DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

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Examiner

Examination TDDE36 2024

The course is assessed through two practical groupwork modules (Research work, Design work) and two individual assignment modules (Research method and Design method). Attendance is compulsory for presentations in Research work and Design work.

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

Information on how to perform the required activities in the examination modules is given in lectures and in the course literature. Reading the course literature should be done continuously during the course from day one.

Groupwork: Research and Design Work

The focus for the group work is to design interactive systems for sustainable development. You can find the deadline in the timetable. 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.

Goal

To design an interactive system that addresses one or more of the United Nations' Sustainable Development Goals (SDGs) and provides a platform for students to contribute to the achievement of these goals.

Target User Group

Design for other students. However, you may not use students from your own study program as participants in user research and prototype testing.

Design Challenges

Choose one of the following challenges:

1. Design an interactive system that encourages students to reduce their carbon footprint– SDG 13: Climate Action.
2. Design an interactive system that facilitates students to learn about

sustainable agriculture and food systems – SDG 2: Zero Hunger and SDG 12: Responsible Consumption and Production.

3. Design an interactive system that educates students on the importance of water conservation and challenges them to reduce water usage – SDG 6: Clean Water and Sanitation.
4. Design an interactive system that connects students with local volunteering opportunities or local associations that support environmental sustainability – SDG 13: Climate Action and SDG 15: Life on Land.
5. Design an interactive system that connects students with different skills and abilities to support each other's academic success – SDG 4: Quality Education.
6. Design an interactive system that introduces students to coding and computer science concepts – SDG 4: Quality Education and SDG 9: Industry, Innovation, and Infrastructure.
7. Design an interactive system that connects students with local farmers and allows them to purchase fresh, locally grown produce – SDG 2: Zero Hunger and SDG 12: Responsible Consumption and Production.
8. Design an interactive system that helps students reduce energy consumption for themselves and others – SDG 7: Affordable and Clean Energy.
9. Design an interactive system that educates students on the importance of biodiversity conservation – SDG 14: Life Below Water and SDG 15: Life on Land.
10. Design an interactive system that connects students with local artisans and promotes sustainable, handmade goods – SDG 12: Responsible Consumption and Production.
11. Design an interactive system that helps students understand the impact of their fashion choices on the environment and provides resources for sustainable fashion alternatives – SDG 12: Responsible Consumption and Production.
12. Design an interactive system that raises awareness of the challenges faced by refugees and connects students with local organizations that provide support – SDG 10: Reduced Inequalities and SDG 16: Peace, Justice and Strong Institutions.
13. Design an interactive system that helps students find and participate in local community service projects or local associations that address social and environmental challenges – SDG 3: Good Health and Well-being, SDG 4: Quality Education, and SDG 17: Partnerships for the Goals.

You should focus on and explore solutions building on different kinds of screen-based interactive systems, as for example:

- *Websites*: Interactive webpages that allow users to navigate and interact with content through buttons, links, forms, and other interactive elements.
- *Mobile apps*: Interactive applications designed specifically for mobile devices, which can include features such as touch controls, location tracking, and push notifications.

- *Desktop apps*: Interactive applications made for PCs, and laptops, where you interact using inputs such as mouse, touchpad, and keyboard, where you have a large display, and user interfaces characterized by windows, icons, menus, and pointers (WIMP).
- *Interactive kiosks*: Publicly accessible touchscreen displays that provide information, services, or entertainment in a variety of settings, such as museums, airports, and retail stores.

Project Goals

- To research and understand the needs, motivations, and behaviours of the target user group in relation to the challenge.
- To explore multiple potential design concepts and alternative solutions before choosing what to go ahead with.
- To create a user-centred design solution that effectively addresses the design challenge and contributes to the associated SDG by engaging the target user group in contributing to its achievement.
- To prototype the interactive system and test it to ensure it meets the needs and expectations of the target user group.

Deliverables

Deliver a link to a sway-report via e-mail to the examiner that describes both design process and design results of each phase of the project. You can find Sway among the Office 365 apps in the top left menu when you log in on Lisam.

Each phase should be **planned and performed in accordance with the course literature and the lectures**. Use the list below as a checklist to make sure you don't miss any part of the deliverables. Research work and Design work mentioned in parentheses below are the two examination modules for the group work.

- The concept phase (week 3 – 9)
  - Introduction and planning (week 3)
  - Qualitative User Research and Needs Analysis (week 4 – 7):
    - Interviews with 5-10 representative users (Research work)
    - Thematic analysis using affinity diagramming (Research work)
    - Personas and problem scenarios (Design work)
    - Design objectives in effect goals and UX-goals (Design work)
  - Concept design (Design work) (week 8 – 9):
    - Concept ideation and sketching
    - Pugh chart
    - Concept proposal and presentation
- The elaboration phase (week 10, 13 – 15)
  - Requirement specification (Design work)
  - User interface sketching (Design work)
  - Paper prototype covering at least three significant user tasks (Design work)
  - Qualitative formative usability testing with another group from the course (Research work).

- The detailing phase (week 16 – 19)
  - Interactive computer prototype in the Material Design system covering at least three significant user tasks (Design work)
  - Quantitative summative usability testing with 5-10 representative users (Research work)
- The presentation and reflections phase (week 20 – 21)
  - Presentation of the final design with changes after the test in four slides (Design work):
    - Slide 1: Challenge and concept.
    - Slide 2: Screencast demo of prototype.
    - Slide 3: Evaluation results.
    - Slide 4: Lessons learned.
  - Reflections on the work in a wider context
    - Sustainability in interaction design and UX (Design work)
    - Gender and equal opportunities in interaction design and UX (Design work)
    - Business aspects in interaction design and UX (Design work)

There are three sessions with mandatory attendance (you can find the dates in the timetable):

- Presentation of the Concept Design phase
- Workshop for testing of paper prototype
- Final presentation of your four slides that you will show on a large screen in TP42 where you also can walk around and look at and discuss others' work.

Individual Assignments: Research and Design Methods

Write your name and LiU-ID on every page. Write in Swedish or English. Submit your assignments in PDF on Lisam and use the following file naming convention: `liuid-tdde36-2024.pdf` (e.g., `matar63-tdde36-2024.pdf`). Make use of both exam periods for the individual assignments, but make sure to read the course literature during the study periods while you do the group work. You can find the deadline in the timetable.

Research Method

You need 5 points in total from Part 1 and Part 2 for grade 3; 8 points for grade 4; and 10 points for grade 5.

Part 1 Qualitative Research Methods

You need 2 points from this part to pass and get grade 3. Answer the following questions (about half a page per answer and one page for the answer to the last question), and relate your answers to the course literature by concrete references in the Harvard format with page numbers for relevant and specific pages (e.g., not just "p. 143–160"). Make sure to highlight your own personal experiences from the group project.

a. How did you use a qualitative research method (choose one) in the group project, in comparison to key concepts and principles for that

method described in the course literature (1 p.)?
b. What were the advantages and disadvantages of using that method in your group work, and what should you do differently in the future? (1 p.).
c. How did you use triangulation in the group project in comparison to what you can read about the topic in the course literature, and what should you have done differently (1 p)?
d. How trustworthy are the results from your use of the method? Relate your discussion to criteria for good qualitative research that you can find in the course literature (2 p.).

Part 2 Quantitative Research Methods
You need 2 points from this part to pass and get grade 3. Answer the following questions (about half a page per answer and one page for the answer to the last question), and relate your answers to the course literature by concrete references in the Harvard format with page numbers for relevant and specific pages (e.g., not just "p. 143–160"). Make sure to highlight your own personal experiences from the group project.

a. What quantitative research have you done in the group project? Provide a short description of how the methods were used and relate to the course literature (1 p.).
b. How did you recruit participants in your group project? Evaluate your recruitment in terms of considerations for sampling that you can find in the course literature. What should you do differently in future projects? (1 p.).
c. What ethical issues did you consider in the usability tests? Compare them to what you can read about ethical research in the course literature. Did you miss anything? (1 p.).
d. Can the quantitative studies in your group work be considered valid, and were there any threats to validity? Motivate your evaluation in relation to what you can read about validity in the course literature (2 p.).

Design Method

You need 8 points in total from Part 1 and Part 2 for grade 3; 12 points for grade 4; and 14 points for grade 5.

Part 1 Design Methods
You need 8 points from this part to pass and get grade 3. Answer the following questions (about half to one a page per answer and one to two pages for the answer to the last question), and relate your answers to the course literature by concrete references in the Harvard format with page numbers for relevant and specific pages (e.g., not just "p. 143–160"). Make sure to highlight your own personal experiences from the group project.

a. What were your procedures for creating *Personas* in your group project, and how were they used during the project? What were the drawbacks and strengths of your use of the methods? Relate your answer to the

descriptions of the method in the course literature. (2 p)

b. What were your procedures for creating *Scenarios* in your group project, and how were they used during the project? What were the drawbacks and strengths of your use of the methods? Relate your answer to the descriptions of the method in the course literature. (2 p)
c. What were your procedures for creating *Storyboards* in your group project, and how were they used during the project? What were the drawbacks and strengths of your use of the methods? Relate your answer to the descriptions of the method in the course literature. (2 p)
d. What were your procedures for creating *Wireframes and Wireflows* (Swe. gränssnittsflöde) in your group project, and how were they used during the project? What were the drawbacks and strengths of your use of the methods? Relate your answer to the descriptions of the method in the course literature. (2 p)
e. What different kinds of *Prototypes* did you create in your group project, and how were they used during the project? What other kinds of prototypes could you have done and what advantages and disadvantages would they have had? (4 p)

Part 2 Sketching Methods

You do not need any points from this part to pass and get grade 3. Design a screen-based interactive system (i.e., website, mobile app, game, desktop application, or machine) for ordering at a restaurant.

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. (1.5 p).
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. (0.5 p).
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 (e.g., Adobe XD or Figma). Consider both aesthetics and usability (1 p).
d. *UI Design Principles* – Discuss your design from step c in relation to principles for interface design described in the course literature. Again, make references in Harvard style with page numbers (~1 page) (1 p).

Grading Criteria for the Course

The course has the following intended learning outcomes:

1. Use and account for basic qualitative user research methods (e.g., interviews, observation, and thematic analysis).
2. 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.
3. Ideate and sketch interaction design concept proposals, assess them, and make a convincing argument for one proposal based on user research results.
4. Sketch, develop, and present interaction design prototypes.
5. Conduct and account for a user experience evaluation of interaction design prototypes.
6. Assess user research and evaluations with respect to scientific criteria.
7. Review interaction design projects with respect to societal and ethical aspects, as for example research ethics, gender, and sustainability.

Grading Criteria for Grade 3 and 5

L1 – L7 refers to intended learning outcomes above. PRA1 is Research work. PRA2 is Design work. UPG6 is Research method. UPG7 is Design method.

	GRADE 3	**EX. MODULE**	**GRADE 5**	**EX. MODULE**
L1	Use and account for several aspects of basic qualitative research methods in user studies, based on the literature.	PRA1 UPG6	Exhaustively and in detail describe basic qualitative research methods in user studies, based on the literature.	UPG6
L2	Use and account for several aspects of basic quantitative tests of user experience, based on the literature, including analysis of the results using descriptive statistics.	PRA1 UPG6	Exhaustively and in detail describe basic quantitative tests of user experience, based on the literature.	UPG6
L3	Idea generation and sketching of concept proposals in interaction design, evaluate the proposals and convincingly argue for a proposal based on results from user studies.	PRA2	Exploratory and independent idea generation and sketching of concept proposals in interaction design, evaluating the proposals and convincingly arguing for a proposal.	UPG7
L4	Sketch, develop and present prototypes of interactive products and services.	PRA2	Exploratory and independently sketch and visually refine presentations of prototypes of interactive products and services with a focus on both usability and aesthetics.	UPG7
L5	Carry out and account for evaluation of prototypes, interactive products and services with regard to user experience. Describe several aspects of design methods and their use in user experience interaction design, based on the literature.	PRA1 PRA2 UPG7	Discuss design solutions based on design principles from the literature. Exhaustively and in detail describe design methods and their use in user experience interaction design, based on the literature.	UPG7

L6	Describe several aspects of how research methods are used for user research and evaluations, based on the literature. Describe several criteria for good scientific research, based on the literature.	UPG6	Exhaustively and in detail describe how research methods are used for user research and evaluations, based on the literature. Exhaustively and in detail describe exhaustively the criteria for good scientific research, based on the literature.	UPG6
L7	Review interaction design projects with regard to societal and ethical aspects, such as research ethics, gender and sustainability. Describe several ethical considerations in the research parts of an interaction design project grounded in the literature.	PRA2 UPG6	Exhaustively and in detail describe ethical considerations in the research parts of an interaction design project grounded in the literature.	UPG6

Intermediate grades

For grade 4, all criteria for grade 3 must be met and half of the criteria for grade 5 must be met.

Operationalization

EX. MODULE	SCALE	MODULE GRADING	COURSE GRADES
PRA1 Research parts of project work in groups with milestones and written final report and oral presentation	U/G	U/G	Given G on PRA1 and PRA2, and at least 3 on UPG6 and UPG7, the course grade is given based on the sum of the points from UPG6 and UPG7 (max. 26 p.): **3:** 13 p. **4:** 20 p. **5:** 23 p.
PRA2 Design parts of project work in groups with milestones and written final report and oral presentation	U/G	U/G	
UPG6 Two-part submission	U,3,4,5	**3:** 2 p. on part 1, 2 p. on part 2, and 5 p. in total (max. 10). **4:** 8 p. in total. **5:** 10 p. in total.	
UPG7 Submission 1 (required part) Submission 2 (optional part)	U,3,4,5	**3:** 8 p. on part 1, 8 p. in total (max. 16). **4:** 12 p. in total. **5:** 14 p. in total.	

Supplementary assignments 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 (U) will be reported if it has not been submitted within two weeks.

Conduct

The following set of rules apply to the examination in this course:

- 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.
- Generative AI techniques can be used for inspiration (i.e., in moodboards, as a sounding board), instead of dummy contents (i.e., stock art, lorem ipsum text), for evaluation, or for proof-reading of your own work, if you state what systems you used and how you used them in the process in a footnote or an endnote, including what prompts you used. You cannot copy generated text or images into your own answers and present them as your own.
- 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.