

Syllabus
“Designing for User Experience”
(5 ECTS)

Course Title in Russian: UX-дизайн

Authors of the Program: Assoc. Prof., Ph.D. Pavel Manakhov (pmanakhov@hse.ru, <https://www.hse.ru/en/staff/pmanakhov>)

School of Software Engineering

Meeting Minute # ___ **dated** _____ **2019**

1 Course Description

The course is offered to students of the Bachelor’s Programme “Software Engineering”, Faculty of Computer Science of the National Research University Higher School of Economics (HSE). Parts of the course are located online (<https://www.coursera.org/learn/mobile-interaction-design>).

The course is delivered in the 3rd and 4th modules. Number of credits is 5. Total course length is 190 academic hours including:

- 64 auditory hours including
 - 40 Lecture (L) hours,
 - 24 Seminar (S) hours and also
- 126 Self-study (SS) hours.

1.1 Pre-requisites

This course has no pre-requisites.

1.2 Abstract

Central to this course is the answer to the question: Can we design user interfaces of digital products so that they support particular experiences? For this purpose, after learning the foundations of interaction design students will be introduced to the following topics:

- Formal methods in Human-Computer Interaction (HCI)
- Traditional user interfaces
- Tangible user interfaces
- Speech & conversational user interfaces
- Psychology of human-computer interaction
- User experience & experience design
- Gamification at work
- Accessibility
- HCI as a scientific discipline

The practical part of the course includes individual assignments as well as assignments designed for teams. The assignments are concerned with designing and prototyping various user interfaces such as text entry methods, chatbots, simple graphics editors, etc.

2 Learning Objectives

- Acquire an initial understanding of the scope of HCI
- Acquire practical skills in designing and evaluating different types of user interfaces
- Appreciate the role of UX Design activities within the whole product development lifecycle

3 Learning Outcomes

While mastering the course material, students will:

- *Know* current research areas within HCI, different assistive technologies, different empirical and analytical usability evaluation methods, different forms of design knowledge, different forms of design representation, different game mechanics, different time spans of experience such as anticipated, momentary, episodic, and cumulative, different types of interaction problems, different types of research problems in HCI, how to apply different creativity tools, the history of HCI, the origins of tangible user interfaces (TUI), the peculiarities of conversational UI design process, the peculiarities of CUI evaluation, typical design activities carried when the app is already on the market, where to find appropriate design knowledge for a particular project; *acquire an initial understanding* of human factors issues, Human-Centered Design (HCD) process, player-centered design, the concept of user experience; *understand* basic concepts of experimental method, different perspectives on user experience, Grice's maxims, Norman's Stages-of-action model, the classification of CUI prototyping tools & techniques, the classification of design tools, the classification of formal methods used within HCI, the classification of usability evaluation methods, the concept of accessibility, the concept of the design space, the concept of the user interface, the concept of UI idioms, the concept of usability, the concept of usability goals, the concept of usability problems, the context of use concept, the principles of HCD, the role of emotions in interaction, the scope of creative approach to UX design, the scope of gamification, the scope of model-based approach to UX design, the scope of TUIs; *appreciate* the difference between informal usability testing and a HCI experiment, the difference between qualitative and quantitative usability data, the need of building the discourse model, the need of exploring a number of design alternatives.
- *Be prepared to* apply formal methods in the design of text entry techniques, conduct a brainstorming session, conduct Wizard of Oz testing, conduct scenario-based walkthrough, create personas, create prototypes of CUI, derive usability goals, evaluate accessibility, write usage scenarios.
- *Acquire practical skills in* analyzing experimental data, conducting a comparative usability study, conducting an accessibility evaluation, conducting scenario-based walkthrough, designing a text entry technique, designing conversational user interfaces (CUI), prototyping a text entry technique, prototyping CUIs, recruiting human subjects, reporting results of usability evaluation, writing accessibility evaluation report.

4 Course Plan

| № | Title of the Topic | Total Hours | Classroom Hours | | Self-study |
|--|--|-------------|-----------------|-------------------|------------|
| | | | Lectures | Practical classes | |
| Module #3 of the 1 st academic year | | | | | |
| 1 | Human-Computer Interaction: An Introduction | 4 | 2 | 0 | 2 |
| 2 | The Essentials of UX Design | 8 | 2 | 2 | 4 |
| 3 | Usability Problems and Metrics | 8 | 4 | 0 | 4 |
| 4 | Creative Approach to Design | 30 | 2 | 6 | 10 |
| 5 | Formal Methods in Human-Computer Interaction | | 2 | | 10 |
| 6 | Prototyping Screen Interfaces | 38 | 2 | 4 | 12 |
| 7 | Overview of Usability Evaluation Methods | | 2 | | 4 |
| 8 | Usability Testing | | 2 | | 12 |
| 9 | Usability Inspection | 4 | 2 | 0 | 2 |
| <i>Module #3 totals</i> | | 92 | 20 | 12 | 60 |
| Module #4 of the 1 st academic year | | | | | |
| 9 | Usability Inspection | 20 | 0 | 4 | 16 |
| 10 | Designing within an Existing UI Ecosystem | 4 | 2 | 0 | 2 |
| 11 | Designing Conversational User Interfaces | 28 | 2 | 4 | 10 |

| | | | | | |
|-------------------------|--|------------|-----------|-----------|------------|
| 12 | Prototyping Conversational Interfaces | | 2 | | 10 |
| 13 | Evaluating Conversational Interfaces | 4 | 2 | 0 | 2 |
| 14 | Tangible User Interfaces | 4 | 2 | 0 | 2 |
| 15 | Accessibility | 22 | 2 | 4 | 16 |
| 16 | Psychology of Human-Computer Interaction | 4 | 2 | 0 | 2 |
| 17 | User Experience & Experience Design | 4 | 2 | 0 | 2 |
| 18 | Gamification at Work | 4 | 2 | 0 | 2 |
| 19 | HCI as a Scientific Discipline | 4 | 2 | 0 | 2 |
| <i>Module #4 totals</i> | | 98 | 20 | 12 | 66 |
| Course totals | | 190 | 40 | 24 | 126 |

4.1 Detailed Course Content

Topic 1. Human-Computer Interaction: An Introduction

Definitions of HCI. Differences with related fields. Where HCI came from. An overview of HCI research areas. The structure of the course.

Readings:

- Oulasvirta, A., & Hornbæk, K. (2016, May). HCI research as problem-solving. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (pp. 4956-4967). ACM. <https://doi.org/10.1145/2858036.2858283>
- Hewett, T. T. (1992). ACM SIGCHI Curricula for Human-Computer Interaction. Retrieved from <https://web.archive.org/web/20180713063411/http://old.sigchi.org/cdg/>
- Carroll, J. M. (n.a.). Human Computer Interaction - brief intro. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/human-computer-interaction-brief-intro>
- Dix, A., Finlay, J., Abowd, G., & Beale, R. (2004). Human-computer interaction. England: Pearson Education Limited. <https://tinyurl.com/y4sbps2n>

Topic 2. The Essentials of UX Design

The concept of the user interface. The concept of the interaction. The context of use concept. The concept of user experience. The concept of usability. Human-centered design process. The place of UX design activities in the whole product development process.

Readings:

- Cockton, G. (n.g.). Usability Evaluation. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/usability-evaluation>
- Cooper, A., Reimann, R., Cronin, D., & Noessel, C. (2014). About face: the essentials of interaction design. John Wiley & Sons. <https://library.books24x7.com/toc.aspx?bookid=63431>
- Hartson, R., & Pyla, P. S. (2012). The UX Book: Process and guidelines for ensuring a quality user experience. Elsevier. <https://library.books24x7.com/toc.aspx?bookid=51040>
- Hassenzahl, M. (n.g.). User Experience and Experience Design. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/user-experience-and-experience-design>
- ISO 9241-210:2010 “Ergonomics of human-system interaction -- Part 210: Human-centred design for interactive systems”. <https://tinyurl.com/y59pvlw>
- ISO/DIS 9241-11 “Ergonomics of human-system interaction -- Part 11: Usability: Definitions and concepts”. <https://www.sis.se/api/document/preview/611299/>

Topic 3. Usability Problems and Metrics

The concept of usability problems. Interaction problems of other kinds. Usability metrics and how to derive them.

Readings:

- ISO/DIS 9241-11 “Ergonomics of human-system interaction -- Part 11: Usability: Definitions and concepts”. <https://www.sis.se/api/document/preview/611299/>
- Manakhov, P., & Ivanov, V. D. (2016, May). Defining Usability Problems. In Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (pp. 3144-3151). ACM. <https://doi.org/10.1145/2851581.2892387>
- Hartson, R., & Pyla, P. S. (2012). The UX Book: Process and guidelines for ensuring a quality user experience. Elsevier. <https://library.books24x7.com/toc.aspx?bookid=51040>

Topic 4. Creative Approach to Design

The concept of the design space. Why an exploration of design alternatives is necessary. An overview of some creativity tools. Selecting design alternatives.

Readings:

- Hartson, R., & Pyla, P. S. (2012). The UX Book: Process and guidelines for ensuring a quality user experience. Elsevier. <https://library.books24x7.com/toc.aspx?bookid=51040>
- ISO 9241-210:2010 “Ergonomics of human-system interaction -- Part 210: Human-centred design for interactive systems”. <https://www.sis.se/api/document/preview/611299/>
- Kolko, J. (2010). Abductive thinking and sensemaking: The drivers of design synthesis. *Design Issues*, 26(1), 15-28. <https://www.jstor.org/stable/pdf/20627839.pdf>
- Ulrich, K. T. (2011). Design: Creation of artifacts in society. University of Pennsylvania. Retrieved from <http://opim.wharton.upenn.edu/~ulrich/ulrichbook-10Aug12.pdf>

Topic 5. Formal Methods in Human-Computer Interaction

Model-based user interface design. The use of formal methods in usability evaluation. Current state of the approach in industry. The application of the approach to designing text entry techniques.

Readings:

- Dix, A. (n.g.). Formal Methods. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/formal-methods>
- Dix, A., Finlay, J., Abowd, G., & Beale, R. (2004). Human-computer interaction. England: Pearson Education Limited. <https://tinyurl.com/y4sbps2n>
- MacKenzie, I. S., & Tanaka-Ishii, K. (2010). Text entry systems: Mobility, accessibility, universality. Elsevier. <https://www.sciencedirect.com/book/9780123735911/text-entry-systems>
- Vetrov, Y. (n.g.). Algorithm-Driven Design: How Artificial Intelligence is Changing Design. Retrieved from <https://algorithms.design/>

Topic 6. Prototyping Screen Interfaces

An overview of various forms of design representations. Functions of representations. An overview of modern 2D prototyping tools.

Topic 7. Overview of Usability Evaluation Methods

What is the evaluation all about? A classification of usability evaluation methods. An overview of the methods.

Readings:

- Cockton, G. (n.g.). Usability Evaluation. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/usability-evaluation>
- Hartson, R., & Pyla, P. S. (2012). The UX Book: Process and guidelines for ensuring a quality user experience. Elsevier. <https://library.books24x7.com/toc.aspx?bookid=51040>
- Howell, J., Miller, P., Park, H. H., Sattler, D., Schack, T., Sperry, E., Widhalm, S., Palmquist, M. (2012). Reliability and Validity. Writing@CSU. Colorado State University. Retrieved from <https://writing.colostate.edu/guides/guide.cfm?guideid=66>

Topic 8. Usability Testing

Variety of usability testing. Basics of experimental research. Research hypotheses. Experimental design. Statistical analysis and significance tests.

Readings:

- Lazar, J., Feng, J. H., & Hochheiser, H. (2017). Research methods in human-computer interaction. Morgan Kaufmann. <https://tinyurl.com/y5zzkpx3>
- Wiklund, M. E., Kendler, J., & Strohlic, A. Y. (2015). Usability testing of medical devices. CRC press. <https://tinyurl.com/yyr3q4uu>

Topic 9. Usability Inspection

Usability inspections methods. Personas and scenarios. Scenario-based walkthrough. Analyzing usability data.

Readings:

- Chisnell, D. (2010, April). Making sense of the data: Collaborative data analysis. Retrieved from <https://usabilitytesting.wordpress.com/2010/04/26/making-sense-of-the-data-collaborative-data-analysis/>
- Cooper, A., Reimann, R., Cronin, D., & Noessel, C. (2014). About face: the essentials of interaction design. John Wiley & Sons. <https://library.books24x7.com/toc.aspx?bookid=63431>
- Kjeldskov, J., Skov, M. B., & Stage, J. (2004, October). Instant data analysis: conducting usability evaluations in a day. In Proceedings of the third Nordic conference on Human-computer interaction (pp. 233-240). ACM. <https://doi.org/10.1145/1028014.1028050>
- Wilson, C. (2013). User interface inspection methods: a user-centered design method. Newnes. <https://library.books24x7.com/toc.aspx?bookid=67008>

Topic 10. Designing within an Existing UI Ecosystem

Forms of design knowledge. What exactly should be stored? How to find relevant design knowledge. Selected design patterns and guidelines.

Readings:

- Dix, A., Finlay, J., Abowd, G., & Beale, R. (2004). Human-computer interaction. England: Pearson Education Limited. <https://tinyurl.com/y4sbps2n>
- Polson, P. G., & Lewis, C. H. (1990). Theory-based design for easily learned interfaces. Human-Computer Interaction, 5(2-3), 191-220. <https://www.tandfonline.com/doi/pdf/10.1080/07370024.1990.9667154>
- Apple Human Interface Guidelines. Retrieved from <https://developer.apple.com/ios/human-interface-guidelines/>
- Google's Material Design. Retrieved from <https://material.io/design/>
- Tognazzini, B. (2014, March). First Principles of Interaction Design (Revised & Expanded). Retrieved from <http://asktog.com/atc/principles-of-interaction-design/#>

Topic 11. Designing Conversational User Interfaces

Is conversation the right fit? Peculiarities of conversation design process. Building the discourse model. Designing the flow & crafting the dialog. Grice's maxims. Selected design patterns and guidelines. The question of style.

Readings:

- Design Guidelines of The Association for Voice Interaction Design. Retrieved from <https://web.archive.org/web/20180731093157/http://videsign.wikispaces.com/>
- Conversation design by Google. Retrieved from <https://designguidelines.withgoogle.com/conversation/#>
- Harris, R. A. (2004). Voice interaction design: crafting the new conversational speech systems. Elsevier. <https://www.sciencedirect.com/book/9781558607682/voice-interaction-design>
- Pearl, C. (2016). Designing Voice User Interfaces: Principles of Conversational Experiences. O'Reilly Media, Inc. <https://tinyurl.com/y2d29pkz>

Topic 12. Prototyping Conversational Interfaces

A classification of prototyping tools & techniques. An overview of digital prototyping tools for CUIs.

Topic 13. Evaluating Conversational Interfaces

Usability evaluation methods. Wizard of Oz testing. Peculiarities of CUI evaluation.

Readings:

- Altiok, A., Felker, N. (2018). Best practices for testing your Actions. Retrieved from <https://youtu.be/eD4x4gj4u2Y>
- Conversation design by Google. Retrieved from <https://designguidelines.withgoogle.com/conversation/#>
- Harris, R. A. (2004). Voice interaction design: crafting the new conversational speech systems. Elsevier. <https://www.sciencedirect.com/book/9781558607682/voice-interaction-design>

Topic 14. Tangible User Interfaces

Origins of TUIs. Overview of systems with a tangible UI. Pros and cons of TUIs. Selected design patterns.

Readings:

- Projects of Tangible Media Group from MIT Media Lab. Retrieved from <http://tangible.media.mit.edu/projects/>
- Shaer, O., & Hornecker, E. (2010). Tangible user interfaces: past, present, and future directions. Foundations and Trends® in Human-Computer Interaction, 3(1-2), 4-137. http://cs.wellesley.edu/~oshaer/TUI_NOW.pdf

Topic 15. Accessibility

The concept of accessibility. Dimensions of diversity. An overview of assistive technologies. Evaluation of accessibility. Overview of tools and techniques to ensure accessibility of a digital product.

Readings:

- Dix, A., Finlay, J., Abowd, G., & Beale, R. (2004). Human-computer interaction. England: Pearson Education Limited. <https://tinyurl.com/y4sbps2n>

- Stephanidis, C. (n.g.). Design for All. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/design-4-all>

Topic 16. Psychology of Human-Computer Interaction

Human memory. Reasoning and problem solving. Emotion. Norman's Stages-of-action model. Idiomatic user interfaces.

Readings:

- Cooper, A., Reimann, R., Cronin, D., & Noessel, C. (2014). About face: the essentials of interaction design. John Wiley & Sons. <https://library.books24x7.com/toc.aspx?bookid=63431>
- Dix, A., Finlay, J., Abowd, G., & Beale, R. (2004). Human-computer interaction. England: Pearson Education Limited. <https://tinyurl.com/y4sbps2n>
- Norman, D. A. (2013). The design of everyday things: Revised and expanded edition. Basic books. <https://proxylibrary.hse.ru:2137/toc.aspx?bookid=59487>

Topic 17. User Experience & Experience Design

Overview of modern theories about experience. Properties of experience. Qualities of experience. Evaluating user experience.

Readings:

- Hassenzahl, M. (2010). Experience design: Technology for all the right reasons. Synthesis lectures on human-centered informatics, 3(1), 1-95. <https://tinyurl.com/y5yfst92>
- Lee, S. et al. Mixed-methods User Experience Evaluation in AR/VR. Retrieved from <https://tinyurl.com/y4rkftus>
- User Experience White Paper: Bringing clarity to the concept of user experience. Retrieved from: <http://www.allaboutux.org/files/UX-WhitePaper.pdf>

Topic 18. Gamification at Work

When to use gamification. Examples of app gamification. Player-centered design. An overview of game mechanics.

Readings:

- Kumar, J. M., Herger, M. Gamification at Work: Designing Engaging Business Software. Retrieved from <https://www.interaction-design.org/literature/book/gamification-at-work-designing-engaging-business-software>

Topic 19. HCI as a Scientific Discipline

HCI practitioners and researchers: Is there any difference? Types of research problems in HCI. An overview of some seminal papers.

Readings:

- Oulasvirta, A., & Hornbæk, K. (2016, May). HCI research as problem-solving. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (pp. 4956-4967). ACM. <https://doi.org/10.1145/2858036.2858283>

5 Reading List

5.1 Required

- Dix, A., Finlay, J., Abowd, G., & Beale, R. (2004). Human-computer interaction. England: Pearson Education Limited. <https://tinyurl.com/y4sbps2n>

- Hartson, R., & Pyla, P. S. (2012). The UX Book: Process and guidelines for ensuring a quality user experience. Elsevier. <https://library.books24x7.com/toc.aspx?bookid=51040>
- ISO/DIS 9241-11 “Ergonomics of human-system interaction -- Part 11: Usability: Definitions and concepts”. <https://www.sis.se/api/document/preview/611299/>
- Lazar, J., Feng, J. H., & Hochheiser, H. (2017). Research methods in human-computer interaction. Morgan Kaufmann. <https://tinyurl.com/y5zzkpx3>

5.2 Optional

- Altiok, A., Felker, N. (2018). Best practices for testing your Actions. Retrieved from <https://youtu.be/eD4x4gj4u2Y>
- Apple Human Interface Guidelines. Retrieved from <https://developer.apple.com/ios/human-interface-guidelines/>
- Carroll, J. M. (n.a.). Human Computer Interaction - brief intro. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/human-computer-interaction-brief-intro>
- Chisnell, D. (2010, April). Making sense of the data: Collaborative data analysis. Retrieved from <https://usabilitytesting.wordpress.com/2010/04/26/making-sense-of-the-data-collaborative-data-analysis/>
- Cockton, G. (n.g.). Usability Evaluation. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/usability-evaluation>
- Conversation design by Google. Retrieved from <https://designguidelines.withgoogle.com/conversation/#>
- Cooper, A., Reimann, R., Cronin, D., & Noessel, C. (2014). About face: the essentials of interaction design. John Wiley & Sons. <https://library.books24x7.com/toc.aspx?bookid=63431>
- Design Guidelines of The Association for Voice Interaction Design. Retrieved from <https://web.archive.org/web/20180731093157/http://videsign.wikispaces.com/>
- Dix, A. (n.g.). Formal Methods. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/formal-methods>
- Google's Material Design. Retrieved from <https://material.io/design/>
- Harris, R. A. (2004). Voice interaction design: crafting the new conversational speech systems. Elsevier. <https://www.sciencedirect.com/book/9781558607682/voice-interaction-design>
- Hassenzahl, M. (2010). Experience design: Technology for all the right reasons. Synthesis lectures on human-centered informatics, 3(1), 1-95. <https://tinyurl.com/y5yfst92>
- Hassenzahl, M. (n.g.). User Experience and Experience Design. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/user-experience-and-experience-design>
- Hewett, T. T. (1992). ACM SIGCHI Curricula for Human-Computer Interaction. Retrieved from <https://web.archive.org/web/20180713063411/http://old.sigchi.org/cdg/>
- Howell, J., Miller, P., Park, H. H., Sattler, D., Schack, T., Sperry, E., Widhalm, S., Palmquist, M. (2012). Reliability and Validity. Writing@CSU. Colorado State University. Retrieved from <https://writing.colostate.edu/guides/guide.cfm?guideid=66>
- ISO 9241-210:2010 “Ergonomics of human-system interaction -- Part 210: Human-centred design for interactive systems”. <https://tinyurl.com/y59pvlw>
- Kjeldskov, J., Skov, M. B., & Stage, J. (2004, October). Instant data analysis: conducting usability evaluations in a day. In Proceedings of the third Nordic conference on Human-computer interaction (pp. 233-240). ACM. <https://doi.org/10.1145/1028014.1028050>

- Kolko, J. (2010). Abductive thinking and sensemaking: The drivers of design synthesis. *Design Issues*, 26(1), 15-28. <https://www.jstor.org/stable/pdf/20627839.pdf>
- Kumar, J. M., Herger, M. Gamification at Work: Designing Engaging Business Software. Retrieved from <https://www.interaction-design.org/literature/book/gamification-at-work-designing-engaging-business-software>
- Lee, S. et al. Mixed-methods User Experience Evaluation in AR/VR. Retrieved from <https://tinyurl.com/y4rkftus>
- MacKenzie, I. S., & Tanaka-Ishii, K. (2010). Text entry systems: Mobility, accessibility, universality. Elsevier. <https://www.sciencedirect.com/book/9780123735911/text-entry-systems>
- Manakhov, P., & Ivanov, V. D. (2016, May). Defining Usability Problems. In Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (pp. 3144-3151). ACM. <https://doi.org/10.1145/2851581.2892387>
- Norman, D. A. (2013). The design of everyday things: Revised and expanded edition. Basic books. <https://proxylibrary.hse.ru:2137/toc.aspx?bookid=59487>
- Oulasvirta, A., & Hornbæk, K. (2016, May). HCI research as problem-solving. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (pp. 4956-4967). ACM. <https://doi.org/10.1145/2858036.2858283>
- Pearl, C. (2016). Designing Voice User Interfaces: Principles of Conversational Experiences. O'Reilly Media, Inc. <https://tinyurl.com/y2d29pkz>
- Polson, P. G., & Lewis, C. H. (1990). Theory-based design for easily learned interfaces. *Human-Computer Interaction*, 5(2-3), 191-220. <https://www.tandfonline.com/doi/pdf/10.1080/07370024.1990.9667154>
- Projects of Tangible Media Group from MIT Media Lab. Retrieved from <http://tangible.media.mit.edu/projects/>
- Shaer, O., & Hornecker, E. (2010). Tangible user interfaces: past, present, and future directions. *Foundations and Trends® in Human-Computer Interaction*, 3(1-2), 4-137. http://cs.wellesley.edu/~oshaer/TUI_NOW.pdf
- Stephanidis, C. (n.g.). Design for All. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/design-4-all>
- Tognazzini, B. (2014, March). First Principles of Interaction Design (Revised & Expanded). Retrieved from <http://asktog.com/atc/principles-of-interaction-design/#>
- Ulrich, K. T. (2011). Design: Creation of artifacts in society. University of Pennsylvania. Retrieved from <http://opim.wharton.upenn.edu/~ulrich/ulrichbook-10Aug12.pdf>
- User Experience White Paper: Bringing clarity to the concept of user experience. Retrieved from: <http://www.allaboutux.org/files/UX-WhitePaper.pdf>
- Vetrov, Y. (n.g.). Algorithm-Driven Design: How Artificial Intelligence is Changing Design. Retrieved from <https://algorithms.design/>
- Wiklund, M. E., Kendler, J., & Strohlic, A. Y. (2015). Usability testing of medical devices. CRC press. <https://tinyurl.com/yyr3q4uu>
- Wilson, C. (2013). User interface inspection methods: a user-centered design method. Newnes. <https://library.books24x7.com/toc.aspx?bookid=67008>

6 Grading System

| Type of control | Form of control | Modules | | Parameters |
|------------------|-----------------|-----------------|-----------------|---|
| | | 3 rd | 4 th | |
| Progress control | Quiz | * | | Interaction Design: An Introduction (Q1) |
| | Team project | * | | Designing a text entry technique (TP1) |
| | Team project | * | | Conducting a HCI experiment (TP2) |
| | Quiz | | * | Usability Inspection Methods & Intro to Usability Evalua- |

| | | | | |
|-----------|--------------|--|---|---|
| | | | | tion (Q2) |
| | Homework | | * | Conducting usability inspection (HW1) |
| | Team project | | * | Designing a chatbot (TP3) |
| | Homework | | * | Evaluating accessibility of a given interface (HW2) |
| Resultant | Final exam | | | Oral examination |

6.1 Progress Control

Assignments of this course are divided into 3 groups: quizzes, team projects, and individual homework assignments. Each assignment, except a quiz, is assessed by the professor according to the criteria which are given to students along with the assignment itself. Unless stated otherwise results of an assignment has to be presented or submitted in due time (which is also provided along with the assignment), otherwise the grade is halved.

The assignments are as follows:

Quiz 1. Interaction Design: An Introduction

The first one is an individual assignment which implies taking the following quiz online: <https://www.coursera.org/learn/mobile-interaction-design/exam/UVNm/mobile-interaction-design-an-introduction>

Team project 1. Designing a text entry technique

To complete this assignment a student has to team up with four other students. The project implies designing a text entry method for a given context of use. Upon the completion of this assignment each team has to submit several alternative designs of the entry method and a justification for the design the team considers the most promising, as well as make a presentation which, alongside with the designs, sheds lights on the process the team has employed to come up with the solutions.

Teams should bear in mind that the solutions they propose are benchmarked against a baseline solution given by the professor in the next assignment. Results of the benchmark influence a grade of the next assignment, hence, it is of great importance to design a text entry method with particular usability goals in mind.

An example of review criteria relevant to this assignment can be found here: https://docs.google.com/document/d/1poxmJkTWWatTYCgzHIFPyDOTd_7uOU8YI9AsT5rs-zY/edit?usp=sharing All members of a team get the same grade. Design concepts are prepared by every team and presented on the 2nd seminar, otherwise the grade for practice activities is reduced (*O_{practice activities}*).

Results of this assignment can be resubmitted (no more than one time, the same for the following assignment). Moreover, it is highly recommended to alter and resubmit before proceeding to the next assignment. However, if the aforementioned presentation wasn't made on a specified date, the team receives 0 for the assignment.

Team project 2. Conducting a HCI experiment

This team project is a continuation of the previous one. It implies preparing an interactive prototype of a proposed entry method and conducting an experiment which designed to benchmark the proposed and baseline designs against each other. It is allowed to test several designs proposed by a team. To complete the assignment each team has to find participants, conduct an experiment, and analyze gathered data. The experimental plan is provided by the professor.

Upon the completion of this assignment each team has to submit source code of the prototype, video recordings of all sessions of the experiment, raw experimental data, and a report which among other contains results of statistical tests. Completeness of the materials and results of the experiment are subject to evaluation. All members of a team get the same grade.

Results of this assignment can be resubmitted.

Quiz 2. Usability Inspection Methods & Intro to Usability Evaluation

This is an individual assignment which implies taking the following quiz online: <https://www.coursera.org/learn/mobile-interaction-design/exam/i3M37/usability-inspection-methods-intro-to-usability-evaluation>

Homework 1. Conducting usability inspection

This individual assignment implies conducting scenario-based walkthrough and writing a report which contains all discovered usability problems. A user interface and personas are given as a part of the assignment.

Overall quality of the inspection and individual usability problem reports are all subject to evaluation. An example of review criteria relevant to this assignment can be found here: <https://www.coursera.org/learn/mobile-interaction-design/peer/FrdLQ/finalize-writing-the-usability-evaluation-report> A draft of the report is prepared by a student and presented on the 7th or 8th seminars, otherwise the grade for practice activities is reduced ($O_{practice\ activities}$). During the seminars the professor discusses the draft with a student and gives tips on how to improve it which is quite important because results of this assignment cannot be resubmitted.

Team project 2. Designing a chatbot

To complete this assignment a student has to team up with four other students. The project implies designing a chatbot and implementing it in the form of an interactive prototype on the platform of the team's choice. Recommendations regarding the platform are given by the professor. Also each team has to present its design during a presentation on the 10th seminar.

Usability of the conversational interface is subject to evaluation. All members of a team get the same grade. Design concepts are prepared by every team and presented on the 9th seminar, otherwise the grade for practice activities is reduced ($O_{practice\ activities}$).

Results of this assignment can be resubmitted (no more than one time, the same for the following assignment). Moreover, it is highly recommended to alter and resubmit. However, if the aforementioned presentation wasn't made on a specified date, the team receives 0 for the assignment.

Homework 2. Evaluating accessibility of a given interface

This individual assignment implies conducting an accessibility evaluation and writing a report which contains all findings. A user interface (mobile or web) and a sequence of user's actions (evaluation scenario) are given as a part of this assignment.

Overall quality of the inspection and individual usability problem reports are all subject to evaluation. A draft of the report is prepared by a student and presented on the 11th or 12th seminars, otherwise the grade for practice activities is reduced ($O_{practice\ activities}$). During the seminars the professor discusses the draft with a student and gives tips on how to improve it.

Results of this assignment cannot be resubmitted.

6.2 Course Evaluation

A final course grade is calculated as follows:

$$O_{total} = 0.025 \cdot O_{Q1} + 0.1 \cdot O_{TP1} + 0.1 \cdot O_{TP2} + 0.025 \cdot O_{Q2} + 0.125 \cdot O_{HW1} + 0.1 \cdot O_{TP3} + 0.125 \cdot O_{HW2} + 0.1 \cdot O_{practice\ activities} + 0.3 \cdot O_{exam}$$

The grade is rounded to the nearest integer.

Conversion of the rounded resultant grade (O_{total}) to five-point scale is done in accordance with the following table:

Correspondence of ten-point (10) to five-point (5) system's marks

| Ten-point scale | Five-point scale |
|------------------------------------|--------------------|
| 1 – unsatisfactory 2 – very bad | unsatisfactory – 2 |

| | |
|---|------------------|
| 3 – bad | |
| 4 – satisfactory 5 – quite satisfactory | satisfactory – 3 |
| 6 – good 7 – very good | good – 4 |
| 8 – nearly excellent 9 – excellent 10 – brilliantly | excellent – 5 |

7 Examination Type

The final exam consists of answering two topics blindly chosen by a student. Topics for the oral examination are given to students at least 3 weeks before the exam takes place. Examples of the topics go as follows:

- Goal-Directed Design Process.
- The concept of design questions. Why is an exploration of design alternatives necessary?
- Usability problems.
- Classification and overview of user research methods.
- Scenario-based walkthrough. How does it differ from Cognitive Walkthrough?
- Etc.

8 Methods of Instruction

Class studies in this course are organized in the form of lectures and seminars. The theoretical part of the course is supported by slides that allows to cover corresponding material faster, without spending much time on writing. Assignments of the course include team projects. Team work advances communication skills in addition to ‘hard’ skills developed during the work on course exercises.

The materials of this course is complemented by a massive online open course “Mobile Interaction Design: How to Design Usable Mobile Products and Services” (<https://www.coursera.org/learn/mobile-interaction-design>) thought in English.

8.1 Remote Support

A Facebook group or Telegram channel is used to remote course support (will be announced at the first lecture).

9 Special Equipment and Software Support

- Projector for lectures and practical classes
- Figma (<https://www.figma.com/>)
- Visual Studio Community (<https://visualstudio.microsoft.com/vs/community/>)
- XCode (<https://developer.apple.com/xcode/>)
- Android Studio (<https://developer.android.com/studio/>)