

# User Experience and Interaction Design (TDDE36)

## 12 ECTS Credits:

## Study Guide

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### Syllabus

<https://liu.se/studieinfo/kurs/tdde36/vt-2022>

### Editions

Edition 1.0: First published version.

Edition 1.1: Changed an error in the references to course literature in UPG6 Research Method. Smaller editorial changes and typos, including erroneous deadline dates.

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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 in 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 in 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 course went generally well the spring semester 2021 (Mdn = 4, IQR = 4 – 5) according to Evaluate, but the response rate was low (21%, 15 of 71 respondents). Those who responded to the course evaluation experienced that the content gave them the opportunity to reach the learning goals (Mdn = 4, IQR = 4 – 5). The teaching methods were perceived as relevant (Mdn = 4, IQR = 4 – 5), as well as the examination (Mdn = 5, IQR = 5 – 5). The pedagogical implementation worked despite the distance mode (Mdn = 3, IQR = 3 – 4). The vast majority (80%) felt that the hours they put into the course work corresponded to the size of the course in points.

As a result of the course evaluation, the lectures will be revised this year so that they don't repeat what can be read in the literature. The instructions for the design methods assignment will be revised. Links to example projects connected to the global sustainability goals will be given. The literature in English are changed to books that also are available through the library as e-books, but even though they have to be complemented by other material for concept design, prototyping and usability evaluation. The grading has been slightly revised.

## Working and Teaching Methods

*Lectures* in will be given over Zoom since they are in full class. Links to zoom-lectures will be published on Lisam. The plan is to give *all other sessions* face-to-face. Other sessions may however, with short notice, be changed to distance mode due to the covid-19 pandemic. Apply also for an education plan of Miro, which is a collaborative online drawing surface for distance work with many useful templates, that you can use for both group work and teacher-led sessions:

- <https://help.miro.com/hc/en-us/articles/360017730473-Education-Plan>

**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. Lectures are in Zoom.

**Presentations** (Swe. redovisningar) have compulsory attendance and are held as critique sessions with two project teams at the time (except for the final presentation which is in full class). Critique sessions are conducted around a show-and-tell about produced materials. It is important to give constructive critique on the others work. Two 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. 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.

## 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: 2022-05-27, 17:15

The *individual assignments* have a deadline at:

- UPG6 Research method: 2022-02-07, 17:30
- UPG7 Design method: 2022-06-03, 17:15.

There are two deadlines for *re-examination*:

- Re-examination 1: 2022-08-28, midnight.
- Re-examination 2: 2022-10-21, 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 co-teacher and lecturer. Three lectures are given by other men.
- 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):

- A 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 Distance Mode

This code of conduct is written to clarify what we as teachers expect of you as students during distance mode, 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 always 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

Choose **one** of the following two books as your *main book* on research methods:

Patel & Davidson (2019). *Forskningsmetodikens grunder: Att planera, genomföra och rapportera en undersökning* (5. uppl.). Studentlitteratur.  
Walliman, N. S. R. (2011). *Research methods: The basics*. Routledge.

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.  
Cooper, A. (2014). *About face: The essentials of interaction design* (4. ed.). John Wiley and Sons.

If you use Cooper’s book and not Arvola’s, then you also have the following two papers for the reflection part of the group work, and also refer to [usability.gov](https://usability.gov) for prototyping and usability testing and in concept design phase of the group work rely on the lectures (these are recommended but not mandatory for other students):

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:

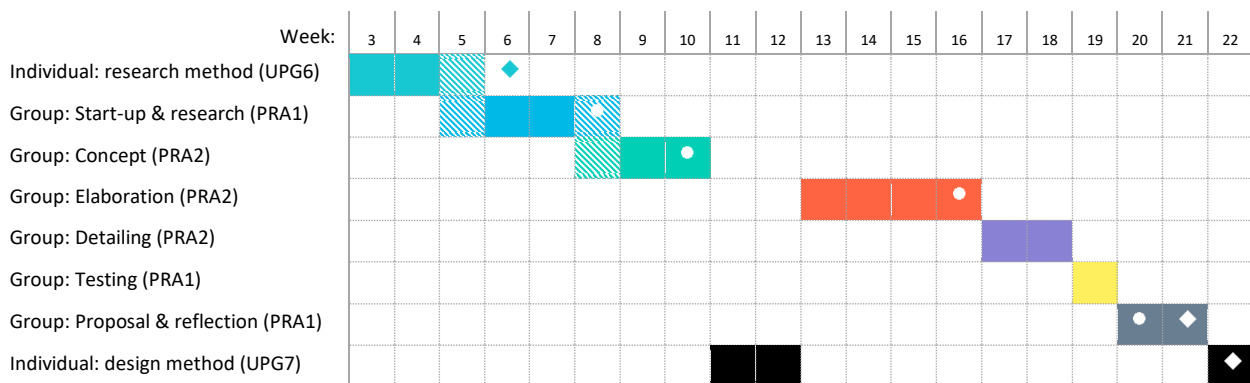
Wever, R., van Kuijk, J., & Boks, C. (2008). User-centred design for sustainable behaviour. *International journal of sustainable engineering*, 1(1), 9-20.  
<https://www.tandfonline.com/doi/full/10.1080/19397030802166205>

## 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](mailto: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 and lecturer. [emma.mainza.chilufya@liu.se](mailto:emma.mainza.chilufya@liu.se)
- *Wanjun Chu*, has a PhD in Design and is Lecturer in interaction and service design reseach. He specialises in design for sustainable behaviour. Lecturer. [chu.wanjun@liu.se](mailto:chu.wanjun@liu.se)
- *Ludwig Halvorsen* is an interaction designer and has a MSc in Cognitive Science as is a Junior Lecturer in user experience and interaction design at Linköping University. Lecturer and course assistant. [ludwig.halvorsen@liu.se](mailto:ludwig.halvorsen@liu.se)
- *Henrik Asteberg* has a MSc in Cognitive Science and is a UX Designer at Consid. Guest lecturer.

## Timeline

The timeline for the course is visualised in the simplified Gantt chart below (Table 1). You have two full work days 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 (◆) but check TimeEdit for the exact date and time. Presentations are marked with dot (●).*

## Examination Modules

### 1<sup>st</sup> Individual Assignment (UPG6 Research Methods)

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

*Deadline:* 2022-02-07, 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 page references to the course literature (Patel and Davidson OR Walliman) (1/2–1 page per question):

- a) What characterizes qualitative research? (1 p)
- b) What research ethical considerations do you have to do in a study (regardless if it is qualitative or quantitative)? (1 p)
- c) What do you need to consider if you plan to do an interview study? (1.5 p)
- d) What do you need to consider if you plan to do an observation study? (1.5 p)

#### 2 Quantitative Research (5 p)

Describe and explain, in your own words, but with page references to the course literature (Patel and Davidson OR Walliman) (1/2–1 page per question):

- a) What characterizes quantitative research? (1 p)
- b) What do the terms validity and reliability mean? (1 p)
- c) What do you need to consider if you plan to do a questionnaire study? (1.5 p)
- d) What do you need to consider if you plan to do an experiment? (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: 2022-05-27, 17:15.*

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. Then, choose collectively a design challenge from the list to work with and define a user group you will target (e.g., elderly, children, teens, administrators, musicians, café staff etc.). You need to recruit participants for user research and later on prototype testing, so you have to figure out how to get into contact with them. The user group should not be other students. 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. It is a good idea also

to have informal morning or afternoon coffee together in Teams if we were to go over to full distance mode.

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. 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 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 with regard to 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, 6, and 7
- Group 8 and 9
- Group 10 and 11
- Group 12, 13, and 14

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 representative users for the final usability test. One user per group member is the minimum. 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 Cooper 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. Respect social distancing. You might consider using moderated remote usability testing in Microsoft Teams where you give the user control of the window on your computer. You can also use Zoom. Read more here: "[Moderating UX research with Zoom](#)" (note that Zoom has been updated since it was written). Remote testing is usually not as good as testing face-to-face.

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) if the pandemic situation allows for that. 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) and Wikberg Nilsson and Jahnke (2018)). 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.

## 2<sup>nd</sup> Individual Assignment (UPG 7 Design Methods)

Do this module individually during the exam periods week 11, 12, and 22.

*Deadline:* 2022-06-03, 17:15.

UPG7 consists of two parts that examines how well you individually can perform some of 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:* Every part is worth eight points each.

- Fail (U): <8 points in total or less than three points on one of the two parts.
- 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-tdde36-2022-upg7.pdf` (e.g., `matar63-tdde36-2022-upg7.pdf`).

*Design Brief:* Design a screen-based interactive system (i.e., website, mobile app, game, desktop application, or installation) for making your own mix of grenola/müssli/serials.

### 1 Concept and UI Sketching (8 p)

- A. Concept Design – 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. Document by taking photos of your sketches.  
Grading rubric: Divergence on many alternative concepts (1p).  
Convergence on one concept (1p).
- B. UI Design – Scribble sketch for about one hour working time variations of user interface designs for you chosen concept in 1.A. Work with detailed screens and interaction flows (i.e., wireflows, Swe. gränssnittsflöde). Document by taking photos of your sketches.

Grading rubric: Divergence on many variations of user interface designs (1p). Convergence on one proposed user interface design (1p).

- C. Design Rationale Annotation – Make notes in your sketches in Part 1.A and Part 1.B 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. Use also your minuses as issues to solve in further sketching.

Grading rubric: Pro et contra assessment of alternatives (1p). Highlights design issues and decisions (1p).

- D. Process Description – Describe your design process and explain the reasons for your design in step A and step B. Relate your description to what you can read in the course literature on design methods and process, and give references with page numbers (~1 page).

Grading rubric: Describes and explains the design process and reasons for the design (1p). Connects own work to course literature (Arvola or Cooper) on design methods and processes (1p).

## 2 Prototype Refinement and Presentation (8 points)

- A. Visual Design – Refine the visual aspects on computer for selected parts from the design you sketched in 1.B. 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 (3 p).
- B. Design Styles – Make a variant of your visual design from 2.A where you take inspiration from a graphic design style or art movement. Make explicit notes on what movement you use and how it affects the design (one screen and a half a page of description). Choose a style or movement among the one’s described at the following sites and make sure it has a clear and distinct impact on your visual design. (2 p):
- <https://www.shillingtoneducation.com/blog/graphic-design-styles/>
  - <https://www.theartstory.org/movements/>
- C. UI Design Principles – Discuss your visual design 2A and 2B in relation to principles for interface design described in the course literature (Arvola or Cooper). Give references with page numbers. (~1 page) (3 p)

## Appendix. Design Challenges

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

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

The design challenge is to 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 by facilitating a user group of your choice (but not students) to:

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.