs.	18
Business Ethics	Individual Morality and Human Interactions; human interactions play a key role, in order to find solutions for dilemma situations.; Scarcity is not an individual problem, but it has turned into a social dilemma situation, because two persons are competing for the same resources such as water, shelter or food. Ethics is not merely concerned with the description and explanation of human action, but seeks to justify principles, norms and rules of action. Business Ethics can be understood as a part of ethics which is dealing with economic topics. In business ethics, we try to solve ethical problems with economical methods. Universal Health Care: Everyone has the right to access medical treatment. A solidarity system financed by everyone	2	3 Good Health and Well-being (Universal Health Care: Everyone has the right to access medical treatment); 8 Decent Work and Economic Growth (The Ethical Responsibilities of Companies); 10 Reduced Inequalities; 12 Responsible Consumption and Production (consumer ethics); 16 Peace, Justice and Strong	18

	<p>according to his or her income is the best approach to ensure the health care for a society. Universal Health Care helps promote solidarity and, ultimately, the common good. In the course we will venture into the history of ethics, concentrating on the concept of duty, on consequentialism, on the virtues of Aristotle, Adam Smith, and modern management virtues. The historical background conveys an essential understanding of current ethical dilemmas. In the second part we will concentrate on corporate social responsibility and corporate governance. We will discuss the significance of these concepts in the light of globalisation, the financial crisis of 2008 and major corporate scandals. The third part of the course is dedicated to two specific subjects: The first is power; the combination and coexistence of sympathy and the power struggle in professional life and interaction. The second subject is consumer ethics. Here, we will investigate religious, bourgeois and intellectual values and their relationship to hedonistic consumerism.</p>		Institutions; (two actors are competing for the same resources. The main problem is not only individual behaviour, but also social interaction)	
0000005607Advanced Seminar Energy Markets: Economics of Energy and Technology (WI001254)	<p>The seminar reviews the research on energy technologies, incl. - Prosumers, Digitization, Sector coupling (Power + Heat); - Hydrogen & Ammonia (trade, production, utilization); - Alternative (H2 and battery-based) Mobility; - Smart City: a nexus of technologies (coordination vs. competition of technologies); - Unconventional Resources (technology that changed resource endowment, supply capabilities, and energy costs). The impact of those and other novel technologies on energy production/supply strategies and on energy trade (domestic / international) is discussed. Special focus is given to the role of technological improvements and uncertainties, the implications for economic / financial / operational / technical considerations defining investments in new technology projects at scale. The aim of this seminar is to introduce and provide the understanding of the novel energy-related technologies; Explain the role of technologies and technology-related uncertainties in energy and associated industries and markets; Enhance students' ability to conduct sound and independent research in the area of energy markets.</p>	2	Affordable and Clean Energy, Industry, Innovation and Infrastructure, Responsible Consumption and Production	18
0000005329Empirical Research in Economics and Management - Exercise (WIHN0258)	<p>This module prepares students for qualitative and quantitative research (e.g. for their Master's Thesis) by introducing them to basic and advanced topics of empirical research. Amongst others, the topics are: Experiment design; Correlation analysis; Linear and</p>	5	no SDGs tackled	20

(MiM at Campus Heilbronn)	multiple regression models; Qualitative methods; Factor- and cluster analysis; Conjoint analysis			
0000005328Empirical Research in Economics and Management (WIHN0258) (MiM am Campus Heilbronn)	This module prepares students for qualitative and quantitative research (e.g. for their Master's Thesis) by introducing them to basic and advanced topics of empirical research. Amongst others, the topics are: Experiment design; Correlation analysis; Linear and multiple regression models; Qualitative methods; Factor- and cluster analysis; Conjoint analysis	5	no SDGs tackled	20
240993978Empirical Research in Management and Economics (WI000258)	Amongst others, the topics are: Experiment design; Correlation analysis; Linear and multiple regression models; Qualitative methods; Factor- and cluster analysis; Conjoint analysis	5	no SDGs tackled	20
0000001767Energy Economics - Exercise (WI001145)	This course discusses both theoretically and empirically the industrial economics and regulation of energy markets. It examines the fundamentals of primary energy markets for coal, gas and oil, foundations of electricity markets, price regulation, regulation of networks, policies to promote security of supply and policies to control emissions. A focal point of this course lies on electricity markets and their theoretical description and empirical analysis. The course provides basic concepts for demand, supply, markets, energy markets and security of supply, hedges and forwards markets. With this the course also focussed on economic growth through perfect competition and expansion in markets, leveraging it with innovation and technology.	2	SDGs 7,8,9,11,12.	18
0000003601Energy Economics (WI001145)	This course discusses both theoretically and empirically the industrial economics and regulation of energy markets. It examines the fundamentals of primary energy markets for coal, gas and oil, foundations of electricity markets, price regulation, regulation of networks, policies to promote security of supply and policies to control emissions. A focal point of this course lies on electricity markets and their theoretical description and empirical analysis. The course provides basic concepts for demand, supply, markets, energy markets and security of supply, hedges and forwards markets. With this the course also focussed on economic growth through perfect competition and expansion in markets, leveraging it with innovation and technology.	2	SDGs 7,8,9,11,12.	18
0000005330Entrepreneurship	Entrepreneurship provides students with knowledge of the theoretical concepts and models of	3	SDGs tackled: 5,8,9	18

(WIHN1185) (MiM Campus Heilbronn)	entrepreneurship. However, course considers also women entrepreneurship, eco, social ventures etc			
000000247Entrepreneurship (WI000984, WI900005, WI001185)	Entrepreneurship provides students with knowledge of the theoretical concepts and models of entrepreneurship. However, course considers also women entrepreneurship, eco, social ventures etc	3	SDGs tackled: 5,8,9	18
000000482Financial Accounting (WI001139) (MiM)	accounting standards, bookkeeping, financial statements, IFRS standards, fiscal year budgeting	5	no SDGs tackled	20
820546378Innovative Entrepreneurs	Outstanding founders, managers and investors covering a wide range of industries talk about their individual entrepreneurial career paths. They present the diversity of the entrepreneurial life, entrepreneurial personalities, skills and motivations. They also talk about identifying opportunities, innovation management, growth, leadership and facets of entrepreneurship. After the lecture students can ask guest speakers questions and discuss with them. In the summer semester the focus is on starting a business and in the winter semester on managing and leading large and medium-sized companies.	2	innovation management, growth, leadership and facets of entrepreneurship. Opportunities Through New Technologies. "...basic understanding of starting and leading technology-based and growth-oriented businesses". 8 Decent Work and Economic Growth; 9 Industry, Innovation and Infrastructure. "Successful Female Entrepreneurs Panel" - 5 Gender Equality	18
0000005226International Trade II	Topics: Course Motivation and linkage to "old" International Trade Theory; Introduction of a Firm to IT; Firm's Structure and Trade & Firm's Characteristics and Trade; Focus on productivity, economies of scale, entry, exit; Multinationals and Global Supply Chains; Competition, Product Diversity and Differentiation, Geography and Trade; Trade Theory with Numbers: Quantifying the Globalization. The course provides the concepts and models of international trade theory and uses instruments and rationals for the international trade policy and promotes productions and consumption and partnership through the global supply chains. The course deals with sustainability issues but not at the core.	3	SDGs 8,12 and 17.	18

0000005289Management Science - Excercise (WIHN1137) (MiM Heilbronn)	Management Science is about modeling, solving and analyzing operational and decisional problems using mathematical concepts. This module covers the following topics: mathematical model formulation, linear programming, integer programming, network flows, dynamic programming and decision theory.	5	no SDGs tackled	20
0000003285Management Science (WIHN1137) (MiM Heilbronn)	Management Science is about modeling, solving and analyzing operational and decisional problems using mathematical concepts. This module covers the following topics: mathematical model formulation, linear programming, integer programming, network flows, dynamic programming and decision theory.	5	no SDGs tackled	20
0000000481Management Science (WI001137): (MiM)	Management Science is about modeling, solving and analyzing operational and decisional problems using mathematical concepts. This module covers the following topics: mathematical model formulation, linear programming, integer programming, network flows, dynamic programming and decision theory.	5	no SDGs tackled	20
0000003568Strategic and International Management (WI001114, WI900012, WI001185) (Master)	Strategic and international management targets long term decisions and the sustainable development of the company.	4	Decent Work and Economic Growth.	8
0000005398Strategic International Management (WIHN1185) (MIM Campus Heilbronn)	Strategic and international management targets long term decisions and the sustainable development of the company.	4	Decent Work and Economic Growth.	8
0000003609 Cost Accounting (WI001130)	The course introduces students to topics in managerial cost accounting. This course focuses on the basic concepts, analyses, uses, and procedures of cost accounting and how cost information helps managers make better decisions. In order to emphasize this prominence in decision making, the “different costs for different purposes” theme is used throughout this course. Topics covered include: Job costing; Activity-based costing; Process costing; Cost allocation; Cost behavior; Cost-volume-profit analysis; Relevant costs for decision making. After successfully completing this course, students should be able to understand and apply managerial cost accounting systems and use them in practice.	5	no SDGs tackled	20

0000001208 Introduction to Business Law (WI001122)	Topics: inter alia, the formation and termination of contracts, selected types of contract (in particular, sale of goods), torts, property law, the law of business associations, intellectual property law, competition law.	5	no SDGs tackled	20
0000002038 Investment & Financial Management (WI001138)	Financial Statement Analysis (balance sheet analysis, analysis of profit and loss account); - Investment Analysis (net present value method, actuarial return); - Capital Budgeting (determination of free cashflows, choosing between alternatives); - Cost of Capital (equity costs, borrowing costs, capital costs); - Capital Structure	5	no SDGs tackled	20
0000002365 Marketing & Technology and Innovation Management (WI001129)	This course introduces a series of frameworks and tools that can be used to a) solve general business problems and b) develop specific marketing strategies and programs. The course consists of the following units: Principles of Marketing; Marketing research; Consumer behavior; Market Segmentation; Targeting; Positioning; Product Management; Channels; Pricing; Promotion; Social Media Marketing; International Marketing. Technology and IM focuses on innovation, its strategy, R&D and design	3	Industry, Innovation and Infrastructure	9
Advanced Seminar Finance and Accounting (WIB30003): The influence of COVID 19 on digital accounting and auditing	Key topics of the seminar may include: - the impact of COVID 19 on financial accounting, - digital financial reporting (e.g., ESEF), digital auditing (e.g., Audit 4.0), digital participation of stakeholder (e.g., digital annual general meeting), long-run costs and benefits of digital innovations for accounting and auditing (e.g., AI, Blockchain, etc...). Upon successful completion of this module students are able to analyze and discuss current issues in financial auditing and financial accounting. Students are able to evaluate the advantages and drawbacks of current issues in financial auditing and financial accounting from different perspectives (e.g., clients, audit firms, shareholders, or stakeholders).	4	8 Decent Work and Economic Growth, 9 Industry, Innovation and Infrastructure; 3 Good Health and Well-being	18
Seminar Finance & Accounting (WIB30002): Brave new world? Digital innovations in accounting	In this module, students deepen their knowledge in scientific work. In particular, they practice the preparation of literature reviews, the application of theories, scientific argumentation and, if necessary, the analysis of relevant data. In addition, they deepen specific auditing and accounting topics with regard to new technological methods. Students also have the opportunity to improve their presentation techniques. Amongst others, the following problems will be dealt with: -Effects of crises on accounting practice (e.g. as a consequence of COVID-19), -Handling uncertainty in accounting (e.g. for forecasts), -Digital reporting (e.g. ESEF), -Digital auditing (e.g. Audit 4.0, Remote Audit), - Digital shareholders' meeting, -Potentials of digital	4	8 Decent Work and Economic Growth, 9 Industry, Innovation and Infrastructure; 3 Good Health and Well-being	18

	<p>innovations (e.g. AI, Blockchain etc.) for accounting and auditing. After successfully completing the module, students are able to illustrate and critically analyse current topics in the field of digitisation of auditing and accounting. Students are also able to discuss the advantages and disadvantages of using new technologies in the field of accounting and auditing for different stakeholders. Furthermore, students have in-depth knowledge of scientific work (literature research, scientific writing, empirical analysis, presentation techniques).</p>			
<p>WI001133 Advanced Seminar Economics & Policy: Strategic Interaction - in Theory, Lab, and Field</p>	<p>This seminar introduces you to game theory and behavioral experiments as useful means for enhancing our understanding of strategic interactions. Game theory provides a framework to structure the overly complex reality and predict plausible outcomes. With the tools of experimental economics, we can test those predictions and assess their behavioral validity, both in the lab and in the field. In this course, we will focus our attention on four distinct sets of questions: Trust and Reciprocity; Cooperation and Punishment; Coordination and Communication; Competition and Contest</p>	4	<p>The course provides information regarding the game theory and behavioural experiments as useful means enhancing strategic interaction. In this course, we will focus our attention on four distinct sets of questions: Trust and Reciprocity, Cooperation and Punishment, Coordination and Communication, Competition and Contest. (16 Peace, Justice and Strong Institutions)</p>	16
<p>Logistics and Supply Chain Management (WI001131) (MiM, WIN, NAWI). This course is part of the module "Production and Logistics"</p>	<p>Topics: Transport logistics: travelling salesman problem; Vehicle routing problem; Packing logistics; Material logistics; Newsvendor and safety stocks; Inventory control rules & simulation (Excel). Supply Chain Management: Bullwhip effect; Contracts and information; Procurement; Sourcing and data envelopment analysis; Distribution; Retail logistics, cross docking, service provider networks; Locations: Warehouse location and Set covering; Capacity planning. Warehousing</p>	4	<p>Industry, Innovation and Infrastructure</p>	9
<p>Production Management (WI001131) (MiM, WIN, NAWI). This course is part of the module</p>	<p>The course focuses on strategic planning problems such as site location planning, on material requirements planning, production planning issues where we focus on lot sizing questions, machine scheduling and sequencing in flow lines.</p>	4	<p>Industry, Innovation and Infrastructure</p>	9

"Production and Logistics"				
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