Academic Guide Exchange 2025-2026

Faculty of IT & Design

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THE HAGUE
UNIVERSITY OF
APPLIED SCIENCES

Academic Guide Exchange 2025-2026

Faculty of IT & Design

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Date
April, 2025

Version
2.0

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About the Faculty of IT & Design

About the Faculty of IT & Design ICT and digital developments form an important part of our society. Computers are used in every area of everyday life and that starts as soon as you wake up in the morning: you read all your messages on your mobile phone and check what you have to do that day. And when travelling with public transport, you check in using your chipcard. The future of our society is intertwined with the development of ICT technologies and digital design. The Hague University of Applied sciences offers a wide range of opportunities to follow courses which eventually contribute to a bright future. Whether at school or at work, practically everything has become computerised.

In this leaflet you will find information about a variety of courses taught in English at the Faculty of IT & Design. The Faculty offers courses in English in the following fields of interest.

ADS&AI

ChatGPT has an answer to every question. Spotify can recommend new music that perfectly matches your taste. And Instagram shows posts that you find interesting. But how do these algorithms actually work? And how can you apply the right algorithm in every situation?
You'll discover this during the Applied Data Science and AI program. You'll learn how to analyze data and use it to make a difference for people. For example, by enabling better medical treatments or detecting shoplifting and fraud earlier. The possibilities are endless. Data is everywhere, which means that as a data scientist, you'll have plenty of career options.
Of course, this program involves a lot of technology. You'll learn to program and dive into machine learning. But surprisingly, it’s also very much about people. How can you use all your knowledge and skills to help others make better decisions? And at the same time, how do you ensure that your solutions respect people's privacy and treat everyone fairly?
You'll actively work on these challenges. Through real-world projects and hands-on learning, you'll develop into an expert who can transform large amounts of data into valuable insights that truly make a difference. In which sector will you create impact?”

Communication & Multimedia Design (CMD)

CMD is a comprehensive, topical and interesting degree programme in the field of design that offers a unique combination of interaction design, visual design, ICT, media and communication. We focus on the process of Look & Listen, Create Concepts, Design Details and Realise and train our students to become interaction designers. An interaction designer designs an interface that ensures optimum interaction between people and systems.

User Experience Design (UXD)

Whether it’s a smart fridge that replenishes itself online, or a watch that tracks our activity, the user experience of digital technology has become a reality for every professional designer. You might already have some ideas of how to improve your daily life with the use of technology, but what UXD teaches you is to funnel your creativity by putting the end users of your product at the forefront of the designing process.

HBO-ICT

What did you do when you woke up? WhatsApp, put a photo on Snapchat? Later you probably did a payment with your bank card and checked the news on you smart-phone? All this is possible thanks to life changing ICT. HBO-ICT combines creativity and functionality to make you develop this fast changing sector. The bachelor programme consists of 5 specialisations: Software Engineering, Business and Management, Information Security Management, Network and Systems Engineering and Information and Media Studies.

The Faculty ITD has three campuses: The Hague, Delft and Zoetermeer. Each location has its own character. The main campus in The Hague is the largest and characterized by a vibrant and international atmosphere. The campus in Zoetermeer is located in the Dutch Innovation Factory: a place where education, research and companies meet and closely collaborate. The campus in Delft is located, together with our technical faculty, on the premises of TU Delft. Please note on which campus your course takes place; if your minor is in Delft or Zoetermeer and you opt for housing in the Hague, additional travel expenses may be applicable.

Courses

Find below an overview of all courses offered in English at the Faculty of IT & Design

Courses	ECTS	Fall Semester	Spring Semester
European Project Semester	30	x	x
User Experience Design – Fall semester year 1	30	x	
User Experience Design – Spring Semester year 2			x
Game Development	30	x	x
Interactive Digital Art	30	x	
Photography in Focus/Basic Video Production	30	x	
Becoming the next successful online startup	30	x	
Innovative Data Visualisation	30	x	
AI for Good	30	x	
Visual Design and Frontend Development	30	x	
Software reversing and exploitation	30		Xx
Internship/Practical training at Digital Design Agency New Designers	30	x	x

You will be placed on the course of your preference based on available places. When this course is full, we will make you another offer.

European Project Semester

Interdisciplinary

Climate change, poverty or security, the problems we are facing today are complex. Strong disciplinary knowledge does not suffice to solve these problems; we need professionals who are prepared to look at problems from different perspectives and who have learnt to collaborate with professionals from other disciplines. The European Project Semester (EPS) is crafted to prepare students with all the necessary skills to face the challenges of today's fast changing world.

Students work in international and interdisciplinary Scrum teams of 4–8 students on their projects. Students learn to learn and to take responsibility for their learning and their project work and they develop their intercultural competences, their communication skills and their interpersonal skills.

Students work in an interdisciplinary and international student team on a project provided by an external partner: company, research group or other organisation. Students will apply their disciplinary knowledge and skills and learn from students from other disciplines.

European Project Semester	
Credits	30 ECTS
Code	ITD-HMVT25-K70
Entry requirements	Passed the first two years of a bachelor programme
Semester	Fall Semester & Spring Semester
Method	Workshops and project work
Lecturer(s)	Molood Aleebrahimdehkordi, m.aleebrahimdehkordi@hhs.nl +31 6 28837905
Learning outcomes	In this minor, you will learn the following: • To evaluate your knowledge on different cultures in an international group of students • To express yourself well in business English during oral presentations • To write a structured research report in English • To demonstrate a critical and investigative attitude, including: - to be able to formulate relevant research questions - to be able to apply relevant search strategies - to select and apply relevant theories • To clearly describe research results in a research report • To be able to bridge cultural differences in order to carry out a project successfully • To apply your own disciplinary knowledge to the project and to respect and value the input of people from other disciplines • To combine relevant disciplinary knowledge from different group members (including your own) to develop an innovative solution for a company's problem. • To demonstrate your progress in three selected 21st century skills

	• To apply Scrum appropriately to develop the final solution
Recommended or required reading/tools	Bring your own laptop. Other tools and literature will be provided.
Assessment methods	Group assessment (45%), individual portfolio (15%), group assignments (40%)
Level	Undergraduate: fourth year
Location	The Hague
Course content	Technical know-how will be provided by experts from companies involved and the nature of it is based on the type of project. In each group attention will be paid to - Intercultural communication (15%) - Research (10%) - English (15%) - Project (60%: Scrum, collaboration, personal development and content depending on the type of project)

Game Development

Have you always dreamed of developing your own game? Did you ever wonder how the game you played was built? Or are you intrigued with items like concept art and storytelling? In this minor, you will be part of a (bigger) multidisciplinary team developing your own game. You will gain experience in collaborating with people from different disciplines and are encouraged to enrich your way of thinking in the game development domain.

You are free (within certain constraints) to come up with a proposal and a so-called game design document (GGD), for a game. This proposal will be assessed on complexity and feasibility. Your project team consists of members from different disciplines: engineers, designers, artists. It is important that everybody has the possibility to develop themselves.

During the development of the game you will be rewarded with achievements by accomplishing milestones (continuous assessment of knowledge and skills). At the end of the minor, the project will be presented at a conference where all interested people and companies involved are invited.

This minor could interest students from different programs within The Hague University. By offering you to apply for different roles (profiles) the course is especially suitable for HBO-ICT and CMD. Also, students of other programs can join, but are maybe limited to the role they can choose (see admission requirements).

Game Development	
Credits	30 ECTS
Code	ITD-HMVT25-K85
Entry Requirements	There are no formal requirements, however students may be limited in their choices if they don't have a technical background.
Semester	Fall Semester & Spring Semester
Method	The course uses different didactical approaches. The project, in which you create your own game (as a group) is the most dominant part. Next to that we offer a theoretical basis in the form of lectures and workshops.

	Other approaches that are used are: student feedback sessions (guided by lecturers) and presentation sessions (in which students present their (intermediate) results). The total of the study load is 30 credits. The grade is calculated with a weighted average between the project part and the track part (lectures, self-study, company visit).
Lecture(s)	Mathijs Koning, gamedevelopment@hhs.nl
Learning outcomes	In this minor, you will work in a group consisting of eight students, which requires some group management skills. Additionally, every student chooses classes to focus on a specific role(s) they will fulfill within the group. It is mandatory to attend at least four different classes, but all classes are scheduled in a way you could attend all of them. Below you'll find the different roles and some examples of their responsibilities. **Game Producer** Responsible for managing the group, organizing the EXPO, possible product owner. **Game Designer** Design the experience the game tries to achieve for its players through its core mechanics. Main contributor to the Game Design Document (GDD). **Level Designer** Create beautiful levels, tell a story in each level and invent puzzles. **Sound Designer** Make the game feel alive and keep your players' heads banging by designing sound effects and background music. **Storyteller** Use the game to engage the player in an intriguing story. **Concept Artist** Convey your ideas for use in video games before it is put into the final product. Combine traditional techniques with modern day technology and learn about different stages in the design stadium like sketching, inking and rendering. **Game Programmer** Code the game mechanics and the main gameplay loop, communicate with the engine code, unit test mechanics. **Artificial Intelligence Programmer** Code the A.I. your players battle against without making the game an impossible challenge. **Graphics Programmer** Optimize code to achieve high frame rates and create custom tools, rewrite some core engine mechanics, make the game look good with custom shaders and effects. **3D modelling**

	Create 3D models using meshes and textures and everything in between. The roles the student chooses have influence on the classes/lessons to follow. You must choose at least four classes. BUT we do plan all classes in such a way that the schedule makes it possible to attend all classes, even those that are not mandatory for your chosen classes/roles.
Recommended or required reading/tools	The lecturers provide materials through the Brightspace course of the minor. It is, however, important to note that using a 3D Game Engine or 3D modeling software can be resource-heavy, so we recommend having a decent laptop available that can run this kind of software. There is no required literature students are expected to purchase, but students are expected to create and purchase marketing materials (t-shirt, stickers) for the expo at the end of the course.
Assessment methods	There will be no written tests in this game development course! But there are assignments to make per class. **Individual portfolio of achievements** 50% or your grade will be determined by the number of achievements you'll earn during the course. You will be granted achievements by attending lessons and by finishing individual assignments. There are even bonus achievements that are hidden so you don't know beforehand how to get them! Silver achievements are granted by attending all lectures of a track. Each track offers two gold achievements in the form of individual assignments. Each track also offers two platinum achievements, which are individual assignments of a higher skill level that have more impact on your final grade. In order to complete the WHOLE semester, you need at least eight Gold achievements (to get a 6 as a grade). If you also get eight Platinum achievements, then your final grade for the achievements is a 10. **Making a game** The other 50% of the grade will be determined by your group project and your individual contribution to that project. The project will be graded by the lecturers of the minor: each of them focusing on their own area of expertise.
Level	Undergraduate
Location	Zoetermeer
Course content	See Learning Outcomes.

Visual Design and Frontend Development

Visual Design & Frontend Development are specializations within the professional practice of Communication and Multimedia Design (CMD). In this field, novice professionals are often assigned tasks beyond their current knowledge or skill set, and the company expects the employee to solve it independently. In this minor, the student learns how to approach such tasks, gaining in-depth knowledge and skills simultaneously.

Throughout the minor, students work on assignments within self-selected themes during four separate blocks. The learning methods include guidance sessions and masterclasses on substantive topics. An important component of the minor is providing and receiving feedback on realized products. The feedback is formative and focused on improving the learning process but is clear in the form of a grade per product so that you know where you stand and what you can still improve. In the final block, you collaborate on a group portfolio.

The minor consists of 30 credits (a half year) and focuses on deepening knowledge and skills in the field of Visual Design and/or Frontend Development, as well as developing learning skills outside regular education.

Within the minor, you decide what you want to learn and explore how to best achieve it. You work on Visual Design or Frontend Development assignments that require new knowledge and skills. Teachers are available to assist you, provide feedback on your work, and guide you along the way.

Visual Design & Frontend Development	
Credits	30 ECTS
Code	ITD-MINOR25-K86E
Entry Requirements	50 ECTS
Semester	Fall semester
Method	We expect students to dedicate 40 hours per week to the minor. Throughout the week, there are studio hours (2,5 hours) where teachers and experts are present for feedback and guidance. In addition, there is an opportunity to contact the teachers outside of the studio hours.
Lecture(s)	William Beekhuis (W.Beekhuis@hhs.nl)
Learning outcomes	Competencies: Visualizing and Prototyping – knowledge and skill level above the basic level of the major Reflecting Learning Ability Learning objectives: Student can set goals for personal development Student can take control of their own learning process. Supplemented with the learning objectives that you set yourself.
Recommended or required reading/tools	LinkedIn Learning account (provided by the program)
Assessment methods	The minor is divided into four 'blocks,' each of which must be concluded with a passing grade (5.5 or higher). The final grade is the average of these four grades. In each block, the student, using a portfolio and a final product (form = free), demonstrates

	how they have structured their learning process and achieved the learning objectives.
Level	Undergraduate
Location	The Hague
Course content	See the introduction description.

AI for Good

Help build a better world with AI
Do you want to discover how artificial intelligence can change the world for the better? In the *AI for Good* minor, you will work with the power of AI to tackle social issues. This minor offers you the opportunity to explore AI technology, investigate ethical dilemmas and develop your own AI solution to a problem that you consider important.
During this semester, you will not only learn the technical basics of AI, but also how to use AI for sustainability, inclusivity, and social equality. In collaboration with fellow students and experts from the field, you will create a working prototype.
Expect a mix of theory, practical assignments and creative experimentation with tools such as generative AI. Whether you have a technical background or not, this minor challenges you to think innovatively and ethically, and thus make a difference with AI. **Join us and let your creativity and AI come together for a good cause!**

AI for good	
Credits	30 ECTS

Code	ITD-HMVT25-K108
Entry Requirements	Must have completed second year of major
Semester	Fall Semester
Method	**Teaching methods:** Workshops, project work, group coaching and guest speakers. • Workshops / guest speakers: 17 * 7 = 68 • Project days: 17 * 16 = 272 • Coaching: 17 * 1 = 17 • Independent (group) work: 483
Lecture(s)	Erik van den Ham e.j.vandenham@hhs.nl
Learning outcomes	At the end of the programme the student is able to - apply AI for social added value. - make the right ethical considerations in the context of an AI project. - make a thorough problem analysis in which design thinking is applied. - gather domain knowledge and apply it in the context of an AI project. - develop a working prototype of an AI solution using GenAI.
Assessment methods	- *Working prototype (groupwork) (70%)* - *Individual portfolio (30%)* Minimum requirement to pass minor: 5.5. Each grade should at least be a 4.5. **Assessment schedule** (per sub-test): - *Working Prototype (70%): week 18 (retake week 20)* - *Individual portfolio (30%): week 18 (retake week 20)*
Level	Undergraduate. Completed the first two years of major.
Location	Den Haag: Main Building.

Becoming the next successful online start-up (interdisciplinary)

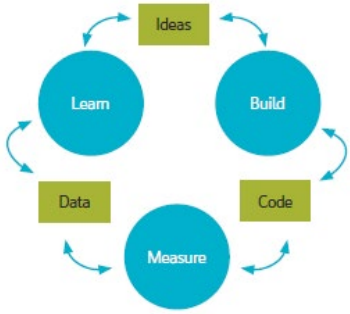
Do you have a groundbreaking business idea or want to contribute to one? In this minor, you'll gain the skills, mindset, and cutting-edge tools to turn ideas into successful online startups!
Join forces with fellow students as co-founders to create and develop your own startup. Together, you'll tackle the challenges of building a new IT-related business. Understanding customer needs, validating solutions, and refining your business model are key. This program guides you step-by-step, combining interactive lectures with coaching from experienced startup mentors.
You'll learn how to leverage AI to rapidly test and validate your assumptions, giving your team a competitive edge. Refine your ideas with feedback from instructors, peers, and customers, and tackle real entrepreneurial challenges.
By the end, your team will have a functional prototype, a compelling pitch, and the confidence to launch your online business.

Course Content

In 'Becoming the Next Successful Online Start-Up' we will guide you through the early phases of entrepreneurship. Therefore we will use the Lean Start-Up – Methodology by Eric Ries.

Lean Start-Up by Eric Ries

Where traditional companies mainly focus on creating an extensive business plan, Lean Start-Up thinks of building your own company in a completely different way. The main idea of Lean Start-Up is that you improve your idea or product continuously.
This thought is executed by a Build-Measure-Learn strategy. Only within weeks you will create your first minimal viable product (MVP) and start measuring whether this product actually adds value from the perspective of your primary target group.



Becoming the next succesfull online start-up (interdisciplinary)	
Credits	30 ECTS
Code	ITD-HMVT25-K68
Entry Requirements	There are no formal entry requirements. However, we encourage students who have an idea for an online or software-based concept—such as a website, app, or cloud application—or who are passionate about addressing a specific problem area, to apply. Even if you don't have a clear idea yet, a willingness to contribute to a team is highly valued. We recommend forming groups with diverse academic backgrounds to foster creativity and innovation. Ideal fields of study include software application or interface design, business IT management, software development, user experience design, marketing, business development, process engineering, data analysis, and AI. A mix of technical, creative, and business skills is key to building a successful startup.
Semester	Fall Semester
Method	Teaching methods and average study load per week (40 hours) • Physical class (Lecture & Peer review) • Coaching • Self-study • Group project (Research and Development)
Lecture(s)	Jelle Hijlarides (J.P.Hijlarides@hhs.nl)
Learning outcomes	Starting a successful online start-up requires a different approach than starting a traditional company. Instead of creating an extensive business

<table>
<tr><td></td><td>plan, you learn how to build your company by continuously improving your concept based on the Build – Measure - Learn strategy. How?
Analysing: Students will analyse the market, their team and their idea. They will make assumptions about their target group Research Skills: Students continuously measure whether an idea actually adds value from the perspective of the primary target group.
Managing the Project: Students will build a team and divide the roles and the work within the team with Lean Start up.
Pitching: Students will have to convince a jury of their own idea with a pitch in English.
Co-creation: Students need to work in smalls teams where effort and investments must be divided equally.
Build-Measure-Learn: Students will validate their assumptions and learn from feedback to make a pivot and change their original plan.
MVP: Students will be transforming an idea into a concrete (online) product (MVP) with market potential with the help of Lean Start up and Business Model Canvas
Product- or service development: Students from multidisciplinary teams will develop their idea into a real IT related product or service.</td></tr>
<tr><td>Recommended or required reading/tools</td><td>Book: Eric Ries, The lean startup (recommended purchase)</td></tr>
<tr><td>Assessment methods</td><td>Requirements: Students must pass all weekly assignments as part of their portfolio (minimum 5.5 per product)
The module has the following tests:<table><tr><td>Portfolio</td><td>75%</td><td>Same term wk 1 to 18</td><td>Same term wk 19-20</td></tr><tr><td>Assessment (oral exam)</td><td>25%</td><td>wk 19</td><td>Same term wk 20</td></tr></table></td></tr>
<tr><td>Level</td><td>Undergraduate. Completed the first two years of major</td></tr>
<tr><td>Location</td><td>Zoetermeer</td></tr>
<tr><td>Course content</td><td>The Key Principles of this minor are
- Love Your Problem – Deeply understand the challenges before jumping to solutions
- Fail Fast to find the Innovation Sweet Spot – Rapid experimentation to refine ideas.

Using proven frameworks such as the Value Proposition Canvas, Business Model Canvas, and Customer Segmentation, you’ll explore how to validate ideas efficiently. Through Meso and Macro analyses (DESTEP, Porter’s 5 Forces, and Competitor Analysis), you’ll gain strategic insights into your market landscape.

At the heart of this minor is the Riskiest Assumption Test (RAT) – an essential method to validate business ideas and minimize uncertainty. You’ll also develop a Marketing Plan and Financial Plan, ensuring your innovations are not just visionary but also viable.

This minor is hands-on, fast-paced, and designed for students eager to test, iterate, and bring ideas to life.</td></tr>
</table>

Interactive Digital Art

Unleash Your Creativity with the Minor Interactive Digital Art (IDA)
Are you passionate about digital media, art, and storytelling? Do you want to create interactive experiences that respond to today's societal challenges? The Minor Interactive Digital Art (IDA) is your chance to push creative boundaries and bring art to life through technology!

Minor Interactive Digital Art (IDA) explores how digital media can be used in an interactive and artistic way to respond to society.

This minorprogram explores how digital media can be used in an interactive and artistic way to engage audiences. You will dive into various artistic disciplines, including: 🎨 Visual arts; 🎬 Film; 🎧 Music; 📜 Art history; 💻 Digital art
During the minor, you will design and develop an interactive digital installation that responds to a relevant social theme. You'll work in a multidisciplinary team, applying a structured Design Thinking approach—from concept development to low-fi prototyping and testing—leading to a final exhibition where your work takes center stage.

This minor is perfect for students who love thinking outside the box and want to develop creative problem-solving skills. Whether you're a designer, programmer, filmmaker, musician, or simply curious about digital art, your unique perspective will contribute to an innovative, meaningful installation.
Join us and turn ideas into interactive experiences that make an impact!



Interactive Digital Art	
Credits	30 ECTS
Code	ITD-HMVT25-K109
Entry Requirements	-Open to students from all fields. -Multidisciplinary teamwork. -no specific prior knowledge required.
Semester	Fall Semester
Method	**Teaching Methods and Weekly Study Load** The teaching methods and study load vary throughout the semester: First Ten Weeks: • Lectures: 8 hours • Guest Lectures: 4 hours • Workshops: 4 hours • Research Project: 26 hours Second Ten Weeks: • Project Supervision: 4 hours • Presentations: 4 hours • Guest Lectures: 4 hours • Research Project: 30 hours

Lecture(s)	Klaas Jan Mollema (K.J.Mollema@hhs.nl)
Learning outcomes	**Learning Outcome 1 (Assignment | Individual)** You are able to extrapolate the provided theory to your own interests and societal relevance, enabling you to identify a topic and effectively present it to others. This can be done in the form of a lecture, workshop, poster, or other formats, and shared with fellow participants of the minor, instructors, and possibly professionals from the relevant field. Learning Objectives: • The student analyzes the material already covered and identifies a complementary topic. • The student selects an appropriate format for conveying knowledge about the chosen topic. **Learning Outcome 2 (Portfolio | Group)** You will research societal events or behaviors and develop an interactive digital installation that responds to them. Throughout the process, you will maintain a portfolio and write a paper that documents the stages of concept development, prototyping, production, testing, and an evaluation of the installation's effectiveness. Learning Objectives: • The student applies a methodical approach to creating an interactive digital installation. • The student documents the process of concept development. • The student thoroughly tests their product and refines it based on findings. • The student investigates whether the interactive digital installation effectively elicits interaction or response from the audience. • The student writes a (scientific) summary paper that substantiates the process, outcomes, and results. The paper objectively evaluates the audience's response to the installation and how it aligns with the intended effect. **Learning Outcome 3 (Exhibited Interactive Digital Installation | Group)** You will create an interactive digital installation that demonstrates a cohesive integration of concept, technical execution, and artistic quality. The installation will invite the audience to engage in meaningful interaction during an exhibition. Learning Objectives: • The student produces a fully functional interactive digital installation. • The student successfully exhibits the interactive digital installation.
Recommended or required reading/tools	Students are required to have a laptop for accessing course materials and working on research projects. All course materials are provided free of charge. *Materials for the installation* Some materials will be made available in consultation with the

	instructors. Other material costs, estimated at approximately €50, are the responsibility of the student. *Excursions* There may be additional costs for excursions. All costs will be specified in advance in the minor catalog.
Assessment methods	**Assessment, Individual/Group, Weighting, Planning, and Minimum Requirements** The assessment for the minor consists of three components: ***Assignment** *Individual* *25*% Weeks 11-17 retake weeks 19-20 ***Portfolio** *Group* *5*0% Week 19 retake week 20 ***Exhibited Interactive Digital Installation** *Group* *25*% Week 19 retake Week 20 The grades for each component of the minor must be 4.5 or higher and will contribute to the final grade according to the assigned weight percentages. To successfully complete the minor, the final grade must be 5.5 or higher. For the resit of each component, the **same requirements** apply as in the initial assessment opportunity.
Level	Undergraduate
Location	Monday afternoon and Friday afternoon Zoetermeer. Wednesday afternoon The Hague.
Course content	The minor Interactive Digital Art (DA) explores how digital media can be used interactively and artistically to respond to society. Throughout the minor, various art disciplines are explored and considered in terms of their ability to create an impact on the audience: • Visual arts • Film and music • Art history • Digital art Participating students will develop an interactive digital installation during the minor that engages the audience and responds to a current societal theme. The minor follows a methodical approach closely aligned with the principles of the Design Thinking method. After the conceptual phase, students progress through a low-fi prototyping and testing process to achieve the final realization of their installation. The resulting works will be showcased together in a closing exhibition.

Innovative Data Visualisation

Are you a driven HBO student who has always wanted to understand how cutting-edge technologies are transforming the world of data visualization and dashboard design? Every field encounters situations in which large amounts of data need to be processed and made understandable to end users. This is often done using graphs, infographics or dashboards.
The deployment of new technology (GEOdata, 3D/AR/VR, digital twins, etc.) can make these visualizations more powerful and understandable. In this multidisciplinary minor, where IT students collaborate with students from other disciplines, you share your knowledge of your field to create innovative visualizations.

The minor Innovative Data Visualization (IDV) explores the added value that arises when state-of-the-art technologies are used for data visualization and dashboard design:

- Data Quality in the Spotlight: We start by examining the core - the quality of the data. Learn how to lay the foundation for innovative data visualizations by ensuring the reliability and usability of data.

- Unlock Predictive Insights: Go beyond a first look at the data and learn how to analyze data to make valuable predictions. We encourage you to develop innovative methods to enrich and supplement data as needed.

- Design Thinking in Action: Discover the power of the Design Thinking method as you explore the most appropriate way to visualize data. Learn how to make information understandable and engaging for users. Experiment with Geodata, 3D/VR/AR, and digital twins.

- Bring Your Vision to Life: With the knowledge you have gained, realize your innovative data visualization on the platform of your choice. Document your journey in a scientific paper and present your creation to clients.

But that's not all! At IDV, we work in an inspiring learning community where students, teachers, and industry professionals come together to learn, explore, and innovate. You work with your project group on real assignments from industry clients. During classroom sessions, you share knowledge, experiences, and tips with your fellow students.

Innovative Data Visualisation	
Credits	30 ECTS
Code	ITD-HMVT25-K99E
Entry Requirements	Strong analytical skills, creativity, and/or programming skills are helpful, but not required. During the minor basic topics will be covered to bring all students to the same level of understanding. While working in multi-disciplinairy teams the group will have enough basic-knowledge to finish the final product.
Semester	Fall Semester
Method	Teaching methods and average study load per week (40 hours): Physical Class 12 hours a week Online class 4 hours a week Presentations 1 hour a week Self-studie 4 hours a week Group project 19 hours a week During the project we do research using the Design Thinking Method.
Lecture(s)	Klaas Jan Mollema (K.J.Mollema@hhs.nl)
Learning outcomes	Students learn how to transform a complex amount of information into an innovative visualization that adds value to the workflow of end users at the client. - Students can determine the underlying question of the client through design thinking. - Students can connect different data sources and make them collaborate with each other. - Students can intelligently supplement and enrich data (quality). - Students can apply elementary data techniques regarding making data understandable and predicting data developments. - Students can, based on research into innovative visualizations and the preferences of end users, create an innovative visual product that adds value for the stakeholders. - Students are aware of ethical and legal aspects related to data and know how to apply them correctly in their final product. Keywords: Analyzing problem domain & formulating problem statement; Gathering, analyzing & processing information; Conducting research; Critical, investigative & methodical work; Effective communication
Recommended or required reading/tools	Students need a laptop to access course materials and work on research projects. Course materials are available at no cost. - In order to get up to speed with Python scripting students use -free of charge - online materials such as Datacamp or Youtube-tutorials. - Several in depth articles will be provided on the digital learning environment. - Inspirational books about the design thinking method and usefull research activities will be available on the physical class days

	○ Aan de slag met Design Thinking / Eveline van Zeeland ○ The design thinking toolbox / Michael Lewrick ○ Design. Think. Make. Break. Repeat. / Martin Tomitsch
Assessment methods	Assessment Form — Percentage — Week — Retake Individual assignment — 25% (>=5.5) — wk 13-17 — wk 20 Portfolio (group) — 50% (>=4.5) — wk 19 — wk 20 Assessment (group) — 25% (>=4.5) — wk 19 — wk 20
Level	Undergraduate
Location	Zoetermeer
Course content	DATA : Collecting Data, analysing and pre-processing data (ETL); Data-quality; Basic statistical knowledge / data-analytics techniques; Big data and predictive analytics; Python programming Data USER EXPERIENCE DESIGN: Data visualization; Dashboard design; Geographical data; Digital Twin TOOLS: PowerBI of Tableau; Elastic; 3D/AR/VR/XR data visualisation Open Data (Unity); Leflet.js (GEO-data) ORGANIZATION: Government(alData); Open data RESEARCH SKILLS: Design Thinking Method; Main and Sub-questions; Design Research: Investigating through Doing

Software Reversing and Exploitation

Given the increased dependency on software in our lives and the ever-present misuse of security vulnerabilities in software by cyber attacks, this course's aims to provide a deep dive into the field of reverse engineering software to find and exploit security vulnerabilities. Students will review key research papers from the history of binary analysis and (automated) vulnerability discovery, up to the current state-of-the-art. The instructors of this course have a strong belief in learning by using a hands-on approach. Students will be provided with technical challenges to solve via online Capture the Flag education, during which students will evaluate tools and techniques actively used in the field. Students will also be provided with the opportunity to spend time on an individual learning track preparing for, or enroll in, a relevant (certification) program: OSCP/OSCE or pwn.college.

Software reversing and exploitation	
Credits	30 ECTS
Code	ITD-MINOR25-K94
Entry Requirements	This course is for students who are near the end of their bachelor education. Background knowledge in reading and writing software is preferred and students should expect a steep learning curve in analysing C code and Assembly language at the beginning of the course.
Semester	Spring Semester
Method	Hybrid lectures, lab assignments and personal project.
Lecture(s)	Mike Gilhespy (M.D.Gilhepsy@hhs.nl)

Learning outcomes	Given the increased dependency on software in our lives and the ever-present misuse of security vulnerabilities in software by cyber attacks, this course's aims to provide a deep dive into the field of reverse engineering software to find and exploit security vulnerabilities. The main focus of this course will be on binary analysis under both the Windows and Linux operating systems. Students will be trained on viewing security issues from an attacker's perspective to better understand what needs to be fixed and how.
Recommended or required reading/tools	Bring your own laptop (minimun 8GB RAM).
Assessment methods	(1) Presentation, participation and lab assignments minimum pass rate: satisfactory (2) Portfolio on write-ups (50%), minimum pass rate: 4.5 (3) Portfolio on learning track or project (50%), minimum pass rate: 4.5 Minimum pass rate course: 5.5 Assessment (1) will be throughout the course, based on the planning of the presentations. Assessment (2) and (3) will be at the end of the course.
Level	Undergraduate: fourth year
Location	Zoetermeer
Course content	In order to properly fix security vulnerabilities in applications, a good understanding is required on how the application's software works internally and how software interacts with its computer operating system. Students will be provided a deep dive into the theoretical background and will review key research papers from the history of binary analysis and (automated) vulnerability discovery, up to the current state-of-the-art. The instructors of this course have a strong belief in learning by using a hands-on approach. Students will be provided with technical challenges to solve via online Capture the Flag education, during which Students will evaluate tools and techniques actively used in the field. Students will also be provided with the opportunity to either choose to spend time on an individual learning track preparing for, or enroll in, a relevant (certification) program: OSCP/OSCE or pwn.college. They may also choose to spend time on a group project to work together in answering a course related research question. This course will be assessed via presentations and portfolio assignments in which students are required to provide write-ups on their approach and explain why related theory is important for their learning.

Photography in Focus/Basic Video Production

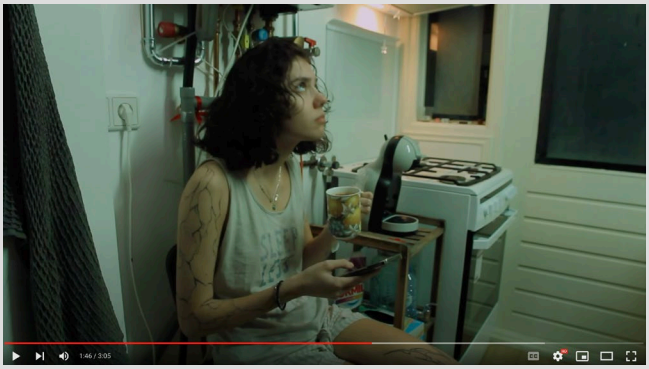
This minor offers an introduction to the world of visual communication, specifically the creation and processing of images; both still and moving.

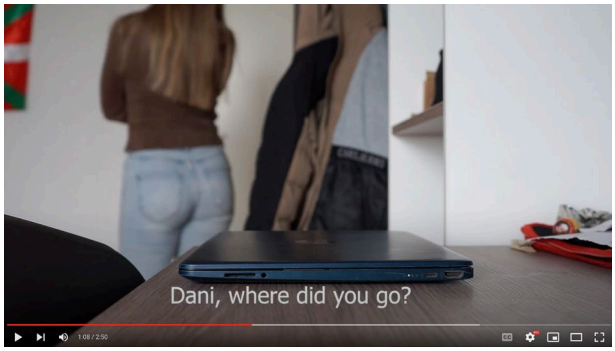
Learning 'to see' is key. The aim of this minor is that this leads to the production of meaningful images; images that shape the ideas of the maker. To achieve this, knowledge of photographic and film technique is necessary. This (basic) technique is discussed extensively in the minor. In addition to this practical knowledge, the minor focuses on photography from a historical and theoretical perspective.
After completing the minor, the student can independently communicate a message or short story effectively by means of images, supported by audio.

Photos: student Jordey Doevendans

Photography in Focus/Basic Video Production	
Credits	30 ECTS
Code	ITD-HMVT25-K96E
Entry Requirements	First year of bachelor's degree The student requires certain hardware and software and must be able to work independently.
Semester	Fall Semester
Method	Work forms: (Based on Blended Learning principles) Classroom instruction, group work, workshops, online consultation and homework assignments. Weekly 2 lectures and 1 workshop in the schedule.
Lecturer(s)	Leon Schröder (L.C.Schroder@hhs.nl)
Learning Outcomes	The following 4 competences are central to this minor. • Creative ability: the student develops the ability to produce solutions from various perspectives in the creation of still and moving images. • Capacity for critical reflection: the student can evaluate their own work and that of others. • Organizational ability: the student is able to organize internal and external factors for an effective and inspiring work and research process • Communicative ability: the student is able to present and justify their own work and development. These competences are practised in the various components and phases of the minor and are translated into the following learning objectives: • The student can translate an idea into a photographic image. • The student can effectively use different photographic (basic) techniques. • The student is aware of historical developments in photography and can analyze and comment on them. • The student can show their vision on contemporary expressions of photography or visual arts. • The student is able to execute image editing programs at a basic level; Apply Photoshop, InDesign, Lightroom and Premiere Pro in their work process. • The student can reflect orally and in writing on their development process.

	• The student is able to recognize different narrative forms. • The student can edit both image and sound in an editing program. • The student recognizes and uses different interview techniques. • The student knows the basic principles of visual language and knows how to apply these correctly in their own photo/video production. • The student can independently design and shape a video project. They choose the appropriate story form and techniques. • The student is able to complete assignments in time that meet the set substantive and formal criteria (photo book and video clips with a specified minimum size and format).
Recommended or required reading/tools	**Laptop, SSD and software:** The student must have a powerful laptop with a properly working version of Adobe CC (at least Lightroom Classic, Photoshop, InDesign and Premiere Pro). Furthermore, the laptop must have at least 100GB of free space and an external SSD of 500GB. **Camera:** a digital SLR or system camera that can make Full HD video recordings, preferably with an external microphone. **Tripod:** A sturdy tripod that reaches at least chest height.
Assessment methods	The student has completed the minor and is entitled to 30 credits if both parts of the minor have been completed satisfactorily. The assessment is divided into: **A. Photography** - 1. Practice (37% - minimum requirement 5.5) In week 8 it will be determined whether the student has passed or failed the digital elaboration of the practical assignments. If the assessment is satisfactory, the student can participate in the oral assessment in week 10. During this assessment, the student presents the assignments in a photo book. The mark is determined after the assessment by the practical teacher in consultation with the theory teacher. - 2. Theory (13%) The theory mark is determined on the basis of the average of the theory test (week 5) and the photo analysis during the assessment. Planning review Photography: Theory test: week 5 (Resit in week 20). Assessment: week 10 (Resit in week 20). **B. Videography** (50%) This part of the minor has three formative tests and an assessment. The student provides a final product for the assessment. The final mark is determined after the assessment, on the condition that all partial tests have been handed in and passed. Planning review Videography: Delivery partial tests weeks 13, 14 and 16. Assessment: week 20 (Resit in week +10)

	 Video: student Sofia Klimashevka
Level	Undergraduate
Location	The Hague
Course content	This minor consists of two parts: Photography and Videography. **Photography** This part of the minor is built around five practical and three theoretical assignments. On the basis of these assignments, the student investigates possibilities from a specific photographic angle. In 'Texture and Rhythm' the focus is on the interaction between light, depth of field and camera angle. 'Styling' is about designing an advertisement or film still. The assignment 'Light' explores how to create shapes and compositions with light and the naked human body. In 'Time' refers to making a series of images that have an action or change as a starting point. Finally, with 'Fascination', the student can design his own project. In the classes, the photographic technique, which is necessary to make the assignments, is discussed. In addition to this transfer of practical knowledge, progress in the execution of the assignments is made visible in a digital portfolio on Google Drive. Finally, the student presents all the practical assignments in the form of a photo book. The 'theory' lectures provide the student with the basic knowledge to get started with the assignments. The student learns to recognize and describe different genres, such as documentary photography and advertising photography, and develops an understanding of the historical development of photography. **Videography** This part of the minor focuses primarily on making video. Theory lessons support the creation of the videos. In theory classes, a variety of narrative forms in documentaries and interviews and the various story structures (chronological, use of flashbacks) are discussed. Attention is also paid to a number of important technical aspects such as light, frequencies, audio formats, codecs, resolution and frame rates, quit claims and copyright on images and music.

	 Video: student Ander Incera Eneriz

International Semester UXD: User Experience Design – Fall semester Year 1

This international 20-week semester covers the foundations of user experience design (UXD) and consists of several courses. The semester allows a maximum of six exchange students (in order of registration). Please find below an overview of courses in the semester.

Credits	30 ECTS
Code	The semester consists of the modules listed under “Course content”.
Entry requirements	**English level B2 or higher (mandatory), C1 recommended**
Semester	Fall Semester
Method	Mixed methods, varies per course.
Lecturer(s)	Contact person: Ruud Brok (r.j.f.brok@hhs.nl)
Learning outcomes	The student: - Understands different facets of UXD and is able to explain and assess the user experience of a digital product using UX terminology. - Is able to conduct a creative design process using the design thinking methodology. - Demonstrates curiosity, creativity, and bravery in design work and communication. - Is able to reflect on the impact of design on the intended user(s). - Demonstrates self-expressivity and professional attitude. There are more detailed learning outcomes per course module, which will be published in the corresponding study guides.
Recommended or required reading/tools	Bring your own laptop. It is required to obtain the license for Adobe Creative Cloud. Required books: - Hanington, B., Martin, B., *Universal Methods of Design, Expanded and Revised: 125 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions (Rockport Universal*. ISBN: 978-1631597480. Other tools and literature will be provided.
Assessment methods	UXD-RD-25: assignment, week 9 UXD-SC-25: assessment, week 7 UXD-IUX-1-16: assessment, week 8 UXD-DC-20: assignment, week 7 UXD-BTP-22: portfolio, week 17 UXD-P1-25: portfolio + assessment, week 18 + 19 UXD-PW-25: assignment, week 18
Level	Undergraduate: first year
Location	The Hague
Course content	**UXD-RD-25 Research for Design (5 ECTS)** UX designers are investigative designers. To have your curiosity effectively spark your inspiration and to make founded choices in your design processes you need to build an understanding of research and to develop your research skills. On this course, you learn basics of ethnographic observation and interview methods that aim at gaining empathy towards the people you are designing for. **UXD-SC-25 Design in a Connected World (3 ECTS)** The course focuses on fundamental professional skills, such as intercultural sensitivity, communication, and working in groups. You will construct an intercultural portfolio. Under this course, you will also participate in a community-building field trip. **UXD-IUX-1-16 Introduction to User Experience (3 ECTS)** You will gain insight into what User Experience is and what factors to take into account when creating a great User Experience. When defining User Experience, people tend to talk about three aspects: what experience is, the

quality of the experience and the design of experience. We find it important to define and teach all three. On this course, you will create a frame of reference on UX and its terminology and make a product review video.

UXD-DC-20 Design and Creativity (3 ECTS)
Creativity is a crucial ingredient of design. On this course, you learn about your own creativity and you are trained to further develop your creativity. Sketching is an important skill to enhance creativity and to cooperate with others in design processes. On this course you familiarize yourself with design skills such as exploring solution spaces and generating ideas in visual ways. You learn about design processes (iteration, diverge/converge), and you practice various related skills for ideation. You will try out different creative techniques and you will experiment with different visual techniques.

UXD-BTP-22 Building and Testing Prototypes (5 ECTS)
The course Building & Testing Prototypes focuses on becoming familiar with a variety of prototyping techniques on the one hand, and a selection of testing and evaluation methods on the other hand. You will do this by completing a series of short assignments, spread over 4 design challenges. For each assignment you will have to build a simple prototype using different prototyping techniques each time. After this, your prototypes have to be tested using a variety of testing and evaluation methods. You need to prepare and execute a small test cycle, collect results and interpret them.

UXD-P1-25 Project Bespoke Design (6 ECTS)
Bespoke: made specially, according to the needs of an individual customer (Oxford Advanced Learner's Dictionary). When we talk about Bespoke Design we mean design that fits the needs, personality, lifestyle, and context of a user, and using empathy to understand what this user wants and needs. This is the first of three projects in the first year. Designing for one particular user with a specific cultural background, will give you an understanding of how people experience things and how technology can play a role in people’s daily lives. It will also allow you to go through all phases of the Design Thinking process using the knowledge gained in previous courses.

UXD-PW-25 Publishing for Web (5 ECTS)
In Publishing for Web, we are introducing the interrelation of designing User Interfaces and basic programming skills in HTML & CSS. In this course, you will explore the concept of User Interface design from various angles, both conventional and non-conformist frameworks. By learning the basics of web design and exploring visual possibilities, you will create a hand-made webzine. The webzine is a web browser-based publication that contains mediums such as text, images, videos, sounds, etc. ‘Zine’ refers to a magazine, usually produced by amateurs, for fans of a particular topic, group, or form of entertainment. The content of the zine can be personal, short story, material, sentimental, etc.

International Semester UXD: User Experience Design - Spring semester Year 2

This international 20-week semester expands the skillset of User Experience Design (UXD). The main project is a group project with assignments given by partners in the professional field. There is also space for individual side-projects and for exploring personal interests in the wider range of design practice. The semester allows a maximum of six exchange students (in order of registration). Please find below an overview of courses in the semester.

International Semester UXD	
Credits	30 ECTS
Code	The semester consists of the modules listed under “Course content”.
Entry requirements	**English level B2 or higher (mandatory), C1 recommended**
Semester	Spring Semester
Method	Mixed methods, varies per course.
Lecturer(s)	Contact person: Ruud Brok (r.j.f.brok@hhs.nl)
Recommended or required reading/tools	Bring your own laptop. It is required to obtain the license for Adobe Creative Cloud. Required books: - Hanington, B., Martin, B., *Universal Methods of Design, Expanded and Revised: 125 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions (Rockport Universal*. ISBN: 978-1631597480. Other tools and literature will be provided.
Assessment methods	UXD-HCI: individual portfolio UXD-PS1: assessment UXD-RTB: oral exam UXD-UXB: assignment (pitch) and written exam UXD-XLA: individual portfolio
Level	Undergraduate: 2nd year
Location	The Hague
Course content	**UXD-HCI-25 (6 ECTS)** In this course you learn to research and use Human Computer Interaction Technologies to come up with interactive concepts. In this course, not the user, but the technology is the starting point. You will research new interactive technologies and technological applications, such as mixed, augmented and virtual reality, wearables, artificial creatures, and playful interaction. These technologies play a major role in the development of physical computing, virtual worlds, intelligent machines, and other innovative applications. You will research, tinker, experiment and create. Together we will explore the exciting new possibilities of Human Computer Interaction Technologies. **UXD-PS1-1-17 Project Studio (12 ECTS)** In this module students explore user experience design beyond single-user interfaces. Within the theme of "shared spaces" students will gain knowledge on where people and technology intersect and interact in confined public- and private spaces. Inspired by this knowledge and their own research they will design for an interactive space. This course covers the following topics:

	• Private and public spaces as an interactive, social environment • Private and public spaces as an interactive, commercial environment • Private and public spaces as an interface • Technology for spaces • The internet of things • Data flows and data visualisation for shared spaces • Service design; interacting with a system through multiple touchpoints **UXD-RTB-24 Research Toolbox (3 ECTS)** Designers must know how to choose and use the right research tools and methods. They develop their individual 'toolbox': a range of practical and conceptual tools, shaped by personal preference, by the type of projects they encounter, by company contexts, and by current developments in the field. They often need to adopt new methods (e.g. with new technologies, with new theoretical insights) and to adapt methods to fit with specific, often unexpected situations. In this course you will encounter a variety of research methods and experiment with a couple of them. You will combine methods to come up with research plans for different kind of projects and situations. **UXD-UXB-25 UX in Business (3 ECTS)** Designers operate in a constantly changing world. To prepare them for this, they must not only learn design, but also get to know the world around them. Different organisation types they work in and how that will affect their work. Team structures and project methods and how they play a major role. And the business models that drive these organisations. In this course you will set up your own company in group and come up with an innovative idea. Not only designing it, but making a business model for it. Further more you will learn about what it is to be a designer in the 'real world'. **UXD-XLA-1-17 Experience Lab a (6 ECTS)** In Experience Lab, students specialize and craft a personal profile as a designer by gaining experience working with a plethora of clients / stakeholders. The Experience Lab provides room for students to experiment, take risks and fail. Experience Lab also provides students with opportunities to excel and build on their strengths. The Experience Lab is not about creating a showcase, but about drawing learnings from experiences. Based on these experiences, students will be able to articulate what kind of UX designers they are. The course changes each year to stay up to date with developments in the field. See the latest study guide for course setup and assessment criteria.

Internship/practical training at Digital Design Agency New Designers

In-house student-run learning company New Designers at THUAS provides you with hands-on experience by working in a real design studio. This physical space fosters learning through doing, allowing you to co-create solutions for a variety of projects for real clients, while being encouraged to make mistakes. It is almost entirely student-run, with over 20 students from UX design, ICT, and related fields, supported by a small team of lecturers and professionals.

Are you looking for your next challenge? During an internship at New Designers, you have a unique opportunity to work on your competences in a realistic work environment. The main goal is to get a real live experience as for most students it is the first moment they can experience how it is to work as a professional in the field.

Please, take into account that there is a **selection process** for a spot at New Designers.

Internship at New Designers	
Credits	30 ECTS
Code	CMD-IN
Entry Requirements	The internship is available for undergraduate students who have finished their first and preferably their second year of studies in digital design, IT or another study program that would fit a digital agency. There is an application process for which you are required to send your motivational letter and a cv. In this letter you explain your motivation and show your suitability. Also address the competencies you would like to work on during your internship/practical training. Please, send your letter and cv to the coordinators (see below). If the coordinators think there could be a match, you will be invited for an (online) interview. The coordinators will select the student(s) who fit best.
Semester	Fall & Spring Semester
Method	The internship takes 20 weeks, and you will work around 640 hours at the company. Remuneration might be available.
Coordinator(s)	Stephanie van der Meer & Louise Roose. E-mail: newdesigners@hhs.nl. Also check New Designers' website for more information.
Learning outcomes	After successfully completing your internship, you will be able to: • Work as a junior UX designer or junior IT'er, • Know what the competences for your field entail, • Know how cooperation is managed within a company, • Critically reflect on products delivered. The learning objectives are derived from the competencies decided on together with your mentor and possibly your home university.

Recommended or required reading/tools	The agency appoints a company mentor to you. This mentor has a university degree (in a UX or IT related field) and has years of experience in UX design or IT and/or research.
Assessment methods	At the end of the internship, you will deliver a portfolio with the products you have worked on, including a reflection on the work delivered and the competences learned/improved. You will deliver this portfolio in the last week of your internship, and it will be graded by two assessors, your internship supervisor and a second assessor.
Criteria portfolio	• The student can describe the competences in their own words and referring to assignment the company executes. • The student can illustrate their execution of the competences based on the tasks executed. • The student can describe what one has learned in executing the competences. • The student can show that working on these competences was a major part of their internship (by explanation and deliverables).
Location	The Hague
Course content	The activities fit with a second/third-year bachelor level, so you do not have too many responsibilities right away, but with enough challenge for you to learn new skills or improve on existing ones. Since we are a university of applied sciences there should be a focus on the application of knowledge and skills (that fit with the competences). Please, check the website for projects students have been working on. Examples of possible activities for a UXD-student • Act as assistant researcher in user research • Carry out basic interviewing and observation tasks in user research • Do an analysis/synthesis of qualitative research data • Perform basic desk research and/or basic design ethnography • Apply creativity techniques (such as brainstorming) • Make visualizations that communicate ideas and concepts • Write user needs and -stories based on research data and insights • Do task analysis to better understand existing systems • Perform user trialing • Draw up sitemaps and flowcharts and sketch wireframes • Make prototypes in Figma or Adobe XD • Do an expert review on the usability of an existing website • Make visual designs for a user interface using interaction design patterns
Level	Undergraduate