Course offer
Information & Communication
Technology

Fall semester 2021-2022

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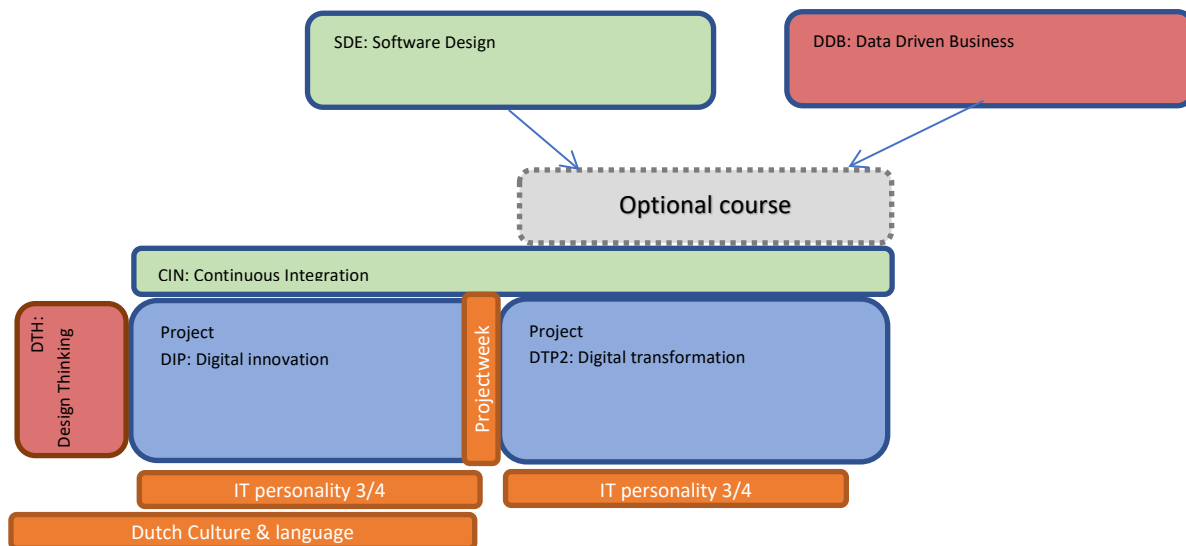**HZ UNIVERSITY**
OF APPLIED SCIENCES

INFORMATION & COMMUNICATION TECHNOLOGY

Information and Communication Technology (ICT) focuses on a hands-on approach with real-life casus to Software engineering, Digital innovation, Business IT Consulting and Data Science. You will learn how to come up with new digital solutions for real company problems. You will develop solutions and explain the technology. We welcome exchange students in our fall or/and spring semester.

COURSE OFFER FALL SEMESTER 2021-2022

In the fall semester the ICT program for incoming exchange students like you, consists of one information technology package with some mandatory courses and some optional courses. We call this IT Package 1. IT package 1 consists of courses mainly taken by regular 2nd year students of the ICT program. Students who need less than 30EC can drop courses.

For a brief overview see to the next page. For detailed course descriptions see to subsequent pages.

SDE: Software Design		DDB: Data Driven Business

Optional course

CIN: Continuous Integration

| DTH: Design Thinking | Project DIP: Digital innovation | Projectweek | Project DTP2: Digital transformation |

IT personality 3/4   IT personality 3/4

Dutch Culture & language

COURSES ESPECIALLY FOR EXCHANGE STUDENTS

- **CU34638**   **Dutch Culture & Language**   2 ECTS
  This class helps you to become known in basic Dutch and introduces you to Dutch culture and history.

TIMELINE OF HZ UAS ICT COURSES AND TESTS

Under Dutch law, every student is entitled to one resit per test per year. It is of crucial importance that you do not book your travels home before the resit-opportunity. Test dates are usually known three to four weeks in advance. Test weeks however are already known now. For a full overview of class weeks see page 9.

- Introduction week: from Monday 30 August
- First classes: from Monday 6 September
- Christmas break: expect your last classes to be on the 24th of December and the first on the 10th of January.

- Test periods: from the 1st – 13th of November and from the 17th January – the 4th of February.

YOUR CONTACT PERSONS AT HZ

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IT PACKAGE 1

Course code	Course name	ECTS	Quarter	Year of HZ ICT Curriculum
CU75019	Design Thinking	2,5	1	2
CU75016	Digital innovation project	7,5	1	2
CU	Continuous integration	5	1+2	2
CU	Digital transformation project	5	2	2
	Total	20		
Optional courses to choose from				
CU75020	Software Design	5	2	2
CU	Data driven business	5	2	2
CU34638	Dutch Culture & Language	2	1	2
CU	IT personality 3	1,25	1 or 2	2
CU	IT personality 4	1,25	1 or 2	2
CU34573	Personality Project Week2	1,25	1	2
	Total	15,75		

COURSE DESCRIPTIONS – IT PACKAGE 1

Overall study package description

Semester 1 of year 2 is devoted to a project in which students are asked to solve a problem for a client with an innovative idea. The problems require an innovative approach to the context in which the problem lies. Usually a standard solution is not available, or does not meet expectations, is too expensive, etc. In accordance with Design thinking, students set to work to find a suitable solution and then the students realize it, taking various aspects into account.

Requirements before start. Students know object oriented programming and can realize software components through programming.

CU75019 Design Thinking

Enterprises are faced with challenges related to environmental and social sustainability. For some, issues like worker satisfaction, alternative supply chains and mitigating the effect of climate change are business opportunities. Others need to find ways to change the way in which they do business to align with the Sustainable Development Goals of the UN. In this course, current issues related to sustainability are addressed. You will be presented with tools you can use to be a change agent for sustainable business or, at least, to address the most important issued in an intelligent way.

Final test will be a portfolio & presentation

Learning outcomes the student will work on:

4.1H	You can develop empathy for all parties involved in a complex problem
4.1I	You can define a problem through an analysis of all available data
4.1J	You can genenerate a lot of (innovative) ideas for a defined problem
4.1K	You can make a prototype of an chosen idea.
4.1L	You can carry out tests based on the prototype and thus generate new insights.

CU75016 Continuous Integration

Students will develop a thorough understanding of a version control system (VCS) and learn strategies to incorporate a VCS in effective team collaboration. Setup a complete CI pipeline with an automated build for a given project. Add tests and metric tools like code coverage to control the software quality. Course will be based on several deliverables. The course planning is based on different types of releases. Improved by feedback, each deliverable will be part of the final portfolio.

Final test will be a portfolio based assessment

Learning outcomes the student will work on:

4.5F	Master the advanced features of the distributed version control system (DVCS) Git to enable effective collaboration on a software project.
4.5G	Achieve manageability of your software project releases by choosing a branching model and corresponding workflow.
4.5H	Design a deployment pipeline that runs an existing open source software application and generates an automatic build.
4.5I	Proof your solution by performing a complete release from a change in code that generates corresponding executables executing all the steps of a release management cycle.
4.5J	Guarantee software quality by enabling quality tools and executing unit tests.

CUxxxx Digital Innovation project (new course, number will be added before May)

This project is focused on digital innovation. With the end result of the design sprint student teams will work on delivering the IT solution they come up with for the clients. During Sprint 0 the students will build the project structure. Deliverables are epics, user stories, definition of done and the backlog. Students will verify all these deliverables with the stakeholders and discuss the impact and technologies proposed. This process will lead to modified user stories and priorities. Student learns to clearly draw up structured (functional) specifications. This methodology is focused on an agile approach.

During the following sprints student will develop their project as a team in an Agile way. Gathering feedback to improve as a team and as an individual. This feedback can be used for the course professional skills [Medior]. Student will use a number of different methods to verify their ideas with the stakeholders. Students will verify the user stories in x from y ways. Verification will be a continuous process.

The focus of this project is on digital innovation for the stakeholders. Students work agile, report progress, improve their effectiveness in their team and deliver a suitable solution to the clients. During the project they continuously evaluate their progress and report that to the stakeholders and study coach.

Students will deliver their solution as a product demo. Furthermore they deliver a final innovation clip (video) students will address the technological innovations they used or researched and they also share this in a presentation in a technical knowledge session.

During this course some theory will be tested through the online learning environment. Students have to pass 70% of these quizzes before taking their final assessment.

The deliverables can be improved by the feedback received in the sprint delivery's. The final portfolio consists of the deliverables and the end result, and is delivered through a presentation followed by an optional assessment and counts for 60% for the final grade

The knowledge clip and the demo are both 20% of the final grade.

During sprints 1 and 2 the student are introduced to the theory of User experience (UX) principles, this is the basis for the deliverables in the innovation and transformation project.

Learning outcomes the student will work on:

1.1A	You can define important consequences for the UX based on the characteristics of a target group
1.3F	You can take into account suitable design guidelines in UX
1.3G	You can take into account human factors in UX
1.3H	You can take into account emotional design in UX
4.2F	You can solve a problem occurring in the market and involve the right stakeholders.
4.2G	you generate new insights by translating a solution into an MVP, test it, and analyse the metrics (results)
4.2I	you make a first overview of a business model.
4.2J	you describe the needs of the users of the software system to be developed.
4.2K	you draw up a functional design for a complex part of a software system
4.2M	you demonstrate the success of the solution in an organized way through metrics developed
7.5C	as a team you can deep dive in a new innovative technique/technology. Gaining knew knowledge by researching the way that is works and validate it by using an expert and reliable scientific resources.
7.3Q	as a team you can communicate your research in an organized way, appropriate for the audience.
7.3R	Students are able to deliver a solid product demonstration to the stakeholders in which they demonstrate the product and address the main challenges and present a realistic roadmap.
7.3P	Students can present their project, the content of their portfolio and their process considerations in a sound way making plausible the equal contribution of each project member to the project.

CUXXXX Digital transformation project (new course, number will be added before May)

Continuing the project from block 5 students work agile, report progress, improve their effectiveness in their team and deliver a suitable solution to the clients. During the project they continuously evaluate their progress and report that to the stakeholders and study coach.

Student develop their solution with a special focus on the impact of their solution on the stakeholders company or process. Students will deliver their solution as a product demo including the transfer. In their final presentation students will address the impact their solution has. Deliverables are reported in a professional portfolio.

Final product will be graded by innovativeness, appropriateness, progress, quality and transfer to the client. The students are introduced to the User experience (UX) principles and learns to apply them correctly within their project. Students make up a UX improvement report in which they demonstrate that they can improve the user experience of their projects by analysing the project, making a test plan, testing, evaluating and improvements. The deliverance of the test plan is supplemented with a demo of the UX test technique used. (can be a video or life demo)

During this course some theory will be tested through the online learning environment. Students have to pass 70% of these quizzes before taking their final assessment.

The final portfolio consists of the deliverables and the end result, and is delivered through a presentation followed by an optional assessment and counts for 80% of the final grade

The demo presentation is 20% of the final grade.

1.2A	You can formulate a suitable UX research approach
1.3F	You can take into account suitable design guidelines in UX
1.3G	You can take into account human factors in UX
1.3H	You can take into account emotional design in UX
1.3I	You can test and improve a your digital solution on UX aspects
1.3J	You can design a testplan report your digital UX solution
4.2J	you describe the needs of the users of the software system to be developed.
4.2K	you draw up a functional design for a complex part of a software system
4.2N	you write a report that can be transferred to third parties
4.2L	you determine the quality of the design, for example through testing or prototyping, taking into account the formulated quality characteristics (ISO 25010)
7.3Q	as a team you can communicate your research in an organized way, appropriate for the audience.
7.3R	Students are able to deliver a solid product demonstration to the stakeholders in which they demonstrate the product and address the main challenges and present a realistic roadmap.
7.3P	Students can present their project, the content of their portfolio and their process considerations in a sound way making plausible the equal contribution of each project member to the project.

Optional courses

CU 75020 Software design

Make software robust! Learn how to detect weak spots in programming code (code smells) and how to solve them (refactoring) with proven solutions like design patterns. Student will learn to Detect design patterns with a tool in an open source software system and will report the result (including class diagram) in a short report. Student will learn to apply refactorings in an open source software system and report their findings and opinion in a blog. Students will Create in pairs a working program that houses multiple design patterns. The report counts for 30%, the blog for 30% and the program for 40%.

Learning outcomes the student will work on:

4.3J	Indicate for a given code example/class diagram which design patterns were applied. [B5]
4.3K	Apply a suitable design pattern for a given situation and work it out in both a class diagram and actual code. [B5]
4.3L	Recognise weak points in code, so-called code smells, and apply an appropriate standardised remedy, so-called refactoring. [B5]

CUxxxx Data Driven business (new course, number will be added before May)

Introduction in "how to become a data driven organization". Students will learn the definition of Data Driven business and why companies want or need to change their business. Students are given tools to determine which companies are data driven. Furthermore they will have understanding in what is needed for companies to become data driven. Additionally, from a maturity point of view, students will be introduced to an exemplary roadmap in which a company may become data driven. In addition, students are given insight in flaws, failures & don'ts becoming data driven. All aspects of the courses will be backed by reallife cases, so far as possible. Lastly the connection to Data Strategy will be explained, so ensure students understand what the end-goals may look like in a broader overview. Students will work in groups of 3 or 4 (depends on the number of students starting the course). Final test will be a report and presentation.

Learning outcomes the student will work on:

2.1K	Students are capable of understanding the need for business to embrace data and can report what their maturity in this field is
2.4E	Students understands how a company's data maturity fits in a broader context of data strategy and therefore they can advise about the future perspective of data driven business.

CUxxxx IT Personality 3 and or 4 (new course, number will be added before May)

IT Personality content is based on the HZ-wide programme HZ personality that stimulates the skills concerning and attitudes towards personal development and personal leadership. The programme can either have a broadening or a deepening focus when it comes to the curriculum.
A prerequisite for starting the HZ Personality related activities is having obtained a GO from one of the IT personality coordinators. The assessment criteria and assessment process are listed in the HZ Personality 2021-2022 instruction manual which can be found on the Learn page. Final test will be a portfolio.

Learning outcomes the student will work on:

7.2L	Developing skills and behavior to achieve personal and professional goals. Carrying out activities that contribute to sustainable development goals, community goals and personal goals.

CUxxxx Personality project week 2 (new course, number will be added before May)

This course can be followed 3 times during the study programme. IT Personality content is based on the HZ-wide programme HZ personality that stimulates the skills concerning and attitudes towards personal development and personal leadership. The programme can either have a broadening or a deepening focus when it comes to the curriculum. Each year the ICT program organizes a project week with real life casus and (if possible) in cooperation with other programs. This project week course can be chosen as 1,25 ECTS content for personality.

The assessment criteria and assessment process are listed in the IT Personality 2021-2022 instruction manual which can be found on the Learn page.
This course is already approved for IT personality, students only need to define their personal goals within the given context. Final test will be a portfolio/

Learning outcomes the student will work on:

7.2M	Developing skills and behavior to achieve personal and professional goals. Carrying out activities that contribute to sustainable development goals through participation in a project week.

TIMELINE COURSES, BREAKS AND TESTS AT HZ FALL 21/22

Calendar week	Nr	Type of week	Starts Monday the…
35	-	Introduction week	30-8-2021
36	B1	Class	6-9-2021
37	B2	Class	13-9-2021
38	B3	Class	20-9-2021
39	B4	Class	27-9-2021
40	B5	Class	4-10-2021
41	B6	Class	11-10-2021
42	B7	Class	18-10-2021
43	B8	Wk 43 is study and project week without classes	25-10-2021
44	B9	Course: interdisciplinary Projectweek	1-11-2021
45	B10	Tests	8-11-2021
46	B1	Class	15-11-2021
47	B2	Class	22-11-2021
48	B3	Class	29-11-2021
49	B4	Class	6-12-2020
50	B5	Class	13-12-2021
51	B6	Class	20-12-2021
52	-	Christmas Break	27-12-2021
1	-	Christmas Break	3-1-2022
2	B7	Class	10-1-2022
3	B8	Tests	17-1-2022
4	B9	Tests	24-1-2022
5	B10	Tests	31-1-2022