Course Plan March-July 2024

1. Faculty Information
        Name : Dr Patricia Lago and Dr Emitza Guzman
            Vrije University Amsterdam

Department inside Amrita:
AmritaWNA, Amritapuri
Email : aryadevird@am.amrita.edu,
maneesha@amrita.edu

Contact No: 9496212037

Course Overview
Modern society is growing increasingly digital. At the same time, it aims to be inclusive, to increase the quality of life, to tune and adapt for the need of different contexts, and finally, to decrease its environmental footprint as we learn how to best integrate, apply, and prioritize sustainability. In this course students will learn how to translate the notion of sustainability into design concerns relevant for the design of digital solutions (like software systems and/or services). Also, you will learn how to assess the extent to which such digital solutions realize the target sustainability goals.

The course starts by providing the students with a strong theoretical foundation on sustainability and how it is related to software/digital solutions. Next, we provide the students with a set of practical tools for designing sustainability into your own project of choice. Throughout the week there will be several hands-on sessions in teamwork in which we guide and support the students in developing your project and building the necessary skills and competences.

Course Outcomes

COs	Description
CO1	Understand the notion of sustainability and its impact over time, in the context of software intensive systems
CO2	Apply sustainability analysis to concrete projects
CO3	Identify ethical and social issues in information systems
CO4	Reason about ethical and social issues in information systems
CO5	Guide discussions about ethical and social issues in information systems

Recommended background knowledge:
Basic programming experience. Some knowledge about the software lifecycle is of advantage.
Familiarity with Information Systems.
 Course Syllabus
Intro to Ethics, discussion of general ethical dilemmas in Information Technology, Intro to ethical theories, Gender and videogames, Extracting ethical concerns from user reviews + whistleblowing, Ethics & Al, bias. Gender bias, Ethics and Privacy in Information Technology, Surveillance capitalism, Intro Software and Sustainability. Decision Maps. SAF Toolkit, On the use of the DMatrix Maintenance,

The Sustainable Development: From Stockholm to the SDGs, Understand the notion of sustainability and its impact over time, in the context of software-intensive systems. quantify and qualify sustainability impacts and the role of (software architecture) design decisions in an inter-disciplinary context.

Reference books
- Lago, P. (2019). Architecture Design Decision Maps for Software Sustainability. IEEE/ACM 41st International Conference on Software Engineering: Software Engineering in Society (ICSE-SEIS), 61–64.
- Gossart, C. (2015). Rebound Effects and ICT: A Review of the Literature. ICT Innovations for Sustainability, Springer, 435–448.
- Condori-Fernandez, N., & Lago, P. (2018). Characterizing the contribution of quality requirements to software sustainability. Journal of Systems and Software, 137, 289-305.

From Theory to Practice:
- Condori-Fernandez, N., Lago, P., Luaces, M. R., & Places, Á. S. (2020). An Action Research for Improving the Sustainability Assessment Framework Instruments. Sustainability: Science Practice and Policy, 12(4), 1682.
- Lago, P., Verdecchia, R., Fernandez, N. C., Rahmadian, E., Sturm, J., van Nijnanten, T., Bosma, R., Debuysscher, C., & Ricardo, P. (2020). Designing for Sustainability: Lessons Learned from Four Industrial Projects. International Conference on Informatics for Environmental Protection.

More on Digital Transformation and Sustainability:
- GeSI. (2000). Digital with Purpose: Delivering a SMARTer 2030. GeSI.
- Hietala, J., & Härkin, J. (n.d.). Digital Transformation of the Workforce. Valamis (white paper).
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. The Journal of Strategic Information Systems, 28(2), 118–144. Other references will be given during the lectures.

Main objectives of the course
Students will be conversant with the following aspects at the end of the course:
1) Sustainability and its impact over time, in the context of software intensive systems.
2) Apply sustainability analysis to concrete projects.
3) Be able to quantify and qualify sustainability impacts and the role of (software architecture) design decisions in an inter-disciplinary context.
4) Identify ethical and social issues in information systems.
5) Guide discussions about ethical and social issues in information systems.
6) Reason about the design of ethically and socially responsible information systems.

CO-PO Mapping

COs	Description	PO1	PO2	PO3	PO4	PO5	PO6
CO1	Understand the notion of sustainability and its impact over time, in the context of software intensive systems	3	3	3	3	2	1
CO2	Apply sustainability analysis to concrete projects	3	3	2	2	3	1
CO3	Identify ethical and social issues in information systems	3	3	3	3	2	2
CO4	Reason about ethical and social issues in information systems	3	3	3	3	2	1

CO5	Guide discussions about ethical and social issues in information systems	3	3	2	2	3	2

Teaching Methods

The lecture will mostly be in a seminar format. Students will read material before the lecture, write small reports on the material and discuss the main points during the lecture with the rest of their peers and lecturers.

Students will also present a topic of their choice within the course domain and guide the discussions among the rest of their peers.

Evaluation pattern 70:30

The course carries three credits. The evaluation pattern is given below:

4 assignments/activities – 40 points. The assignments/activities are designed to test the student's understanding of the materials. These are both theoretical and problem oriented so that the student can assess his own abilities in handling the different aspects of the course.

1 project – 30 points.

1 final project presentation – 30 points. Project presentation will be based on the project that the students have chosen.

Importance of the course:

The course starts by providing the students with a strong foundation on sustainability and how it is related to software/digital solutions. The lecture will cover an introduction to ethical thinking and ethical issues faced by current information systems. Specifically, it will cover the interplay of ethics andinformation systems, social issues caused with poorly handled ethical concerns and privacy in information systems. During the course students will reflect through actual real-world examples on the main ethical issues faced by information systems and will design and present potential alternatives for identified ethical concerns.

For VU professors,
Signature with Date:

Dr. Aryadevi R D,
Assistant Professor,
AmritaWNA

23/02/2024