CURRICULUM MADM10 VERSION MADM10/18

Title of curriculum: Design and Technology Futures

Code of curriculum's version: MADM10/18

Valid from: 2018/2019

Educational aims of the curriculum: The aim of the program is:
- to prepare young professionals with the background in innovation, design or technology who are able to spark, lead and perform socially and economically future oriented product- or service concept development;
- to offer possibility to gain a wide range of theoretical and practical knowledge about the interdependence of design, technology and economics;
- to create a skillset to implement design thinking for dealing with contemporary complex problems, understanding the interests, limits and possibilities of users, technology and entrepreneurs in economic, social and cultural context;
- to create an understanding of sustainable development regarding social, environmental and economic sense;
- to hold a discussion about the role of design in the context of emerging technology, culture, society and environment;
- to ensure skills and attitude to work efficiently in interdisciplinary team towards solving complex and undefined problems;
- to create an understanding about the strategic functions of a company, including technological production processes, business planning, marketing and design management;
- to encourage and support to take responsibility and work actively for creating a better World.

We are open to students with a variety of different backgrounds with an ambition for innovation. They have to demonstrate high level of professional skills connected to development in a wide sense, an open mind-set, interest, curiosity and creativity.

The career of graduates depends on their first profession and stretches over the horizon of innovation, involving researches in research institutes, designers and consultants in design offices, development engineers, design or development managers in businesses, freelancers or successful entrepreneurs.

Graduating prepares students for doctoral studies.

Learning outcomes: After passing the curriculum the student:
- is able to systematically develop innovative concepts testing different possible Futures of essential themes for people and society;
- has acquired skills and abilities to handle problems systemically by being able to untangle the them, noticing the interrelationships between different nodes and opportunities for possible change;
- can creatively and critically envision future possibilities of emerging technologies and propose new and well explored concepts for possible solution opportunities in socio-cultural and economic context;
- is able to contextualise developed concepts and understand and consider the effect of a new proposition in creating a meaningful and desirable Futures;
- is able to plan, lead and manage design led transdisciplinary research and development process;
- demonstrates knowledge and skills to conduct human-centred development process, can independently perform user, design and technology research and masters co-creation techniques to involve users and stakeholders in development process;
- knows design and product development processes, masters skills to integrate design, technology and entrepreneurship mind-sets in development activities;
- has acquired entrepreneurship, brand building and marketing knowledge and understands the relationship between company's strategic level, commercialising and developing new ideas, products and services;
- has acquired knowledge about contemporary production processes and can make decisions about production planning;
- presents skills and knowledge to work out concept ideas for new product- and service systems, for running agile and iterative product development, rapid prototyping and testing;
- is able attractively and clearly present the outcome and the process of the work, revealing design ambition, the value for users and/or society and opportunity for commercialisation.

Structure of the curriculum:

Specialization: design and technology

General studies module(s)	
General studies	12 ECTS credits
Core studies module(s)	
Design	12 ECTS credits
Elective studies	6 ECTS credits
Engineering	12 ECTS credits
Entrepneurship	6 ECTS credits
Special studies module(s)	
Specialization studies	42 ECTS credits
Free choice courses module(s)	
Free-choice course(s)	6 ECTS credits
Graduation thesis	24 ECTS credits
TOTAL	**120 ECTS credits**

Conditions of completion of basic studies:

Conditions of graduation: Studing 120 ECTS credits from study programme. Diploma is handed to the student who has passed all the studies according to the curriculum.
Cum laude requirements:
- Master's Thesis mark "5";
- average graduation mark 4.60 or higher, including all exams, practical training and Master's Thesis marks

List of courses according to curricular parts

	*	ECTS credits	Weekly hrs	Le-Pr-Exer	Evaluation	Teach. sem	Std sch sem
General studies							
General studies							
Goals: The general aim of the Module is to widen students' horizon of knowledge and to introduce the role and impact of technology and innovations on social, cultural and economic development. On the other hand, to understand the cultural theory and learn visual literacy in order to see culture's possibilities and influence to guide technology development. A set of the subjects explain different theoretical conceptions and build a platform students can tie these with their own professional practice and everyday life.							
Study results: Upon completion of this module, student is able to: - demonstrate the understanding of the inter-relationship of culture, science, technology and economic development and can interpret their own ideas within the theory; - can build connections and comparison between different theoretical models and use them in contextualizing their own professional practices; - is aware of the processes taking place in contemporary development of technology, culture and society and able to form his/her own opinion: - is able to assess the role and consequences of technology by ethical, social and cultural criteria.							
Compulsory courses: 6.00 ECTS credits							
ÜT7130 - Cultural Theory and Visual Literacy		6.00	4	2.5-0-1.5	E	SP	2
Optional courses: at least 6.00 ECTS credits							
MNI5130 - Techno-Economic		6.00	3	2.5-0-0.5	P-F.Ass.	A	1
MNI5130 - Techno-Economic Paradigms and Technological Transitions		6.00	3	2.5-0-0.5	P-F.Ass.	A	1
MNR5320 - Technology, Society and the Future		6.00	4	2.5-0-1.5	E	A	1

Core studies							

Core studies

Design

Goals: The aim of the Module is to offer contemporary knowledge and theoretical understanding about the current design thinking trends and practices so that students can build up their own personal attitude based on critical understanding about designers' responsibilities and possibilities dealing with the complex problems situated in the 21st century, understanding humans, culture, environment and entrepreneurship.

Study results: Upon completion of this module, student is able to:
- understands the conception and practices of human-centred design and is able to practice these independently in innovation process;
- possesses in-depth knowledge in integrating design over the whole set of activities in entrepreneurial company or public organisation starting from identifying possibilities for change, to conceptualising new product or service development, till final polish of user experience design in the interaction happening in the touchpoints of product or service use;
- understands design's responsibility and possibilities of action in the movement towards globally sustainable development, regarding and judging activities from social, economic and environmental perspective;
- is able to critically judge and analyse whole complex systems from the viewpoints of business, technology and human perspective and tie it to contemporary thinking in design.

Compulsory courses: 12.00 ECTS credits

EMD0010 - Human-Centred Design		6.00	4	1.5-0-2.5	E	A	1
EMD0080 - Corporate Entrepreneurship and Design		6.00	4	1.5-0-2.5	Gr.Ass.	SP	2

Entrepneurship

Goals: Create an understanding about the essence of entrepreneurship and it's processes, the role of entrepreneur and the principles of business planning and development (incl growth) process, also about the main aspects of the activities of enterprises in the context of external business environment. To give an opportunity for students on the basis of chosen business idea to practically plan the business process, design business model and compile business plan through teamwork and interdisciplinary study, which is supporting students in their career choice of becoming entrepreneur or entrepreneurial employee.

Study results: Learning outcomes:
- Explaining the essence of entrepreneurship, phases of entrepreneurship processes and business planning as well as the main activities of enterprises.
- Assessing own abilities to initiate teamwork and activate on the development of business ideas in real life and handle risks.
- Assessing business opportunities and analysing them based on problems needful to solve, uncovered market nisches and development trends.
- Carrying out market and competition analysis originated from chosen business opportunities, compiling the general and competition strategy for planned enterprise.
- Designing full marketing mix for enterprise (products/services, pricing policy, market channels and promotion activities).
- Compiling report for profit, cash flows and balance prognosis and cost-benefit analysis.
- Presenting and justifying the feasibility of business model (business plan).

Compulsory courses: 6.00 ECTS credits

TMJ3300 - Entrepreneurship and Business Planning		6.00	4	1-0-3	E	ASP	1

Engineering

Goals: The general aim is to give systemic knowledge about the philosophy and processes of contemporary product development, learn to know different production Technologies and the role of IoT, digitalising manufacturing and evolving layer-additive production methods to mass and small series production; to understand the principles of Internet of Things and to learn to utilise the possibilities offered by such digital platforms for creating new product and service system concepts.

Study results: Upon completion of this module, student is able to:
- understands the integrated nature of product development, it's different phases and guiding logic;
- is able to plan product development process, put together and lead project team and integrate the activities to all the connected partners in a company;
- can plan and design for product quality for all product life cycle:
- can plan and control production processes;
- can decide and choose manufacturing processes according to the specification of product design;
- knows the technologies of Internet of Things, is able to design, build and test simple IoT systems by himself;
- can create digital simulation environments based on virtual reality and machine vision technology.

Compulsory courses: 12.00 ECTS credits

EMT0160 - Production Digitalization		6.00	4	1-3-0	E	SP	2
EMT8600 - Concurrent Product Development		6.00	4	2-0-2	E	A	3

Elective studies

Goals: The aim of the Module is to deepen student's knowledge in the realms of entrepreneurship, design or technology.

Study results: Upon completion of this module, student has gained deeper knowledge and skills in a specific field of entrepreneurship, design or technology.

Optional courses: at least 6.00 ECTS credits

EMT0150 - Production Engineering - Planning and Control		6.00	3	1.5-0-1.5	E	A	0
EMT0140 - Internet of Things for Industry		6.00	4	1-2-1	E	A	0
EMM0020 - Engineering for Natural Scientists		6.00	4	3-0-1	E	A	0
MMJ5250 - Venture Creation		6.00	4	0-0-4	E	SP	0
ÜT7131 - Problems of 20th and 21st century Design		6.00	4	2.5-0-1.5	E	A	0
TD7150 - Design for Sustainability		6.00	4	2-0-2	Gr.Ass.	A	0
MMJ5240 - Social Entrepreneurship		6.00	4	1-0-3	Gr.Ass.	SP	0

Free choice courses
Free-choice course(s)
Goals: To give to the students following possibilities: - To improve the basic professional knowledge and skills acquired during studies with the complementary subjects needed for orienting in professional as well as in general cognition. - To choose subjects from different curricula depending on individual interests and abilities;
Study results: Upon completion of this module, students will be able to: explain and apply new knowledge in a constructive way for his/her professional and social needs
Graduation thesis
Master Thesis
Goals: To conduct independent and thorough development or research project. In thesis project student demonstrates his abilities to carry out design-led innovation practices and ideas in a creative project. The theme of the thesis is chosen by student according to his personal interest or professional ambition.
Study results: Upon completion of this module, student is able to: - define problems, form exact research questions and solve them using a set of innovative methods in a given frame; - is able to conduct independently different background research to understand problem context, technology and market possibilities, understanding users and other stakeholders; - demonstrates abilities to critically analyse research material and to synthesise the out-comes of the research in generating creative solution ideas; - demonstrates independent creative thinking and ability to create and work out innovative and well-argued concepts; - demonstrates the ability to understand different stakeholders of the problem issue and envision product or service systems combining design and technology futures; - can compile problem analyses and study according to scientific principles and international standards of scientific literature.
Special studies modules: design and technology
Specialization studies