

University of  
Applied Sciences

**Windesheim**



Minor

# Future Technology

Study Guide

2022-2023 Semester 2

Version 06-02-2023

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## 1. INTRODUCTION

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Future Technology is one of the elective semesters in the third and fourth years of the ICT Professional Bachelor study program at the University of Applied Sciences Windesheim. These elective semesters allow students to choose electives that broaden their knowledge base to other areas (broadening minor) and are open to students from all Windesheim study programs to students from other Universities of Applied Sciences and to international exchange students.

### 1.1 OBJECTIVE AND TOPICS

In Future Technology you learn, in various phases to investigate the possibilities of new technologies and work on new applications using technology. Students work in multidisciplinary teams of three to five students with each member bringing in their own area of expertise. In this way, you learn from the professional environment, as well as other disciplines in the project. The feedback, evaluation and supervision focus on preparing students as much as possible for the final and last project phase of their study program: graduation.

The assignments can vary considerably. Examples are developing new hardware devices, the optimization of business processes using technology or the deployment of new technology and/or new applications. Conducting research, developing proof-of-concepts and/or building prototypes form a substantial part of most projects. Also, aspects like security, legal, communication, sustainability (SDG's), transferring and capturing your knowledge and project management are of importance.

In consultation with the company mentor the group will decide from which location they will work from. This can be at the location of the company, at Windesheim or sometimes at home.

### 1.2 HBO-ICT COMPETENCIES

Students learn to work together with other disciplines in their project team and gain experience in the HBO-ICT professional competencies<sup>1</sup>: Analyze, Advise, Design, Realize and Manage & Control. Each student chooses two elective competencies on level 3 on which they individually will be coached whilst being evaluated and graded on level 2.

### 1.3 PROFESSIONAL SKILLS

In addition to the HBO-ICT competencies, your personal development as a professional is an important goal. Students take two elective subjects in Personal Professional Development, each for a three-month period, and track the progress of this.

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<sup>1</sup> See the HBO-i competences description 2018 (<https://www.hbo-i.nl/publicaties-domeinbeschrijving/>) and the assessment form for more details.

#### 1.4 YOUR PROJECT TEAM, ASSIGNMENT AND LOCATION

In this semester the project teams will work on available real-life assignments connected to a client location and a Windesheim coach. These assignments will be shared during the Kick-off on Monday February 6<sup>th</sup>, 2023. The starting time can be found in your Windesheim agenda (<http://roosters.windesheim.nl>).

One of the first steps is to poll who wants to volunteer as team leader for one of the teams. These joint team leaders set-up and facilitate the process directly after the kick-off to assign each project in a best fit with students. This is based on individual student preferences like: location, type of project/client, technologies, personal development goals, chosen HBO-ICT competences etc. This grouping should be done directly after the kick-off.

#### 1.5 MANAGEMENT TEAM OF THE SEMESTER

The team leaders together plus the lecturer responsible for Future Technology form the Management Team (MT) of this Semester. Tasks of the MT are to create a smooth agenda, agree on logistics, discuss team dynamics, etc.

#### 1.6 LECTURERS' ROLES

The following lecturers are involved in this semester:

- Project Coach: This lecturer provides process-oriented supervision to the student project team while executing the development project. The Project Coach is also one of the examiners.
- Second Examiner: A student project team is assessed by two examiners. The Second Examiner is a lecturer that is closely involved in the elective semester program.
- Workshop and Master Class Leaders: The just-in-time Workshops and Master Classes are given by lecturers with specialized knowledge of the subject areas.

#### 1.7 CONTACT DETAILS

- Email address/phone for the service desk:  
[servicepunt-techniek@windesheim.nl](mailto:servicepunt-techniek@windesheim.nl) / +31 88 4699700.
- Email address/phone for Future Technology Semester Coordinator:  
Wim Rill, [w.rill@windesheim.nl](mailto:w.rill@windesheim.nl) / +31 88 469 6487 or mobile +31 6 460 56 197.  
Lecturer Rob van de Star is joint coordinator.

#### 1.8 ECs

This Elective Semester yields 30 EC's: 24 ECs for the Future Technology project and 2 x 3 ECs for Personal Professional Development.

## 2 SEMESTER OVERVIEW

Elective Semester Code	ICT.KS.FT.V22		
Faculty and Study Programme	Engineering & ICT, ICT Professional Bachelor Study Program		
Study Programme Year, Academic Year, Semester, Block	Study program year 3 or 4; academic year 2022-2023; semester 1 (blocks 1 and 2) or semester 2 (blocks 3 and 4)		
Number of ECs	24 ECs x 28 hours = 672 hours allocated		
Elective semester coordinators	Wim Rill & Rob van de Star		
Competencies	Manage & Control, Analysis, Advise, Design, Realization and Professional Skills		
Learning outcome	In a multidisciplinary team, the student learns to execute an innovation project. All development stages are covered: analyze, advise, design, realization and hand-over. Students apply a project-based approach in executing this assignment.		
Content	<p><b>Practice</b></p> <p>For the Future Technology elective semester students conduct an innovation project. In the various phases, students, possibly in consultation with clients, research the possibilities of new technologies and work on new applications using technologies.</p> <p>The assignment is conducted partly at the client's premises and partly at the ICT Community at Windesheim. Students work in multidisciplinary teams made up of students from various disciplines with each member bringing in their own area of expertise. The study programs that the students come from are, for example: Software Engineering, Business IT &amp; Management, Infrastructure Design &amp; Security or Embedded Systems &amp; Automation.</p> <p><b>Theory</b></p> <p>During the elective semester, students learn from each other and from the research conducted. Visiting meet-ups and congresses is also a way to acquire theoretical knowledge. During the semester, students provide knowledge lectures in which they present acquired knowledge to the rest of the class. In this way, we ensure that knowledge of innovative techniques is also passed on to the other project teams.</p> <p><b>Assignment</b></p> <p>The assignments can vary considerably in relation to content. Examples are developing brand-new hardware devices, the optimization business processes using or the deployment of new technology and/or new applications.</p> <p>Conducting research, building proof-of-concepts and/or prototypes form a substantial part of most of the assignments.</p>		
Teaching methods	Students execute a practical assignment as a member of a project team. The team members are jointly responsible for the result.		
Teaching aids	All teaching aids are included on the Electronic Learning Environment (Brightspace).		
Supervision	The project is supervised by a company mentor and a project coach.		
Entry requirements	The student has successfully completed at least 105 ECs from years 1 and 2. In addition, the student has at least a basic knowledge of ICT.		
Attendance requirements	100% in relation to teamwork.		
Required prior knowledge	The semester is open for enrolment to third- and fourth-year students of universities of applied sciences. A basic knowledge of ICT is also an entry requirement.		
Level	Advanced		
Marking range	1 to 10, 1 decimal place.		
Assessment methods	Test		Passmark
Team	Portfolio assessment	5 HBO-ICT competences + Professional Development	Higher than or equal to 5.5
Individual	Portfolio assessment	For 2 chosen individual HBO-ICT competences	Higher than or equal to 5.5
	Professional attitude	0 (Knock-out criterium)	Sufficient
Reading list	Study material is supplied free of charge.		

In this elective semester the students are required to take two Professional Skills electives (2x 3 ECs) in addition to the project of 24 EC's.

### 3 ASSESSMENT

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#### 3.1 ASSESSMENT PLAN, ASSESSMENT CONTENT SPECIFICATION

The final assessment exists out of two parts:

- Team assessment: each student project team must convince the assessors of the quality of the results, the approach, the deviations, the adjustments, the choices made and their personal professional development covering the five competencies. Both the project team as a whole and the individual members of the team are held accountable for the results.
- Individual assessment: each student must convince the assessors of the quality of the results, the approach, the deviations, the adjustments, the choices made and their personal professional development covering their chosen two HBO-ICT competencies<sup>2</sup>.

Substantiation of the results is illustrated by presenting appropriate examples in a PowerPoint. The PowerPoint acts as a support for the assessment which is led by the student project team. The end assessment is not a presentation, the PowerPoint acts as visual support for the assessment. A template for this PowerPoint can be found on Brightspace.

During the assessment, the project team and the individual team members defend the substantiation put forward in the PowerPoint. Two lecturers form an assessment based on the stipulated life-cycle activities and the personal professional development of the individual students. A similar approach is applied to the individual assessments for each student for the two selected HBO-ICT competences.

#### 3.2 EVALUATION FORMS — USED BY THE CLIENT

The project is evaluated on a student-by-student basis together with your business mentor. This occurs both halfway through the project (mid-term) and at the close of the project. The client form template can be found on Brightspace.

#### 3.3 ASSESSMENT FORM — USED BY THE WINDESHEIM EXAMINERS

The assessment form for both the team and individual assessment is based on the Final Project Graduation Assessment Form. In this way, the feedback given to students reflects the feedback that will be given in the final graduation project. The initial assessment is for the project team as a whole. If necessary, an assessment result that deviates from the team assessment result may be given to an individual team member. The individual assessment is on a per student basis. The assessment form template can be found on Brightspace.

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<sup>2</sup> See the HBO-i competences description 2018 (<https://www.hbo-i.nl/publicaties-domeinbeschrijving/>) and the assessment form for more details.

### 3.4 RESIT PROTOCOL

In the case of an insufficient grade, specific agreements are made and recorded on the assessment form in relation to improving / repeating the assessment and a deadline is set for the completion of the improvements and re-submission.

### 3.5 LIST OF REFERENCES/READING LIST

There is no specific textbook for this elective semester program. The relevant study material can be found on the Brightspace-course ICT.KS.FT.V20\_2223 on the Windesheim Electronic Learning Environment (Brightspace).

All sources and material consulted for the project must be documented in accordance with the APA standard.



## 4 WEEKLY TIMETABLE

Project semester 2 2023 (blocks 1 and 2).

Week	Deliverable <sup>1)</sup>	Student presentation <sup>2)</sup>	Timetabled activities <sup>3)</sup>	Project coaching <sup>4)</sup>
6	Project proposal Schedule Progress report		Kick-off February 6 <sup>th</sup> , workshops Project Management & Interviewing (on-line)	Assignment description Semester schedule
7	Project proposal SDG impact analysis Progress report Client expectations		Workshops on Project Management, Project Proposal & SDG's	Project proposal Progress
8	Project Plan Progress report	Project Proposal	Dragons Den	Stakeholder analysis Project Plan
9	Project Plan Progress report	Projectplan/PID		Progress
10	Progress report			Progress
11	Progress report			Progress
12	Progress report			Progress
13	Progress report		Knowledge Lecture by Students	Progress
14	Progress report			Progress
15	Progress report		Mid-term evaluation of lecturers and education	Progress
16	Interim evaluation Progress report Client Expectations	Self assessment, Project overview, Tips & Tops, Client assessment		Mid term evaluation / progress
17	Improvement plan Progress report	Sharing project progress with all teams		Mid term evaluation / progress
18	Progress report			Progress
19	Progress report			Progress
20	Progress report			Progress
21	Progress report			Progress
22	Progress report			Progress
23	Client expectation Promotional material Assessment	Dry Run Assessment Delivery of full portfolio	Winnovation Expo Followed by reception	Promotional material End report Progress
24	Assessment Project finalization	Winnovation Expo	Assessments	Progress
25	Assessment Hand over document	Discharge	Assessments	

**Week numbers are preliminary. Please check the dates in your agenda!**

- 1) Deliverables and progress reports are submitted to the project coach and company mentor by the end of each week (latest each Friday at 16:00).
- 2) Participation in the student presentations is compulsory.
- 3) Participation in the timetabled sessions is compulsory. For the timeslots see <http://roosters.windesheim.nl>. (link to timetables). For deadlines, submission dates and submission locations see electronic learning environment (Brightspace).
- 4) Students receive one hour of project coaching each week. Attendance is compulsory. The first coaching meetings are timetabled. In consultation with the project coach, it is possible to arrange a coaching meeting outside these timetabled hours.

## 5 DELIVERABLES AND ASSIGNMENTS

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The final assessment is substantiated with a compilation of all the project results and educational deliverables. The full portfolio must be uploaded to the Brightspace-course ICT.KS.FT.V22 on the date specified on this Electronic Learning Environment and shared in the Kick-off. The complete portfolio must only be in English if agreed with your client and/or if an international student participates in your team, otherwise it can be in Dutch.

Many different types of assignments are executed in the Future Technology semester. Examples are developing brand-new hardware devices, the optimization of business processes using or the deployment of new technology and/or new applications. Conducting research, building proof-of-concepts and/or prototypes form a substantial part of most of the assignments. In one project the client can be the company itself and their employees and in another case the app can be for use by the clients of the company.

Most of the project teams will work using (some sort of) the Scrum methodology combined with Prince II at the start. It is up to each project team - in conjunction with their client - to decide which methods, tools and techniques plus deliverables are most useful in terms of added value for their specific project.

### 5.1 DELIVERABLES

There is not a standard list of deliverables that you as a project team should produce. The deliverables you will select and/or add should have added value for your client and project. Remember that – from a Windesheim perspective – we will also judge you in your role as a future professional, also in terms of quality of the (with your client) agreed set of documentation. **Examples of these deliverables:**

- Research Plan
- Research Report
- Functional Design
- Technical Design
- Marketing Plan
- Advisory Report
- Proof-of-Concept
- Prototype
- Working End Product
- Manuals & Training
- Client expectations
- Architecture
- Source Code of a Prototype, MVP, or Working End Product
- Implementation Plan
- Transition Document
- Video for your Assessment and Winnovation
- User Satisfaction Survey
- Decharge

## 5.2 SUPPORTING DELIVERABLES

In addition to the above deliverables, there are several deliverables that support the process.

### 5.2.1 Project proposal

The project proposal is a short description of the problem situation, goals, scope, and deliverables. The preconditions, possible links to other projects, the client's expectations (ask them explicitly upfront) and possible risks are also addressed in the project proposal on a high level. The client's brief and expectations for the project are to be used as the basis for composing your project proposal. The project proposal is discussed with the client to determine the project's viability.

### 5.2.2 Project Plan or PID

The project plan describes in detail the who, what, where when and how of the project and forms the basis for the project's execution. The project plan offers a working structure and clarity for both the student project team and all the other stakeholders. It is essential that the project plan is described in SMART terms. The letters S and M generally mean specific and measurable. Possibly the most common version has the remaining letters referring to achievable (or attainable), relevant, and time bound.

### 5.2.3 Project schedule

The project schedule forms part of the project plan. The schedule systematically shows the project phases and milestones.

### 5.2.4 Stakeholder analysis

The stakeholder analysis forms an integrated part of the project plan. This analysis identifies the stakeholders that are interested in or that can influence the project results. The results of the stakeholder analysis are incorporated into the project plan.

### 5.2.5 Business Case

The business case of your project is of importance as a tool to understand the benefits and costs (both tangible and intangible) of your project and to place the requirements into context. It should also contain a SDG impact analysis for your project. The business case helps to question and understand the WHY of your client.

### 5.2.6 Weekly progress report

Each week, the student project team reports their progress to both the client and the project coach using the weekly progress report (format can be found on Brightspace). The progress report outlines amongst others the activities performed, the difficulties encountered and possible solutions, choices made, and the activities planned for next week. Any deviations from the project plan are clearly highlighted in the progress reports.

Each project team member also writes a short personal reflection on the progress of their chosen personal development goals and reflect on followed Workshops/Master Classes plus a team reflection (lessons learned, successes, pain points, etc.). The weekly progress report template and other templates can be found on Brightspace.

### 5.2.7 Mid-term evaluation

Halfway through the project period the company mentor/client, the student project team and project coach jointly evaluate the project. The aspects that are evaluated are: autonomy, behavior, context, and professionalism. You could see this as a mid-term “super retrospective”. Preparation upfront:

- Self-assessment: on a per team basis based on the template in Brightspace score each rubric and fill in the two bottom lines (deliverables & complexity) per competence, and provide at least three proofs per competence which show the results.
- Signed individual assessment by the business mentor.
- Tips & tops toward colleague students, business mentor and coach.
- Mid-term client satisfaction by the business mentor.

Based on the findings in the evaluation the student project team formulates next steps to work on potential improvements. These are documented in the next weekly progress report.

### 5.2.8 Final evaluation

Refer to the section on mid-term evaluation above. Start on time with the end evaluation, so that this can be included in the portfolio and processed into the end report.

Note: no assessment will take place if the end and mid-term evaluation form are not signed by the business mentor/client.

### 5.2.9 Presentations of Phase

Planned around the mid-term evaluation each project team present their progress, deviations, and adjustments, and demonstrate their deliverables or intermediate deliverables. The audience gives feedback.

### 5.2.10 Dry Run

In the week prior to the hand-in of the portfolio each project team presents their project and self-assessment as a prelude to the final assessment presentation. The audience gives feedback.

### 5.2.11 Winnovation Expo

During the Winnovation Expo, the student project team present their project results to their fellow students, lecturers, and companies. A member of the project team acts as contact person for the Winnovation Expo organization.

### 5.2.12 Promotional material

The promotional material is used during the Winnovation Expo. A product video of the solution developed is a compulsory element in the promotional material. The product video shows the end deliverable in operation. The physical components of the end product are shown. The functionality is explained to the viewer using a sample scenario. The start of the video shows an overview of participating parties and persons. Use the Windesheim logo and the client's logo. The video lasts from 3 to a maximum of 5 minutes. Video format: AVI, MP4 or WMV.

### 5.2.13 Evaluation of lecturers and education

Halfway through and at the end of the semester, there is an evaluation of lecturers and education. Students provide feedback to Windesheim in relation to the set-up and execution of the semester program. The evaluation is completed at college and students can offer an oral explanation for their feedback.

### 5.2.14 Assessment

In the end assessment, the student project team must convince the assessors of the quality of the results, the approach, the deviations, the adjustments, the choices made and the personal professional development. Both the project team as a whole and the individual members of the team are held accountable for the results. Substantiation of the results is illustrated by presenting appropriate examples in a PowerPoint. The PowerPoint acts as a support for the assessment, which is led by the student project team.

Beside the Powerpoint a self-assessment (in Word) is a must-have part of your hand-in on Brightspace. For both the Powerpoint .ppt presentation and the self-assessment form in Word use the latest version of the template which can be found on Brightspace.

## 6 WORKSHOPS AND MASTER CLASSES

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Over a dozen of Workshops and Master Classes are offered during the semester. These workshops are offered according to the just-in-time concept and are a standard and compulsory part of the semester program. The workshops directly relate to the actual project that the students are working on. Students prepare for these workshops by bringing the relevant project material to the workshop and by formulating questions in advance. The learning outcomes of these workshops can be directly deployed in and applied to the project.

It is compulsory to document in your Project Plan the choice of which Workshops / Master Classes you as a team will follow. Besides Project Management, Interviewing and SDGs you have to select, preferably as a team, at least two Workshops / Masterclasses to be followed, document this in your project plan and enroll ASAP via the link on Brightspace. Workshops descriptions, timing and enrollment can be found on the link on Brightspace. Several workshops are supplemented with subsequently timetabled question-and-answer sessions. These question-and-answer sessions are optional.

Click [here](#)<sup>3</sup> for a complete overview of all Workshops and Masterclasses.

Click [here](#)<sup>4</sup> to sign up for the desired Workshops and Masterclasses. Some are mandatory!

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<sup>3</sup> <https://liveadminwindesheim.sharepoint.com/sites/hbo-ict-elective-semester-information/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2Fhbo%2FDict%2FDelective%2Dsemester%2Dinformation%2FShared%20Documents%2FWorkshops%2FMinor%20workshop%20descriptions%202022%2D2023%2Epdf&parent=%2Fsites%2Fhbo%2FDict%2FDelective%2Dsemester%2Dinformation%2FShared%20Documents%2FWorkshops>

<sup>4</sup> <https://mijninschrijvingen.windesheim.nl/inschrijving-colleges-star-3/>

## 7 TERMS, CONDITIONS AND WORKING ARRANGEMENTS

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### 7.1 CLIENTSHIP AND WORKING LOCATION

Students execute the assignments partly at Windesheim and partly at the client's premises. Students use their own laptops. The client supplies any special equipment required for the project. If required there is a limited number of devices (e.g., iPad's, iPhone, and Android) on loan (contact the lecturer responsible for this semester). The client provides the students with a fixed workspace that complies with working conditions directives (ARBO).

The business mentor (often the Product Owner) is available each week for at least one hour to answer questions, give feedback and provide supervision. The minimum level of supervision is at Professional Bachelor level. The business mentor evaluates the students halfway through the project and at the end of the project.

Working from home is only allowed after upfront mutual agreement of both the business mentor and your project coach.

### 7.2 WORKING HOURS, DAYS OFF

Students spend four full working days, Tuesday to Friday, on the assignment each week. Students attend college on Mondays for Professional Development courses. The working day for a student is in line with the company's hours of business.

There are no school holidays during this semester, but students are entitled to eight annual leave days in consultation with the client and their project coach at Windesheim. Students are not entitled to take an annual leave day when there are planned activities like enrolled Workshops/Master Classes and the like. Students report absence through illness and return after illness to the client and the project coach at Windesheim via the Weekly Progress Report.

### 7.3 DELIVERABLES

All the business deliverables produced are handed over to the client. These deliverables are also presented to the ICT study program as part of the portfolio, which students submit at the end of the semester for assessment.

### 7.4 CONFIDENTIALITY

If necessary, students can work under the conditions of a signed non-disclosure agreement. All results of the project must be made available to the ICT study program for assessment purposes. The assessment in which the student project team defends the project results is open to the public. The ICT study program at Windesheim is legally obliged to keep a record of all material relating to the assessment, and, if so requested, is obligated to make the material available to the accreditation body in its execution of its statutory supervisory task. In principle, the ICT study program at Windesheim is also entitled to use the material in anonymous format as teaching material. It should, of course, be clearly stated in the project plan if there is an obligation of confidentiality.

### **7.5 SUPERVISION BY WINDESHEIM**

The project coach supervises the project team on a one hour per week basis in relation to the process and, when necessary, attends progress meetings between students and the client. The project coach discusses the evaluations with the students and the business mentor.

The Workshop and Master Class leaders offer knowledge and skills relevant to the actual project situation. The project coach and workshop leaders are also available outside scheduled contact hours to answer questions.

### **7.6 ASSIGNMENTS ARE CONTRACTED BY WINDESHEIM**

Most of the projects are contracted by Windesheim. In many cases the client pays Windesheim a fee of 4.000 Euro per project team per semester for the intensified project coaching.

### **7.7 STUDENT PAYMENT BY THE CLIENT**

It is fully at the discretion of the client if a student receives e.g., a travel allowance and/or payment for his or her effort. It is advised to clarify that in the first meeting with the client between the student and the client. This topic is for Windesheim fully “out of scope”.

### **7.8 IMPORTANT DATES**

Will be shared at the kick-off.