

IT Product Design (*IT Produktudvikling*)

Master Programme

Course Curriculum

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1. Introduction

IT Product Design is a two-year master programme offered by the University of Southern Denmark in Sønderborg. It is established under the IT-University West collaboration between four Universities in the western part of Denmark.

The programme is organised according to the executive order issued by the Danish Ministry of Education: *Bekendtgørelse om kandidatuddannelsen i informationsteknologi under IT-Vestsamarbejdet* (nr. 678 af 23. august 1999) and the extension (nr. 745 af 22. august 2001).

The Mads Clausen Institute for Product Innovation is responsible for the programme, and it belongs under the auspices of the Academic Study Board of the Engineering Masters Programmes.

Goal

The purpose of this master programme is to educate designers, who can design interactive IT-products like home appliances, industrial sensors and controls, mobile phones, palmtop computers. Designers, who can work in multidisciplinary teams and can help expand information technology into the products of those manufacturing industries that are not normally associated with IT.

In particular the programme aims to qualify students to:

1. Understand and apply theories and methodologies relating to the development of innovative IT-products - and the user work practices they instigate,
2. Design user interaction for small, solid/tangible interfaces based on user empathy and aesthetics of interaction,
3. Establish and facilitate collaboration between design team and stakeholders in the development process - users in particular,
4. Organise successful development processes (with IT support) and pilot them in an industrial organisation, and
5. Contribute to the continuous development of theories, methods, and technologies in the field of IT product development.

Admission requirements

The programme accepts students with a Bachelor's degree from relevant disciplines including industrial and graphics design, engineering, business administration, anthropology, and language studies.

Students are admitted based on a motivated application, samples of previous creative work, and interview. As this is an international programme, good skills in spoken and written English are required.

Based on an individual assessment, the programme may accept applicants without a formal Bachelor's degree, if they have equivalent academic qualifications.

Programme structure

The programme is organised as a full-time education, and requires students to contribute with time and energy equivalent to that of a full-time job.

The programme is based on project work in a design studio. Students learn through completing projects in teams or individually. Theory is introduced both during the projects and in independent lectures and seminars throughout the semesters.

Projects are organised in themes, but the actual topics within each theme are largely left for the students themselves to decide.

The programme is divided into four semesters:

1. Design research horizon
2. User centred design fundamentals
3. Professional practice
4. Graduation thesis

The thesis work takes 6 months. It starts in the second half of the third semester and requires the full workload of the fourth semester.

Graduate degree

Upon completion, this programme awards students the degree of *Master of Science in Information Technology (Product Design)*. In Danish the degree is *cand.it. i Produktudvikling* (candidates/-candidata informationis technologiae).

The University of Southern Denmark issues a graduate diploma upon completion of the education. If students leave the education without completing it, the University will issue diplomas on those courses passed.

Job opportunities

Graduates qualify for positions in multidisciplinary design teams in manufacturing industry, consultancies etc. Depending on the field of their Bachelor's degree, they will be able to take on different responsibilities in the team: Product and business concept development, interaction design, user guide design, user experience modelling, usability work, or design process management.

The programme also qualifies candidates to enter a 3-year PhD programme to pursue a research and education carrier.

2. Assessment

The master programme consists of a number of courses, which are assessed one by one. Each course has an ECTS (European Credit Transfer System) credit figure, which indicates the weight of the course in the total programme. The equivalent of a one-year full-time work load is set at 60 ECTS. The required credit to complete the IT Product Design programme is 120 ECTS.

Exams are regulated by the executive orders *Bekendtgørelse om eksamen ved visse videregående uddannelser under Undervisningsministeriet* (nr. 1021 af 20. november 2000) and *Bekendtgørelse om karakterskala og anden bedømmelse* (nr.513 af 22. juni 1995).

General rules

All exams must be passed to complete the master programme.

If students fail an exam, they may enter the same exam up to three times. If requested, the University will offer the opportunity of a re-exam within the following semester.

Exams once passed cannot be entered again.

If students miss an exam because of illness, they must provide a medical certificate to cancel the exam registration. The University will offer the opportunity of a re-exam within the following semester.

All projects and exams are in English. Language proficiency and spelling are part of the assessment criteria for exams.

The graduation thesis is written in English. It must contain a 1-page summary in both the student's native language and in English.

Examiners and grading

Exams are assessed by the teachers of each course in cooperation with internal or external examiners. Internal examiners are other teachers from the University of Southern Denmark. External examiners are experts from outside the University appointed by the Ministry of Education.

Exams are graded using either marks of the Danish 13-scale or a Passed/Failed assessment. The following table will be applied to convert Danish marks into the international ECTS grading system.

<i>13-scale</i>	<i>ECTS</i>	<i>Grading system</i>
11, 13	A	EXCELLENT – outstanding performance with only minor errors
10	B+	VERY GOOD – above the average standing with few errors
9	B	VERY GOOD – above the average standing but with some errors
8	C	GOOD – generally sound work with a number of notable errors
7	D	SATISFACTORY – fair but with significant shortcomings
6	E	SUFFICIENT – performance meets the minimal criteria
5	Fx	FAIL – some more work required before the credit can be awarded
03, 00	F	FAIL – considerable further work is required

Exams can be group exams, individual exams, or a combination of both. Group exams will normally not exceed 4 students. At a group exam with 13-scale grading, at least half of the contribution of each student must be identifiable to allow individual assessment. The same rule applies to reports and essays.

Results of an exam assessment must be made available to students no later than 1 month after the exam.

Types of exams

Project report

A project report is the documentation of results and process of a design project. For design projects, the report will typically include edited video recordings of relevant user studies, scenarios etc. and product mock-ups or prototypes.

The course sets a page-limit per student for the essay. A standard page has 2100 characters.

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Design Crits

Design critiques are sessions in which students (individually or in teams) present their project progress and results for open discussion and evaluation in class. Design crits can be arranged both while projects are in progress and when they terminate. The type of material to be prepared for a design crit (posters, mock-ups, interactive presentation) depends on the goal and focus of the project. Participation in design crits is mandatory to pass exams. Crits are not open to public, but guests may be invited pending on teachers' acceptance.

Oral Exams

Oral exams are typically prepared presentations based on project reports, essays, or literature. Oral exams are public, unless the students under examination refuse public attendance. Oral project presentations are public unless projects have been carried out under a non-disclosure agreement with e.g. a company.

Portfolio exam

Students are encouraged to establish and maintain a presentable collection of their personal work achievements. The portfolio exam is a 20 min presentation of this collection to teachers and examiners, simulating a job interview in the industry. The students select which media they prefer and decide on the format of the presentation (room arrangement, activities, teacher roles etc.).

Essays

Essays are written reflections and discussions of a particular theme based on references to literature, practical experiments, observations etc. Essays are written individually or in pairs. The course sets a page-limit per student for the essay. A standard page has 2100 characters.

Attendance

Where attendance is a criteria for assessment, courses require active, regular and satisfactory participation in course activities. 'Active' means that all course assignments are completed, and 'regular' means that students attend at least 90% of the course activities throughout the course period.

Exam overview

<i>Course</i>	<i>ECTS</i>	<i>Exam type</i>	<i>Examiner</i>	<i>Grading</i>
Exploring Design	15	Portfolio presentation (individual)	External	13 scale
IT Product Visions	5	Essay (individual)	Internal	13 scale
Design Skills	5	Attendance & Test Piece	Internal	Pass/fail
Design Specialisation A	5	Project Report	Internal	13 scale
User Centred Innovation	7	Project Report and Design Crit	Internal	Pass/fail
Expressive Interaction	3	Design Crit	Internal	Pass/fail
User Centred Development	15	Project Report and Oral (group and individual)	External	13 scale
Design Studies	5	Essay (individual) – elective course	Internal	Pass/fail
Professional Roles	10	Essay and Oral (individual or pair)	External	13 scale
Electronic Prototyping	10	Product and Design Crit	Internal	Pass/fail
Design Specialisation B	5	Project Report	Internal	13 scale
Thesis	30	Thesis and Oral (individual or pair)	External	13 scale
Critique and Show Production	5	Show organisation and material	Internal	Pass/fail
<i>Sum</i>	120			

3. Course descriptions

Exploring Design 15 ECTS

The goal is to establish a state-of-the-art overview of directions in design research and to provide concepts and terminology to discuss design. The course also aims at providing students with an understanding of explorative research.

Contents: Through project work the students explore different perspectives of IT Product Design:

- Process related: What is the focus of current research in design and design methods? E.g. design learning, self-organising teams.
- Product related: What are the prevailing themes in IT Product research? E.g. tangible interaction, pervasive computing.

The contents will vary from year to year, depending on current research issues at the Mads Clausen Institute.

Structure: The course consists of 4-6 mini-projects that introduce current research themes, each of 2-3 weeks duration. Each project has a concrete product goal: In teams students will create a method, an analysis, or a product concept. The projects will introduce a variety of working methods and presentation forms. Project work is supported by seminars, literature, discussions, tutoring, and design crits. The projects will be organised by researchers and PhD students who work within each theme.

Assessment: 13-scale marks based on a portfolio exam. The portfolio exam is an individual presentation of each student's achievements during the course. To enter the exam, all mini-projects must be completed satisfactorily.

IT Product Visions 5 ECTS

This course aims at providing a broad understanding of current directions within the field of IT Products.

Contents: Prevailing ideas about future IT technologies, products, interaction, and societal implications. The content will vary year by year, but will represent a broad range of perspectives from engineering, design, marketing, industry, user organisations etc.

Structure: Students are encouraged to formulate their understanding and visions about the future of IT Product based on a series of thought provoking guest lectures, movies, and self-study literature. The course may include a study trip.

Assessment: 13-scale marks based on an essay (6-pages).

Design Skills 5 ECTS

The goal is to train the skills necessary for collaborative interaction design.

Contents: Practical education in tangible programming, model making with cardboard/foam/wood/metal, sketching, written communication, graphical communication, and process facilitation.

Structure: 20 half-day workshops with hands-on exercises training practical skills. Following this, the students produce a test-piece, which demonstrates the skills learned.

Assessment: Pass/ fail based on regular attendance of workshops (min. 90 %) and assessment of the test piece.

Design Specialisation A 5 ECTS

The goal is to expand competences in a specialised area relating to IT Product Design.

Contents: Exploration and project work within a selected design specialisation, e.g. vision based design, scenario development, experience modelling, creative methods.

Structure: 3-week tutored full-day assignment. Seminars and presentations.

Assessment: Pass/ fail based on individual or group report and project presentation.

Design Specialisation B 5 ECTS

The Design Specialisation course is offered with a variety of specialisations each year. Students get credit for the course twice with different specialisations – in the first and second year. In the second year, students must select the specialisation to complement their thesis work.

User Centred Innovation 7 ECTS

The goal is to train professional working methods for the early phases of user oriented product development.

Contents: Ethnographic user studies, video analysis, scenario design, design mock-ups, user workshops.

Structure: 4-week project. Case-based seminars, hands-on exercises, project assignment and presentations. The projects are co-organised with engineering and marketing students.

Assessment: Pass/ fail based on project report and design crits. The project report includes video of user studies and design prototypes.

Expressive Interaction 3 ECTS

The goal is to provide an understanding of human-machine interaction theories and interaction aesthetics.

Contents: Form and interaction, semantics and affordances, history of interaction, interaction expression and interaction styles.

Structure: 2-week seminar. Case-based seminars, hands-on exercises, project assignment and presentations.

Assessment: Pass/ fail based on project report and design crit.

User Centred Development 15 ECTS

The goal is to provide design process understanding and project management competences for user-oriented product development.

Contents: Design process strategies, design iteration loops, process rhythm, continuous user involvement. Application of user centred design methods on a complex real-life problem.

Structure: 8-week multidisciplinary group design project in collaboration with a company. The projects are co-organised with engineering and marketing students.

Assessment: 13-scale marks based on project report and oral exam. The project report includes a description of project results and process, video of user studies, and design prototypes. The oral exam consists of two parts:

- (1) A group presentation of the project
- (2) Individual reflection on methods applied in relationship to course literature.

Design Studies 5 ECTS (elective)

The goal is to provide an understanding of theories and philosophies of IT product design. Students should be able to analyse and relate their own design experiences to key literature.

Contents: Basic concepts and theories in design research: Participatory design, design learning, design philosophy, ethics and values in collaborative design, design as communication, artefacts/tools/representations.

Structure: Literature study, seminars with student's presentations and discussions, and essay writing. The course will be arranged as a study circle that includes PhD students and researchers from the Mads Clausen Institute. Students can take the course as a preparation for a thesis in the research direction.

Assessment: Pass/ fail based on an essay in scientific paper format.

Electronic Prototyping 10 ECTS

The goal is to develop an understanding of the value of user interaction prototypes that actually work, and provide hands-on experience with prototyping techniques.

Contents: Electronic prototyping techniques and prototyping kits. Basic introduction to electronic components, displays, interface components, microprocessors, programming, A/D converters etc.

Structure: 6-week experimental project, individually or in pairs of students. Hands-on workshops on electronic components. Design project resulting in a working interaction prototype. The prototype must be evaluated with user involvement.

Assessment: Pass/ fail based on prototype presentation. The presentation must include findings from user trialing of the prototype.

Professional Roles 10 ECTS

The goal is to relate theories and methodology to the existing work practice of designers in the IT product industry. The course also aims at establishing role models so that students can imagine their future work options.

Contents: Ethnographic studies of designers at work. Prescriptive models of the product development process and how they relate to reality. Usability traditions and techniques and how they actually work in industry.

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Structure: Literature studies, lectures and seminars. Video design cases. Study visits to companies and discussions with design teams in Denmark or abroad. 2-week internship in a company, where students shadow a professional at work. Reflection and reporting. Final presentation to industrialists.

Assessment: 13-scale marks based on an essay (15 pages) and oral presentation.

Thesis 30 ECTS

The goal is for the students to independently establish and complete an extensive project that demonstrates the skills and competencies acquired throughout the master programme.

Contents: The students decide in dialog with course tutors on the theme for their thesis. A tutor is appointed as personal advisor for each student. The thesis must document both practical IT product design activity and theoretical reflection. The contents and quality of the thesis must approach professional state-of-the-art design level (or research level depending upon the chosen focus).

Structure: The thesis is initiated on the basis of a thesis statement, which describes the focus, relevance, method and scope. The thesis theme must be approved by the Academic Study Board. To enter the thesis work, students require a minimum of 60 ECTS.

The project is divided into two parts: A concept study (2 months) and a production/reflection period (4 months). Thesis work is typically individual, but may be completed in pairs of two students.

Assessment: 13-scale marks based on thesis and oral exam.

Critique and Show Production 5 ECTS

The goal is to develop an understanding of the role of critique in design and the importance of communication of project results.

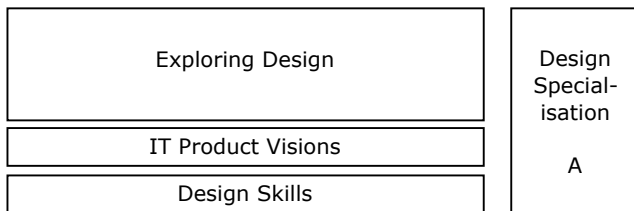
Contents: The role of critique in disciplines like theatre, film, literature etc. Principles and organisation of public presentation and communication.

Structure: 3-week period with seminars, critique of the thesis of colleague students, planning of public design show, production of show material.

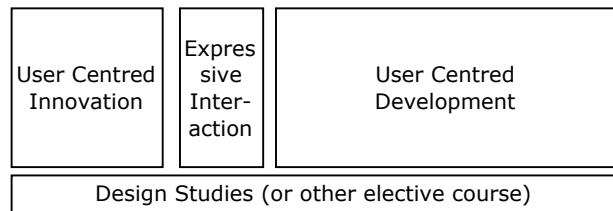
Assessment: Pass/ fail based on active attendance.

4. Recommended study plan

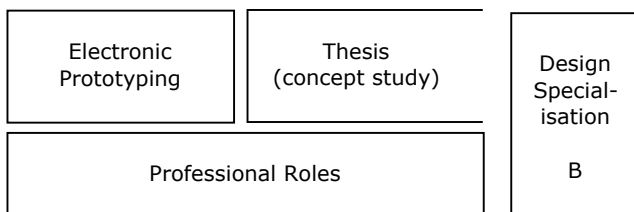
1. Semester



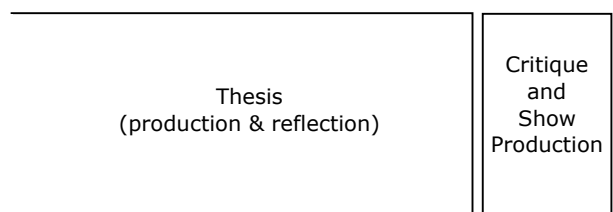
2. Semester



3. Semester



4. Semester



5. Validity

The Academic Study Board can – if extraordinary circumstances support this – allow deviations from this curriculum for those regulations that are determined by the University and not part of the executive orders of the Ministry.

The Academic Study Board may allow that exams taken in other courses or at other universities replace exams in this curriculum.

30. October 2001, Jacob Buur buur@mci.sdu.dk

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