Course Catalogue Engineering and ICT

EXCHANGE PROGRAMME

All-round Designer 2024-2025

University of Applied Sciences Windesheim

Course summary

VOE Code: EDPADENG.24 ECTS credits: 20 Level: Bachelor's degree (full-time)

Course Title	Project All-round Designer: Engineering
Type	Compulsory
Learning competences	BoE1 Analysing BoE2 Designing BoE3 Realise BoE4 Manage BoE5 Managing BoE6 Advise BoE7 Research BoE8 Professionalise
Learning outcomes	The objective of this project is to have the students execute as independently as possible a full scale design process in order to prepare them further for their professional situation. When you successfully complete this project: • You will be able to demonstrate more in-depth knowledge and experience in designing a product in the line of the IPO curriculum paths "Working" and "Making" – which means there will be an emphasis on the technical aspects of industrial design. • You can successfully apply biomimicry input in the design process, according to the biomimicry design process steps (www.biomimicry.org): Define, Identify Functions, Translate, Discover, Abstract, Brainstorm, Emulate, Measure and Engineering. You will be able to apply advanced design skills when creating products, with an emphasis on technical details and innovative solutions that align with this biomimicry design process. *Learning outcomes of the specific courses in the MAD Engineering minor:* **Biomimicry:** see second item above. You independently apply a defensible application of biomimicry in the product design according to the method explained in the lectures of the classes 'biomimicry'. This application is included in a process report. **Functional testing:** You independently conduct functional tests in the course of the project, in a systematic way according to the learned methods in the lectures 'research basics' and 'functional testing'. You report on a test plan in a process report with the following structure in: • Context description, why these researches? • Research questions; • Research methods; • Results and consequences for the project. **Factory excursions & Design Rules:** You organize independently at least 1 excursion to a company, which is relevant for the project in regard to production design rules. The student reports on this excursion in a process report according to the following structure: • Context description, why these visits? • Research questions • Research methods • Results and consequences for the project, what design rules did you find? You distil your own set of design rules based on the company visit(s) and based on design rules from different sources. You present these design rules to your peers in a presentation. You demonstrate that you designed the product according to these design rules in a process report. **Mechanical strength analysis:** You analyze a crucial technical element of a design and perform a FEM-simulation (e.g. with SolidWorks) on this part. On the basis of mechanical calculations (e.g. in Excel with help of Visual Basic) you verify the results of the simulation in a technical design report, in which you document an advice on dimensions, loads, materials and other technical aspects in order to ensure the safety of the elements.

Course content	The project focuses on the working and the making of a product. Subjects that are part of the process are; • Biomimicry • Functional testing • Factory excursions (self organised) and design rules of production techniques • Mechanical strength analysis		
Planned learning activities and teaching methods	Project activities, lectures and workshops.		
Recommended or required reading and other learning resources / tools	Everything that is needed for the project and that can be made available.		
Prerequisites and co-requisites	You are required to have two years of Bachelor's study experience in a relevant field (e.g. Bachelor's degree in Engineering or Business) and English-language skills at B2 level.		
Level	Bachelor = NLQF 6		
Grading scale	1 up to 10, 1 dec.		
Assessment methods and criteria	**Type of assessment**	**Grade weighting**	**Criteria**
	P1 Project Allround Designer Engineering: Project Grading	1	Higher or equal to 5.5
	P2 Project Allround Designer Engineering: Biomimicry	0	Higher or equal to 5.5
	P3 Project Allround Designer Engineering: Functional testing	0	Higher or equal to 5.5
	P4 Project Allround Designer Engineering: Excursions & Design rules	0	Higher or equal to 5.5
	P5 Project Allround Designer Engineering: Mechanical Strength Analysis	0	Higher or equal to 5.5
Language of Instruction	English		
Name of lecturer	For information about the lecturers you can contact Martijn Verkuijl		
Mode of delivery	Face to face		

Course summary

VOE Code: EDPADPE.24 ECTS credits: 20 Level: Bachelor's degree (full-time)

Course Title	Project Allround Designer: Product Experience
Type	Compulsory
Learning competences	BoE1 Analysing BoE2 Designing BoE3 Realise BoE4 Manage BoE5 Managing BoE6 Advise BoE7 Research BoE8 Professionalise
Learning outcomes	**1. Integrated Analysis and Design**: • Students can demonstrate advanced analytical skills by critically examining relevant psychological and cultural aspects associated with a product or situation.

<table>
<tr><td></td><td colspan="3">

They can translate insights into robust semantic design guidelines, showcasing a deep understanding of the science of meaning construction and communication.

2. Experiential Testing and Research Skills :

Students can execute experiential testing and prototyping methodologies to evaluate consumer experience and product context, displaying practical application of knowledge.
They can conduct a comprehensive design research process, integrating findings to refine designs and demonstrating a nuanced understanding of the impact of meaning in constructing and communicating user experiences.

3. Professional Presentation :

Students can present their final project results effectively through visual and oral means, supported by a prototype, presentation poster, and design report.

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<tr><td>Course content</td><td colspan="3">The project focuses on product experience.
Subjects that are part of the process are;

Consumer Experience
Meaningful Design
Design Research
Product Context

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<tr><td>Planned learning activities and teaching methods</td><td colspan="3">Project activities, lectures and workshops.</td></tr>
<tr><td>Recommended or required reading and other learning resources / tools</td><td colspan="3">Everything that is needed for the project and that can be made available.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">You are required to have two years of Bachelor’s study experience in a relevant field (e.g. Bachelor’s degree in Engineering or Business) and English-language skills at B2 level.</td></tr>
<tr><td>Level</td><td colspan="3">Bachelor = NLQF 6</td></tr>
<tr><td>Grading scale</td><td colspan="3">1 up to 10, 1 dec.</td></tr>
<tr><td rowspan="6">Assessment methods and criteria</td><td>Type of assessment</td><td>Grade weighting</td><td>Criteria</td></tr>
<tr><td>P1 Project Allround Designer product experience: Project Grading</td><td>1</td><td>Higher or equal to 5.5</td></tr>
<tr><td>P2 Project Allround Designer product experience: Consumer Experience</td><td>0</td><td>Higher or equal to 5.5</td></tr>
<tr><td>P3 Project Allround Designer product experience: Product Research</td><td>0</td><td>Higher or equal to 5.5</td></tr>
<tr><td>P4 Project Allround Designer product experience: Meaningful Design</td><td>0</td><td>Higher or equal to 5.5</td></tr>
<tr><td>P5 Project Allround Designer product experience: Product Context</td><td>0</td><td>Higher or equal to 5.5</td></tr>
<tr><td>Language of Instruction</td><td colspan="3">English</td></tr>
<tr><td>Name of lecturer</td><td colspan="3">For information about the lecturers you can contact Martijn Verkuijl</td></tr>
<tr><td>Mode of delivery</td><td colspan="3">Face to face</td></tr>
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Course summary

VOE Code: EDPADI.24 ECTS credits: 20 Level: Bachelor’s degree (full-time)

Course Title	Project Allround Designer: Innovation
Type	Compulsory

<table>
<tr><td>Learning competences</td><td colspan="3">BoE1 Analysing
BoE2 Designing
BoE3 Realise
BoE4 Manage
BoE5 Managing
BoE6 Advise
BoE7 Research
BoE8 Professionalise</td></tr>
<tr><td>Learning outcomes</td><td colspan="3">1. Context Discovery. The students receives an assignment from the client. By critical evaluation and independently analyzing the context of the business and the business itself, they find opportunities for innovation. The students use knowledge of context mapping and use expert coaching to create ideas for new offerings which suit the client's business ideology.
2. Empirical Market Research. The students validate the problem, the solution and the market in an empirical way. By creating experiments, executing them, and observing the behavior of target groups. Therefore, the students use/analyse/evaluate knowledge and skills on empirical market research. They create 3 solutions directions for product design.
3. Concept Design. The students use gathered information from the stages context discovery and empirical market research to create concepts (groups) filling the gaps for wanted solutions. They use knowledge and skills on industrial product design to create concepts for new offerings and show multiple iterations. Including validation of desirability through use of design thinking and technical feasibility through experimental prototyping.
4. Scaling up. The students translate the designed concepts into (a) business case(s) with a brief on people, strategy, execution and cash. They use knowledge and skills on business: organization, commerce, planning and microeconomics. They inform the client how to proceed through use of a one/two-pager, financial plan, 3-minute pitch and visual storyboard.</td></tr>
<tr><td>Course content</td><td colspan="3">The project focuses on Innovation development.
Subjects that are part of the process are:
• Context Mapping
• Visual Translation
• Proposition Development
• Design Thinking
• Business Case</td></tr>
<tr><td>Planned learning activities and teaching methods</td><td colspan="3">Project activities, lectures and workshops.</td></tr>
<tr><td>Recommended or required reading and other learning resources / tools</td><td colspan="3">(). Blue Ocean Strategy. (2022, December 9). Four Actions Framework: Reconstruct Buyer Value | Blue Ocean Strategy Tools & Frameworks. https://www.blueoceanstrategy.com/tools/four-actionsframework/. :</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">You are required to have two years of Bachelor’s study experience in a relevant field (e.g. Bachelor’s degree in Engineering or Business), business related study experience and English-language skills at B2 level.</td></tr>
<tr><td>Level</td><td colspan="3">Bachelor = NLQF 6</td></tr>
<tr><td>Grading scale</td><td colspan="3">1 up to 10, 1 dec.</td></tr>
<tr><td rowspan="3">Assessment methods and criteria</td><td>Type of assessment</td><td>Grade weighting</td><td>Criteria</td></tr>
<tr><td>P1 Project Allround Designer Innovation</td><td>1</td><td>Higher or equal to 5.5</td></tr>
<tr><td>P2 Project Allround Designer Innovation: Innovation Development Tools</td><td>0</td><td>Higher or equal to 5.5</td></tr>
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Language of Instruction	English
Name of lecturer	For information about the lecturers you can contact Martijn Verkuijl
Mode of delivery	Face to face

Course summary

VOE Code: EDMOD1.24 ECTS credits: 5 Level: Bachelor's degree (full-time)

Course Title	Module 1 (Workshop International Week, Professional Life, Open Subject Module 1)
Type	Compulsory
Learning competences	
Learning outcomes	**Learning outcomes Workshop International Week:** 1. The student will be able to collaborate with people from other cultural identities. 2. The student will be able to design for a client, will show understanding the clients needs for this assignment and will connect to a specific target group of the shop. 3. The student will be able to use a specific inspiration source as a starting point for designing a product and thus design an inspiring product for the ANNO Museum shop. **Learning outcomes Professional Life:** • The student shows that he/she has a good overview of the job opportunities for recent graduates in the current field of work. The student can proactively explore these options and make choices that match his/her professional identity. • The student shows that he/she is aware of his/her personal competences and talents and the student is able to communicate this professional identity in a convincing way. • The student is able to estimate the financial aspects of a design project and draw up a project quotation based on this. **Learning outcomes Open Subject Module 1:** The students is free to choose an activity or subject that fits/is relevant to the general purpose of the minor Allround Designer. The choice of the student must be approved by the minor coach. Free project or subject. Students have a free choice as long as the topic is related to the Minor Allround Designer. The students make a proposal which must be approved by the coach. No past activities are allowed. Hobby projects are excluded.
Course content	**Workshop International Week:** During the module International week, you will undertake a real life, one week, project together with other international students. The objective is to create a tangible project result in a very short time in an international context. Your project is assigned by an external client. Generally this project will be more in the conceptual phase of a product development project. **Professional Life:** The module Professional Life provides all the tools you need to successfully start your career. Besides learning how to create, check and enhance your portfolio and using social media professionally, you will also learn about the ins and outs of running a small business. Topics covered include: • The design office • A professional LinkedIn page • Your portfolio • Choosing a job • Applying for a job • Pitching • Meeting alumni • Protecting your ideas • Networking

	• Website setup • Start-up subsidies **Open Subject Module 1:** For the Open subject you are free to choose an activity or subject that is relevant to the general purpose of the exchange programme All-round Designer. Your choice must be approved by the programme coordinator. Hobby projects are excluded.
Planned learning activities and teaching methods	Project activities, lectures. lessons, coaching and workshops.
Recommended or required reading and other learning resources / tools	
Prerequisites and co-requisites	You are required to have two years of Bachelor's study experience in a relevant field (e.g. Bachelor's degree in Engineering or Business) and English-language skills at B2 level.
Level	Advanced
Grading scale	1 up to 10, 1 dec.

Assessment methods and criteria	**Type of assessment**	**Grade weighting**	**Criteria**
	P1: Module 1 Workshop International Week	1	Higher or equal to 5.5
	P2: Module 1 Professional Life	1	Higher or equal to 5.5
	P3: Module 1 Open Subject	0	Higher or equal to 5.5

Language of Instruction	English
Name of lecturer	For information about the lecturers you can contact Martijn Verkuijl
Mode of delivery	Face to face

Course summary

VOE Code: EDMOD2.24 ECTS credits: 5 Level: Bachelor's degree (full-time)

Course Title	Module 2 (Designing Interactive Products, Open Subject Module 2)
Type	Compulsory
Learning competences	
Learning outcomes	**Learning outcomes Designing Interactive Products:** Technology is increasingly integrated in everyday products. Interacting with products often includes interacting with technology. It is therefore important for the designers of such products that they are familiar with these technologies and that they can design and prototype interactive products. Moreover, the interaction with products greatly influences the way users experience the product. Students that finish this course show they can design and prototype experience-based interactive products. 1. The student understands how interaction design affects how users experience a product and demonstrates this in the design of user-product interactions that suit the desired product experience. 2. The student prototypes an interactive product using at least an Arduino, a sensor and an actuator. 3. The student gathers online information on relevant examples, software and hardware, and integrates/translates this to his/her own application. **Learning outcomes Open Subject Module 2:** The students is free to choose an activity or subject that fits/is relevant to the general purpose of the minor All-round Designer. The choice of the student must be approved by the

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<tr><td></td><td colspan="3">minor coach. Free project or subject. Students have a free choice as long as the topic is related to the Minor All-round Designer. The students make a proposal which must be approved by the coach.

No past activities are allowed. Hobby projects are excluded.</td></tr>
<tr><td>Course content</td><td colspan="3">Designing Interactive Products:
In Designing Interactive Products you will create your own interactive prototype! In order to do so, you will acquire the tools, knowledge and skills for designing and prototyping interactive products. We will cover subjects such as:
User-product interaction / Interaction Design
User experience
Sensors and actuators
Programming Arduino
Prototyping
Open Subject Module 2:
For the Open subject you are free to choose an activity or subject that is relevant to the general purpose of the exchange programme All-round Designer. Your choice must be approved by the programme coordinator. Hobby projects are excluded.</td></tr>
<tr><td>Planned learning activities and teaching methods</td><td colspan="3">Lessons, workshops and coaching.</td></tr>
<tr><td>Recommended or required reading and other learning resources / tools</td><td colspan="3"></td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">You are required to have two years of Bachelor’s study experience in a relevant field (e.g. Bachelor’s degree in Engineering or Business) and English-language skills at B2 level.</td></tr>
<tr><td>Level</td><td colspan="3">Advanced</td></tr>
<tr><td>Grading scale</td><td colspan="3">1 up to 10, 1 dec.</td></tr>
<tr><td rowspan="3">Assessment methods and criteria</td><td>Type of assessment</td><td>Grade weighting</td><td>Criteria</td></tr>
<tr><td>P1 Module 2 Designing Interactive Products</td><td>1</td><td>Higher or equal to 5.5</td></tr>
<tr><td>P1 Module 2 Open Subject</td><td>0</td><td>Higher or equal to 5.5</td></tr>
<tr><td>Language of Instruction</td><td colspan="3">English</td></tr>
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