Course: T520051101 - Interactive Systems Engineering (ISE), Fall 2023.

Schedule:

Day	Date	12:15 – 13:15	13:30 – 14:30	14:45 – 15:45 (16:00)
1	**01/09**	L1. Introduction to the course and group organization	E1. Topic discussion and agreement (15 min. per group)	
2	**08/09**	L2. Review of key HCI concepts, theories, and models	L3. Review of user-centered requirements engineering techniques	L4. Task analysis and modelling
3	**15/09**	L5. Cognitive and human-error task modelling	E2. Group work supervision (15 min. per group)	
4	**22/09**	L6. End-user development	L7. Low-code development	L8. Low-code development and generative AI
5	**13/10**	E3/E4. Group work supervision (20-25 min. per group)		
6	**03/11**	E4/E5. Group work supervision (20-25 min. per group)		
7	**10/11**	L9. Interactive systems design processes	E6. Group work supervision (15 min. per group)	
8	**17/11**	L10. Consistency assurance between requirements and UI artefacts	E7. Group work supervision (15 min. per group)	
9	**24/11**	L11. GUI evaluation and automated testing	E8. Group work supervision (15 min. per group)	
10	**01/12**	E9/10. Group work supervision (20-25 min. per group)		
11	**04/12**	E10/11. Group work supervision (20-25 min. per group)		
12	**08/12**	L12/E12. Final group presentations (15-20 min. per group)		

Readings (Core readings are highlighted):

- **L1. Introduction to the course and group organization**

No reading.

- **L2. Review of key HCI concepts, theories, and models** (content review)

- Yvonne Rogers (2012), "HCI Theory Classical, Modern, and Contemporary", Chapters 1, 2, 3, and 4, In: Synthesis Lectures on Human-Centered Informatics, Morgan & Claypool.

- Clarisse Sieckenius de Souza, Carla Faria Leitão (2009), "Semiotic Engineering Methods for Scientific Research in HCI", Chapters 1 and 2, In: Synthesis Lectures on Human-Centered Informatics, Morgan & Claypool.

- **L3. Review of user-centered requirements engineering techniques**

Personas (content review)**:**

- John Pruitt, Tamara Adlin (2012), "Putting Personas to Work: Employing User Personas to Focus Product Planning, Design, and Development", In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 1055-1080, CRC Press.
- William Hudson (2013), "User Stories Don't Help Users: Introducing Persona Stories", interactions, 20(6), pp. 50-53, ACM.
- Joelma Choma, Luciana AM Zaina, Daniela Beraldo (2016), "UserX Story: Incorporating UX Aspects into User Stories Elaboration". In: International Conference on Human-Computer Interaction (HCI 2016), pp. 131–140, Springer.

Scenarios and BDD Stories (content review)**:**

- Mary Beth Rosson, John M. Carroll (2012), "Scenario-Based Design", In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 1105-1124, CRC Press.
- Dan North, "Introducing BDD", Available at: https://dannorth.net/introducing-bdd/
- Dan North, "What's in a Story?", Available at: https://dannorth.net/whats-in-a-story/
- Gabriel Oliveira, Sabrina Marczak, Cassiano Moralles (2019), "How to Evaluate BDD Scenarios' Quality?", In: XXXIII Brazilian Symposium on Software Engineering (SBES 2019), pp. 481-490.
- Leonard Peter Binamungu, Suzanne M. Embury, Nikolaos Konstantinou (2020), "Characterising the Quality of Behaviour Driven Development Specifications", In: International Conference on Agile Software Development (XP 2020), pp. 87-102, Springer.

Conceptual Models (content review)**:**

- Jeff Johnson, Austin Henderson (2012), "Conceptual Models: Core to Good Design", In: Synthesis Lectures on Human-Centered Informatics, Morgan & Claypool.
- Nathalie Aquino, Jean Vanderdonckt, José Ignacio Panach, Óscar Pastor (2011), "Conceptual Modelling of Interaction", In: Handbook of Conceptual Modeling, pp. 335–358, Springer.

GUI Prototyping (content review)**:**

- Michel Beaudouin-Lafon, Wendy E. Mackay (2012), "Prototyping Tools and Techniques", In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 1081-1104, CRC Press.
- Thiago Rocha Silva, Jean-Luc Hak, Marco Winckler, Olivier Nicolas (2017), "A Comparative Study of Milestones for Featuring GUI Prototyping Tools", In: Journal of Software Engineering and Applications, 10, pp. 564-589, Scientific Research Publishing Inc.

- **L4. Task analysis and modelling**

- Célia Martinie, Philippe Palanque, Marco Winckler (2015), "Designing and Assessing Interactive Systems Using Task Models", In: Book of Tutorials of the 14th Brazilian Symposium on Human Factors in Computing Systems (IHC 2015), pp. 29-58, SBC.
- Catherine Courage, Jhilmil Jain, Janice Ginny Redish, Dennis Wixon (2012), "Task Analysis", In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 955-982, CRC Press.

- **L5. Cognitive and human-error task modelling**

- Racim Fahssi, Célia Martinie, Philippe Palanque (2015), "Enhanced Task Modelling for Systematic Identification and Explicit Representation of Human Errors", In: IFIP TC.13 International Conference on Human-Computer Interaction (INTERACT 2015), pp. 192–212, Springer.
- James L. Szalma, Gabriella M. Hancock, Peter A. Hancock (2012), "Task Loading and Stress in Human–Computer Interaction", In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 55-76, CRC Press.
- Weining Ning (2021), "Addressing cognitive challenges in design: A designers' perspective", Chapter 2, In: Doctoral thesis, University of Cambridge, UK.

- **L6. End-user development**

- Margaret M. Burnett, Christopher Scaffidi, "End-User Development", Chapter 10, In: The Encyclopedia of Human-Computer Interaction, 2nd Edition. Available at: https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/end-user-development

- Amy J. Ko, Robin Abraham, Laura Beckwith, Alan Blackwell, Margaret Burnett, Martin Erwig, Chris Scaffidi, Joseph Lawrance, Henry Lieberman, Brad Myers, Mary Beth Rosson, Gregg Rothermel, Mary Shaw, Susan Wiedenbeck (2011), "The state of the art in end-user software engineering", ACM Computing Surveys, 43(3), Article No.: 21, pp. 1–44, ACM.
- Barbara Rita Barricelli, Fabio Cassano, Daniela Fogli, Antonio Piccinno (2019), "End-user development, end-user programming and end-user software engineering: A systematic mapping study", Journal of Systems and Software, 149, pp. 101-137, Elsevier.

- **L7. Low-code development**

- Davide Di Ruscio, Dimitris Kolovos, Juan de Lara, Alfonso Pierantonio, Massimo Tisi, Manuel Wimmer (2022), "Low-code development and model-driven engineering: Two sides of the same coin?", Software and Systems Modeling, 21, pp. 437–446, Springer.
- Apurvanand Sahay, Arsene Indamutsa, Davide Di Ruscio, Alfonso Pierantonio (2020), "Supporting the understanding and comparison of low-code development platforms", In: 46th Euromicro Conference on Software Engineering and Advanced Applications (SEAA 2020), pp. 171-178, IEEE.
- Alexander C. Bock, Ulrich Frank (2021), "In Search of the Essence of Low-Code: An Exploratory Study of Seven Development Platforms", In: 2021 ACM/IEEE International Conference on Model Driven Engineering Languages and Systems Companion (MODELS-C), pp. 57-66, IEEE.
- Fulya Gürcan, Gabriele Taentzer (2021), "Using Microsoft PowerApps, Mendix and OutSystems in Two Development Scenarios: An Experience Report", In: 2021 ACM/IEEE International Conference on Model Driven Engineering Languages and Systems Companion (MODELS-C), pp. 67-72, IEEE.
- Yajing Luo, Peng Liang, Chong Wang, Mojtaba Shahin, Jing Zhan (2021), "Characteristics and Challenges of Low-Code Development: The Practitioners' Perspective", In: Proceedings of the 15th ACM / IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM 2021), Article No.: 12, pp. 1–11, ACM.

- **L8. Low-code development and generative AI**

- Martin Fowler (2023), "An example of LLM prompting for programming". Available at: https://martinfowler.com/articles/2023-chatgpt-xu-hao.html
- Jacob Austin, Augustus Odena, Maxwell Nye, Maarten Bosma, Henryk Michalewski, David Dohan, Ellen Jiang, Carrie Cai, Michael Terry, Quoc Le, Charles Sutton (2021), "Program Synthesis with Large Language Models". Available at: https://arxiv.org/abs/2108.07732

Complementary material:

- freeCodeCamp (2023), “Use ChatGPT to Code a Full Stack App – Full Course”. Available at: https://youtu.be/GizsSo-EevA
- Martin Breuss (2023), “Prompt Engineering: A Practical Example”, Real Python. Available at: https://realpython.com/practical-prompt-engineering/
- OpenAI (2023), “GPT best practices”. Available at: https://platform.openai.com/docs/guides/gpt-best-practices
- OpenAI (2023), “OpenAI Cookbook”. Available at: https://github.com/openai/openai-cookbook

- **L9. Interactive systems design processes**

- Hugh Beyer (2010), “User-Centered Agile Methods”, In: Synthesis Lectures on Human-Centered Informatics, Morgan & Claypool.
- Deborah J. Mayhew, Todd J. Follansbee (2012), “User Experience Requirements Analysis within the Usability Engineering Lifecycle”, In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 945-954, CRC Press.
- Tiago Silva Da Silva, Milene Silveira, Frank Maurer, Fábio Fagundes Silveira (2018), “The evolution of agile UXD”, Information and Software Technology, 102, pp. 1-5, Elsevier.
- Andrei Garcia, Tiago Silva da Silva, Milene Selbach Silveira (2019), “Artifact-facilitated communication in agile user-centered design”, In: International Conference on Agile Software Development (XP 2019), pp. 102-118, Springer.

- **L10. Consistency assurance between requirements and UI artefacts**

- Thiago Rocha Silva, Marco Winckler, Hallvard Trætteberg (2019), “Ensuring the Consistency Between User Requirements and GUI Prototypes: A Behavior-Based Automated Approach”, In: IFIP TC.13 International Conference on Human-Computer Interaction (INTERACT 2019), pp. 644–665, Springer.
- Thiago Rocha Silva, Marco Winckler, Hallvard Trætteberg (2020), “Ensuring the Consistency between User Requirements and Task Models: A Behavior-Based Automated Approach”, Proceedings of the ACM on Human-Computer Interaction, 4, EICS, Article 77, ACM.

- **L11. GUI evaluation and automated testing**

Inspections (content review)**:**

- Gilbert Cockton, Alan Woolrych, Kasper Hornbæk, Erik Frøkjær (2012), “Inspection-Based Evaluations”, In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 1279-1298, CRC Press.

- Clarisse Sieckenius de Souza and Carla Faria Leitão (2009), "Semiotic Engineering Methods for Scientific Research in HCI", Chapters 3 (3.1), 4 (4.1, 4.3), 5, and 6, In: Synthesis Lectures on Human-Centered Informatics, Morgan & Claypool.
- David Kieras (2012), "Model-Based Evaluation", In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 1299-1318, CRC Press.

User studies (content review)**:**

- Joseph S. Dumas, Jean E. Fox (2012), "Usability Testing", In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 1221-1242, CRC Press.
- Clarisse Sieckenius de Souza and Carla Faria Leitão (2009), "Semiotic Engineering Methods for Scientific Research in HCI", Chapters 3 (3.2), 4 (4.2, 4.3), 5, and 6, In: Synthesis Lectures on Human-Centered Informatics, Morgan & Claypool.
- A. Ant Ozok (2012), "Survey Design and Implementation in HCI", In: The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, pp. 1259-1278, CRC Press.
- Tiago Silva da Silva, Milene Selbach Silveira, Frank Maurer (2015), "Usability Evaluation Practices within Agile Development", In: Hawaii International Conference on System Sciences, pp. 5133-5142, IEEE.

GUI automated testing:

- Thiago Rocha Silva, Marco Winckler, Hallvard Trætteberg (2019), "Ensuring the Consistency Between User Requirements and Graphical User Interfaces: A Behavior-Based Automated Approach", In: International Conference on Computational Science and its Applications (ICCSA 2019), pp. 616–632, Springer.
- Michel Nass, Emil Alégroth, Robert Feldt (2021), "Why many challenges with GUI test automation (will) remain", In: Information and Software Technology, 138, Elsevier.
- Thiago Rocha Silva (2022), "Towards a Domain-Specific Language to Specify Interaction Scenarios for Web-Based Graphical User Interfaces", In: ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS 2022), pp. 48-53, ACM.

- **L12. Final group presentations**

No reading.