Technische Hochschule Ingolstadt

Module Handbook

M.Sc. User Experience Design (SPO WS 24/25)

Faculty of Computer Science

Summer term 2026

as of: 2024-02-05

This program and module description become effective on 15.03.2026. It supplements the study and examination regulations and serves to ensure that the modules are available according to the regulation of WS 24/25.Additionally, it contains detailed information about modules, contents, assignments, and examinations.

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1 Overview

Name of the program	User Experience Design (Master)
Type of study	Graduate program, MSc. (Master of Science), Full time
Initial start date	March 15, 2020; starts every semester
Normal study period	3 semester, 90 ECTS, 48 SWS (full-time) 6 semester, 90 ECTS, 48 SWS (part-time)
Place of study	Ingolstadt
Language of instruction	English
Cooperation (Dual study)	Not offered (see Faculty Council resolution of 13.11.2023)
Double degree program	Double degree programs with the University of Buenos Aires (UBA), Argentina and the Meritorious Autonomous University of Puebla (BUAP), Mexico are in preparation
Admission requirements	The qualification requirements for admission to the Master's degree program User Experience Design include proof of successful completion of a degree course at a German university with at least 210 ECTS credits or equivalent with a focus on computer science and/or design (e.g., Computer Science, Media Informatics, Human-Technology Interaction, Multimedia and Creative Technology, Computer Engineering, User Experience Design, Interface/Communication Technologies, Interaction Design, Digital Media, Digital Design, Integrated Design, Assistive Technologies, Information Technology and Design, Media Engineering, Multimedia and Communication, Digital Animation, Design, or similar) or an equivalent degree successfully completed in Germany or abroad. In addition, proof of sufficient knowledge of English (language level B2 of the Common European Framework of Reference for Languages) must be provided.

	Applicants who fulfill the admission requirements must undergo an aptitude assessment procedure (curricular analysis).
Capacity	15 (20) students per semester
Academic coordinator	Prof. Dr. Andreas Riener E-Mail: andreas.riener@thi.de Phone: +49 (0) 841 / 9348-2833
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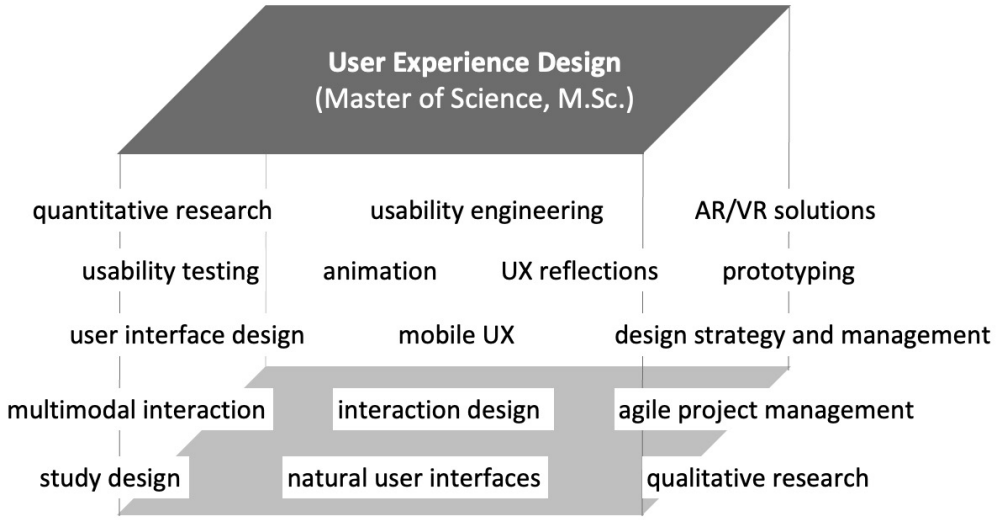
2 Introduction

Modern societies need professionals who thoroughly understand how to design and develop user-friendly interactive products and engaging ways to interact with various technological devices. The master User Experience Design (UXD) takes on a special role and niche function among the degree programs offered by the Faculty of Computer Science. It is the only hybrid degree program at THI that considers both technical-engineering skills (system programming) and usability research (incl. design aspects, conception, human factors). Digital technologies play a significant role in all areas of everyday life. Thus, this mix of competencies is increasingly demanded by industry today.

Competencies gained by graduates of the master user experience design in a nutshell:



In the master program User Experience Design, students will gain up to date knowledge on interaction design, human factors & ergonomics, as well as multimodal and multi-sensory human-computer interaction. Mobile prototyping and interface solutions for augmented & virtual reality are also part of the program as are design strategy and management or a critical reflection on user experience. In a broader context, graduates are skilled for scientific thinking and writing and are enabled to participate in or manage complex projects in an international context.

2.1 Objectives

A UX designer provides the link between product development, IT, design, ergonomics, and marketing. As such, the job can involve the following: programming, implementation, system design, prototyping, usability testing, user interface design, interaction design, web design, usability engineering, research, requirements analysis, user insights, surveys, evaluation, ergonomics assessment, acceptance tests, product conception, project management.

Considering the continuous evolution of technologies embedded in the professional and daily life of people, the master program provides the students with training in and access to several technologies and design approaches. They are not specialized to specific or current user experience design challenges but are able to apply and adapt the acquired skill set to future technological and usage evolutions: analyze a usage context from technical and human perspectives and develop and design solutions based on them.

The master program User Experience Design (UXD) aims at providing graduates with the skills required to design and prototype user-friendly interactive products, AR/VR applications, etc. They are skilled for scientific thinking and writing and are enabled to participate in or manage complex projects. Graduates will further possess the necessary intercultural and communicative skills required for working in an international context.

In more depth, after successful completion of the program, graduates

- …can describe common problems in computer science at different levels of abstraction and discuss possible solutions.
- …have gained a basic understanding of the prototyping/development of mobile applications (apps).
- …have acquired applied understanding of statistical methods and their fields of application.
- …know different spatial representation types and can name their areas of application.
- …are familiar with different computer-aided tools for displaying and editing static and dynamic designs.
- …can create and discuss general concepts for information architectures.
- …can use and compare different tools for software and hardware prototyping.
- …understand criteria that influence the usability/user experience of products.
- …have acquired a sound knowledge of the distinction between usability and user experience.
- ...understand how essential technologies in human-computer interaction work.
- …have a solid understanding of human information processing and can discuss it in the context of computer systems.
- …have acquired comprehensive knowledge of target group-specific characteristics that play a role in user-centered design and are able to apply this knowledge.

- …know about and can discuss the possibilities and limitations of current technological solutions.
- …can apply management techniques to support the development and distribution of systems and products throughout their life cycle.
- …have comprehensive knowledge of the design of human-machine interactions and can apply it.
- …know qualitative and quantitative methods of research.
- …have acquired a holistic understanding of UX theories and gained the knowledge to design UX experiences that address social issues, promote inclusivity, and empower marginalized communities.

A detailed overview of the acquired competencies at the module level can be found in section 3.2.5.

2.2 Admission requirements

The qualification requirement for admission to the Master's degree program User Experience Design is proof of successful completion of a degree course at a German university with at least 210 ECTS credits or equivalent with a focus on computer science and/or design (e.g., Computer Science, Media Informatics, Human-Technology Interaction, Multimedia and Creative Technology, Computer Engineering, User Experience Design, Interface/Communication Technologies, Interaction Design, Digital Media, Digital Design, Integrated Design, Assistive Technologies, Information Technology and Design, Media Engineering, Multimedia and Communication, Digital Animation, Design, or similar) or an equivalent degree successfully completed in Germany or abroad.

For degrees not displaying credits, the number of hours (workload) evidenced will be converted into credit points, whereby one credit point corresponds to a study load of 25 full (i.e., 60 minutes) hours. If it is impossible to determine the number of study hours, 30 ECTS will be recognized per theoretical study semester. Practical semesters are credited with 30 ECTS provided these correspond with the practical study semester at the Technische Hochschule Ingolstadt in terms of their type and extent.

Applicants who can provide evidence of a completed university course of study or equivalent degree qualification for which less than 210 ECTS but at least 180 ECTS credit points have been awarded may be admitted with the consent of the Examination Commission if evidence of compensation for the respective missing skills is provided with the application for admission.

Applicants will be subject to an assessment test, which requires proof of competencies in the following areas to pass.

- knowledge in the field of computer science, in particular programming of interactive systems, rapid prototyping in software/hardware, game development platforms, virtual/augmented reality, computer graphics and web technologies,
- knowledge in the field of design, in particular design basics, typography, sketching, interaction design, web design, product design, design of user interfaces (graphics, audio, video), study design and implementation,
- practical experience in the field of developing interactive systems including their conception/design or implementation in software/hardware,
- Letter of motivation (presentation of relevant qualifications and competencies, in particular those that go beyond the knowledge and qualifications acquired in the first degree program; proof of previous own work relevant to the degree program in computer science or design by providing a link to work samples/portfolio).

Each applicant will receive a notification of the results of the assessment test in writing at the latest two weeks prior to the commencement of studies. Further details are regulated by the statutes on the aptitude procedure for the Master's degree course in User Experience Design at Technische Hochschule Ingolstadt in the currently valid version.

In addition, applicants need proof of their proficiency in English (level B2 according to the Common European Framework of Reference or TOEFL iBT min. 80 Pt.).

Generally, the admission requirements of the BayHIG apply.

2.3 Target Group

The study program is aimed at ...

- Graduates of engineering, computer science, interaction design or related fields (or an equivalent domestic or foreign degree) with an interest in both programming and design.
- Potentially missing competencies can be compensated by
    1. practical work experience outside of the degree program, which corresponds in content and scope to the practical semester of a BA program in the field of Human-Machine Interaction, User Experience Design, Media Informatics, Interaction Design, Internet of Things, Information Technology, Computer Science or another bachelor's degree program, e.g., at THI.
    2. Proof of practical or theoretical study and examination achievements in addition to the first degree from a domestic or foreign university, which correspond in content and scope to the requirements of a Bachelor's degree program in the field of Human-Machine Interaction Design, User Experience Design, Media Informatics, Interaction Design, Internet of Things, Information Technology, Computer Science or another equivalent Bachelor's degree program, e.g. at the THI, provided that the submitted degree shows deficits in the area of the theoretical or practical competencies to be proven compared to the qualification requirement.

The knowledge gained in the master's program should enable graduates to take on qualified specialist and management tasks in the field of human-technology interaction and enable them to work on or manage complex projects.

Furthermore, graduates should have the intercultural and communicative competencies required for working in an international context. To this end, the program is entirely conducted in English.

The master's program also opens the possibility for students to subsequently pursue a doctorate or work in research in the field of human-computer interaction, interaction design, usability research, etc.

2.4 Internationalization

The master's program in User Experience Design is conducted entirely in English. On the one hand, this is due to the job description of the user experience designer, who is to be seen as an interface function between the most diverse roles in the product development process and thus, especially due to the increasing global, worldwide networking, will increasingly communicate with distributed teams and in English. On the other hand, the English-language offer and the orientation of the degree program are intended to attract an international clientele, which promotes social diversity and allows intercultural differences to be experienced in the study group - thus making a significant contribution to the understanding of the influence of origin, culture, religion, anthropomorphic differences, etc.

Other aspects that justify the English-language implementation are the internationalization strategy of THI, which is also documented in the target agreement with the ministry, as well as the fact that in the broader field of computer science, HCI, usability, interaction design, most of the literature (especially the most current findings, e.g., in conference proceedings and journals) is available in English. German-language literature usually lags a few years behind and is not widely available.

Finally, the feedback from companies where UXD undergraduates are employed also confirms this decision. English as a language of instruction and discussion prepares students for the job market. In (interaction) design agencies, English is already the main language. Even in internationally operating companies such as Audi, BMW, Siemens, etc., the language of communication is increasingly being changed to English and especially management functions (including UXD master's graduates) often work with English-speaking teams in an international environment.

2.5 Structure of the program

Studies are offered in the form of a consecutive degree course (full-time study) with a standard study period of three semesters or in the form of a part-time study program with a reduced workload (standard study period of six semesters), each with a total credit point score of 90 ECTS. The master's thesis must also be written during this standard study period (the allotted time for thesis writing is six months for full-time students, 12 months for part-time students). At the time of enrollment, students have to choose whether they want to study full-time or part-time.

There is no entitlement to all modules being offered every semester, i.e., most of the modules are offered only once per year, according to the table below. Further fragmentation is planned for part-time students: Half of the courses in each semester must be taken in the first or second year. When planning the timetable, emphasis is placed on ensuring that it is as easy as possible to study. Even-numbered semesters correspond to the summer term, odd-numbered semesters to the winter term.

THI may also provide teaching offers supported by virtual forms of teaching. Offered virtual teaching formats for this master program are given in the Annex of the study and examination regulations on a per-module basis. Detailed regulations for all modules are contained in the module handbook of the program (updated every semester).

Specializations can be achieved by choosing the appropriate electives. There is no compulsory semester abroad - however, to strengthen international competences, a subject-related semester or the master thesis can be completed at a foreign partner university (or, in the case of the final thesis, company).

The following table graphically depicts the course of study (full-time students):

1st semester	**Research Methods in HCI** ● *[5 ECTS]*	**Interaction Design** *[6 ECTS]* ■	**Multimodal, Interactive Systems** ■ *[6 ECTS]*	**Project Natural User Interfaces** ● *[5 ECTS]*	**Agile Project Management** ■ *[3 ECTS]*	**Elective** ● *[5 ECTS]*
2nd semester	**Mobile UX Prototyping** ● *[5 ECTS]*	**Augmented and Virtual Reality Applications** ■ *[7 ECTS]*	**Critical UX Reflections** ■ *[3 ECTS]*	**Design Strategy and Management** ● *[5 ECTS]*	**Project** ● *[5 ECTS]*	**Elective** ■ *[5 ECTS]*

3rd semester	**Master's Thesis** (including Master thesis seminar) *[30 ECTS]*

Legend

Cluster 1: Programming/Computer science	4 Modules (23 ECTS)
Cluster 2: Design	4 Modules (17 ECTS)
Cluster 3: Practical/application skills	4 Modules (20 ECTS)
● / ■	Clustering for part-time students (15 ECTS per semester), recommendation: ■ year 1 / ● year 2

2.6 Concept and advisory board

The degree program was developed based on a competitive analysis/market analysis complemented by discussions with company representatives from BMW AG, Audi AG, Continental AG, DATEV and representatives from universities (Munich University of Applied Sciences, Hagenberg University of Applied Sciences/Austria). The positioning of the program in the intersection of digitalization, internationality, and interdisciplinarity with the resulting mix of subjects in the broader area of User Experience was made based on industry requirements and current developments in UX research. Discussions further confirm that the competence profile of the degree program absolutely meets the needs of the industry and that appropriately qualified graduates are in high demand now and in the future. The requirements from these parties were considered in a special way.

Statements from company and university representatives:

- We think the English-language implementation is particularly important to take into account the increasing globalization or internationalization, interculturality, and worldwide market competition.
- ...a right step at the right time and we are very happy to support the introduction through a constant exchange about requirements from the industry for the continuous optimization of the curriculum.
- We very much welcome the plans of THI to start an English-language master's program in UXD with the proposed curriculum and consider this step to be very beneficial to prepare the region of Ingolstadt and THI for the planned increase in student numbers in the near future.
- Recently, the topic of User Experience Design has therefore grown very strongly at [company]. The demand for UX designers is so high that we can only cover it with high recruitment efforts. This is also in line with the experience of other companies in Bavaria. In addition, as the size of the design organization increases, we are confronted with new requirements in the areas of design management, design strategy and the establishment or efficient operation of design organizations. These contents are missing in most study programs in UX.
- I am pleased that THI would like to introduce a degree program with the envisaged focal points within reach of our company and I am happy to support it. On the one hand, this takes the form of feedback on the match between practical requirements and curriculum. On the other hand, cooperation in teaching, e.g. in the form of joint projects, would be desirable.
- …the curriculum appears to be well-balanced in terms of content, especially technical and design aspects.
- …the qualifications of the graduates are very much in line with the requirements of the future labor market.

- The content structure of the degree program is consistent and coherent and is intended to provide students with interdisciplinary technical and methodological knowledge in the field of interactive systems for human-technology interaction on a scientific basis.
- The purely English-language implementation corresponds to the current trend of increasing internationalization at German universities and takes also into account the increasing globalization and internationalization and the acquisition of intercultural competence.

Graduates of the UXD degree program are thus qualified to take on skilled specialist and management tasks in the field of human-technology interaction and enable them to work on or lead complex projects. The graduates also have the intercultural and communicative competences required to work in an international context. Further on, they have gained sufficient abstraction skills and analytical thinking to be able to independently familiarize themselves with new, unfamiliar areas of expertise and complex problems and implement solutions accordingly.

3 Qualification profile

3.1 Mission statement

The master's program in User Experience Design was developed with the aim of providing students with **interdisciplinary specialist and methodological knowledge in interactive systems for human-technology interaction on a scientific basis**. On these grounds, graduates should be able to independently develop creative and innovative ideas for interactive systems, design prototypes and implement them in software and/or hardware. In addition to the basic competences in dealing with interactive technologies, another essential goal of the degree program is to impart the necessary know-how to work within the professional field in the areas of

- **Programming technical/multimedia systems**
- **Design strategy**
- **Design, conception, implementation**
- **Qualitative/quantitative research and**
- **Scientific work**

to be successful. In addition to analytical and methodological competence, key qualifications in working in a scientific environment are to be taught.

Through strongly research-oriented teaching, graduates should be at the cutting edge of knowledge in the areas of research methods in human-technology interaction, ergonomics, design, implementation of interactive systems, implementation of multimodal user interfaces and thus be able to independently apply and expand this knowledge in the complex subject area. Graduates should be able to competently communicate their acquired knowledge to laypersons and exchange ideas with scientists in the field of human-technology interaction at a scientific level.

The degree program addresses the following strategic goals of the university:

1. **Internationalization**
   The master's program in User Experience Design is conducted entirely in English. On the one hand, this is due to the job description of the user experience designer, who is to be seen as an interface function between the most diverse roles in the product development process and thus, especially due to the increasing global, worldwide networking, will increasingly communicate with distributed teams and in English. On the other hand, the English-language offer and the orientation of the degree program are intended to attract an international clientele, which promotes social diversity and allows intercultural differences to be experienced in the study group - thus making a significant contribution to the understanding of the influence of origin, culture, religion, anthropo-morphic differences, etc. Other aspects that justify the English-language implementation are the internationalization strategy of THI, which is also documented in the target agreement with the ministry, as well as the fact that

in the broader field of computer science, HCI, usability, interaction design, most of the literature (especially the most current findings, e.g., in conference proceedings and journals) is available in English. German-language literature usually lags a few years behind and is not widely available. Finally, the feedback from companies where UXD undergraduates are employed also confirms this decision. English as a language of instruction and discussion prepares students for the job market. In (interaction) design agencies, English is already the main language. Even in internationally operating companies such as Audi, BMW, Siemens, etc., the language of communication is increasingly being changed to English and especially management functions (including UXD master's graduates) often work with English-speaking teams in an international environment.

2. **Entrepreneurship**
   With their inter-/cross disciplinary skills, graduates of the master's program in User Experience Design are predestined for founding and leading start-ups. To support students/graduates on this path, the subject-specific elective modules "Global Entrepreneurship and Global Leadership" (summer term) and "Entrepreneurship Coaching" (winter term) of the THI Center of Entrepreneurship (CoE) are offered on an ongoing basis. These modules can be counted toward the THI Basic Entrepreneurship Certificate (requires a total of two entrepreneurship-related modules). The Advanced Entrepreneurship Certificate requires one additional optional module in complement to the Basic Certificate (i.e., in addition to the 90 credits of UXM). Furthermore, other compulsory modules, including "Design Strategy and Management" and "Agile Project Management", address topics that are relevant for setting up/managing a company.

3. **Digitalization**
   The main objective of the Master UXD is to act as a link between the user and technical systems. Human-machine interaction happens via the (increasingly digital) user interface. The competences acquired in the program enable students/graduates to support and optimize digitalization (goal: "technology adapting to user requirements and capabilities, not human adapts to technology"). The support of digitalization through social discourse (usability of apps, privacy, explainability of systems, etc.) is centrally anchored in the educational content of the master's program. During the COVID19 pandemic (2020-2022), a lot of additional experience was gained in how modules can be offered virtually/remotely and how teaching content can be conveyed digitally. This knowledge can be used in the future to offer customized digital teaching modules.

4. **Sustainability**
   The orientation and objectives of the degree program do not primarily address the topic of sustainability (through dedicated courses). However, the topic is present and is addressed, for example, in project topics (4 SWS/5 ECTS), subject-specific elective modules (4 SWS/5 ECTS) and in use cases in other compulsory courses. Students who are interested in the topic of sustainability can scientifically work on it as part of their final thesis.

3.2 Study objectives

3.2.1 Subject-specific competences of the study program

Upon successful completion of the program, graduates will have acquired the following qualifications or competencies:

1. **Understanding of design/interaction fundamentals**
    - Design of human-machine interactions, incl. visual screen design
    - Knowledge of design strategy and design management
    - Ability to assess the quality of design work
    - Carrying out user-centered design projects throughout all phases
2. **Proficiency in software/hardware for rapid prototyping**
    - Interactive programming, e.g., with game engines
    - Implementation of new operating concepts using different sensor/actuator technologies (gestures, haptics, speech, olfactory/smell, etc.)
    - Prototyping in soft- and hardware, e.g. Processing, vvvv, Unity, Arduino
3. **Knowledge of research methods in the field**
    - Definition of the study design and execution of user studies
    - Collection and evaluation of qualitative and quantitative data
    - Understanding of (digital) “touch points” with products
    - Interpretation of emotion experience

3.2.2 Interdisciplinary compenteces of the study program

Upon successful completion of the program, graduates will possess the following generic competences:

1. **Ability to work scientifically**
2. **Social competences, including working together on a project in teams**
3. **Personal competences**
    - Self-organization
    - Time management
    - Self-representation

3.2.3 Examination concept of the study program

The full-time study program is comprised of three theoretical semesters. The first two semesters contain six and five modules respectively. All these modules are either compulsory or elective. The third semester is reserved for the master's thesis. The topic of the master's thesis is issued at the beginning of the second semester at the earliest. The issue of the topic requires that at least study and examination achievements to the extent of 30 ECTS points have been successfully completed. The processing time for the master's thesis is 6 months and is accompanied by a master's thesis seminar.

Regarding the forms of examination, it should generally be noted that attention was paid to diversity here. The most suitable form of examination is used for each module, including written examination (W), oral examination (O), portfolio (PP), seminar paper with presentation (SA), project work (Proj) or practical examination (PR). Semester in full-time program (Sem FT), semester in part-time program (Sem PT).

Sem FT	Sem PT	No.	Module description	Place	SWS	ECTS	Form of examination
1	3	1	Research Methods in HCI	THI	4	5	**O**
	1	2	Interaction Design (including practical training)	THI	5	6	**PP**
	1	3	Multimodal, Interactive Systems (including exercises)	THI	5	6	**W**
	3	4	Project Natural User Interfaces	THI	4	5	**Proj**
	1	5	Agile Project Management	THI	2	3	**W**
	3	11	Elective (subject specific)	THI	4	5	**Any type, according to SER**
2	4	6	Mobile UX Prototyping	THI	4	5	**SA**
	2	7	Critical UX Reflections	THI	2	3	**SA**
	2	8	Augmented And Virtual Reality Applications (including practical training)	THI	5	7	**PR**
	4	9	Design Strategy and Management	THI	4	5	**W**
	4	10	Project	THI	4	5	**Proj**

	2	11	Elective (subject specific)	THI	4	5	**Any type, according to SER**
3	5-6	12	Master Thesis (including Master thesis seminar)	THI	1	30	**Thesis and colloquium**
Total					**48**	**90**	**ECTS**

3.2.4 Application of the study program

The knowledge acquired in the master's degree program User Experience Design should enable graduates to take on qualified specialist and management tasks in the field of human-technology interaction and enable them to work on or manage complex projects. Furthermore, graduates should have the intercultural and communicative competencies required for working in an international context. To this end, the program is also advertised internationally and conducted in English. The master's program also opens the possibility for students to subsequently pursue a doctorate or work in research in the field of human-computer interaction, interaction design, usability research, etc.

The program was developed based on a series of discussions with experts from other universities with similar programs as well as with company representatives. Special care was taken to achieve a well-balanced mix of modules and not to overweight the influence of companies on the program. The discussions confirmed, among other things, the planned English-language implementation, the high importance of usability research to meet future challenges in the companies and led to the inclusion of a 2 SWS module on agile project management.

The strategic consideration of design, from brand management to translation at the touchpoints towards the customer, is currently missing in many training courses. This feedback from the industry is an important input, which is why the module Design Strategy and Management was included in the curriculum.

Further discussions with industry and university representatives as part of the advisory board meetings (during system accreditation) have led us to develop the modules Mobile UX Prototyping and Critical UX Reflections into the curriculum.

The above-mentioned personal competences are ensured through interactive, seminar-based teaching, project and seminar work and a mixture of different forms of examination (see previous section).

The master's thesis can be written as a theoretically oriented university internal research work or as an application-oriented work in a company.

3.2.5 Contribution of individual modules to the objectives of the program

Learning Objectives \ Modules	Research Methods in HCI (No. 1)	Interaction Design (No. 2)	Multimodal, Interactive Systems (No. 3)	Project Natural User Interfaces (No. 4)	Agile Project Management (No. 5)	Mobile UX Prototyping (No. 6)	Critical UX Reflections (No. 7)	Augmented and Virtual Reality Applications (No. 8)	Design Strategy and Management (No. 9)	Project (No. 10)	Electives (No. 11)	Master Thesis (No. 12)
Can describe common problems in computer science at different **levels of abstraction** and **discuss possible solutions**	○		●	⊙		⊙		●		↓↑	↓↑	↓↑
Have gained a **basic understanding** of the **development of mobile applications** (apps)	○		○	↓↑		●		○		↓↑	↓↑	↓↑
Have acquired **applied understanding** of **statistical methods** and their **fields of application**	●			○						↓↑	↓↑	↓↑
Know different **spatial representation** types and can name their **areas of application**				⊙				⊙		↓↑	↓↑	↓↑
Are **familiar with** different computer-aided **tools for displaying and editing static and dynamic designs**		○						○		↓↑	↓↑	↓↑
Have a deep understanding on the **concepts of interaction design**		●		○		○				↓↑	↓↑	↓↑
Can **create and discuss** general concepts for **information architectures**	○	●	⊙	⊙		⊙		⊙		↓↑	↓↑	↓↑
Can **use and compare** different **tools** for **software and hardware prototyping**	○		●	⊙		⊙		○		↓↑	↓↑	↓↑
Have extensive knowledge on the **creation** of **multimodal user interfaces**		○	●	⊙		○				↓↑	↓↑	↓↑
Have an **understanding of criteria** that influence the **usability/UX of products**	●	●	⊙	⊙	○	⊙		○		↓↑	↓↑	●
Understand how essential **technologies** in human-computer interaction **work**	⊙		●	●		○		●		↓↑	↓↑	●
Have a solid **understanding** of **human information processing** and can **discuss** it in the context of **computer systems**.	⊙	○	⊙	○				⊙		↓↑	↓↑	↓↑
Have acquired **comprehensive knowledge** of **target group-specific characteristics** that play a role in user-centered design and are **able to apply this knowledge.**	○	⊙	○	○	○			○		↓↑	↓↑	●
Know about and are able to **discuss** the **possibilities and limitations** of current **technological solutions**			⊙	⊙	○	○	●	●		↓↑	↓↑	↓↑

	Learning Objectives / Modules	Research Methods in HCI (No. 1)	Interaction Design (No. 2)	Multimodal, Interactive Systems (No. 3)	Project Natural User Interfaces (No. 4)	Agile Project Management (No. 5)	Mobile UX Prototyping (No. 6)	Critical UX Reflections (No. 7)	Augmented and Virtual Reality Applications (No. 8)	Design Strategy and Management (No. 9)	Project (No. 10)	Electives (No. 11)	Master Thesis (No. 12)
	Can **apply management techniques** to support the development and **distribution of systems** and products throughout their life cycle				◎	●				●	●	↓↑	↓↑
	Have **comprehensive knowledge** of the **design of human-machine interactions** and are able to **apply it**		●	◎	○		◎		◎		↓↑	↓↑	↓↑
	Know qualitative and quantitative **methods of research**	●	◎		◎						↓↑	↓↑	◎
CAPABILITIES	**Can** use current programming languages to **algorithmically solve** common **problems** in human-technology interaction			◎	◎		◎		◎		↓↑	↓↑	↓↑
	Have **acquired the ability** to **structure** data and **create** data models	◎	○		↓↑		○		○		↓↑	↓↑	↓↑
	Are **able** to **understand** software architectures and **use them** to design their own applications in the broader context of human-technology interaction			◎	◎		◎		●		↓↑	↓↑	↓↑
	Are able to **capture** and **validate** user **requirements**	◎	○	○	○		○	○	○		↓↑	↓↑	↓↑
	Are **capable** of **applying evaluation** methods for quantitative and qualitative data	●	○	◎	◎		○		○		↓↑	↓↑	↓↑
	Have **acquired extensive skills** to **interpret results** and **draw conclusions**	●			↓↑		○	●			◎	↓↑	●
	Have acquired the **ability** to **recognize** and **evaluate** the **quality of design**		●	○	○		○	●		◎	↓↑	↓↑	↓↑
	Are **able** to **prepare data visually** and in a way that is **appropriate** for the target group	◎	○	○	○		○				↓↑	↓↑	↓↑
	Are **able to evaluate and apply** different methods of the design process and **discuss** the results		●	○	○		○	◎		○	↓↑	↓↑	●
	Have acquired the **ability to evaluate** milestones and **argue the decision** to move forward in the process		◎		○	●			○	●	●	↓↑	↓↑
	Are **able** to **evaluate** and **improve** the usability of products and to **differentiate** usability from user experience	◎	●	○	◎		◎		○		↓↑	↓↑	↓↑

	Learning Objectives \ Modules	Research Methods in HCI (No. 1)	Interaction Design (No. 2)	Multimodal, Interactive Systems (No. 3)	Project Natural User Interfaces (No. 4)	Agile Project Management (No. 5)	Mobile UX Prototyping (No. 6)	Critical UX Reflections (No. 7)	Augmented and Virtual Reality Applications (No. 8)	Design Strategy and Management (No. 9)	Project (No. 10)	Electives (No. 11)	Master Thesis (No. 12)
	Are **able** to **determine and implement** suitable interaction **concepts** for concrete **problems** with regard to factors such as application area, user, feasibility, etc.	○	●	⊙	⊙		⊙		⊙		↓↑	↓↑	↓↑
	Are **able** to **conceptualize** spatial interaction and **develop** adequate interaction **concepts**		○		⊙				●		↓↑	↓↑	↓↑
	Know about the **benefits** of the iterative development process and are **able to apply** them in the product development process				⊙	●				⊙	⊙	↓↑	↓↑
	Know how to **manage complex projects** by consistently focusing on creating customer value				○	●				⊙	○	↓↑	↓↑
	Are **able** to **plan**, **implement**, and **execute** user studies	●	○		⊙				○		↓↑	↓↑	⊙
COMPETENCES	Can **communicate professionally** at an **adequate level** of abstraction using **appropriate forms of media**	⊙	⊙		⊙	●	⊙		○	⊙	⊙	⊙	⊙
	Know different ways **of organizing teams**, are **familiar with different roles** in teamwork and can assume them as needed to **successfully lead interdisciplinary teams**		○	⊙		●			○	●	○	↓↑	↓↑
	Have a **high level of experience** in **intercultural** cooperation and have acquired the **competence to work** successfully in **global teams**	○	○	○	●	⊙	⊙			●	●	↓↑	
	Have sufficient **abstraction skills** and **analytical thinking** to be able to independently familiarize themselves with **new, unfamiliar areas of expertise** and **complex problems** and implement solutions	○	⊙	⊙	↓↑	●	⊙	●	⊙	●	↓↑	↓↑	●
	Are able to grasp **the current state of research** and independently publish **scientific papers**	⊙		○	↓↑						↓↑	↓↑	●
	Have gained **analytical** and **problem-solving capabilities**	○		○	⊙		○	●	⊙		↓↑	↓↑	↓↑
	Have learned to **consider failures as a basis for improvement**				↓↑	●		⊙		○	○	↓↑	●
	Are able to **organize themselves** and to work successfully in **teams**		○	○	●	⊙	⊙			○	●	↓↑	↓↑

Explanation

Symbols	*Contribution to the learning objective*
●	High
⭘	Medium

Symbols	*Contribution to the learning objective*
○	Low
⇵	Contribution variable (between low and high)

3.2.6 Possible professional fields

The knowledge acquired in the program should enable graduates to take on qualified specialist and management tasks in the field of human-technology interaction and enable them to work on or manage complex projects.

Furthermore, graduates should have the intercultural and communicative competencies required for working in an international context. To this end, the program is entirely conducted in English.

The master's program also opens the possibility for students to subsequently pursue a doctorate or work in research in the field of human-computer interaction, interaction design, usability research, etc.

The user experience designer is a highly requested expert for almost all industries:

- Automotive
- Healthcare
- Consumer and industrial goods
- Transportation
- Household appliances
- Internet of Things
- Robotics
- Lifestyle
- Smart Home
- Services
- Gaming
- Mobile app design
- Web design

4 Description of Modules

4.1 Compulsory Modules

4.1.1 Research Methods in HCI

Module abbreviation:	UXDM_RM	**SPO-No.:**	1
Curriculum:	**Program**	**Module type**	**Semester Full time/ part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	1/ 3
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only summer term

Responsible for module:	Riener, Andreas
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	Research Methods in HCI (UXDM_RM)
Lecture types:	UXDM_RM: SU/Ü – lecture with integrated exercises
Usability for other study programs:	None

Examinations:

Oral exam, 15 minutes

Requirements:
None

Prerequisites according examination regulation:

None.

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, a basic understanding of human factors, qualitative/quantitative research methods and fundamentals in statistics would be beneficial.

Objectives:

After active participation in the course, students

- …have acquired applied understanding of statistical methods and their fields of application.
- …have a comprehensive understanding of the criteria that influence the usability/UX of products.
- …can use and compare different tools for software and hardware prototyping.
- ..have gained a deep understanding of criteria that influence the usability/UX of products.

- …have acquired knowledge about the operation of essential technologies in human-computer interaction and can use the technologies in a targeted manner.
- …have acquired comprehensive knowledge of target group-specific characteristics that play a role in user-centered design and are able to apply this knowledge.
- …know how to apply different qualitative and quantitative methods of research.
- …have acquired the ability to structure data and create data models.
- …are able to capture and validate user requirements.
- …are capable of applying evaluation methods for quantitative and qualitative data.
- …have acquired extensive skills to interpret results and draw conclusions.
- …are able to prepare data visually and in a way that is appropriate for the target group.
- …are able to evaluate and improve the usability of products and to differentiate usability from user experience.
- …are able to plan, implement, and execute user studies.

Self- and social competences:
Upon completion of the module, students

- ...are able to grasp the current state of research, to identify gaps and to develop and discuss possible solutions.
- …can communicate professionally at an adequate level of abstraction using appropriate forms of media.
- …have sufficient abstraction skills and analytical thinking to be able to independently familiarize themselves with new, unfamiliar areas of expertise and complex problems and implement solutions.
- …can professionally acquire study participants and conduct user studies in the lab or field.
- … have gained knowledge independently publish scientific papers with consideration of relevant related work.
- …are able to present research results (in a visually appealing way).

Content:

Quantitative part

- Introduction to human factors engineering, Motivation for human-computer interaction
- Foundations of research
- Designing HCI experiments, Conducting usability studies
- Models and theories of interaction
- Statistical testing, Data evaluation and analysis in SPSS
- Data and information visualization

Qualitative part

- Introduction to qualitative methods
- Qualitative/UX interviewing
- Quality in use, Usability and UX goals
- Methods and tools for rich qualitative data analysis
- Thematic analysis, Data analysis with NVivo
- Observational methods, Naturalistic and contextual research
- Qualitative UX data synthesis and presentation

Literature:

Compulsory:

- FIELD, Andy und Graham HOLE, 2008. *How to design and report experiments*. r. Auflage. Los Angeles [u.a.]: Sage. ISBN 978-0-7619-7383-6, 0-7619-7382-6

- LAZAR, Jonathan, Jinjuan Heidi FENG und Harry HOCHHEISER, 2017. *Research methods in human-computer interaction*. S. Auflage. Cambridge, MA: Morgan Kaufmann Publishers, an imprint of Elsevier. ISBN 978-0-12-809343-6
- Various journal articles (provided in Moodle)

Recommended:

- SHNEIDERMAN, Ben und andere, 2016. *Designing the User Interface: Strategies for Effective Human-Computer Interaction*. 6. Auflage. ISBN 978-0134380384
- STANTON, Neville A., 2013. *Human factors methods: a practical guide for engineering and design*. Burlington, VT: Ashgate Publishing Company. ISBN 978-1-4094-5755-8, 1-4094-5755-9
- MACKENZIE, I. Scott, 2013. *Human-computer interaction: an empirical research perspective*. Waltham, Mass.: Morgan Kaufmann. ISBN 978-0-12-405865-1, 978-0-12-407165-0
- LEE, John D. und andere, 2017. *Designing for people: an introduction to human factors engineering*. 3. Auflage. Charleston, SC: CreateSpace. ISBN 978-1-5398-0800-8, 1-5398-0800-9

Additional remarks:

The teaching concept of this course closely connects theoretical foundations and practical applications. Thus, this course is designed workshop-like: The learning contents are presented in relation to concrete areas of application and are deepened by concrete group and single tasks. An active participation of the students is explicitly desired.

Bonus points are awarded for this course according to APO §25 paragraph (2): Active participation in the course can compensate up to 10% of the points for the exam.

The exact framework conditions for this are:

- Working on (and submitting via Moodle) optional exercises on individual topics; the submissions will be graded (0-100%).
- The average of the achieved points over all (submitted) exercises results in 0-10 (out of 100) additional points for the oral exam.

Further details will be discussed at the beginning of the semester and any questions regarding the mode will be answered in the first lecture unit.

4.1.2 Interaction Design

Module abbreviation:	UXDM_ID	**SPO-No.:**	2
Curriculum:	**Program**	**Module type**	**Semester Full time/ part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	1/ 1
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only summer term

Responsible for module:	Ritzer, Veronika
Credit points / SWS:	6 ECTS / 5 SWS
Workload:	Contact hours: 59 h Self study hours: 91 h Total hours: 150 h
Subjects of the module:	2.1: Interaction Design (UXDM_ID) 2.2: Practical Training in Interaction Design (UXDM_IDP)
Lecture types:	UXDM_ID: SU/Ü – lecture with integrated exercises UXDM_IDP: Pr - laboratory
Usability for other study programs:	None

Examinations:

2.1: LN – Portfolio Review
2.2: PA – PrA – Pracitcal work/ Proof of performance: Participation with/ without success

Requirements:

Proof of course performance is provided by short presentations in the second half of the semester, in which the theory acquired in the first half of the semester is applied. In groups of two students, a presentation of 10 minutes has to be prepared and presented. The topics can be suggested by students or will be assigned by the lecturer. The aim and content of this short presentation is a critique of the interaction design of an existing product or service. The course is considered passed if the presentations are held on time and in the given length. The grade results from a conclusive chain of argumentation taking into account/including theories (lecture material of the semester).

Prerequisites according examination regulation:

Prerequisite for 2.1 Interaction design (UXDM_ID) is the successful completion of 2.2 Practical Training in Interaction Design (UXDM_IDP).

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, a basic understanding of design and creative processes as well as practical design experience and fluency with usual design software would be beneficial.

Objectives:

After active participation in the course, students

- …are able to differentiate between historical aspects and future trends of interaction design and describe different approaches to and fundamental concepts of interaction design.
- …can describe basic advantages and challenges of visual, physical, and sensory dimensions in interaction design.
- …have gathered first hand experience in the fundamental methods and problem-solving strategies in design processes.
- …have acquired comprehensive knowledge about the human centered design process and its application for interaction design projects.
- …are able to discuss interaction design concepts and products in regard to their functional and emotional qualities as well as their larger context within systems, digitalization and society.
- …can create and discuss general concepts for information architectures across technologies.
- …have an understanding of criteria that influence the usability/UX of products.
- …have comprehensive knowledge of the design of human-machine interactions and are able to apply it.
- …have acquired the ability to recognize and evaluate the quality of design.
- …are able to evaluate and apply different methods of the design process and discuss the results.
- …are able to evaluate and improve the usability of products and to differentiate usability from user experience.
- …are able to determine and implement suitable interaction concepts for concrete problems with regard to factors such as application area, user, feasibility, etc.

Self- and social competences:
Upon completion of the module, students

- …have acquired experience in creative processes and developed an individual approach to it.
- …are able to communicate professionally at an adequate level of abstraction using appropriate forms of media.
- …have sufficient abstraction skills and analytical thinking to be able to independently familiarize themselves with new, unfamiliar areas of expertise and complex problems and implement solutions.
- …have a high level of experience in intercultural cooperation and have acquired the competence to work successfully in global teams.

Content:

Lecture (UXDM_ID):

- History of interaction design, recent development and future trends
- Process models, elements and usability
- Approaches to interaction design
- Methods and tools for design research
- Methods and tools for ideation and co-creation
- Rapid experience prototyping
- Methods and tools for evaluating interaction design
- Design of graphical user interfaces
- Design of physical and sensory interactions beyond the screen
- Tangible interactions
- Focused and peripheric interactions
- Interaction Design for connected systems and services
- Design of multimodal interactions

Practical (UXDM_IDP):

During the practical training, 4 design projects will be worked on individually or in a team. The duration of the projects varies between 2 and 4 weeks. These are design projects, which include a quick idea generation, as well as the presentation in a tangible prototype. The quality of execution of the prototypes varies with

the nature and duration of the projects and is described in detail at the beginning of each project. The idea is to be presented and argued on the basis of the prototype within the announced time schedule. Work statuses are to be presented in intermediate meetings. Only if all 4 projects are presented on time, the proof of performance is considered as achieved.

Literature:

Compulsory:

- SAFFER, Dan, 2010. *Designing for interaction. 2nd edition. Berkeley, Calif.: New Riders, ISBN: 978-0-321-64339-1*
- MOGGRIDGE, Bill, 2007 . *Designing interactions. Cambridge, Mass.: MIT Press. ISBN 978-0-262-13474-3*
- BUXTON, William, 2007. *Sketching User Experiences*. Morgan Kauffmann. ISBN 978-0-123-74037-3

Recommended:

- NORMAN, Donald A., 1988 . *The Psychology of Everyday Things*. New York, NY: Basic Books. ISBN 978-0-465-06709-1
- NORMAN, Donald A., 2013. *The Design of Everyday Things*. 2nd edition. New York, NY: Basic Books. ISBN 978-0-465-05065-9
- CHIPCHASE, Jan, 2017. *The Field Study Handbook*. 2nd edition. Field Institute. ISBN 978-1-939-72709-1

Additional remarks:

None

4.1.3 Multimodal, Interactive Systems

Module abbreviation:	UXDM_PMIS	**SPO-No.:**	3
Curriculum:	**Program**	**Module type**	**Semester Full time/ part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	1/ 1
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only summer term

Responsible for module:	Nestler, Simon
Credit points / SWS:	6 ECTS / 5 SWS
Workload:	Contact hours: 59 h Self study hours: 91 h Total hours: 150 h
Subjects of the module:	Multimodal, Interactive Systems (UXDM_PMIS)
Lecture types:	UXDM_MIS: SU/Ü – lecture with integrated exercises
Usability for other study programs:	None

Examinations:

schrP90 – written exam, 90 minutes

Requirements:

None

Prerequisites according examination regulation:

None.

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, a basic understanding of various technologies related to human-machine interaction would be beneficial.

Objectives:

After active participation in the course, students

- …have acquired deep understanding on how to use and combine different modalities for the prototyping of interactive systems.
- …are able to evaluate perception and action modalities with regard to their suitability for the respective application case.
- …have acquired extensive knowledge to create multimodal user interfaces.
- …have acquired in-depth understanding of how to evaluate the practicality of the applications they develop.
- …have obtained the ability to analyze the accessibility of concrete multimodal systems.
- …have gained knowledge to improve the accessibility of digital technologies through an appropriate combination of different modalities.

Self- and social competences:

Upon completion of the module, students

- ...are able to apply the basics of scientific work to the design and evaluation of multimodal interfaces.
- ...have acquired the competence to communicate professionally at an adequate level of abstraction using appropriate media forms.
- ...have a high level of experience in intercultural cooperation and have acquired the ability to work successfully in global teams.
- ...have become familiar with different forms of team organization, are familiar with different roles in teamwork, and can assume these roles as needed to successfully lead interdisciplinary teams.
- ...have a sufficient capacity for abstraction and analytical thinking to be able to familiarize themselves independently with new, unfamiliar specialist areas and complex problems and implement solutions.

Content:

- Case Study: Development of a multimodal user interface
- Graphic Modalities: Static and dynamic graphic languages, Analogue and non-analogue units, Analogue and dynamic graphics
- Acoustic & haptic modalities: Acoustic language with analogue and non-analogue units, analogue static-dynamic acoustics, haptic language with analogue and non-analogue units, analogue static-dynamic haptics
- Natural user interfaces: Evolution of HCI, Natural vs. Supernatural, Human Factors in the context of NUI, Ergonomic foundations, Physical ergonomics, multisensory evaluation
- Touch gestures: State models, anatomy of gestures, mechanics and dynamics, gesture languages, models for gesture systems, seamlessness, 2D spatial NUIs, thick fingers
- In-air gestures: Spatial knowledge, 3D input devices, sensing technologies, hand & finger tracking, radar sensing, 3D spatial NUIs, touch vs. in-air
- UX of NUIs: Development frameworks & process, user differentiation, social embedding & context, handling false positives, less is more, providing feedback, self-descriptiveness, in-air gesture languages
- Screen-based thinking: App experiences, interface thinking, simplifying interaction processes
- From the interface to the experience: The experience, UX vs. UI design, distraction and multitasking
- Post-visual interfaces: Processes vs. screens, Ringxiety, Usage Patterns, Back pocket apps & experiences, serving computers, leveraging computers, adaptation, command prompts
- Voice user interfaces: Cooperative principle, Turing Test, ELIZA, Mitsuku, Conversational interactions
- Conversational design: ChatBots, Visual capabilities & conversational design, setting expectations, dialogs & flows,
- Basic VUI concepts: Confirmation, Command & Control, Error handling, Recognition, Adaptivity, Open Speech
- Advanced VUI concepts: Help, Optimization, Barge-In, Avatars, Evaluation

Literature:

Compulsory:

- KRISHNA, Golden, 2015. *The best interface is no interface: the simple path to brilliant technology*. San Francisco, Calif.: Pearson Education, New Riders. ISBN 978-0-133-89033-4
- PEARL, Cathy, December 2016. *Designing voice user interfaces: principles of conversational experiences*. F. Auflage. Beijing ; Boston ; Farnham ; Sebastopol ; Tokyo: O'Reilly. ISBN 978-1-4919-5538-3
- COHEN, Michael H., James P. GIANGOLA und Jennifer BALOGH, 2004. *Voice user interface design*. 1. Auflage. Boston [u.a.]: Addison-Wesley. ISBN 0-321-18576-5

Recommended:

- LEE, Henry, 2018. *Voice user interface projects: Build voice-enabled applications using Dialogflow for Google Home and Alexa Skills Kit for Amazon Echo*. Birmingham, UK: Packt Publishing. ISBN 978-1-78847-335-4

- WILLIAMS, Sam, October 2016. Hands-on chatbot development with Alexa Skills and Amazon Lex: create custom conversational and voice interfaces for your Amazon Echo devices and web platforms. Birmingham; Mumbai: Packt. ISBN 978-1-78899-248-7

Additional remarks:

The teaching concept of this course closely connects theoretical foundations and practical applications. Thus, this course is designed workshop-like: The learning contents are presented in relation to concrete areas of application and are deepened by concrete group and single tasks. The active participation of the students is explicitly desired.

Bonus points are awarded for this course according to APO §25 paragraph (2): Regular participation in the exercises can compensate for missing 5% of the points for the exam. The exact conditions are:

- The student has decided at the beginning of the semester to participate in the exercises and to acquire exam points.
- The student has actively participated in at least 6 exercises (4 SWS each).
- The student uploads a solution via the learning platform within 48 hours after the exercise that fulfills the requirements described in the exercise sheet.

4.1.4 Project Natural User Interfaces

Module abbreviation:	UXDM_NUI	SPO-No.:	4
Curriculum:	**Program**	**Module type**	**Semester full time/ part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	1/ 3
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only summer term

Responsible for module:	Sturm, Christian
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	Project Natural User Interfaces (UXDM_NUI)
Lecture types:	UXDM_NUI: Proj - project
Usability for other study programs:	None

Examinations:

Proj – project report (min. 10 pages excluding tables and graphs, font size 10-12 pt.) and a presentation (10-15 minutes)

Requirements:

None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, prior experience in the practical application of the human-centered design process, prototype development, and the use of human-centered evaluation methodologies would be beneficial.

Objectives:

After active participation in the course, students

- …are able to describe basic terms and possible applications for natural user interfaces.
- …have acquired detailed knowledge of methods and concepts for the realization of natural user interfaces.
- …can apply principles of project management and teamwork in the context of a project on natural user interfaces.
- …are able to apply the user-centered design process in their own projects.
- …have acquired the knowledge to select suitable hardware and software solutions for the realization of projects/applications with natural user interfaces.
- …have acquired comprehensive knowledge of how to plan, design and implement their own natural user interfaces.

- …have gained knowledge about how to prototype and evaluate solutions.
- …are able to comprehensively evaluate the practicality of the applications they develop.

Self- and social competences:
Upon completion of the module, students

- ...are able to work effectively and efficiently with people with different professional and personality profiles.
- ...have acquired the competence to communicate professionally at an adequate level of abstraction using appropriate media forms.
- ...have a high level of experience in intercultural cooperation and have acquired the ability to work successfully in global teams.
- ...have a sufficient capacity for abstraction and analytical thinking to be able to familiarize themselves independently with new, unfamiliar specialist areas and complex problems and implement solutions.
- …have gained analytical and problem solving capabilities.

Content:

- Technologies: Hardware and software solutions for natural interfaces, frameworks, best practices
- Types: Touch interfaces, multi-touch interfaces, pen-based interfaces, gestural interfaces, conversational interfaces (speech)
- Interaction: Interaction paradigms, gesture sets, spoken dialogs, primitives, design principles, interaction with natural interfaces
- User Experience: Prototype implementation, User-centered gesture and speech dialog design, Wizard-of-Oz implementation
- Evaluation: Testing gestures and spoken language understanding, NUI Mock-Ups, Experiments for conversational and gesture interfaces, Remote testing of NUIs

Literature:

Compulsory:

- WIGDOR, Daniel und Dennis WIXON, 2011. *Brave NUI World: designing natural user interfaces for touch and gesture*. Amsterdam [u.a.]: Morgan Kaufmann/Elsevier. ISBN 978-0-12-382231-4

Recommended:

- LAVIOLA, Joseph J. und andere, 2017. *3D user interfaces: theory and practice*. S. Auflage. Boston: Addison-Wesley. ISBN 0-13-403432-5, 978-0-13-403432-4
- PREMARATNE, Prashan, 2014. *Human computer interaction using hand gestures*. Singapore; Heidelberg; New York; Dordrecht; London: Springer. ISBN 978-981-4585-68-2
- TUR, Gokhan, DE MORI, Renato, 2011. *Spoken language understanding: systems for extracting semantic information from speech* [online]. Hoboken, NJ: Wiley PDF e-Book. ISBN 1-119-99269-9, 978-1-119-99269-1. Verfügbar unter: https://onlinelibrary.wiley.com/doi/book/10.1002/9781119992691
- HUANG, Xuedong, Alex ACERO und Hsiao-Wuen HON, 2001. *Spoken language processing: a guide to theory, algorithm, and system development*. Upper Saddle River, NJ: Prentice Hall PTR. ISBN 0-13-022616-5

Additional remarks:

The NUI project is divided into several groups of approximately 12 students each and students can choose between different topics. The number and scope of the projects are determined in the study plan for the respective semester.

The description of the specific projects (NUI is only offered in summer term) will be published in Moodle: https://moodle.thi.de/login/index.php#section-8

4.1.5 Agile Project Management

Module abbreviation:	UXDM_APM	SPO-No.:	5
Curriculum:	**Program**	**Module type**	**Semester full time/ part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	1/ 1
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only summer term

Responsible for module:	Märtens, Holger
Credit points / SWS:	3 ECTS / 2 SWS
Workload:	Contact hours: 24 h Self study hours: 51 h Total hours: 75 h
Subjects of the module:	Agile Project Management (UXDM_APM)
Lecture types:	UXDM_APM: SU/Ü – lecture with integrated exercises
Usability for other study programs:	None

Examinations:

schrP90 – written exam, 90 minutes

Requirements:
None

Prerequisites according examination regulation:

None.

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, a basic knowledge of traditional project management would be beneficial.

Objectives:

After active participation in the course, students

- …are able to understand and explain the most important methods of agile project management.
- …have acquired the competence to apply agile project management methods in companies, start-ups and scientific institutions.
- …have acquired extensive knowledge to manage complex projects by consistently focusing on creating customer value.
- …have acquired the ability to apply Kanban and scrum methodologies in order to catalyze cultural change and deliver better business agility.
- …are able to identify the appropriate environment for the application of agile methods.
- …have acquired the knowledge to outline a hybrid project scenario and subsequently realize it.
- …can describe in detail how agile methods can be applied to large projects.
- …are able to list the reasons for the failure of agile projects and understand the causes for it.

Self- and social competences:
Upon completion of the module, students

- ...are able to think agile and can take responsibility in an agile team.
- ...have good communication skills in critical project situations.
- ...have learned to work openly with each other and to communicate transparently.
- ...have learned to consider failures as a basis for improvement.

Content:

- Foundations: Brief summary of traditional project management; Cynefin Framework; the agile manifesto and principles; Stacey Matrix
- Scrum: Values; events; roles; artifacts; additional elements
- Kanban
- Lean thinking: Lean principles; Lean startup, MVP
- Other agile methods: Extreme programming; PDCA; Continuous Improvement; TDD; BDDe
- Hybrid approaches
- Agile approaches for large projects/programs: Nexus; LeSS; SAFe
- Reason for failure in agile: Anti-patterns

Literature:

Compulsory:

- FLEWELLING, Paul, 2018. *The Agile developer's handbook: get more value from your software development : get the best out of the Agile methodology*. Birmingham, UK: Packt Publishing. ISBN 978-1-78728-073-1
- SUTHERLAND, Jeff, 2019. *SCRUM: the art of doing twice the work in half the time*. London: Random House Business. ISBN 978-1-847-94110-7
- KNIBERG, Henrik und Mattias SKARIN, 2010. *Kanban and Scrum: making the most of both*. s. l.: C4Media Inc.. ISBN 978-0-557-13832-6
- ANDERSON, David J., 2010. *Kanban: successful evolutionary change for your technology business*. Sequim, Wash.: Blue Hole Press. ISBN 978-0-9845214-0-1

Recommended:

- RIES, Eric, 2020. *The lean startup: how today's entrepreneurs use continuous innovation to create radically successful businesses*. 7. Auflage. New York: Redline Verlag. ISBN 978-3-86881-567-2
- OLSEN, Dan, 2015. *The lean product playbook: how to innovate with minimum viable products and rapid customer feedback* [online]. Hoboken: Wiley PDF e-Book. ISBN 978-1-118-96102-5, 1-118-96102-1. Verfügbar unter: https://onlinelibrary.wiley.com/doi/book/10.1002/9781119154822
- CHRISTENSEN, Clayton M., 2016. *The innovator's dilemma: when new technologies cause great firms to fail*. Boston, Massachusetts: Harvard Business Review Press. ISBN 978-1-4221-9602-1, 978-1-63369-178-0
- LEOPOLD, Klaus, 2017. *Practical Kanban: From team focus to creating value*. Vienna, Austria: LEANability Press. ISBN 978-3-903-20500-0

Additional remarks:

None

4.1.6 Mobile UX Prototyping

Module abbreviation:	UXDM_MXUP	SPO-No.:	6
Curriculum:	**Program**	**Module type**	**Semester full time/ part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	2/ 4
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only winter term

Responsible for module:	Nestler, Simon
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	Mobile UX Prototyping
Lecture types:	UXDM_MXUP: SU/Ü – lecture with integrated exercises
Usability for other study programs:	None

Examinations:

SA – seminar paper (3000-6000 words) and a presentation (30 minutes)

Requirements:
None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, a basic understanding of the practical application of the human-centered design process, experience in prototyping software applications and in the evaluation of interactive systems, and expertise in conducting heuristic evaluations and/or usability tests would be beneficial.

Objectives:

After active participation in the course, students

- …have acquired in-depth knowledge of the mobile market and know what characterizes competitive mobile applications (e.g. on smartphones, smartwatches, and tablets).
- …have acquired the competence to develop mock-ups and prototypes for mobile applications themselves.
- …are able to analyse and interpret the mobile user experience of existing applications and derive appropriate solutions.
- …have gained a thorough understanding of the concept of push notification and can apply it to create new app user experience.
- …have acquired the competence to implement the “Offline First” paradigm in their own developments.

Self- and social competences:

Upon completion of the module, students

- …have acquired the competence to present their own concepts for the new mobile user experiences in a focused presentation and to moderate a sound discussion with the audience.
- …can communicate professionally at an adequate level of abstraction using appropriate forms of media.
- …have gained extensive experience in intercultural cooperation.
- …have sufficient abstraction skills and analytical thinking to be able to independently familiarize themselves with new, unfamiliar areas of expertise and complex problems and implement solutions for it.

Content

- Navigating the mobile market
- Mobile UX success strategies
- Technologies for mobile user experiences
- Mobile navigation patterns
- Menu design and organization
- Search strategies and auto-completion
- Crafting user-friendly forms
- Mobile checkout and table design
- Providing feedback in mobile UX
- System status, affordance, and feedback/error messages
- Tools, toolbars, and screen control
- Enhancing user interaction in mobile contexts
- Effective help concepts in mobile UX
- Tutorial design and implementation
- Social patterns and gamification
- Visualization: charts, dashboards, tables
- “Anti-patterns”

Literature:

Compulsory:

- NEIL, Theresa, c2014. *Mobile design pattern gallery: UI patterns for smartphone apps*. 2. Edition. Sebastopol, CA: O’Reilly. ISBN 978-1-4493-6363-5
- TIDWELL, Jenifer, Charles BREWER and Aynne VALENCIA, 2020. *Designing interfaces: Patterns for effective interaction design*. T. edition. Beijing ; Boston ; Farnham ; Sebastopol ; Tokyo: O’Reilly. ISBN 978-1-492-05196-1

Recommended:

- JOOSR, 2016. *A Joosr guide to How to build a billion dollar app by George Berkowski*. Hove: Joosr Ltd. ISBN 978-1-78567-516-4, 1-78567-516-8
- SEMLER, Jan and Kira TSCHIERSCHKE, 2019. *App-Design*. 2. Edition. Bonn: Rheinwerk Verlag. ISBN 978-3-8362-7052-6
- STAUFFER, Matt, April 2019. *Laravel: up & running: a framework for building modern PHP apps*. S. edition. Sebastopol, CA: O’Reilly Media. ISBN 978-1-492-04121-4, 1492041211
- ATER, Tal, 2017. *Building Progressive Web Apps: bringing the power of native to the browser*. F. edition. Beijing ; Boston ; Farnham: O’Reilly. ISBN 978-1-4919-6162-9
- LIEBEL, Christian, 2019. *Progressive Web Apps: das Praxisbuch*. 1. Edition. Bonn: Rheinwerk. ISBN 978-3-8362-6494-5

Additional remarks:

Bonus points are awarded for this course according to APO §25 paragraph (2): Regular participation in the exercises can compensate for missing 5% of the points for the presentation (LN). The exact conditions are:

- The student has decided at the beginning of the semester to participate in the exercises and to acquire exam points.
- The student has actively participated in at least 5 exercises (4 SWS each).
- The student uploads a solution via the learning platform within 48 hours after the exercise that fulfills the requirements described in the exercise sheet.

4.1.7 Critical UX Reflections

Module abbreviation:	UXDM_CUXR	SPO-No.:	7
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	2 / 2
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only winter term

Responsible for module:	Sturm, Christian
Credit points / SWS:	3 ECTS / 2 SWS
Workload:	Contact hours: 24 h Self study hours: 51 h Total hours: 75 h
Subjects of the module:	Critical UX Reflections
Lecture types:	UXDM_CUXR: S – Seminar
Usability for other study programs:	None

Examinations:

SA – seminar paper (3000-6000 words) and a presentation (30 minutes)

Requirements:
None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, a basic understanding of the foundations of UX research and design as well as strong problem-solving and analytical skills would be beneficial.

Objectives:

After active participation in the course, students

- …have acquired a holistic understanding of the critical theories and perspectives on UX design, including its psychological, social, cultural, political, and ethical dimensions.
- …are able to recognize the potential for UX design to manipulate or exploit users and develop strategies to mitigate these risks.
- …are able to analyze and predict the impact of real-world UX interventions.
- …have gained the knowledge to design UX experiences that address social issues, promote inclusivity, and empower marginalized communities.
- …have acquired the competence to reflect on their own assumption and how these assumptions shape their design decisions.

Self- and social competences:
Upon completion of the module, students

- …have acquired the competence to self-reflect on the consequences of their work in UX research and design.
- ...have gained experience in shifting their viewpoints to see a wider range of the users' perspectives on problems and solutions.
- ...can lead a discourse on critical UX between peers.

Content:

- Current and historical critical theories
- Ethical principles such as data privacy, user autonomy, and informed consent, ensuring transparency, accountability, and responsible data handling
- Principles of accessibility, diversity, and inclusion
- Global, regional and local approaches to UX
- Approaches to holistically predict consequences of UX interventions
- Critical thinking, self-reflection, and mindfulness
- Dark UX patterns
- Sustainable HCI

Literature:

Compulsory:

- Bardzell, J., & Bardzell, S. (2013, April). What is" critical" about critical design?. In Proceedings of the SIGCHI conference on human factors in computing systems (pp. 3297-3306).
- Garrett, R., Popova, K., Núñez-Pacheco, C., Ásgeirsdóttir, T., Lampinen, A., & Höök, K. (2023, April). Felt Ethics: Cultivating Ethical Sensibility in Design Practice. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (pp. 1-15).
- Dunne, A., & Raby, F. (2013). Speculative everything: design, fiction, and social dreaming. MIT press.
- Amugongo, L. M., Bidwell, N. J., & Corrigan, C. C. (2023, June). Invigorating Ubuntu Ethics in AI for healthcare: Enabling equitable care. In Proceedings of the 2023 ACM Conference on Fairness, Accountability, and Transparency (pp. 583-592).
- Gray, C. M., Kou, Y., Battles, B., Hoggatt, J., & Toombs, A. L. (2018, April). The dark (patterns) side of UX design. In Proceedings of the 2018 CHI conference on human factors in computing systems (pp. 1-14).

Recommended:

- Toyama, K. (2015). Geek heresy: Rescuing social change from the cult of technology. PublicAffairs.
- Schroeder, D., Chatfield, K., Singh, M., Chennells, R., Herissone-Kelly, P., Schroeder, D., ... & Herissone-Kelly, P. (2019). The San code of research ethics. Equitable research partnerships: A global code of conduct to counter ethics dumping, 73-87.
- Taylor, J. L., Wujal Wujal Aboriginal Shire Council, W. W. A. S. C., Soro, A., & Brereton, M. (2022, August). Tangible 'Design Non-Proposals' for Relationship Building in Community-Based Co-Design Projects. In Proceedings of the Participatory Design Conference 2022-Volume 1 (pp. 63-74).
- Bowen, S. (2010, April). Critical theory and participatory design. In Proceedings of CHI (pp. 10-15).
- Linxen, S., Sturm, C., Brühlmann, F., Cassau, V., Opwis, K., & Reinecke, K. (2021, May). How weird is CHI?. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1-14)

Additional remarks:

None

4.1.8 Augmented and Virtual Reality Applications

Module abbreviation:	UXDM_AVR	**SPO-No.:**	8
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	2 / 2
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only winter term

Responsible for module:	Riener, Andreas
Credit points / SWS:	7 ECTS / 5 SWS
Workload:	Contact hours: 59 h Self study hours: 116 h Total hours: 175 h
Subjects of the module:	8.1 Augmented and Virtual Reality Applications (UXDM_AVR) 8.2 Practical Training in Augmented and Virtual Reality Applications (UXDM_AVRP)
Lecture types:	UXDM_AVR: SU/Ü - lecture with integrated exercises UXDM_AVRP: Pr - laboratory
Usability for other study programs:	None

Examinations:

8.1 LN - project work
8.2 prA - Practical work/Proof of performance: Participation with/without success

Requirements:

The practical consists of 5 experiment steps (with an average processing time of 4-6 hours each). In order to pass the practical course, all 4 sub-tasks must be completed and handed in.

Prerequisites according examination regulation:

Prerequisite for 8.1 Augmented and Virtual Reality Applications (UXDM_AVR) is the successful completion of 8.2 Practical Training in Augmented and Virtual Reality Applications (UXDM_AVRP).

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, good skills in object oriented programming (e.g., C#, Java, C++), Hands-on experience in 3D modeling and with game engines (e.g., Unreal, Unity), as well as basic knowledge of software project management would be beneficial.

Objectives:

After active participation in the course, students

- …have acquired a thorough understanding of the possibilities and limitations of AR and VR applications.
- …have basic knowledge of the specialities regarding the project management in the area of AR and VR.
- …have gained the ability to review and assess the state-of-the-art in AR and VR technologies and use this knowledge to select appropriate technologies for a project.

- …have acquired extensive skills to critically evaluate current research and practice in virtual and mixed reality.
- …have gained extensive interdisciplinary understanding of VR and AR encompassing psychology, technology and creative practice.
- …have acquired technical development skills that enable a personal VR and AR creation practice.
- …have gained extensive expertise to critically assess AR/VR experiences in different creative contexts (e.g., gaming, education, healthcare, shopping or telepresence).
-

Self- and social competences:
Upon completion of the module, students

- …have gained communication, collaboration, and presentation skills.
- …have improved their analytical and problem solving capabilities.
- …are more comfortable with exploring unfamiliar technologies and hardware.
- …have lost the fear to work with unknown people in an interdisciplinary project.

Content:

Lecture (UXDM_AVR):

- Fundamentals and state-of-the-art in virtual and augmented reality
- Demarcation/parallels to related areas, such as computer vision and (3D) graphics
- Design for AR/VR (implementation tool-chain)
- Basics of human perception (depth perception, projection)
- Negative effects
- Input/output: Tracking, markers, etc.
- Interaction concepts
- Theoretical concepts are explained with practical solutions/AR/VR applications ranging from Gaming, Entertainment, Education, Healthcare, Architecture, Engineering and Construction, Shopping, to Telepresence

Practical (UXDM_AVRP):

In the accompanied practical - and based on the principle of problem-based learning - students will be asked to design an own project (individual or in small groups) from idea, via implementation, testing, evaluation, demonstration, to documentation. In this way they will experience the full lifecycle of a practical project in AR/VR, as they will face it once they leave the university in either industry or academia. A default project will be suggested as fall back, still covering the full lifecycle except the idea.

Literature:

Compulsory:

- AUKSTAKALNIS, Steve, 2017. *Practical augmented reality: a guide to the technologies, applications, and human factors for AR and VR*. Boston ; Columbus ; Indianapolis ; New York ; San Francisco ; Amsterdam; Cape Town ; Dubai ; London ; Madrid ; Milan ; Munich [und 12 weitere]: Addison-Wesley. ISBN 978-0-13-409432-8
- JERALD, Jason, 2016. *The VR book: Human-Centered Design for Virtual Reality*. F. Auflage. [New York]: acm, Association for Computing Machinery. ISBN 978-1-97000-112-9, 978-1-97000-115-0; https://doi-org.thi.idm.oclc.org/10.1145/2792790

Recommended:

- PANGILINAN, Erin, Steve LUKAS and Vasanth MOHAN, April 2019. *Creating augmented and virtual realities: Theory and Practice for Next-Generation Spatial Computing*. F. edition. Beijing; Boston; Farnham; Sebastopol; Tokyo: O'Reilly. ISBN 978-1-492-04419-2
- GLOVER, Jesse und Jonathan LINOWES, 2019. *Complete Virtual Reality and Augmented Reality Development with Unity: Leverage the power of Unity and become a pro at creating mixed reality applications*. Birmingham: Packt Publishing. ISBN 978-1-83864-818-3

- SCHMALSTIEG, Dieter und Tobias HÖLLERER, 2016. *Augmented reality: principles and practice*. Boston ; Columbus ; Indianapolis: Addison-Wesley. ISBN 978-0-321-88357-5, 0-321-88357-8

Additional remarks:

The project work focuses on the concept, design, and development of a virtual or augmented reality application. The idea for the AR/VR application will be given within the lecture, or the students can develop their own ideas. The students realize the project in small groups, working with different provided AR/VR hardware devices during the practical sessions. The scope of the project work is aligned with the user-centered design process and represents the full lifecycle of a practical project in AR/VR, including testing, evaluation, and demonstration of the application. During the course of the semester, the students will receive feedback on their project status. The results must be documented in a written report (around 15 pages) and the program code of the developed VR or AR application must be handed in for evaluation.

4.1.9 Design Strategy and Management

Module abbreviation:	UXDM_DS	**SPO-No.:**	9
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	2 / 4
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only winter term

Responsible for module:	Ritzer, Veronika
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	Design Strategy and Management (UXDM_DS)
Lecture types:	UXDM_DS: SU/Ü – lecture with integrated exercises
Usability for other study programs:	None

Examinations:

schrP90 - written exam, 90 minutes

Requirements:
None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, a basic understanding of the nature of design work and the role of design within a larger organization and/or in a consulting context would be beneficial.

Objectives:

After active participation in the course, students

- …are able to describe and argument for the role of the design in an entrepreneurial context.
- ...are able to describe most important goals and activities for design management on project, process and strategic levels.
- …are able to evaluate design capabilities of an organization.
- …have acquired the ability to evaluate basic business goals, strategies and actions considering design.
- …have comprehensive knowledge about basic principles, tasks and activities of project management in a design context.
- …have comprehensive knowledge of evaluation and measurement tools for design activities in an organization.
- …are able to describe the purpose of corporate and business strategies as well as design strategies.

- …have comprehensive understanding of responsibilities and typical activities of brand, marketing and innovation departments and how these affect design in corporations.
- …are able to argument the values of design and its contribution to business success.
- …have acquired the know-how to write a design brief.
- …are able to describe the role of design in an innovation context.

Self- and social competences:
Upon completion of the module, students

- ...know different ways of organizing teams, are familiar with different roles in teamwork and can assume them as needed to successfully lead interdisciplinary teams.
- ... have a high level of experience in intercultural cooperation and have acquired the competence to work successfully in global teams.
- ...have adopted sufficient abstraction skills and analytical thinking ability to be able to independently familiarize themselves with new, unfamiliar areas of expertise and complex problems and implement solutions.

Content:

- Design roles and levels of activity in corporate structures
- Purpose and nature of strategies in companies
- Strategic management practice
- Purpose and nature of a design strategy
- The business perspective on design
- Corporate and design strategy
- Value of design from a business perspective
- Building competitive advantage including chances and challenges for design
- Methods to evaluate and measure design success
- Main activities and responsibilities of brand, marketing and innovation
- How design relates and contributes to marketing, brand and innovation
- Methods and approaches for guiding design decisions
- Management of design processes
- Project management for design projects
- Design brief and project acquisition
- Different types of innovation

Literature:

Compulsory:

- BEST, Kathryn, 2015. *The fundamentals of design management*. London; New York: Fairchild Books, an imprint of Bloomsburry Publishing Plc. ISBN 978-2-9404-1107-8
- BEST, Kathryn, 2019. *Design Management*. 2. Auflage. London: Bloomsbury. ISBN 978-1-3501-4881-9
- BAARS, Jan-Erik, 2018. *Leading Design*. München: Vahlen. ISBN 978-3-8006-5640-0 ; https://opac.ku.de/s/thi/de/2/10/BV044880755
- BROWN, Tim, 2019. *Change by Design - How Design Thinking Transforms Organizations and Inspires Innovation*. 2nd edition. Harper Business. ISBN 978-0-062-85662-3

Recommended:

- WITTMANN, Robert G. und andere, 2019. *Strategy design innovation: how to create business success using a systematic toolbox*. Completely revised 5. Auflage. Augsburg: ZIEL. ISBN 978-3-96557-077-1, 3-96557-077-3
- LEVY, Jaime, 2022. *UX strategy: how to devise innovative digital products that people want*. Heidelberg: O'Reilly. ISBN 978-3-96009-177-6

Additional remarks:
This course is held in the manner of an inverted classroom course: Students prepare a number of topics in self-study closely guided by the lecturer. The focus of the time in class is on interactive discussion of these topics, applied exercises, case studies and discourse with guests from industry and academia.

4.1.10 Project

Module abbreviation:	UXDM_PR	**SPO-No.:**	10
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	2 / 4
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only winter term

Responsible for module:	Riener, Andreas
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	Project (UXDM_PR)
Lecture types:	UXDM_PR: P - project
Usability for other study programs:	None

Examinations:

Proj - project report (min. 5 pages excluding tables and graphs, font size 10-12 pt.) and a presentation (10-15 minutes)

Requirements:

None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, depending on the role a participant wants to play in the project, appropriate prior knowledge (i.e., basic knowledge of agile project management and PM tools, programming experience, design skills, knowledge of user research, data analysis and visualization, or statistics) would be beneficial.

Objectives:

After active participation in the course, students

- …have developed a broad understanding of interdisciplinary context.
- …can apply management techniques to support the development and distribution of systems and products throughout their life cycle.
- …know how to effectively cooperate in interdisciplinary teams.
- …have acquired knowledge about how to organize team processes.
- …know how to apply creativity techniques and moderate groups.
- …have acquired the ability to evaluate project milestones and argue the decision to move forward in the process.

- …know about the benefits of the iterative development process and are able to apply them in the product development process.
- …are able to evaluate and improve the usability of products and to differentiate usability from user experience.
- …have acquired the ability to recognize and evaluate the quality of design.

Self- and social competences:
Upon completion of the module, students

- …have improved on methodological skills and social competence.
- …can communicate professionally at an adequate level of abstraction using appropriate forms of media.
- …are able to present research results to different audiences, either as oral presentation or written report.
- …have acquired the competence to work successfully in (global) teams.

Based on the role taken individually, learning outcomes may differ.

Content:

Each semester, several projects with different thematic alignments are offered. Depending on the project, the focus and thus also the contents differ.

- Introduction to the project/problem statement
- Related work analysis/state-of-the-art research
- Brainstorming/Ideation processes
- User research
- Implementation of software/hardware prototypes
- Study design and execution of user studies
- Data analysis, results presentation and interpretation
- Derivation of recommendations
- Preparing of presentations, teaser video, project report

Literature:

Compulsory:

- FLEWELLING, Paul, 2018. *The agile developer's handbook: get more value from your software development : get the best out of the agile methodology*. Birmingham, UK: Packt Publishing. ISBN 978-1-78728-020-5

Recommended:

- LAYTON, Mark C., Steven J. OSTERMILLER und Dean J. KYNASTON, 2020. *Agile Project Management for Dummies*. 3. Auflage. Newark: John Wiley & Sons, Incorporated. ISBN 978-1-119-67706-2
- SUTHERLAND, Jeff, 2019. *SCRUM: the art of doing twice the work in half the time*. London: Random House Business. ISBN 978-1-847-94110-7

Project-specific primary and secondary literature will be provided in the course (depending on the topic of the project).

Additional remarks:

The project module is carried out in a team of about 12 students and, in many cases, offered by external companies or the university's research center FORTEC. Alternatively, lecturers/PhD students also specifically present project topics that are to be processed as part of their teaching or research activities.

The project management and organization is the responsibility of the students. The instructor acts only as a coach and/or client (product owner). Classic methods or agile methods such as Scrum or Kanban can be used as project management methods. The decision which method is used is up to the project team, as are the tools used for project management.

At the beginning of the project, the lecturer clearly communicates his expectations regarding the dates, form and proof of the individual achievements to be provided by all students. The project team agrees with the lecturer on the forms of communication and documentation to be adhered to by all project participants (students, lecturer, client) during the project period.

A description of the specific projects (this module is only offered in winter term) will be published in Moodle: https://moodle.thi.de/course/view.php?id=6470#section-8

4.1.11 Master Thesis

Module abbreviation:	UXDM_MT	**SPO-No.:**	12.1
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	3 / 5-6
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester full time, 2 semester part time	winter and summer term

Responsible for module:	Riener, Andreas
Credit points / SWS:	28 ECTS / 0 SWS
Workload:	Contact hours: 0 h Self study hours: 700 h Total hours: 700 h
Subjects of the module:	Master Thesis (UXDM_MT)
Lecture types:	UXDM_MT: MA - Master thesis
Usability for other study programs:	None

Examinations:

Master thesis

Requirements:

The length of a master thesis is 50-80 pages (A4 format, font size 10-12pt) plus cover page, preface with abstract, table of contents, etc., bibliography and optional appendices. It should demonstrate sound theoretical and methodological knowledge and expertise in an area or issue relevant to the content of the master program.

Prerequisites according examination regulation:

Acquisition of 30 ECTS in the form of completed modules according to §9(1) of the study and examination regulation of the program.

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, it is recommended that before starting the thesis all theory modules have been attended and successfully completed (at least those closely related to the topic of the thesis).

Objectives:

After active participation in the course, students

- ...are able to define the chosen research problem and work on it independently.
- ...has gained a comprehensive understanding and expert knowledge of the topic of the thesis.
- ...are able to identify a research gap in the topic of the thesis, develop a research approach, and define research questions/hypotheses.
- ...are able to independently conduct research on the chosen research question.

- ...have acquired the competence to apply underlying theories to their own work and to select appropriate research methods.
- ...are able to develop a solution or prototype, collect data, conduct a user study, or conduct user research.
- ...have comprehensive skills in data analysis and can present the results in a scientifically appropriate form.
- ...are able to draw scientifically tenable conclusions and make recommendations.
-

Self- and social competences:

Upon completion of the module, students

- ...have learned to think "academically".
- ...have acquired the ability to argue in a scientifically sound manner and to communicate at a high academic level.
- ...are able to give constructive criticism and to see criticism as potential for improvement.
- ...have learned to manage different phases of the research process.
- ...can demonstrate an in-depth knowledge of the chosen topic.
- ...have mastered the relevant theories and research methods and are able to write scientifically.

Content:

The master thesis is a self-study aimed at deepening a student's understanding of a selected key subject area in the topic of the program, i.e., user experience design, HCI, interaction design, usability research, etc. Prototypes, design concepts or products developed within the work may be included as part of the thesis. The work should have a strong research character (e.g., acquisition of new knowledge, development of new methods) and the focus should be on the acquisition of knowledge and the interpretation of results - supported, if appropriate, by creative design.

- Introduction to the thesis: Motivation/problem statement
- Related work analysis/state-of-the-art research
- Identification of research gaps/design opportunities
- Research questions/hypotheses
- Method/approach: Creation of designs, realization of prototypes, implementation of software, selection of appropriate research methods
- Evaluation: User research, study design, usability testing
- Data analysis, results presentation and interpretation
- Derivation of recommendations, indication of limitations and future work

Literature:

Compulsory:

- FIELD, Andy und Graham HOLE, 2011. *How to design and report experiments*. R. Auflage. Los Angeles [u.a.]: Sage. ISBN 978-0-7619-7383-6, 978-0-7619-7382-9
- LAZAR, Jonathan, Jinjuan Heidi FENG und Harry HOCHHEISER, 2017. *Research methods in human-computer interaction*. S. Auflage. Cambridge, MA: Morgan Kaufmann Publishers, an imprint of Elsevier. ISBN 978-0-12-809343-6, 0-12-809343-9

Recommended:

- Ohne Autor. *Additional literature based on own research, depending on the subject of work* [online].

Additional remarks:

In the master thesis, the student will have to demonstrate its ability to scientifically work on a current research topic in the broader domain of user experience design, HCI, interaction design. The thesis needs to be completed within a specified time frame (six month, according to the study and examination regulation (SER) of the program, §9(2)).

According to §2 para. 3 of the SER for UXD-M it is regulated that the study program is conducted in English. This also applies to the master thesis. Unless otherwise stated in the module handbook according to §8 Abs. 2 no. 9 of the SER, the only possible language for the master thesis is English.

4.1.12 Master Thesis Seminar

Module abbreviation:	UXDM_MTS	**SPO-No.:**	12.2
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Compulsory subject	3 / 5-6
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester full time, 2 semester part time	winter and summer term

Responsible for module:	Riener, Andreas
Credit points / SWS:	2 ECTS / 1 SWS
Workload:	Contact hours: 12 h Self study hours: 38 h Total hours: 50 h
Subjects of the module:	Master Thesis Seminar (UXDM_MTS)
Lecture types:	UXDM_MTS: S - seminar
Usability for other study programs:	None

Examinations:

Koll - Presentation (20 minutes) and a discussion of the scientific findings of the Master thesis (10 minutes)

Requirements:

None

Prerequisites according examination regulation:

None.

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, it is recommended that before starting the thesis (together with this seminar) all theory modules have been attended and successfully completed (at least those closely related to the topic of the thesis).

Objectives:

After active participation in the course, students

- ...have learned to search for high-quality scientific information in a systematic and goal-oriented way.
- ...have acquired an understanding of the strategy and methodology of information research for scientific papers.
- ...have learned the necessary steps for the preparation of a scientific paper/work and are able to apply them.
- ...have learned to handle information responsibly and to question published information for correctness.
- ...can quote scientifically correct, create a bibliography for a scientific paper and interpret literature references.

- …have lost the fear of carrying out an extensive scientific work independently.

Self- and social competences:
Upon completion of the module, students

- ...have acquired the competence to organize themselves and to practice time management.
- ...have learned how to think and write scientifically.
- ...have learned to present research results in a compact and comprehensible way to a broad audience.
- ...have acquired the competence to defend research results and to conduct a scientific discourse.

Content:

The purpose of the master thesis seminar is to continuously assist students through all stages of the master thesis.

Students of the program are expected to, firstly, develop a concrete master's thesis research plan. The master's thesis seminar supplies guidance in the process of revising the master's thesis proposal and moving from the proposal towards conceptual and empirical work on the master's thesis itself (accomplished bilaterally between student and lecturer). The classroom-section of the master's thesis seminar provides a forum for the presentation and in-depth discussion of the master's thesis proposals (for new students) and the results of the thesis (for those ready to submit).

- Development of a concrete research plan for the master thesis
- Discussion and revision of the proposal for the master's thesis until a final agreement is reached on the work to be carried out
- Support in the preparation of conceptual and empirical work
- Assistance in data evaluation and interpretation
- Preparation of a presentation, rehearsal, defense of the work

Literature:

Compulsory:

- ZOBEL, Justin, 2014. *Writing for Computer Science* [online]. London ; Heidelberg ; New York ; Dordrecht: Springer PDF e-Book. ISBN 978-1-4471-6639-9, 978-1-4471-6638-2. Verfügbar unter: https://doi.org/10.1007/978-1-4471-6639-9.

Recommended:

- Keine

Additional remarks:

The thesis seminar is accompanying the master thesis but is not offered as a regular, weekly course. Instead, the knowledge transfer takes primarily place in bilateral appointments between student and supervising professor. Prior to the final submission of the master thesis, each student is required to present the results of his/her master thesis. Seminar presentations are arranged demand-driven and conducted as a colloquium (master students presenting/defending their results, all students currently writing a master's thesis in the UXD-M program are invited to attend and discuss). In consultation with the first supervisor, students enter their presentation date independently in the following list: https://faubox.rrze.uni-erlangen.de/getlink/fiJqfmDwvAufwB22r78UnH/ (all seminar participants can find the presentation dates and topics in this list). Attendance at the seminar sessions is strongly recommended - for at least 5 seminar sessions (not presentations), attendance must be documented on a running sheet (available in Moodle: https://moodle.thi.de/course/view.php?id=7058). This must be handed over to the first supervisor together with the Master's thesis. All students are asked to actively participate in the discussion by asking questions and providing argumentative comments/feedback.

We also organize a (voluntary) colloquium (about 2 hours) at the end of the semester, to which all students who have completed their master thesis in the current semester (or plan to do so soon) are invited.

The plan for the colloquium is that each student presents his or her master thesis in 2 minutes on an A0 or A1 poster (layout is free); after that there is time for questions and answers. Following all presentations, in-depth discussions with interested parties can be held directly at the poster.

4.2 Individual Electives

4.2.1 Interface Design

Module abbreviation:	UXDM_FWID	**SPO-No.:**	11
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Fachwissen-schaftliches Wahlpflichtfach	1 / 3
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only summer term

Responsible for module:	Stahl, Ingrid
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	Interface Design (UXDM_FWID)
Lecture types:	UXDM_FWID: SU/Ü - lecture with integrated exercises
Usability for other study programs:	None

Examinations:

LN - project work

Requirements:
None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, basic knowledge in visual design and experience with the Adobe Creative Cloud suite would be beneficial.

Objectives:

After active participation in the course, students

- …are able to understand essential aspects of interface design.
- … have acquired extensive knowledge of the history of development as well as conception and design of user interfaces.
- …have gained comprehensive knowledge of the design of human-machine interactions and are able to apply it.
- …have acquired comprehensive knowledge to evaluate design and technical aspects of user interfaces.
- …have acquired in-depth ability to recognize and evaluate the quality of design.

- …have acquired appropriate technical and methodological skills to develop user interfaces themselves.
- …are able to analyze and evaluate user interfaces with regard to possible areas of application.
- …are able to prepare data visually and in a way that is appropriate for the target group.
- …have gained the competence to design suitable usage and operating scenarios for user interfaces.
- …have acquired the skills to develop a user interface by applying the user-centered design process.

Self- and social competences

Upon completion of the module, students

- …have acquired the competence to realize UIs on the basis of a task description and to present idea and process in front of an audience.
- ...have learned in practice to organize themselves and to work in teams.
- ...are able to grasp the current state of research and apply it to their own projects.

Content:

- Introduction to the project, team building, brainstorming
- State-of-the-art research
- Concept Phase 1: Defining functionality, Low fidelity paper prototypes
- Persona creation
- Concept Phase 2: Expanding ideas into a high fidelity clickable prototype
- Visualizing user scenarios/user journey in a storyboard
- Analyzing design trends and State-of-the-art of visual interfaces
- Mood board creation: Explaining the why of a chosen visual design
- Screen design: Matching the defined interface design with the screens of the user scenarios
- Animation and Transitions: Bringing the interface design alive (incl. storyboard)
- Movie creation (project report), documentation and final presentation

Literature:

Compulsory:

- SHNEIDERMAN, Ben, Catherine PLAISANT and Maxine COHEN, 2016. *Designing the User Interface: Strategies for Effective Human-Computer Interaction*. 6th edition. ISBN 978-0-134-38038-4
- STAPELKAM, Torsten, 2010. Interaction- and Interfacedesign. Verlag Springer. ISBN 978-3-642-02073-5
- NORMAN, Donald A., 1988. *The psychology of everyday things*. New York: Basic Books. ISBN 0-465-06709-3

Recommended:

- SHNEIDERMAN, Ben; FERSTER, Bill, 2013. Interactive Visualization. The MIT Press.
- CAMERON, Andy. 2004. The Art of Experimental Ineraction Design. Gingko Press.
- CAMPANELLI, Vito. 2010. Web Aesthetics: How Digital Media Affect Culture and Society. NAi Publishers
- NORMAN, Donald A., 1993. *Things that make us smart: defending human attributes in the age of the machine*. 2. edition. Reading, Mass. u.a.: Addison-Wesley. ISBN 0-201-58129-9
- APPLE COMPUTER INC., 1992. *Macintosh human interface guidelines*. 1. edition. Reading, Mass. u.a.: Addison-Wesley. ISBN 0-201-62216-5
- APPLE COMPUTER INC., 1996. *Newton 2.0 user interface guidelines*. Reading, Mass. [u.a.]: Addison-Wesley. ISBN 0-201-48838-8

Additional remarks:

The course combines knowledge about methods in design with a very concrete interface design assignment. For individual tasks, Adobe Cloud software (or alternative tools for creating visual interface designs) is used for this purpose.

4.2.2 User Experience Participatory Design

Module abbreviation:	UXDM_FWUXPD	**SPO-No.:**	11
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Elective Subject	1 - 4
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	variable term

Responsible for module:	Sturm, Christian
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	User Experience Participatory Design (UXDM_FWUXPD)
Lecture types:	UXDM_UXPD: SU/Ü - lecture with integrated exercises
Usability for other study programs:	None

Examinations:

LN – project work

Requirements:
None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, previous knowledge in qualitative user experience design or user research and experience in running workshops would be beneficial.

Objectives:

After active participation in the course, students

- ...have learned to prepare, plan and conduct participatory design workshops with potential users.
- ...have acquired the competence to take up ideas that have been developed in the context of ideation and to further develop them into products.
- ...are able to identify and solve problems that users thought were unsolvable.
- ...have learned to actively involve “real” users in real-world environments in the design process, thus designing experiences directly in the lived context.
- ...are able to apply the user-centered design paradigm to design with potential users.
- ...have acquired a comprehensive understanding of the importance of designing with/for users.

Self- and social competences:
Upon completion of the module, students

- ...have acquired the competence to deliver results in presentations and to moderate a well-founded discussion with the audience.
- ...can communicate professionally at an adequate level of abstraction using appropriate media forms.
- ...have gained extensive experience in intercultural cooperation.
- ...have lost the fear of conducting workshops and interviews with potential users.

Content:

- Introduction to participatory design
- Stakeholders (users, developers, etc.)
- Participatory design and ethics, politics, democracy, and empowerment
- Ethnography and contextual design
- Personas
- Participation through Co-design
- Scenario-based design
- Participatory prototyping with low-fidelity models (mock-ups)
- Usability tests
- Comparison (pro/cons), general discussion

Literature:

Compulsory:

- SIMONSEN, Jesper, 2013. *Routledge international handbook of participatory design*. London [u.a.]: Routledge. ISBN 978-0-415-69440-7, 978-0-203-10854-3
- LAZAR, Jonathan, Jinjuan Heidi FENG und Harry HOCHHEISER, 2017. *Research methods in human-computer interaction*. S. Auflage. Cambridge, MA: Morgan Kaufmann Publishers, an imprint of Elsevier. ISBN 978-0-12-809343-6, 0-12-809343-9
- PATTON, Michael Quinn, 2015. *Qualitative research & evaluation methods: integrating theory and practice*. F. Auflage. Los Angeles: SAGE. ISBN 978-1-4129-7212-3

Recommended:

- SEARS, Andrew und Julie A. JACKO, 2009. *Human-computer interaction: design issues, solutions, and applications*. Boca Raton, Fla.: CRC Press. ISBN 978-0-4291-4365-6
- RAMASWAMY, Venkatram und Francis J. GOUILLART, 2010. *The power of co-creation: build it with them to boost growth, productivity, and profits*. New York, NY [u.a.]: Free Press. ISBN 978-1-4391-8104-1, 978-1-4516-2354-3
- VINES, J., R. CLARKE und P. WRIGHT, 2013. Configuring participation. In: *Ext. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI'13)*. New York, USA: ACM Press, S. 423.

Additional remarks:

Thematic workshops are held on a small group (student team) basis to promote synergistic and collaborative learning.

4.2.3 Audio/Video Processing and 3D-Animation

Module abbreviation:	UXDM_AVP	**SPO-No.:**	11
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Elective Subject	1-4
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only winter term

Responsible for module:	Riener, Andreas
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 59 h Self study hours: 141 h Total hours: 200 h
Subjects of the module:	Audio/Video Processing and 3D-Animation (UXDM_FWAVP)
Lecture types:	UXDM_FWAVP: SU/Ü - lecture with integrated exercises
Usability for other study programs:	None

Examinations:

LN - project work

Requirements:
None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, knowledge of basic mathematics (equation solving, exponential/logarithmic functions) and basic physics would be beneficial.

Objectives:

After active participation in the course, students

- …have gained a deep understanding of the basic principles of different audio-visual media technologies.
- ...have understood and can apply the principles of auditory and visual perception.
- …are able to explain the principles of various audiovisual media technologies and can describe the main differences between them.
- …have acquired the competence to create suitable audiovisual media solutions for solving concrete practical problems.
- …are able to evaluate audiovisual media solutions and create new solutions.
- …are able to design and develop animations and integrate them into interactive systems.
- … have comprehensively learned to qualitatively and quantitatively evaluate techniques for image capture, image recognition, sound recording and sound reproduction.

Self- and social competences

Upon completion of the module, students.

- …have improved their analytical capabilities.
- …are more comfortable with exploring unfamiliar technologies and hardware.
- …have improved their professional presentation skills.

Content:

Audio processing:

- Introduction to sound and signals
- Time-Frequency analysis and visual representation of sound signals
- Signal recording, analog-to-digital conversion, reproduction
- Filtering
- Auditory perception, spatial perception
- Codecs and media formats

Image/video processing:

- Light, visual perception, and image acquisition
- Color models and HDR
- Lightfield cameras
- Color space adjustment
- Image compression and media formats
- Video color spaces, video coding

Animation:

- UI-Animation, User-centered animation styles
- Motion graphics and rule-based animation
- Storytelling in UI animation
- Compositing

Literature:

Compulsory:

- HUGHES, John F., 2014. *Computer graphics: principles and practice*. 3rd edition. Upper Saddle River, N.J.: Addison-Wesley. ISBN 978-0-13-337372-1
- WILLIAMS, Richard, 2009. *The animator's survival kit: [a manual of methods, principles and formulas for classical, computer, games, stop motion and internet animators]*. E. edition. London: Faber and Faber. ISBN 978-0-571-23833-0, 978-0-571-23834-7
- THOMAS, Frank and Ollie JOHNSTON, c1995. *The illusion of life: Disney animation*. 1st edition. New York, NY: Disney Ed.. ISBN 0-7868-6070-7
- RICKITT, Richard, 2007. *Special effects: the history and technique*. 2nd edition. London: Aurum. ISBN 978-1-84513-130-2

Recommended:

- BRINKMANN, Ron, 2008. *The art and science of digital compositing: techniques for visual effects, animation and motion graphics*. 2nd edition. Amsterdam [u.a.]: Elsevier [u.a.]. ISBN 978-0-12-370638-6
- POYNTON, Charles A., 2012. *Digital video and HD: algorithms and interfaces*. 2nd edition. Waltham, MA: Morgan Kaufmann. ISBN 978-0-12-391932-8
- BIRN, Jeremy, c2014. *Digital lighting & rendering*. 3rd edition. [S.I.]: New Riders. ISBN 978-0-321-92898-6
- PALAMAR, Todd, 2015. *Mastering Autodesk Maya 2016: Autodesk Official Press*. 1st edition. ISBN 978-1-119-05982-0
- PARENT, Rick, 2012. *Computer animation: algorithms and techniques*. 3rd edition. Amsterdam [u.a.]: Elsevier. ISBN 978-0-12-415842-9

Additional remarks:
The teaching concept of this course closely connects theoretical foundations and practical applications. Thus, this course is designed workshop-like: The learning contents are presented in relation to concrete areas of application and are deepened by concrete group and single tasks. An active participation of the students is explicitly desired.

4.2.4 UX Design in a GenAI World

Module abbreviation:	UXDM_FWGenAI	**SPO-No.:**	11
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Elective Subject	1 / 3
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only summer term

Responsible for module:	Riener, Andreas
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	UX Design in a GenAI World (UXDM_FWGenAI)
Lecture types:	UXDM_FWGenAI: SU/Ü - lecture with integrated exercises
Usability for other study programs:	None

Examinations:

LN - project work

Requirements:
None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, basic knowledge of UX/UI design principles including familiarity with design thinking, user-centered design processes, and prototyping would be beneficial. Furthermore, experience with design tools (Adobe XD, Sketch, Figma, etc.) is recommended, as these tools might be used for prototyping AI-enhanced interfaces.

Objectives:

The objectives of the course "UX in a GenAI World" are centered around equipping students with a multi-faceted understanding and skill set in the realm of User Experience (UX) design in the context of generative AI (GenAI).

After active participation in the course, students

- …have acquired a thorough understanding of the landscape of artificial intelligence and intelligence augmentation, emphasizing the ability to distinguish AI's real-world capabilities and limitations in the digital era.
- …have gained comprehensive knowledge of interaction design principles tailored for agentive AI, focusing on developing effective human-AI collaboration and interaction through a variety of interfaces, including textual, gestural, voice, and other digiphysical mediums.

- …have acquired the skills to integrate GenAI tools into the Design Thinking process and everyday UX practices, covering their application in ideation, prototyping, and enhancing user experiences.
- ...have developed an in-depth understanding of the essential principles that govern the design and aesthetics of AI-driven human-machine interactions, with a focus on user-centered design approaches.
- …have acquired appropriate skills to address and navigate ethical issues and privacy concerns in GenAI-enhanced products, ensuring responsible and respectful design practices.
- …have acquired a basic understanding of how to implement personalization in AI-enhanced products, with a particular focus on its role in improving user experience and engagement.
- ...have gained practical insights into real-world applications of GenAI systems in various products and industries, including a comprehensive view of the current and future landscape of GenAI in UX design.

Self- and social competences:
Upon completion of the module, students

- …have acquired the competence to realize GenAI-enhanced products on the basis of a task description and to present ideas in front of an audience.
- ...are able to grasp the current state of GenAI systems and apply it to their own projects.
- ...have learned in practice to organize themselves and to work in teams.

Content:

- Understanding AI in UX: Delving into how artificial intelligence and intelligence augmentation transform digital interactions and interfaces, focusing on their capabilities and limitations in the current digital landscape.
- Design Principles for AI Interaction: Teaching design principles specifically for human-AI interaction, emphasizing creating intuitive and engaging AI-enhanced experiences across various mediums.
- Ethical and Privacy Aspects: Addressing the ethical challenges and privacy concerns in GenAI-enhanced products, promoting responsible and user-centric design practices.
- Real-World Applications: Providing practical insights through case studies and industry examples, showcasing the application of GenAI tools in UX design from conceptualization to execution, including personalization strategies and user experience refinement.

Literature:

Compulsory:

- KORE, Akshay, 2022. Designing Human-Centric AI Experiences: Applied UX Design for Artificial Intelligence [online]. Berkeley, CA: Apress PDF e-Book. ISBN 978-1-4842-8088-1. Available via: https://doi.org/10.1007/978-1-4842-8088-1.
- NOESSEL, Christopher, 2017. *Designing agentive technology: AI that works for people*. Brooklyn, New York: Rosenfeld Media. ISBN 978-1-933820-63-7, 1-933820-63-2
- MAEDA, John, 2019. *How to speak machine: computational thinking for the rest of us*. i. edition. [New York]: Portfolio//Penguin. ISBN 978-0-399-56442-0

Recommended:

- YANG, Qian, 2020. Profiling Artificial Intelligence as a Material for User Experience Design. 1. edition. Pittsburgh, PA: Carnegie Mellon University. ISBN https://doi.org/10.1184/r1/14376731.v1
- ENGENHART, Marc, LÖWE, Sebastian, 2022. Design und künstliche Intelligenz: theoretische und praktische G*rundlagen der Gestaltung mit maschinell lernenden Systemen* [online]. Basel: Birkhäuser PDF e-Book. ISBN 978-3-0356-2555-4. Available via: https://doi.org/10.1515/9783035625554.

Additional remarks:

None

4.2.5 Entrepreneurship Coaching

Module abbreviation:	UXDM_FWEC	SPO-No.:	11
Curriculum:	**Program**	**Module type**	**Semester full time / part time**
	User Experience Design (SPO WS 24/25)	Elective Subject	2 / 4
Modulattribute:	**Language of instruction**	**Duration of module**	**Frequency of offer**
	English	1 semester	only winter term

Responsible for module:	Riener, Andreas
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 47 h Self study hours: 78 h Total hours: 125 h
Subjects of the module:	Entrepreneurship Coaching (UXDM_FWEC)
Lecture types:	UXDM_FWEC: SU/Ü - lecture with integrated exercises
Usability for other study programs:	None

Examinations:

LN - project work

Requirements:
None

Prerequisites according examination regulation:

None

Recommended prerequisites:

There are no prerequisites or corequisites for this class. However, an initial business idea and basic experience (or interest) in founding a company would be beneficial.

Objectives:

After active participation in the course, students

- ...have learned to develop a business idea into a business model.
- ...are able to identify key success factors for implementation.
- ...have acquired the ability to list reasons for the failure of business models and to understand the causes for it.
- ...have acquired the competence to prepare the implementation on the basis of a Minimal Viable Product (MVP) approach.
- ...have learned to prepare their idea for participation in a business plan competition.

Self- and social competences

Upon completion of the module, students

- …have acquired the competence to perform in a professional manner.

- …have learned good communication skills and can use them profitably in critical project situations.
- ...are able to present the business idea briefly and compactly to business angels (elevator pitch).
- ...have learned to consider failures as a basis for improvement.

Content:

- Ideation, Design thinking
- Value proposition design
- Business model canvas
- Business model innovation
- Minimal viable product (MVP) and testing
- Prototyping
- Design brief, business plan
- Pitch presentations

Literature:

Compulsory:

- AULET, Bill, *Disciplined Entrepreneurship*. ISBN 978-1118692288

Recommended:

- KAWASAKI, Guy, 2015. *The art of the start 2.0: ˜theœ time-tested, battle-hardened guide for anyone starting anything*. r. edition. [London] [u.a.]: Portfolio Penguin. ISBN 978-0-241-18726-5, 978-1-59184-811-0
- RIES, Eric, 2014. *The lean startup: how today's entrepreneurs use continuous innovation to create radically successful businesses*. F. edition. New York: Currency. ISBN 978-0-307-88789-4
- OSTERWALDER, Alexander and Yves PIGNEUR, 2010. *Business model generation: a handbook for visionaries, game changers, and challengers*. Hoboken, NJ: Wiley.
- Without author. *Leitfaden Businessplanning* [online]. [Accessed on:]. Available via: www.bay-startup.de/know-how-und-kontakte/leitfaden-businessplanning-know-how.html

Additional remarks:

The coaching is carried out (as far as possible) in cooperation with a business partner as sponsor. Through this cooperation, each team receives a practical sponsor in addition to the support of the lecturer at THI.