

DEVELOPMENT AND DESIGN OF ICT (KDM_KA_INFORMATION STUDIES_CPH_F17)

Introduction and overview

Content

The project module is focused along the semester theme of design and development of IT-based systems. The module is informally split into two components, Development Methods and Design Methods. Both introduce several different methods and processes. The Development Methods section focuses on agile methods, UML and prototyping as core tools. The Design Methods section focus on the use of storyboards, flowcharts and wireframes, as well as the context of design. Furthermore, Information Architecture and basic user testing methods are covered.

The course uses several chapters from the following books:

- J. L. Whitten and L. D. Bentley, *Systems Analysis and Design Methods*, 7th edition or later
- Morville and Rosenfeld (2007): *Information Architecture for the World Wide Web*, 3rd. edition
- Rogers, Sharp & Preece (2011): *Interaction Design*, 3rd or 4th edition

Remaining course materials are available online.

Administrivia

Deliverables: Please see the document describing these for information about deliverables this semester.

Supervisor approval of reference lists: *Reference list bookkeeping template* — According to the Studieordning, your project must have at least 100 pages of academic literature per ECTS, to be approved by your supervisor. This list of supervisor-approved literature must be handed in at least 2 weeks before the project deadline. If you fail to do so, you risk having your project rejected.

To make this cumbersome process as easy as possible on students and supervisors alike, we propose using a Google Spreadsheet (this template) to keep track of your literature and page counts. Literature is entered on the first worksheet; the second worksheet automatically calculates how many pages of approved academic literature you already have. The link below is a template spreadsheet; please do not edit it directly! Instead, select *File > Make a copy...* and copy it to your one of your own Google Drive accounts. Then share it with your supervisor so (s)he can approve literature throughout the semester. Please discuss this with your supervisor if you have any questions.

Do not use the google doc as your list - make a copy for your own use.

Remember there are 2 (two) work sheets - a literature list and a summary statistic sheet.

Deliverable completion spreadsheet: This read-only spreadsheet will allow you to keep track of which semester deliverables you have already completed and which ones are still open. If you believe you have spotted an error in the spreadsheet, please contact Anders. Link to the document.

Lecturers

Anders Drachen

Birger Larsen

Toine Bogers



Announcements





Writing Theses and Dissertations

 IS report template

 ResearchDesign template Spring2017 8th6thsem

 Client communication guide

 Deliverables 8thsem-6sem TOBEUPDATED

 Reference list bookkeeping template

Module description - Development and Design of ICT

Project module on 8th semester (20 ECTS, equaling 550 working hours, Taught in English)

Module coordinator: Birger Larsen

Objectives - in this module students will acquire

Knowledge of

- the theory of science, theory and methods of system development
- user-driven techniques and tools
- organisational change and organisational culture in relation to system development and system design pertaining to ICT
- information architecture and usability
- formalisation and categorisation as regards formal models for the preparation, visualisation and communication of design solutions.

Skills in

- assessing strategies and methods for system development and system design on the basis of user needs and/or customer needs and knowledge of the disciplinary theories and methods.
- choosing suitable strategies and methods for system development and system design directed towards various domains
- data collection and analysis as regards system development and system design
- applying formal models for the preparation and communication of system development and system design
- communicating system development and system design to peers and others.

Competences in

- taking an analytical, reflective and critical approach to the preconditions for system development and system design
- taking an analytical, reflective and critical approach to system development and system design
- engaging in disciplinary and interdisciplinary collaboration on system development and system design, with a professional approach
- identifying own learning needs and structuring own learning in relation to the subject area of system development and system design.

Academic content and conjunction with other modules/semesters

Prerequisites for participation - Only for students on the 8th semester of the Information Studies degree at AAU Copenhagen. All courses and deliverables on the 7th semester of the Humanistic Informatics degree at AAU Copenhagen must be completed.

Module activities (course sessions etc.)

Literature

Mandatory lit.: 594 pages

no of pages. Additional. lit.: 44 pages

no of pages. Dig. Upload*: xx pages

Course activities and literature is described below

Examination

Examination 4 - An external oral examination in: "Development and Design of ICT"

The examination is a conversation between the student(s) and the examiner and external examiner based on a project report produced individually or in a group. The project report/written work will be considered the shared responsibility of the group. Students will be examined and assessed on the basis of the entire project report, and one combined grade will be awarded each student for the project report and the oral performance.

Literature foundation: 2000 standard pages supervisor approved, self-selected literature related to the project.

The project report: total number of pages must be no less than 15 pages and no more than 20 pages per student in a project group, and 30 pages if written individually.

Duration of examination: 20 minutes per student and 10 minutes per group for assessment and announcement of result, although no longer than a total of two hours. 30 minutes in total for individual examinations.

Evaluation: Grading according to the 7-point scale.

At oral group examinations, the examination must be conducted in such a way that individual assessment of each individual student's performance is ensured.

Credits: 20 ECTS.

The project report and the conversation must demonstrate that the student fulfils the objectives for the module stated above.

In the evaluation of the examination performance, the grade 12 will only be awarded to students who give an excellent performance and demonstrate that they have fulfilled the above objectives exhaustively or with only few insignificant omissions.

Any re-examinations will be held on the basis of the revised project report.

1. Introduction (Anders + Birger)

- Course intro
- Summary of previous semesters
- How will we build on this?
- Organization of the semester
- Case introduction (selected pre-defined cases)
- Introduction to the 3 deliverables and the deadlines around the semester projects
- Introduction to 1st semester project deliverable

Reading:

- J. L. Whitten and L. D. Bentley, *Systems Analysis and Design Methods*, 7th edition or later, Chapters 1-4 [160 pages. systems analysis and design methods, IS building blocks, IS development and -management]

2. Development methods (Anders)

- ▶ Waterfall modeling
- ▶ SCRUM/Agile
- ▶ Gantt charts

Reading:

Dix, A.; Finlay, J. Abowd, G. D. and Beale, R. (2005): *Human Computer Interaction*, 3rd edition or newer, chapter 6: HCI in the Software Process [33 pages, introduction to the role of HCI in software development]

Moreira, R. (2013): *Agile Development*. Chapters 1-5 [54 pages, introduction to agile development]

Goodman, E.; Kuniavsky, M. and Moed, A. (2011): *Observing the User Experience: A Practitioner's Guide to User Research*, Chapters 1-4 [72 pages. Introduces the basics of user testing in a practical situation].

Additional reading (this is required for those students who followed the 6. semester specialization at AAU-CPH and who thus know the literature mentioned above. Such students will be required to present one of the below papers):

C. Rand and B. Eckfeldt (2004): Agile software development: the business of innovation [5 pages]

K. Petersen and C. Wholin (2004): The Effect of Moving from a Plan-Driven to an Incremental Software Development Approach with Agile Practices. [39 pages] [see also Hirsch's presentation on the topic: <http://docplayer.net/2824041-Moving-from-a-plan-driven-culture-to-agile-development.html>]

B. Boehm and R. Turner (2006): Management Challenges to Implementing Agile Processes in Traditional Development Organizations [10 pages]

K. Logue and K. Mcdaid (2008): Agile Release Planning: Dealing with Uncertainty in Development Time and Business Value [6 pages]

D. Turk, R. France and B. Rumpe (2002): Limitations of Agile Software Processes. [4 pages].



RandEckfeldt



LogueMcdaid



BoehmTurner



emse10b



Kuniavsky c1-4



Moreira et al. (2010), chapter 1-5



Dix et al. (2003), chapter 6



turketal

3. From Users to Use Cases (Anders)

- ▶ User research
- ▶ Requirements
- ▶ Functions

Reading:

- Whitten, J.L. and Bentley, L.D. (2005). *Systems Analysis and Design Methods*, 7th edition, McGraw-Hill, chapters 5-6 [83 pages. Introduces the techniques for requirements discovery and how to model requirements using use cases]
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4. Modeling I (Anders)

- ▶ Use case diagrams

Reading:

Whitten, J.L. and Bentley, L.D. (2005). *Systems Analysis and Design Methods*, 7th edition, McGraw-Hill, chapter 7 [22 pages. Introduces the modeling of systems requirements with use case diagrams].

5. Modeling 2 (Anders)

Introduces the basics of data modeling and analysis of information systems, working from the perspective of object-oriented modeling and the UML.

Modeling of processes in systems.

Object-Oriented Analysis and -Design.

Reading:

Whitten, J.L. and Bentley, L.D. (2005). *Systems Analysis and Design Methods*, 7th edition, McGraw-Hill, chapters 8,9,11 [138 pages. Introduces core concepts in systems modeling and object-oriented operations].

6. System design (Anders)

Delves further into the core of system designs and how to model application architectures, further building on the object-oriented approaches. Covers distributed systems and various architecture strategies.

Reading:

- Whitten, J.L. and Bentley, L.D. (2005). *Systems Analysis and Design Methods*, 7th edition, McGraw-Hill, chapters 12-13 [72 pages. Introduces the basics of system design and architecture modeling]
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7. User Testing (Birger)

- ▶ Think-aloud
- ▶ Stimulated recall

Readings

Charters, E. (2003): The Use of Think-aloud Methods in Qualitative Research - An Introduction to Think-aloud Methods. *Brock Education Journal* 12(2), 68-82. [14 pages - Full text download]

ICT FOR LEARNING, KNOWLEDGE AND CONTENT MANAGEMENT (KDM_KA_INFORMATION STUDIES_CPH_F17)

Introduction

This module operates in concert with the project module. It is focused on introducing students to the design and management of systems for learning, knowledge and content management. The module focusses on MOOCs, and will introduce students to the fundamentals of e-learning. The module takes the students from the process of user research and requirements definition through to modeling system functions via use case diagrams, as well as wireframing and simple mock-ups for design. Finally, implementation of systems via CMS. Along the way 3 deliverables are generated and shared among the students, forming the dataset for the take-home exam at the end of the course.

The 3 deliverables are:

1. Stakeholder analysis [deadline xxx at 23:59]
2. Interviews/surveys with specific user groups (divided among groups) [deadline xxx at 23:59]
3. User requirements and sharing of these data with other groups [deadline xxx at 23:59]

The deliverables form the basis for the 7-day take-home exam. During this exam, the students take on the role of consultants working with MOOCs. They need to develop a solution for the HCI degree at AAU Copenhagen, and provide scientific arguments as to why their solution should be used to promote the degree, and the pros and cons of the MOOC platform. It is expected that students integrate one or more system functionalities via the chosen CMS such as Wordpress. For more information see the course case description below.

Lecturers

- Thorkild hanghøj
- Toine Bogers
- Birger Larsen



Messages



News forum



Writing Theses and Dissertations



Digital Exam

Module description - ICT for Learning, Knowledge and Content Management

Study subject module on 8th semester (5 ECTS, equaling 137,5 working hours, Taught in English)

Module coordinator: Birger Larsen

Objectives - in this module students will acquire

Knowledge of

- theory and methods at the highest international level as regards ICT systems for learning, knowledge and content management

- ICT systems for learning, knowledge and content management

Skills in

- assessing, selecting and applying methods for learning, knowledge and content management
- selecting, configuring and adapting ICT systems for learning, knowledge and content management
- communicating methods and solutions for ICT for learning, knowledge and content management to peers and others.

Competences in

- taking an analytical, reflective and critical approach to selecting, adapting and applying ICT systems for learning, knowledge and content management
- engaging in interdisciplinary collaboration on selecting, adapting and applying ICT systems for learning, knowledge and content management
- identifying own learning needs and structuring own learning in relation to selecting, adapting and applying ICT systems for learning, knowledge and content management.

Academic content and conjunction with other modules/semesters

Prerequisites for participation - Only for students on the 8th semester of the Information Studies degree at AAU Copenhagen. All courses and deliverables on the 7th semester of the Humanistic Informatics degree at AAU Copenhagen must be completed.

Module activities (course sessions etc.)

Literature

Mandatory lit.: xxx pages

no of pages. Additional. lit.: xx pages

no of pages. Dig. Upload*: xx pages

Course activities and literature is described below

Examination

Examination 5

An internal written examination in English in "ICT for Learning, Knowledge and Content Management"

The examination is a seven-day take-home assignment on a set topic. On the basis of the module, students will respond to one or a number of questions and assignments within the subject area of the module. The assignment paper must not exceed eight pages, and it must be prepared individually.

Evaluation: Grading according to the 7-point scale.

The study elements on which the examination is based is equivalent to 5 ECTS.

In the evaluation of the examination performance, the grade 12 will only be awarded to students who give an excellent performance and demonstrate that they have fulfilled the above objectives exhaustively or with only few insignificant omissions.

Lecture 1 (TH)

Introduction to case: HUMINF goes MOOC

- ▶ What is a MOOC?
- ▶ E-learning in higher education
- ▶ Learning theory and design of learning activities

Reading:

<http://newprairiepress.org/culsproceedings/vol3/iss1/5/>

<http://er.dut.ac.za/handle/123456789/71>

<http://www.tandfonline.com/doi/abs/10.1080/00091383.2013.842103?journalCode=vchn20>

http://gerrystahl.net/cscl/CSCL_English.pdf

Beetham, H. (2007). An approach to learning activity design, in *Rethinking Pedagogy for a Digital Age*, Beetham, H. & Sharpe, R. (eds). London: Routledge, pp 26–38.



Course case description



Groups



Deliverable 1 (stakeholder analysis)



Deliverable 2 (interviews/surveys)



Questions for the interviews (new link)



Deliverable 3 (requirements analysis)

Lecture 2 - Interaction design & Design methods (BL)

- ▶ Introduction to Interaction design
- ▶ Storyboards
- ▶ Flowcharts
- ▶ Wireframes

Readings

Rogers, Sharp & Preece (2015): *Interaction Design - beyond human-computer interaction*, 4th/3rd. edition, Chapters 1, 2 & 9

- Chapter 1: What is Interaction Design?
- Chapter 2: Understanding and Conceptualizing Interaction
- Chapter 9: The Process of Interaction Design

- The 3rd edition online: Link to AUB (8 simultaneous users - remember to log out after reading!!)
- Buy the 4th edition from FACTUM books online
- Buy the 4th edition from Amazon

Lecture 3 - Design (BL)

- ▶ Wireframes (w/ Balsamiq)
- ▶ Usability heuristics

Readings

Dix, A.; Finlay, J. Abowd, G. D. and Beale, R. Human Computer Interaction, 3rd edition or newer, Chapter 5: interaction design basics, Chapter 7: Design rules

Rogers, Y., Sharp, H. & Preece, J (2015): *Interaction Design - beyond human-computer interaction*, 4th/3rd edition, Chapter 11 & 12.

- Chapter 11: Design, Prototyping and Construction
- Chapter 12: Introducing Evaluation

Lecture 4 - Designing Information Spaces (BL)

- ▶ Information Architecture
- ▶ Interaction Design

Readings

Morville and Rosenfeld (2007): *Information Architecture for the World Wide Web*, 3rd. edition, Chapters 1 & 4-8.

- Full text PDF below
- Link to AUB - 8 simultaneous users - remember to log out after reading!!

Lecture 5 - Implementation (TB)

Students will be introduced to the basics of Content Management Systems (CMS) and will gain practical experience with one of the most popular CMS: Wordpress.

Required reading:

- Connolly, R. & Hoar, R. (2014). *Fundamentals of Web Development*, Pearson, chapter 18
 - 18.1-18.4 is required reading, the rest is for those of you who understand PHP
- McKeever, S. (2010). Understanding Web Content Management Systems: Evolution, Lifecycle and Market, *Industrial Management & Data Systems*, vol. 103, no. 9, pp. 686-692



McKeever (2010)



Connolly and Hoar (2014), chapter 18



Lab session: Using WordPress



Installing WordPress.pdf



WordPress tutorial.pdf



Slides

6: Wrapping things up (BL & TB)

- Groups presenting wireframes for a personalised welcome MOOC screen (follow up on exercise from section #4, which you must upload in Moodle)
- Learning theories and E-Learning
- Design principles for MOOCs
- Usability metrics
- Developing and ranking requirements based upon stakeholder analysis


Required reading

Dalsgaard, C. (2005). Pedagogical quality in e-learning. Designing e-learning from a learning theoretical approach. *E-Learning and Education*, Vol. 1. Link: <https://eleed.campussource.de/archive/1/78>

Guàrdia, L., Maina, M. & Sangrà, A. (2013). MOOC Design Principles. A Pedagogical Approach from the Learner's Perspective. *eLearning Papers*, No 33: 1-6. Link

Lackner, E., Kopp, M., Ebner, M. (2014) How to MOOC? – A pedagogical guideline for practitioners. Roceanu, I. (ed.). *Proceedings of the 10th International Scientific Conference "eLearning and Software for Education" Bucharest, April 24 - 25, 2014*. Publisher: Editura Universitatii Nationale de Aparare "Carol I". Link

 test

 8sem LKCM lecture6 wrapup-BL (Updated)

Exam

7-DAY TAKE-HOME ASSIGNMENT IN "ICT FOR LEARNING, KNOWLEDGE AND CONTENT MANAGEMENT"

The exam description will be handed out - and needs to be submitted electronically - via the new electronic exam system: <http://www.en.de.aau.dk/students/>. This page has the basic information you need to submit your exam files electronically - as well as a login link. You need to login using your AAU credentials. We recommend that you do a test login already now to make sure that there are no problems. For more information about the Digital Exam system please see this post: <https://www.moodle.aau.dk/mod/forum/discuss.php?d=92914>

Formal considerations

- Max. number of standard pages: 10 (strict limitation) + appendices.
 - The exam is made available Friday February 19, 2016 @ 12:00
 - The exam is due on Friday February 26, 2016 @ 12:00 (noon).
 - The exam 7-day take-home is individual (i.e. cannot be done in groups), and is assessed by the course instructors and an internal AAU censor if needed.
 - The reports will be evaluated according to criteria defined in the [study guide for the master's degree in Human-Centered Informatics](#).
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Re-exam

7-DAY TAKE-HOME ASSIGNMENT IN "ICT FOR LEARNING, KNOWLEDGE AND CONTENT MANAGEMENT"

The exam description can be found below - and needs to be submitted electronically - via email to Birger Larsen (birger@hum.aau.dk). Take a good look at ALL the content in this Moodle - in particular the 3 deliverables and the wrapup slides from the last lecture.

Formal considerations

- Max. number of standard pages: 10 (strict limitation) + appendices.
- The exam is made available Friday May 6, 2016 @ 12:00
- The exam is due on Friday May 13, 2016 @ 12:00 (noon).
- The exam 7-day take-home is individual (i.e. cannot be done in groups), and is assessed by the course instructors and an internal AAU censor if needed.
- The reports will be evaluated according to criteria defined in the study guide for the master's degree in Human-Centered Informatics.

 7-Day Take-home re-exam in ICT Learning, Knowledge and content
