IT University
of Copenhagen

Curriculum for the Master of Science Programme in Information Technology at the IT University in Copenhagen, the MSc study pro-grammes belonging under the Board of Studies ITU:
Digital Design and Communication
IT for Organizations
Media Technology and Games
Software Development and Technology

1 August 2006

Contents

Background

This curriculum for the Master of Science Programme in Information Technology has been drawn up by the Board of Studies ITU at the IT University of Copenhagen (hence-forth referred to as the IT University) and applies to the four MSc study programmes above belonging under the Board of Studies ITU. The curriculum has been drawn up in compliance with the Executive Order on Bachelor's and Master's (Candidatus) Pro-grammes at Universities (the Order on Study Programmes) from the Ministry of Sci-ence, Technology and Innovation (executive order no. 338 of 6 May 2004).

Students enrolled in the above MSc study programmes with study start from the au-tumn of 2006 study according to this curriculum.

Students enrolled in the IT University's MSc study programme E-Business study accord-ing to the curriculum of 1 September 2005 (http://www1.itu.dk/sw41349.asp).

Chapter 1

The programme, its objectives, duration and titles

Objectives

Section 1. The purpose of the Master of Science Programme in Information Technology is to provide students with the scientific qualifications to formulate and solve complex problems relating to information technology.

Subsection 2. The programme prioritises the student's ability to develop and apply the underlying technology as well as the scientific theories and methods upon which it is based.

Subsection 3. The programme provides the student with the qualifications to define his or her own academic profile within the field of information technology on the background of the student's preceding bachelor's programme.

Subsection 4. Within the framework of the programme, the student should be able to acquire the requisite qualifications for posts in business and industry as well as for research training programmes (PhD programme) in information technology, cf. section 2, subsection 1 in the Act on Universities from the Ministry of Science, Technology and Innovation (act no. 280 of 21 March 2006), and the Order on Study Programmes section 3, subsection 3.

Study Programmes

Section 2. The Master of Science programme includes the MSc study programmes below, each of which extends the student's knowledge of specific academic disciplines.

Subsection 2. The following study programmes belong under the Board of Studies ITU:
- Digital Design and Communication (K-DDK)
- IT for Organizations (K-ITO)
- Media Technology and Games (K-MTG), which comprises two admission areas: Design and Analysis (K-MTG-A), and Technology (K-MTG-T)
- Software Development and Technology (K-SDT)

Subsection 3. The following study programme belongs under the EBUSS Board of Studies:
- E-Business (K-EBUSS). Students enrolled in study the programme E-Business study according to the curriculum of 1 September 2005.

Subsection 4. The IT University is empowered to outsource parts of the programme to Roskilde University, Copenhagen Business School, Technical University of Denmark and the University of Copenhagen.

Duration

Section 3. The programme has a standard duration of 120 ECTS points. 60 ECTS points correspond to one year of full-time studies, cf. the Order on Study Programmes section 6, subsection 3.

Subsection 2. The programme must be concluded within five years. Under special circumstances, the IT University is entitled to grant exemptions from this regulation.

Subsection 3. The IT University may without further notice end the enrolment for students who have not been active in their study programme for a period of at least 2 consecutive years, cf. section 34 in the Executive Order on Admission etc. in Connection with Bachelor's and Master's Programmes at Universities (the Admission Order) from the Ministry of Science, Technology and Innovation (executive order no. 362 of 20 May 2005). Under special circumstances, the IT University is entitled to grant exemptions from this regulation, cf. the Admission Order section 34, subsection 3.

Subsection 4. A student, who does not pass any examinations corresponding to at least 7.5 ECTS points within a period of 2 consecutive years, is not active in his or her study programme.

Titles

Section 4. A student, who has completed the Master of Science programme in Information Technology, has the right to use the title *candidatus/candidata informationis technologiae (cand.it.)* with the addition of the designation for the appropriate study programme.
Subsection 2. The title in English is Master of Science (MSc) in IT*.*

Chapter 2

Admission requirements and conditions

Admission requirements

Section 5. Admission to the Master of Science programme is conditional upon the applicant having successfully completed a bachelor's programme prior to commencing studies for the MSc.
Subsection 2. The programme-specific rules for each MSc study programmes may contain admission requirements pertaining to the individual study programme*.*
Subsection 3. The IT University has the authority to grant admission to applicants, who do not meet the requirements in subsections 1 and 2, but who on the basis of a concrete assessment are considered to have academic qualifications comparable to this. The university may require supplementary tests, cf. the Order on Study Programmes section 9, subsection 3.

Conditions of admission

Section 6. Meeting the admission requirements stipulated in section 5 is a necessity but not sufficient for admission on its own.
Subsection 2. The IT University stipulates and publishes the criteria for selection of applicants if there are more qualified applicants, cf. section 5, than there are places available, cf. the Order on Admission section 29. The IT University publishes the criteria for selection in the IT University's admission rules on the university's website.

Chapter 3

Structure, contents, etc.

Term structure

Section 7. An academic year consists of two terms, the autumn term and the spring term.

Programme structure

Section 8. The Master of Science programme requires passes in *study activities* corresponding to a workload of 120 ECTS points.

Subsection 2. One term of full-time study consists of study activities worth 30 ECTS points.

Subsection 3. The study activities of the programme are composed of *modules* corresponding to 90 ECTS points and a *master's thesis* corresponding to 30 ECTS points.

Subsection 4. A module consists of a *course* and a *project* and examination, or of a course or a project and examination.

Subsection 5. A module may form part of the *mandatory backbone* of an MSc study programme, form part of a *specialization* or be an *optional module*.

Subsection 6. The student must not take part in study activities worth more than the prescribed 120 ECTS points.

Subsection 7. All study activities, including the thesis, are concluded with an examination. When the examination has been passed, the study activity is considered passed.

Subsection 8. If a student fails to sit for an examination in study activities for which the student has been registered, the IT University is entitled to reduce, and in special cases even reallocate, the teaching resources devoted to the student.

Subsection 9. To take part in a study activity, a student must register in advance.

Subsection 10. Students must be allowed to do project activities worth up to 15 ECTS points as well as their thesis in collaboration with students from other MSc study programmes at the IT University.

Subsection 11. When choosing study activities, it is the responsibility of the student to make sure that all composition requirements of his or her study programme can and will be met.

Subsection 12. There is only one Board of Studies responsible for each study activity. Only the Board of Studies responsible for a particular study activity is empowered to organise examinations and assessments.

Mandatory backbone, specializations and optional modules

Section 9. The mandatory backbone of the Master of Science programme consists of modules corresponding to 52.5 ECTS points which are, according to the recommended course of study, carried through as follows:
- 1st term: 2 modules of 15 ECTS points.
- 2nd term: 1 module of 15 ECTS points.
- 3rd term: 1 module of 7.5 ECTS points.

Subsection 2. The specialization of each MSc study programme consists of modules corresponding to 22.5 ECTS points which are, according to the recommended course of study, carried through as follows:
- 2nd term: 1 module of 7.5 ECTS points.
- 3rd term: 1 module of 15 ECTS points.

Subsection 3. The optional modules of each MSc study programme correspond to 15 ECTS points which are, according to the recommended course of study, carried through as follows:
- 2nd term: 1 module of 7.5 ECTS points.
- 3rd term: 1 module of 7.5 ECTS points.

Subsection 4. A survey of the mandatory backbone of each MSc study programme is shown in the programme-specific rules, cf. chapter 5.

Subsection 5. A survey of the specialization of each MSc study programme is published on the IT University's website by the Board of Studies ITU in advance of each term.

Courses and projects

Section 10. During a *course*, the student attends organised classes, which may include lectures, short assignments, practical and theoretical exercises, home study, field trips, etc.

Subsection 2. A course may form an integrated part of a module or constitute a module in itself, cf. section 8, subsection 4.

Subsection 3. A survey of courses including course descriptions is published on the IT University's website by the Board of Studies ITU in advance of each term.

Section 11. A *project* consists of targeted, independent learning under supervision.

Subsection 2. A project may form an integrated part of a module or constitute a module in itself, cf. section 8, subsection 4.

Subsection 3. A project is normally done in groups of 2-5 students. Dependent on the nature of the project, the Board of Studies may grant permission for smaller or bigger groups.

Subsection 4. A project which does not form an integrated part of a module is defined by a *project agreement*.

Subsection 5. The problem formulation and frameworks for the project are defined at the start of the project. Each student taking part furthermore states what individual qualifications he or she possesses for participation.

Subsection 6. Before a project may be carried through, the Board of Studies of each of the participating students must approve of the project.

Subsection 7. One, and only one, Study Administration sees to the administration for each project agreement. The main supervisor acts as the contact person with this Study Administration.

Master's thesis

Section 12. Master's theses follow the same rules that apply to other project activities, cf. section 11. The following special conditions also apply to theses.

Subsection 2. A thesis must be worth 30 ECTS points, corresponding to a workload of half a year.

Subsection 3. The thesis must conclude the Master of Science programme, cf. the Order on Study Programmes section 21, subsection 5. The university may grant exemption from the rule in special cases, cf. the Order on Study Programmes section 74, subsection 1.

Subsection 4. The thesis must not be started prior to completion of study activities corresponding to at least 75 ECTS points.

Subsection 5. The thesis is designed to show skills in applying scientific theories and methods when working on a defined subject, cf. the Order on Study Programmes, section 21, subsection 5. Furthermore, the thesis is designed to show that the student has achieved the objectives of the Master of Science programme, cf. section 1, and can apply, present or elaborate on specialised knowledge within the area of the appropriate MSc study programme. A thesis may be in the nature of being experimental, communicative or innovative.

Subsection 6. The thesis is defined by a *project agreement*.

Subsection 7. The thesis subject and the project agreement are prepared in collaboration with one or more supervisors. The thesis is composed individually or in a group of a maximum of 4 students. The thesis is concluded with a written report and an individual, oral defence.

Subsection 8. The thesis report must be composed in Danish or English. The thesis report must include a summary in a foreign language which enters into the total assessment, cf. section 11, subsection 2 in the Executive Order on Examinations in University Programmes (the Examination Order) from the Ministry of Science, Technology and Innovation (executive order no. 867 of 19 August 2004). If the thesis is written in Danish, the summary must be written in English. If the thesis is written in English, the summary may be written in Danish or in English.

Subsection 9. The student's spelling and writing skills enter into the basis of the assessment of the thesis no matter in which language the thesis is written, however with the main emphasis being given to the academic contents, cf. the Examination Order section 11, subsection 1.

Subsection 10. Please also refer to the IT University's examination regulations.

Study language

Section 13. The MSc study programmes belonging under the Board of Studies ITU are conducted in the following languages of study:
- *Media Technology and Games* and *Software Development and Technology* are conducted in English.
- *Digital Design and Communication* and *IT for Organizations* are conducted in Danish. However, parts of the teaching elements may be conducted in English.

Work experience and study trips abroad

Section 14. Study activities based on work experience must be formulated as projects, cf. section 11.

Subsection 2. Credits for study trips abroad may be transferred to the programme. Credits for educational activities during a study trip abroad can be transferred as courses and/or projects, provided they meet the requirements, cf. section 21.

Chapter 4

Examinations

Section 15. The IT University issues diplomas for all of the MSc study programmes included in the Master of Science programme.

Subsection 2. The following rules apply for examinations:
- Executive Order on Examinations in University Programmes (the Examination Order).
- Executive Order on External Examiners on Certain Further Education Programmes (the External Examiner Order)
- Executive Order on the Grading Scale and Other Forms of Assessment.

Subsection 3. Please also refer to:
- The IT University's examination regulations.
- The IT University's rules and procedures for complaints.

Chapter 5

Programme-specific rules

Digital Design and Communication

Section 16. The MSc study programme *Digital Design and Communication* has as its objective that the student achieves the following competences:
- The graduate can apply theory to enhance practice, and reflect from experience in order to improve his or her own learning and future work.
- The graduate can adapt to changing platforms of digital technologies and media, and create content that translates across several platforms.
- The graduate can cooperate and communicate with people of varying skills and backgrounds and is good at teamwork and project management.

- The graduate can embrace emerging digital genres and technologies and critically exploit their potential.
- The graduate can communicate successfully in a digital-media context.
- The graduate can design and develop suitable content for a variety of digital platforms.
- The graduate can create and innovate, competences which make the graduate a valuable contributor to all forms of development and design teams.
- The graduate can think in a process-oriented way.

Subsection 2. The mandatory backbone of the study programme consists of the following four modules:

1. *Design of Interactive Products*. The module focuses on methods for collection of data, analysis of data and development of ideas for design of interactive products, and planning and carrying out of explorative design projects, in which a definite design problem is not given in advance.

2. *Digital Media in Theory and Practice*. The theoretical focus of the module is basic theories of communication, media theories, theories of computer-mediated communication, and historical and present ideas of the communicative potential of the computer. The practical focus of the module is design of communication and visual-aesthetic experiences on the web.

3. *Multimedia Applications*. The module focuses on design and construction of multimedia applications, including tools for development of multimedia projects which match the possibilities of the interactive media, both as regards concept and programming.

4. C*ommunication Strategies within IT*. The module focuses on theoretical understanding of the special characteristics and conditions of digital media and application of communication strategies on an advanced level.

Subsection 3. Admission to the study programme requires proficiency in written and oral Danish.

Subsection 4. Successful completion of the study programme entitles the student to use the title candidatus/candidata informationis technologiae (cand.it.) with the addition of the designation Digital Design and Communication.

Subsection 5. The study programme belongs under the Board of Studies ITU.

IT for Organizations

Section 17. The MSc study programme *IT for Organizations* has as its objective that the student achieves the following competences:

- The graduate can as an equal participant in the design process formulate the problems and needs of the user organization to other system developers and generally function as a bridge builder between work practices and system construction in all stages of the life cycle of the system.
- The graduate can in a practical analytic and design-oriented context carry through an analysis of existing work practices and business processes; develop an innovative conceptual design; participate as a peer in the configuration and customization of complex IT systems; and plan and supervise system tests as well as overall system evaluation.
- The graduate can in a practical context apply, combine, assess and exploit the newest theories, methodologies, techniques and technologies in order to achieve a functioning socio-technical solution.
- The graduate has a high level of methodological and technologic reflection.
- The graduate is good at relating to and learning from practitioners and professionals from many different fields and is trained in interdisciplinary teamwork and project management.

Subsection 2. The mandatory backbone of the study programme consists of the following four modules:

1. *Design and Ethnographics*. The module focuses on concepts and methods of uncovering, identifying and analysing problems in connection with existing work practices or business processes and of developing suggestions for IT solutions to their rectification.
2. *Modelling and Design*. The module focuses on principles and techniques for modelling of work practices, business processes and data structures as part of the development of IT for organizations.
3. *Organization and Technology*. The module focuses on theories on organization and technology and their application in connection with problems regarding complex IT systems in organizations (for example knowledge sharing, workflow, document management).
4. *Understanding of Practice*. The module focuses on how social sciences contribute to the understanding of work practices in complex labour contexts and how they can be applied in connection with analyses of professional practices with a view to developing IT systems in close connection with the development of practice.

   Subsection 3. Admission to the study programme requires proficiency in written and oral English.

   Subsection 4. Successful completion of the study programme entitles the student to use the title candidatus/candidata informationis technologiae (cand.it.) with the addition of the designation IT for Organizations.

   Subsection 5. The study programme belongs under the Board of Studies ITU.

Media Technology and Games

Section 18. The MSc study programme *Media Technology and Games* has as its objective that the student achieves the following competences:
- The graduate can design and develop innovative technologies and concepts within media and games based on a scientific analysis.
- The graduate can reconcile the limitlessness of creative ideas with the limitations of system requirements to bring about products and prototypes which make appropriate use of media and games technologies.
- The graduate uses a structured approach in the design and development of media technologies and games.
- The graduate is good at interdisciplinary teamwork and project management.

   Subsection 2. The mandatory backbone of the study programme, admission area *Design and Analysis*, consists of the following four modules:
1. *Computer Games Theory*. The module focuses on analysis of games and their context based on a scientific analysis.
2. *Design of Games and Media Concepts*. The module focuses on design and development of prototypes.
3. *Media and Games Development*. The module focuses on the development of innovative products and prototypes which exploit media and games technologies, based on a structured and scientific approach.
4. *MTG Project*. The module focuses on interdisciplinary teamwork and project management within the development and design of media technology and games.

   Subsection 3. The mandatory backbone of the study programme, admission area *Technology*, consists of the following four modules:
1. *Programming*. The module focuses on programming concepts and practical experience.
2. *Design of Games and Media Concepts*. The module focuses on design and development of prototypes.
3. *Media and Games Development*. The module focuses on the development of innovative products and prototypes which exploit media and games technologies, based on a structured and scientific approach.
4. *MTG Project*. The module focuses on interdisciplinary teamwork and project management within the development and design of media technology and games.

Subsection 4. Admission to the study programme requires proficiency in written and oral English.

Subsection 5. Successful completion of the study programme entitles the student to use the title candidatus/candidata informationis technologiae (cand.it.) with the addition of the designation Media Technology and Games.

Subsection 6. The study programme belongs under the Board of Studies ITU.

Software Development and Technology

Section 19. The MSc study programme *Software Development and Technology* has as its objective that the student achieves the following competences:

- The graduate can write well-documented software which meets the given requirements.
- The graduate can create reliable and secure software.
- The graduate can use a modern programming platform and understands general concepts of programming languages.
- The graduate understands software performance in theory and practice.
- The graduate can collaborate with others, also in international projects, using processes which support knowledge sharing and development of high-quality software.

Subsection 2. The mandatory backbone of the study programme consists of the following four modules:

1. *Programming.* The module focuses on programming concepts and practical experience.
2. *Modelling.* The module focuses on data and process modelling, design of user interfaces and system development.
3. *Performance and Test.* The module focuses on algorithmic, complexity analysis and test.
4. *Architecture.* The module focuses on software architecture, network, distributed systems and security.

Subsection 3. Admission to the study programme requires proficiency in written and oral English.

Subsection 4. Successful completion of the study programme entitles the student to use the title candidatus/candidata informationis technologiae (cand.it.) with the addition of the designation Software Development and Technology.

Subsection 5. The study programme belongs under the Board of Studies ITU.

Chapter 6

Miscellaneous regulations

Transferring to another degree or study programme

Section 20. A student wishing to transfer from another degree programme at the IT University to the Master of Science programme, or from one study programme within the Master of Science programme to another, must apply for admission to the programme under the same rules that apply to everybody else who applies for admission to the programme, cf. the IT University's admission rules.

Subsection 2. When assessing transfer applications, the IT University is entitled to consider all registered information about the student's course of studies at the IT University to date.

Subsection 3. When transferring from one MSc study programme to another, all passed study activities are automatically transferred to the new study programme.

Subsection 4. When transferring from another degree programme at the IT University to the Master of Science programme, the student may apply to have all passed study activities transferred to the Master of Science programme.

Credit transfer

Section 21. Credits can be awarded for parts of the degree by credit transfer from other institutions, but only up to a maximum of 60 ECTS points.
Subsection 2. Credit transfers for study activities from other institutions require approval by the Board of Studies.
Subsection 3. The content of the activity for which the credit is transferred must correspond with the objectives of the Master of Science programme, cf. section 1, and documentation must be presented to the amount of ECTS and assessment, and to the activity's being on master's (*candidatus*) level (as opposed to bachelor's level).
Subsection 4. Students, who during their bachelor's programme have covered areas which form part of the mandatory backbone of their MSc study programme, may apply to the Board of Studies to replace one or more modules. Students, who would like to replace 22.5 ECTS points or more, must take two specializations instead.
Subsection 5. The thesis cannot be transferred, cf. the Order on Study Programmes section 72, subsection 2.
Subsection 6. The Board of Studies is entitled to limit the number of credits transferred on the basis of special categories of study activities, for example in connection with study activities based on work experience.

Exemptions

Section 22. When justified by special circumstances, the IT University is entitled to grant exemptions from the rules in the curriculum that have been laid down by the university and the university alone, cf. the Order on Study Programmes section 67, subsection 5.
Subsection 2. The authority to grant exemptions stipulated in subsection 1 is administered by the Board of Studies ITU in the area of responsibility of the Board of Studies, cf. the Act on Universities section 18.
Subsection 3. The Ministry of Science, Technology and Innovation is entitled to grant exemptions from the Order on Study Programmes if justified by special circumstances, apart from instances where the IT University is empowered to grant exemptions, cf. the Order on Study Programmes section 75.

Complaints

Section 23. As regards complaints, please refer to the IT University's rules and procedures for complaints.

Chapter 7

Date of commencement and transitional regulations

Section 24. This curriculum comes into force 1 August 2006 and applies to all students admitted to the MSc study programmes belonging under the Board of Studies ITU, cf. section 2, subsection 2, which start in the autumn of 2006.
Subsection 2. Students who are enrolled under previous curriculums have the right to complete their programmes according to the curriculum under which they were enrolled, but may take part in study activities offered under the new curriculum. Examinations under the former curriculum will be held for the last time in January 2011.

Subsection 3. Students, who are enrolled under previous curriculums, may apply to the Board of Studies ITU to complete the programme under the present curriculum if this can be done within a maximum of 120 ECTS points.
Subsection 4. When a new curriculum is published, or in the event of significant changes to this curriculum, transitional regulations will be set out in the curriculum.

Approved by the Board of Studies ITU 28 June 2006

Approved by Vice Chancellor Mads Tofte 5 July 2006.