

User Experience and Interaction Design (TDDE36)

12 ECTS Credits:

Study Guide

Spring Semester 2023

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Syllabus

<https://liu.se/studieinfo/kurs/tdde36/vt-2023>

Editions

Edition 1.0: First published version.
Edition 1.1: Updated the course literature with edition numbers.
Edition 1.2: Updated some instructions.
Edition 1.3: Fixed an error in the grading table for UPG7.
Edition 1.4: Updated old instructions in the project.

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Intended Learning Outcomes

This course is about how to study and evaluate user experience (UX), and how to conduct human-centred design of interactive products and services (i.e., interaction design). The overarching aim of the course is that the participant will to develop knowledge in basic user experience research and evaluation methods (qualitative and quantitative), as well as interaction design methods.

The student shall after the course be able to:

- Use and account for basic qualitative user research methods (e.g. interviews, observation, and thematic analysis).
 - The goal is examined in the research parts of the groupwork (PRA1) and in the individual research methods assignment (UPG6).
- Use and account for basic quantitative user experience testing methods (e.g., task success, time, self-report questionnaires), including analysis of the results using descriptive statistics.
 - The goal is examined in the research parts of the groupwork (PRA1) and in the individual research methods assignment (UPG6).
- Ideate and sketch interaction design concept proposals, assess them, and make a convincing argument for one proposal based on user research results.
 - The goal is examined in the design work parts of the groupwork (PRA2) and is used for grading the individual design methods assignment (UPG7).
- Sketch, develop, and present interaction design prototypes.
 - The goal is examined in the design work parts of the groupwork (PRA2) and is used for grading the individual design methods assignment (UPG7).
- Conduct and account for a user experience evaluation of interaction design prototypes.
 - The goal is examined in the research parts (PRA1) and in the design work parts of the groupwork (PRA2).
- Assess user research and evaluations with respect to scientific criteria.
 - The goal is examined in UPG6.
- Review interaction design projects with respect to societal and ethical aspects, as for example research ethics, gender, and sustainability.
 - The goal is examined in PRA2 Design work.

Course Contents

Skills: Conducting an interaction design process with customer and user perspectives. Designing well-functioning interactive products and services. Researching and evaluating user experience.

Subjects: Fundamental concepts in human–computer interaction. Design principles and guidelines for user interfaces. Prototyping of interactive products and services. User research methods. Design methods. Different kinds of user interfaces. User experience and usability evaluation methods.

Technologies: Prototyping tools for development of interactive products and services. Interaction technologies.

Course Evaluation from Last Year

The response rate was 19%, which means that 13 out of 66 students answered the evaluation. 63 of the 66 students were active in the course, and therefore 21% of the students who followed the course responded. The response rate is too low to draw any certain conclusions about the experiences for the course participants in general.

The responding participants thought that the course gave them opportunity to achieve the learning outcomes ($mdn = 4$, $IQR = 4 - 4$). The teaching and working methods as well as the examination components was perceived as highly relevant to the learning objectives ($mdn = 4$, $IQR = 4 - 5$ and $mdn = 5$, $IQR = 4 - 5$ respectively). The educational methods were perceived to support learning ($mdn = 4$, $IQR = 4 - 5$). A minority of the responding students (23%) thought that there was too much work in relation to the credits of the course. The course content was perceived to agree with the syllabus ($mdn = 5$, $IQR = 5 - 5$). The overall evaluation of the course was high ($mdn = 4$, $IQR = 4 - 4$).

No problems in relation to discrimination, harassment, victimisation, or exclusion were observed.

The student performance was good with grades slightly skewed towards the higher grading levels. Out of the 57 students that handed in complete individual assignments on time, 28% got a 5, 35% got a 4, 37% got a 3. Notable is that only 2 of the 16 persons who received a 5 were men.

As a result of the course evaluation, the literature has been changed. A course book on research methods in design has been chosen instead of a book about research in general or research in another field (i.e., education). The individual assignment has been slightly changed because of the change in literature. The design methods assignment has been revised and split up into two deadlines to even out the workload; one in each exam period, and the second has been made optional for higher grades. The project has also been narrowed down by assigning every group with a target user group to design for. The interaction design literature in English has been changed to a new book that largely covers the same topics as the Swedish book, but it still has to be complemented by other material for usability evaluation, business, gender issues and sustainability in design. A teaching session on creating personas and scenarios has been added.

Working and Teaching Methods

Lectures (Swe. föreläsningar) introduce or broaden the perspectives given through the readings and seminars. They describe what, why and how of a

certain topic. Smaller exercises are also conducted at some lectures. One guest lecture is in Zoom and the rest are at the campus.

Presentations (Swe. redovisningar) have compulsory attendance and are held as critique sessions with 2–3 project teams at the time. Critique sessions are conducted around a show-and-tell about produced materials. It is important to give constructive critique on the others work. Several groups have presentation at the same time so that learning may occur between groups. For the presentation, every group has 10 minutes for presentation and 5 minutes for critique.

Teaching sessions (Swe. lektioner) focus on exercises that are prepared by the lecturer.

Supervisions (Swe. handledningar) focus on what has been done, in relation to what is expected by the examiner, and what the next steps should be. Prepare questions that you may have for the teacher. If you feel you do not get the feedback you need, then ask again. We expect all students to attend supervision sessions, and if someone repeatedly is missing, we will consider that an indication that something is wrong in the project team.

Group work (Swe. grupparbete) in the practical research and design work is done in groups of approximately five students. It includes collaboration with different user groups (i.e., third-stream activities). There is time in the timetable marked as group work (without teacher and without a lecture hall) for the groups to use as they please.

Individual work is required in reading up on how to do things in the group work. There are also individual assignments.

Examination

The course is assessed through two practical groupwork modules (PRA1, PRA2) and two individual assignment modules (UPG6 and UPG7). Compulsory attendance is required for presentations in PRA1 and PRA2.

- PRA1 Research work fail (U), pass (G) 2 credits
- PRA2 Design work fail (U), pass (G) 4 credits
- UPG6 Research method fail (U), 3, 4, 5 2 credits
- UPG7 Design method fail (U), 3, 4, 5 4 credits

Reading the course literature should be done continuously during the course from day one.

Course Grades

Course grades are only given if all examination parts have been completed and given a passing grade (G, 3) or higher (4, 5). The final course grade is calculated by adding the points earned on the individual assignment modules UPG6 and UPG7 and comparing the result to the following table:

- Grade U: <13 points
- Grade 3: 13 points
- Grade 4: 20 points
- Grade 5: 23 points

Individual Grading of Group Work

In the group parts, the grades (pass/fail) are based on the work performed by the group, but the examination is individual. This means that individual students may receive a different grade than the rest of the group if there are reasons for that. Individual supplementary examination assignments can be given by the examiner. The group members need to tell the examiner if there are reasons for awarding different grades in a group or give supplementary assignments. More precise grading criteria are specified for each assignment.

Compulsory Attendance and Supplementary Tasks

Presentations (Swe. redovisningar) are part of the examination of the modules Research Work (PRA1) and Design Work (PRA2). There are in total four presentation sessions. The first belong to PRA1. The second and third belong to PRA2. The final presentation belongs to both PRA1 and PRA2. They all have compulsory attendance, but there are a few valid reasons for missing a presentation.

You can miss one presentation and still pass PRA1 and PRA2, but if you miss a second presentation you must notify your supervisor in advance about why you cannot participate and do a supplementary task. The supplementary task is to write a description of what you personally did in the group work, and a reflection on lessons learned from the group work (about 800 words). The supplementary tasks must be delivered by email to the examiner within two weeks after the presentation.

Time Budget

You could potentially ship in an infinite number of hours on each assignment, but you should not. Make a time budget based on 16 hours per week and stick to it. The examination is adjusted according to what is possible to do given your time constraints of two days per week on this course.

Deadlines

The *practical group work* deadlines for deliverables on the following date:

- PRA1 Research work and PRA2 Design work: 2023-05-26, 17:30.

The *individual assignments* have the following deadlines:

- UPG6 Research method: 2023-02-06, 17:30
- UPG7 Design method (mandatory Part 1 Methods): 2023-03-24, 17:30
- UPG7 Design method (optional Part 2 Design): 2022-06-02, 17:30.

There are two deadlines for *re-examination*:

- Re-examination 1: 2023-08-27, midnight
- Re-examination 2: 2024-01-05, midnight.

Students that miss the last deadline for re-examination must do the assignments for the following year's course. Students cannot try for higher grade by re-examination. No assignments are graded between deadlines. Re-examination assignments are published on Lisam (under Documents) no later than one month before the re-examination deadline.

Conduct

The following set of rules apply to the assignments in this course. It is a slightly modified version of IDA's general rules for labs:

- The assignments are in a group or individually, according to the instructions given for the course. However, examination is always individual.
- It is not allowed to hand in solutions copied from other students, or from elsewhere, even though modifications have been made. If unauthorized copying or other forms of cheating is suspected, the teacher is required to make a report to the [University Disciplinary Board](#).
- You should be able to explain the details of the assignment. It is also possible that you may have to explain why you have chosen a specific solution. This applies to everyone in a group.
- If you anticipate that you cannot meet a deadline, contact your teacher. You may get some support and possibly a deadline at a later date. It is always better to discuss problems than to cheat.
- If you do not follow the university and a course examination rules, and try to cheat, by for example plagiarizing or using unauthorized assistance, then it may result in a complaint to the University Disciplinary Board. The consequences of cheating can be a warning or suspension from studies.
- Policy for presentation. A definite end date, deadline, generally apply to the submission of assignments in the course. This deadline may be during the course or at the end. If presentation is not done in time, you may have to do a new set of assignments the next time the course is offered.

Feedback

Formative feedback on design process and design product is given orally during supervisions and presentations. Feedback on written reports is given in writing on submissions in Lisam. Feedback on the individual assignments is limited and of a summative rather than formative nature.

How gender equality is integrated into the course

Gender equality is defined as women and men having the same rights, opportunities, and obligations, regardless of gender.

Gender equality in implementation (i.e., learning activities):

- Project groups are formed so that a man or a woman never should be the only person of his or her gender in the group (non-binary or genderqueer identities are however not considered).
- Seminar leaders must ensure that there are equal opportunities for speaking space, time, and attention.
- The groups are urged not to fall back into gender stereotypical patterns where e.g., women document, project lead and remind men who program and construct.
- The examiner and course leader is a man, with a woman as main co-teacher and lecturer. The other three lecturers are men. One guest lecturer is a man, and two are women.
- A workshop where intersectional aspects and design for all is considered is held.
- A workshop where norms and stereotypes are reflected on is conducted.

Gender equality in content (i.e., lectures and course literature):

- A paper on norm-creative strategies in design is recommended reading.
- A section of the course book highlight gender issues.

Gender equality in design (i.e., syllabus):

- A learning objective in the syllabus is to review interaction design projects with respect to societal and ethical aspects, as for example research ethics, gender, and sustainability. The goal is examined in PRA2 Design work.

How sustainable development is integrated into the course

Sustainable development in implementation (i.e., learning activities):

- Considerations between social, economic, and ecological sustainability are central questions in all design work. Designs that are not sustainable are by definition bad design.
- A workshop where environmental, social, and ecological sustainability is reflected on is conducted.
- The project work takes departure from the global sustainable development goals and aims to contribute to one of them

Sustainable development in content (i.e., lectures and course literature):

- One lecture on sustainability work at the university and one lecture on design for sustainability is given.
- There are two papers on design for sustainability as recommended readings.
- A section of the course book highlights sustainability issues.
- The website for UN's global sustainable development goals is used in project work.

Sustainable development in design (i.e., syllabus):

- A learning objective in the syllabus is to review interaction design projects with respect to societal and ethical aspects, as for example research ethics, gender, and sustainability. The goal is examined in PRA2 Design work.

Code of Conduct for Remote Sessions

This code of conduct is written to clarify what we as teachers expect of you as students in remote sessions, and what you can expect from us in turn:

- Online sessions should be treated as any other educational activity; respect the teacher's and fellow students' time and focus fully on the educational activity without other distractions.
- Everyone should join the online sessions in a timely manner, i.e., a few minutes before the scheduled start, so that it can start on time.
- For live lectures and seminars, students and teachers should have a web camera feed on.
- Everyone should mute their microphones when not speaking unless it is a small group.
- Everyone should join online sessions using a stable connection to prevent drop-out issues. If anyone lacks or has unreliable home wi-fi, that person is expected to find alternative solutions (e.g., joining from a room on campus using Eduroam).
- Everyone must be mindful of speaker turn taking during the seminars, and make sure that everyone gets the chance to talk. Hand raising functions in Zoom can be used for both seminars and lectures to indicate that you wish to say something.
- To prevent "Zoom-bombing", passwords will be used for live sessions. Do not distribute these passwords to anyone outside the course.
- If you are not already familiar with Zoom, take a look at the guide available at LiU's website: <https://www.student.liu.se/itsupport/zoom-student?l=sv>

Course Literature

The student bookstore has been notified of the course literature. Get the course books early on and start reading.

The following book is course literature on research methods:

Muratovski, G. (2022). *Research for designers: a guide to methods and practice* (2. ed.). Sage.

Choose **one** of the following two books as your *main book* on interaction design and UX:

Arvola, M. (2020). *Interaktionsdesign och UX: Om att skapa goda användarupplevelser* (2. uppl.). Studentlitteratur.

Boyl, B.L.M. (2019). *Interaction for designers : how to make things people love*. Routledge.
(Exists also as e-book.)

Boyl's book is good, but it does not cover all contents of the course. If you use Boyl's book and not Arvola's, then you also have the following two papers (below) and the [Wikipedia page for the business model canvas](#) for the reflection part of the group work. You also have to rely on usability.gov and lectures for details on prototyping and usability testing.

- Lou, Y. (2018). Designing Interactions to Counter Threats to Human Survival. *She Ji: The Journal of Design, Economics, and Innovation*, 4(4), 342-354.
<https://doi.org/10.1016/j.sheji.2018.10.001>
- Wikberg Nilsson, Å. & Jahnke, M. (2018). Tactics for Norm-Creative Innovation. *She Ji: The Journal of Design, Economics, and Innovation*, 4(4), 375-391.
<https://doi.org/10.1016/j.sheji.2018.11.002>

The following paper is recommended, but not mandatory, reading for the lecture on sustainable design:

- Wever, R., van Kuijk, J., & Boks, C. (2008). User-centred design for sustainable behaviour. *International journal of sustainable engineering*, 1(1), 9-20.
<https://www.tandfonline.com/doi/full/10.1080/19397030802166205>

Teachers

- *Mattias Arvola* has a PhD in Cognitive Systems and is Associate Professor in Cognitive Science at Linköping University. He specialises in interaction design and user experience design methods and theory. Course leader, examiner, lecturer, and supervisor. mattias.arvola@liu.se
- *Emma Chilufya* is a PhD student in Cognitive Science at Linköping University. Her thesis topic is the design of interactive artificially intelligent virtual agents. Supervisor, lecturer and course assistant. emma.mainza.chilufya@liu.se
- *Wanjun Chu*, has a PhD in Design and is Senior Lecturer in interaction and service design research. He specialises in design for sustainable behaviour. Lecturer. chu.wanjun@liu.se
- *Ludwig Halvorsen* is an interaction designer and has a MSc in Cognitive Science as is a Lecturer in user experience and interaction design at Linköping University. Lecturer and course assistant. ludwig.halvorsen@liu.se
- *William Hagman* has a PhD in Psychology and is a Lecturer in cognitive science and interaction design at Linköping University. Lecturer and course assistant. william.hagman@liu.se
- *Henrik Asteberg* has a MSc in Cognitive Science and is a UX Designer at Consid. Guest lecturer.
- *Jenny Johansson* has a MSc in Cognitive Science and is Senior Consultant at SeventyOne Consulting and UX Research Lead at SJ. Guest lecturer.
- *Anna Gustafsson* is Environmental Coordinator at the Linköping University. Guest lecturer.

Timeline

The timeline for the course is visualised in the simplified Gantt chart below (Table 1). You have two full workdays per week to spend in this course (16 hours) including reading.

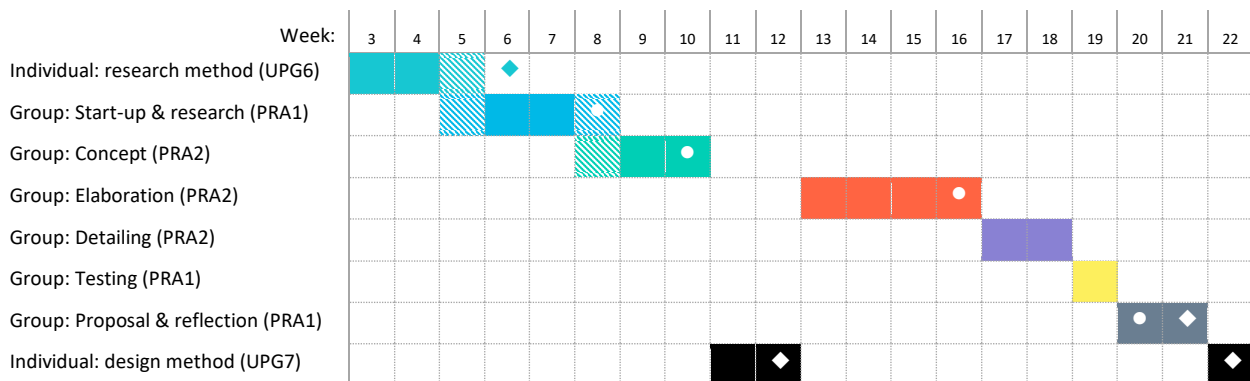


Table 1. Timeline for the course. Examination modules are indicated in parantheses. Deadlines are marked with a diamond. Presentations are marked with dot (●).

Examination Modules

1st Individual Assignment (UPG6 Research Methods)

Do this module individually during the first three weeks of the course.

Deadline: 2023-02-06, 17:30

UPG6 consists of two parts (qualitative research and quantitative research). Write your name and LiU-ID on every page. Write in Swedish or English.

Grading: Both tasks are worth five points each.

- Fail (U): <5 points in total or less than 2 points on one of the two parts.
- Grade 3: 5 points
- Grade 4: 8 points
- Grade 5: 10 points

A supplementary assignment can be given students that are close to a passing grade (3) and must be completed within two weeks from the notice. The grade Fail will be reported if it has not been submitted within two weeks.

Submission: Submit your assignments in PDF on Lisam. File naming convention: `liuid-tdde36-2022-upg6.pdf` (e.g., `matar63-tdde36-2022-upg6.pdf`).

1 Qualitative Research (5 p)

Describe and explain, in your own words, but with concrete page references to the course literature (Muratovski) (1/2–1 page per question, i.e., 200–500 words on question a, and the same on question b and c, in total 600–1500 words):

- What characterizes qualitative research, and what counts as good qualitative research according to the author of the course literature? (1 p)
- What research ethical considerations do you have to do in a user study according to the author of the course literature (regardless of whether it is qualitative or quantitative)? (1 p)
- What are ethnographic studies in the context of design and how are they done (i.e., preparations and procedures for data collection and analysis) according to the author of the course literature? (3 p)

2 Quantitative Research (5 p)

Describe and explain, in your own words, but with concrete page references to the course literature (Muratovski) (1/2–1 page per question, i.e., 200–500 words on question a, and the same on question b, c, and d, in total 800–2000 words):

- What characterizes quantitative research according to the author of the course literature? (1 p)
- What counts as good quantitative research according to the author of the course literature? (1 p)

- c) What do you need to consider as you plan and perform a survey or questionnaire study in design according to the author of the course literature? (1.5 p)
- d) What do you need to consider as you plan and perform experimental research in design according to the author of the course literature? (1.5 p)

Group Work (PRA1 Research Work and PRA2 Design Work)

There are four mandatory presentations (you can find the dates in the timetable):

- Presentation of User Research and Needs Analysis
- Presentation of Concept Design
- Presentation of Elaboration
- Final presentations of Detailing and Usability test

Deadline: 2023-05-26, 17:30.

Grading (pass/fail) of PRA1 Research Work consists of (a) the starting up and (b) the user research and needs analysis in the beginning of the group work, and (c) the usability testing at the end of the group work. Assessment is based on how well you consider, execute, and present these.

Grading (pass/fail) of PRA2 Design Work consists of (a) the concept phase, (b) elaboration, and (c) detailing. Assessment is based on how well you consider, execute, and present these.

The time budget is 16 hours of work per week for every group member including reading and lectures. You may need to distribute tasks among each other in your group.

Start-up, user research and needs analysis (week 5–8)

This part belongs to the examination module PRA1 Research Work.

Step 1. Go through individually the design challenges in the appendix at the end of this document and consider what challenges you find important and interesting. Discuss your arguments in your group and consider that you will work with this challenge during the entire course. You need to recruit participants for user research and later on for prototype testing, so you have to figure out how to get into contact with them. Consider also interviewing other stakeholders than users.

Step 2. Read through the entire group work instructions and decide who should be main responsible for coordinating different parts. Avoid a gender stereotypical division of labour. Set up a *group contract* (see examples and instructions in the Documents section of the course room on Lisam). A team in Microsoft Teams have been created for your group work so that you can chat, share, and co-author documents, and have video meetings. Face-to-face meetings in the group work is however the default mode of work.

Step 3. Skim through the course literature early and take notes so that you can find the different parts when you need to read them more carefully during the

process. Make sure to use the literature and the lectures in the planning of each phase so you know what to do and how *by the book*. Download Adobe XD (not free) or sign up for Figma (free) and play around a little in the tool you choose. An introduction will be given to Figma only, but XD is not very different. There are excellent tutorials online. It is good to learn the basics of the tool early so that you know it when you need it in week 17.

Step 4. Set up a Sway document on Lisam/Office 365 where you can record your process and progress. Do not forget to write the names and LiU-IDs for all group members. Use the following headings: 1. User research and needs analysis; 2. Concept design; 3. Elaboration; 4. Detailing; 5. Usability testing; 6. Final design proposal; and 7. Reflections. Suggested template is “Gör det själv-projekt”, Eng. Do it yourself project, but you can set up your own if you wish.

- [Introduktion till Sway \(in Swedish\)](#)
- [Tutorial on how to use Sway \(in English\)](#)
- [Inspirational example report: The Glass Wall BBC re-design](#)

Step 5. Research: Start recruiting 5–10 users early since it takes more time than you would expect to find participants. Collect qualitative data and do thematic analysis that answers the following questions:

- What is the situation like today for the intended users regarding the chosen challenge?
- What themes are important in the intended situation of use?

Step 6. Create primary and secondary personas and problem scenarios in text or storyboard that answers the following questions:

- Who are the users?
- What are the users doing today?
- What is problematic for them?

Step 7. Set up design goals:

- Why are we doing this project and what difference should our design make for whom (effect goals)?
- How should the design be experienced in use (UX-goals)?

Step 8. The presentation (mandatory attendance) should be in English if there are exchange students participating, and otherwise in Swedish. Make sure you ask your peers and teachers for the critique you need to bring your design work forward. Prepare a 10-minute sketchboard presentation (Arvola, 2020, Figure 1.7, p. 33) where you show the results from step 5–7.

Step 9. Consider the critique from peers and teachers at the presentation session and revise your concept if necessary. Document your process and progress in your Sway document.

Concept phase (week 8–10)

This part belongs to the examination module PRA2 Design Work.

Focus: For the concept design, it is important that the problem is framed from wide perspectives with many design ideas generated. Essential and important aspects should be picked up in designing. Many elements of exploration and judgment should be observed. The chosen concept should have potential to resolve the identified crux.

Step 1. Ideate and sketch out a wide variety of design concepts. Make rough and simple sketched concept storyboards ([example](#)) for at least one concept per group member. Evaluate the sketched concept storyboards using a Pugh-chart.

Step 2. Develop a concept proposal in a more presentable storyboard. Make sure to decide what *the thing* is with the concept, and what *the crux* it addresses.

Step 3. The presentation (mandatory attendance) should be in English if there are exchange students participating, and otherwise in Swedish. Make sure you ask your peers and teachers for the critique you need to bring your design work forward. Prepare a 10-minute sketchboard presentation (Arvola, 2020, Figure 1.7, p. 33) where you show the results from step 1–2.

Step 4. Consider the critique from peers and teachers at the presentation session and revise your concept if necessary. Document your process and progress in your Sway document.

The elaboration phase (week 13–16)

This part belongs to the examination module PRA2 Design Work.

Focus: For the elaboration of ideas, many variations of solutions and parts of solutions should be considered. The design solution should address the identified problem. As Albert Einstein said: “Everything should be made as simple as possible, but no simpler.”

Step 1. Establish the most important requirements for your concept, in terms of functions (what the users should be able to do with the system), data (what contents it should have and their format), qualities (how the system should be), and constraints (under what circumstances it should work).

Step 2. Explore alternative user interface designs in sketched wireflows ([example 1](#), [example 2](#)). Annotate your alternatives with question marks for issues, +/- lists for appraisals of your alternatives, and highlight your design decisions with exclamation marks.

Step 3. Construct a paper prototype that covers the three most important user tasks that your design should support. Make it look sketchy, without polished finish, but it should have realistic contents/data (e.g., no dummy text such as “lorem ipsum”) ([example](#)). Some of your test users may be non-Swedish speaking. If that is the case, then the prototype needs to have a user interface in English. Review your design in relation to the user interface guidelines in the design system for a chosen platform and make sure to use standard interface components (e.g., different kinds of buttons and menus) correctly:

- [Apple Human Interface Guidelines](#)
- [Microsoft Fluent Design System](#)
- [Google Material Design System](#)
- [IBM Carbon Design System](#)
- [Bootstrap](#) (a commonly used framework for web development)

Step 4. Test the paper prototype with another group of students on the study class (Swe. lektion) dedicated for it in the timetable. Prepare and conduct a formative usability test. Prepare for pre-test questions, task scenarios, observation protocol, and post-test questions). The following groups are test users for each other:

- Group 1 and 2
- Group 3 and 4
- Group 5 and 6
- Group 7 and 8
- Group 9 and 10
- Group 11 and 12

Step 5. The presentation (mandatory attendance) should be in English if there are exchange students participating, and otherwise in Swedish. Make sure you ask your peers and teachers for the critique you need to bring your design work forward. Prepare a 10-minute sketchboard presentation (Arvola, 2020, Figure 1.7, p. 33) where you show the results from step 1–4.

Step 6. Revise your design and your requirements based on the results from the formative usability test and the critique from peers and teachers. Document your process and progress in your Sway document. Make sure to include your most important requirements, early sketches, paper prototype and results of the usability test.

Detailing phase (week 17–18)

This part belongs to the examination module PRA2 Design Work.

Focus: The detailed design should be well thought through and resolve the crux you have identified. Highlight also what the thing is in your design. Design features should fit together as a composition.

Step 1. Build an interactive computer prototype in [Adobe XD](#) or [Figma](#). Use (and tweak) existing templates for your chosen design system (see step 3 in the elaboration phase) and use existing icon fonts so you don't have to spend time drawing icons. The prototype should cover the three most important tasks that your design should support. It should have high fidelity in visual design and interaction.

Step 2. Recruit 5–10 representative users for the final usability test. Recruiting users takes more time than you may think; start contacting people early.

Usability testing (week 19)

This part belongs to the examination module PRA1 Research Work. Follow the guidelines on usability testing in the course literature and the lectures when you plan and execute your work (use [usability.gov](#) if you have Boyl as course book).

Focus: The usability testing should follow good research practices for experiments and use of questionnaires. Quantitative data must be analysed with appropriate techniques for descriptive statistics.

Step 1. Prepare a usability and user experience test of the interactive computer prototype. *Measure* basic usability metrics for effectiveness (e.g. success rate), efficiency (e.g. time on task), and satisfaction (e.g. SUS), and take note of usability issues.

Step 2. Do the usability tests, analyse the data with descriptive statistics, that is frequencies, [central tendency](#) (e.g., mean, median), and dispersion ([standard deviation](#) around a mean or inter-quartile [range](#) around a median) and document the results in your Sway. Make changes to your design based on the test results.

Final Design Proposal and Reflection (week 20–21)

This part belongs to the examination module PRA2 Design Work.

Focus: Make it look good and set together the presentation of both design proposal and design process. Make it visual. Reflect critically on your own work.

Step 1. The final presentations will be in full class (mandatory attendance in your session). The presentation should be in English if there are exchange students participating, and otherwise in Swedish. Prepare a 10-minute presentation where you:

- Show a screencast video that demo the computer prototype
- Show your usability test results (what you have measured, how, and the results)
- Describe necessary changes due to the evaluation results

- Highlight challenges you ran into and lessons learned.

Document your process and progress in your Sway document.

Step 2. *Reflect* on the end of the final chapter of Arvola (2020, pp. 236–240) (or Lou (2018), Wikberg Nilsson and Jahnke (2018), and the Wikipedia page for Business model canvas). Start the work at the Reflective Design Workshop (see the timetable). Set up a meeting in your group to put down your answers the following questions, assign one person to take notes, and add a short reflections section to your sway document.

- What is the value proposition and business model of our design?
- What consequences will our design have for people?
- How does our design relate to sustainability/unsustainability?
- How do we as designers build our work on stereotypes, norms and power structures, and how do we change them?

Step 3. Share your Sway document with the teachers (send a public link). Make a note if you do not want it to be shared with students the following years. Consider also sharing it with stakeholders that you may have encountered in during the design work to show the results of their participation in your project.

2nd Individual Assignment (UPG 7 Design Methods)

Do this module individually during the exam periods week 11, 12, and 22, but do the reading during the study periods while working on the group work.

Deadline: The mandatory Part 1 is due on 2023-03-24, 17:30. The optional Part 2 is due on, 2023-06-02, 17:30.

UPG7 consists of two parts that examines how well you individually know the things you do in the group work. You will also have to do many design tasks during your education and during your working life to become a good designer.

You are expected to put in a couple of days of work on each part (reading not included). Write your name and LiU-ID on every page. Write in Swedish or English.

Grading: Grading is done by adding the points from the two parts.

- Fail (U): <8 points in total.
- Grade 3: 8 points
- Grade 4: 12 points
- Grade 5: 14 points

A supplementary assignment can be given students that are close to a passing grade (3) and must be completed within two weeks from the notice. The grade Fail will be reported if it has not been submitted within two weeks.

Submission: Submit your assignments in PDF on Lisam. File naming convention: `liuid-tdde36-2023-upg7-part#.pdf` (e.g., `matar63-tdde36-2023-upg7-part1.pdf`).

Part 1 Methods (max. 12 p)

Part 1 Methods is mandatory and is handed in at the end of the first exam period.

Describe and explain, in your own words, but with page references to the course literature (Arvola or Boyl) (1/2–1 page per question A–D, i.e., 200–500 words per question, and the double for question E):

- A. What are *Personas* and how will you create and use them in the course? (2 p)
- B. What are *Scenarios* and how will you create and use them in the course? (2 p)
- C. What are *Storyboards* and how will you create and use them in the course? (2 p)
- D. What are *Wireframes* and how will you create and use them in the course? (2 p)

- E. What are *the different kinds of Prototypes* and how will you create and use them in the course? (4 p)

Part 2 Design (4 p)

Part 2 Design is not mandatory, but necessary for the highest grades. It is handed in at the end of the second exam period.

Design a screen-based interactive system (i.e., website, mobile app, game, desktop application, or machine) for making and buying your own mix of sweets.

- A. Sketching – Scribble sketch on paper for about one hour working time as many concepts as you can. Choose one concept (or a synthesis of several) explicitly, and make sure to be clear on what the thing you are designing should be and what crux it addresses for the users. Scribble sketch then for about one hour working time variations of user interface designs for your chosen concept. Work with detailed screens and interaction flows (i.e., wireflows, Swe. gränssnittsflöde). Document by taking photos of or scanning your sketches.
Grading rubric: Divergence on many alternative concept ideas and variations of user interface designs and convergence on one (1.5p).
- B. Design Rationale Annotation – Make notes in your sketches from step A by highlighting alternatives with a hashtag and a number (#1). Assess your alternatives using pro et contra (+/-) lists. Mark design decisions with exclamation marks (!) and issues you identify with question marks (?). Use those question marks to spark further sketching. Also, use your minuses as issues to solve in further sketching.
Grading rubric: Pro et contra assessment of alternatives, and highlighting of design issues and decisions (0.5p).
- C. Visual Design – Refine the visual aspects on computer for selected parts from the design you sketched in step A. Present it in one or two “pixel-perfect” screens from your design. Use an established prototyping tool (i.e., Adobe XD or Figma). Grading rubric: Weighs together aesthetics and usability (1 p).
- D. UI Design Principles – Discuss your design in step C in relation to principles for interface design described in the course literature (Arvola or Boyl). Give references with page numbers. (~1 page) (1 p)

Appendix. Design Challenges

Learn more about the Agenda 2030 global goals and find project examples:

- <https://www.globalamalen.se>
- <https://www.globalgoals.org>

Assignment of User Groups to Design for

Group 1: Design for students at the Faculty of Medicine and Sciences (MEDFAK).

Group 2: Design for faculty at the Department of Computer Science (IDA).

Group 3: Design for employees in the Human Resources Division (HRA).

Group 4: Design for faculty at the Department of Management and Engineering (IEI).

Group 5: Design for students at the Faculty of Arts and Sciences (FilFak).

Group 6: Design for employees at the IT Division (LIUIT).

Group 7: Design for faculty at the Department of Science and Technology (ITN).

Group 8: Design for PhD students at LiU.

Group 9: Design for students in the Faculty of Educational Sciences (UV).

Group 10: Design for employees at the Dean's office of the Faculty of Arts and Sciences (FilFaks kansli).

Group 11: Design for employees at the Dean's office of the Faculty of Science and Engineering (TekFaks kansli).

Group 12: Design for employees at the Communications and Marketing Division (KOM).

Design Challenge

Design a screen-based interactive system (e.g., desktop app, mobile app, web app, game, screen-based installations, or online service) that contributes to one or several of the Agenda 2030 global goals for sustainable development (e.g., no poverty) by facilitating your user group (e.g., students at MEDFAK) to do something from the lists below (e.g., join an organisation that fight poverty).

1. *No poverty:*
 - a. Join an organisation that fight poverty
 - b. Find the help that the government or other organisations can offer
 - c. Become entrepreneurs and small business owners
 - d. Learn new skills that will make them more attractive on the labour market
 - e. Learn more about and keep better track of personal finance
 - f. Shop fair trade
 - g. Become a sponsor for a child
 - h. Give to people in need.
2. *Zero hunger:*
 - a. Shop, eat, and drink locally

- b. Reduce food waste
 - c. Raise money for organisations that reach disaster victims with food
 - d. Volunteer at a soup kitchen
 - e. Learn to cook good, nutritious, and healthy food
 - f. Learn more about nutrition
 - g. Join an organisation that fight hunger
 - h. Learn about sustainable farming
 - i. Donate food and food items.
3. *Good health and well-being:*
- a. Volunteer at a hospital
 - b. Reduce pollution
 - c. To vaccinate
 - d. Act responsibly in traffic
 - e. Donate blood
 - f. Learn more and talk more openly about sexual and reproductive health
 - g. Change to a healthier lifestyle
 - h. Stop smoking or drinking
 - i. Improve their mental health and well-being
4. *Quality education:*
- a. Give an online course
 - b. Take an online course
 - c. Volunteer or join a substitute teacher pool at a school or pre-school
 - d. Volunteer as a private tutor
 - e. Learn English (or Swedish)
 - f. Continue studying and developing their competence in an area and also the possibilities for a good job
 - g. Find and watch educational films
 - h. Learn more things outside school
5. *Gender equality:*
- a. Challenge stereotypes on the labour market.
 - b. Learn to read and write and develop their skills and knowledge (user group: illiterate girls and women)
 - c. Demand, discover, and use opportunities to take a leading role in society (user group: girls and women)
 - d. Share positive stories about gender equality and work against stereotypes
 - e. Influence the media industry to portray women as equally good, intelligent and competent compared to men
 - f. Become a sponsor for a vulnerable girl to give her better conditions to create a good life.
6. *Clean water and sanitation:*
- a. Stop flushing down the wrong things in the toilet
 - b. Track how much water they use and reduce it
 - c. Clean a stream, bay, lake, in their local area
 - d. Learn about clean water, efficient water use, and sanitation
 - e. Raise money for World Water Day (March 22) and World Toilet Day (November 19).
7. *Affordable and clean energy:*
- a. Install solar panels

- b. Reduce spikes in the energy network (i.e., not run the washing machine when everybody are doing it)
 - c. Make their homes more energy efficient
 - d. Use electricity efficiently at work.
8. *Decent work and economic growth:*
- a. Shop from companies that use sustainable materials, care for the environment, and treat their employees fairly
 - b. Learn about rights on the labour market
 - c. Follow workplace agreements, regulation, and laws
 - d. Set up workshops and courses where people learn skills that they have use for in the labour market
 - e. Shop, eat, and drink locally
 - f. Participate in a mentorship programme that help people on the labour market
 - g. Protect labour rights
 - h. Become entrepreneurs and small business owners.
9. *Industry, innovation and infrastructure:*
- a. Access information and communication technology
 - b. Re-use technology in industry and businesses.
10. *Reduced inequalities:*
- a. Participate in social, economic, and political life (user group: a discriminated group of people)
 - b. Find a job and earn a living (user group: migrants and refugees)
 - c. Understand migration processes in Sweden
 - d. Stand up to discrimination and harassment.
11. *Sustainable cities and communities:*
- a. Take care of public spaces and keep them clean
 - b. Recycle
 - c. Make their home more energy efficient
 - d. Avoid using the car
 - e. To improve the sustainability and accessibility of their own neighbourhoods
 - f. To give input to urban planning.
 - g. Ride to work together
 - h. Access public services
 - i. Use public transports
 - j. Prepare for crisis and disasters.
 - k. Make use of areas for sports and recreation locally.
12. *Responsible consumption and production:*
- a. Reduce the use of plastics
 - b. Reduce food waste
 - c. Chose ecologically certified products
 - d. Re-use stuff
 - e. Shop, eat, and drink locally
 - f. Plan grocery shopping
 - g. Make their own gifts instead of buying something
 - h. Recycle
 - i. Compost
13. *Climate action:*

- a. Offset carbon emissions
- b. Eat less meat
- c. Reduce air travel
- d. Recycle
- e. Avoid using the car
- f. Save electricity
- g. Reduce food waste.

14. *Life below water:*

- a. Reduce the use of plastics
- b. Eat less fish
- c. Eat fish and shellfish that is produced and caught in a sustainable way
- d. Reduce waste.

15. *Life on land:*

- a. Eat less meat
- b. Set up birdhouses or insect hotels
- c. Buy certified and ecological products (e.g., wood and paper products, fish, bananas, chocolate, coffee)
- d. Plant trees
- e. Choose alternatives to pesticides and toxic fertilizers
- f. Act more environment friendly in their daily life
- g. Conserve and protect endangered species locally
- h. Participate in urban farming.

16. *Peace, justice and strong institutions:*

- a. Exercise their democratic right to vote nationally and/or locally
- b. Pay attention to rights
- c. Become a mentor for younger people
- d. Get involved politically
- e. Solve conflicts
- f. Make sure their own organisation (e.g., schools, municipalities, companies) is inclusive
- g. Get to know people in their area.

17. *Partnerships for the goals:*

- a. Get involved in an organization that works on an issue related to sustainable development, reducing inequality, or combating climate change
- b. Support poor countries by creating demand for products produced in those countries
- c. Spread important and well-founded knowledge and information about sustainable development
- d. Create partnerships and cooperation that promotes sustainable development, reducing inequality, and combating climate change.