SUSE-2022: Sustainability Engineering

Kestävän kehityksen ICT

University of Eastern Finland, Fall 2022

Instructor:

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Lecture: Online
Lecture Hall: Zoom, Moodle, & Discord

(This syllabus is subject to modification as the semester progresses - particularly the schedule. Text highlighted in yellow color are just placeholders and would be updated subsequently)

Course Content: The goals, principles and methods for designing ICT for sustainable development. The role, purpose and impact of design methods in sustainable design of ICT. Various perspectives related to the effectiveness of designing ICT for sustainable development.

Sisältö: Kestävän kehityksen ICT-suunnittelun tavoitteet, periaatteet ja menetelmät. Suunnitelumenetelmien rooli, merkitys ja vaikutus kestävän kehityksen ICT-suunnittelussa. Kestävän kehityksen ICT-suunnittelun vaikuttavuuden näkökulmat.

Objectives: After the course, the students are aware of the goals, principles and methods for designing ICT for sustainable development, as well as connection of designing ICT for sustainable development to general development goals. Specifically, the students comprehend the role, purpose and impact of various design methods (i.e., participatory design, design research, usability studies and energy efficiency) towards designing ICT for sustainable development. In addition, the students understand the various perspectives related to the effectiveness of designing ICT for sustainable development. *This course will take a practical approach where students would learn by doing.*

Osaamistavoitteet. Opintojakson suoritettuaan opiskelija on tietoinen kestävän kehityksen ICT-suunnittelun tavoitteista, periaatteista ja menetelmistä sekä ICT-suunnittelun yhteydestä yleiseen kestävään kehityksen. Erityisesti opiskelija ymmärtää erilaisten suunnittelumenetelmien (esim. osallistava suunnittelu, kehittämistutkimus, käytettävyys ja energiatehokkuus) roolin, merkityksen ja vaikutuksen kestävän kehityksen ICT-suunnittelussa. Lisäksi opiskelija ymmärtää kestävän kehityksen ICT-suunnittelun vaikuttavuuden moninaiset näkökulmat.

Study materials: Online learning materials

Oppimateriaali: Verkkomateriaali

Teaching methods: Online learning. Lectures and online tutoring sessions, self-studying and completion of learning activities

Toteutustavat: Verkko-opetus. Verkkoluennot ja -tutorointi, oppimistehtävien tekeminen ja omatoiminen työskentely.

Modes of study: During the course, the students complete a set of learning activities individually, pairs or in small teams. The submitted learning activities will be evaluated and graded and accepted learning activities will determine the overall course grade.

Suoritustavat: Opintojakson aikana opiskelijat tekevät oppimateriaaliin sekä verkosta löytyvän materiaalin pohjautuvia oppimistehtäviä yksin, pareittain tai pienissä ryhmissä. Palautetut oppimistehtävät arvioidaan, ja kurssiarvosana määräytyy suoritettujen oppimistehtävien perusteella.

Assessment: 0-5

You get points from 0 to 100. In order to pass the course, you must have 50 points. The grades given are: <50 fail; >= 50 – 1; >= 60 – 2; >= 70 – 3; >= 80 – 4; >= 90 – 5.

Arvostelu: 0-5

Workload: The course is **5 credits (ECTS),** implying 133 hours of work (average)

Prerequisite(s): This course is meant for computer science masters students. However, because of the interdisciplinarity nature of concepts to learned in this course, I would encourage even non computer science majors to try it out.

Resources for this course:

There are plenty of resources online related to Sustainable designs, Human-centered design, and sustainability engineering, but this course will try to use a few books. Information about these books is available on the course website. Please, feel free to contact me for any material and I will be willing to help.

Course Implementation Structure and Assessment

This course will consist of lectures, home-works, group projects, presentations, and a final poster report. Each course component is very important to gain expected learning outcomes including grades. Looking at its comprehensive nature, students are encouraged to give their best in all the

components of the course. Full participation in the lecture, via course communication channel or email are strongly encouraged.

- **Lecture**
  Lectures will be held every Mondays and Wednesdays, (except for holidays or other events from the university that may override). The time for the lecture is between 8 – 10 am. Please check out the course syllabus here. Slides and other resources for the lecture can also be accessible from the course webpage. While I explore how to conform to accessibility best practices, I will appreciate your feedback and let me know if some of the materials are inaccessible. Also, I am open to learning new ways of implementing accessibility in this course and any tips is welcome.

- **Homework**
  There will be two homework activities consisting of several tasks to be completed on individual bases during this course. I will decide on when the homework is sent out and the due date. Each homework would contain problem sets that focuses on demonstrating knowledge gained from previous classes and additional knowledge from self-learning. All homework must be submitted on the due date via the course webpage.

- **Projects**
  This course consists of one major project that would require students to execute in group of 3 to 4 students per group. In exceptional cases, a student can be allowed to work alone but that arrangement would be approved by me. The course will practically work students through sustainable design process, hand-on conceptualization, design, and formative testing of an innovative system that addresses one identified issue of sustainability in a selected context. There will be concept presentation, free-writing, and later poster paper in group. In addition, there will be peer-reviewing from each group. All of these activities will contribute towards the final grade on project.

- **Fina Exams**
  There NOT will be final exams, each student will write a personal reflection essay on the course. Although student reflection could be a free form, but some guidelines may be provided by the instructor.

Feedback and Course Grading

I will ensure that feedback is provided on each homework, projects, and final exam/reflection. Aside from the feedback, certain percentage of the grade will be awarded to students for active participation in all the components of the course. The weighting of the grades include:

- Active participation 10%
- Homework activities 20%
- Green ICT hackathon 10%
- Projects 50%
- Final reflection 10%

Course Policies:

Late Submission and Incomplete Policy

While I do students must ensure that all submissions are completed before due date, I totally understand that as human, things can sometimes come up or go wrong and you are unable to get an assignment turned in on time. This kind of situation calls for some flexibility where I could consider accepting a late submission. However, this flexibility MUST be subject to my awareness and approval. Therefore, if any student is in this kind of unfortunate situation and would need more time to submit homework or project a bit late, please, contact me immediately. I must receive an email and reply to it in order to implement this policy. As a matter of rule, no lateness beyond 1 day (24 hours) can be tolerated for any given homework/project.

UEF ethical guidelines:

This section has been largely developed/adapted from the UEF ethical guidelines that addresses pertinent issues related to teaching and learning, which can been accessed via this link https://kamu.uef.fi/en/tietopankki/students-rights-and-obligations/ethical-guidelines-for-teaching-and-studying/

In summary, UEF "is committed to following the guidelines of the Finnish National Board on Research Integrity (TENK) on responsible conduct of research. All teachers and students at the university are expected to be familiar with these guidelines published by TENK (RCR)" (https://tenk.fi/en/research-misconduct/responsible-conduct-research-rcr), and are required to observe them. Universities have a duty to organise their activities in such a way that scientific research, artistic activities, education and teaching follow honesty and responsible conduct of research

Academic Honesty

In line with the UEF guidelines, cheating is defined as any form of intellectual dishonesty or misrepresentation of one's knowledge. Plagiarism, a form of cheating, consists of intentionally or unintentionally representing someone else's work as one's own. Integrity is of prime importance in a college setting, and thus cheating, plagiarism, theft, or assisting another to perform any of the previously listed acts is strictly prohibited.

Tentative Course Outline:

The course plan is only tentative and might change slightly as the course progresses. In such a case, I will notify students via all the course communication channels.

Week	Monday (8-10 am)	Wednesday (8-10 am)	HW due
1	Sept 5	Sept 7	Sept 11
Introduction	Intro to syllabus & sustainability concepts	Human-Computer Interaction (HCI) & sustainability design|	HW-0 due
2	Sept 12	Sept 14	Sept 18
Usability & User-centered Design (UCD)	Goal & principle of sustainability design	HCI genres & user-centered design	HW-1 due
3	Sept 19	Sept 21	Sept 25
User-centered design (UCD) & Users Experience (UX)	Green ICT (Hackathon)	Green ICT (Hackathon)	
4	Sept 26	Sept 28	Oct 2
Green ICT: concept and designs	Users eXperience and usability methods	Agile methods for sustainability design (Guest lecture)	HW-2 due
5	Oct 3	Oct 5	Oct 9
Designing ICT for Sustainable Development	Group project selection & guidelines	Group project topic presentation	
6	Oct 10	Oct 12	Oct 16
Hands-on project	Group project ongoing: (Mentorship by instructor)	Group project ongoing (Mentorship by instructor)	
7	Oct 17	Oct 19	Oct 23
Hands-on project	Group project ongoing (Mentorship by instructor)	Group project ongoing (Mentorship by instructor)	Project report & slides due
8	Oct 24	Oct 26	Oct 30
Project presentations	Group presentations & peer-reviewing	Group presentations & peer-reviewing	
9	Oct 31	Nov 2	Nov 6
Project presentations	Group presentations & peer-reviewing	Group presentations & peer-reviewing	Peer-review due
10	Nov 7	Nov 9	
Project poster submission	Group poster revision and individual reflection	Group poster submission due	