Department of Information Technologies

STUDY GUIDE 2013-2014

MASTER'S PROGRAMMES IN

- ❖ COMPUTER SCIENCE
- ❖ ELECTRONIC AND MOBILE COMMERCE
- ❖ SOFTWARE ENGINEERING
- ❖ EMBEDDED COMPUTING

This guide has been compiled for students that study at Åbo Akademi University in one of the Master's Degree Programmes offered by the Department of Information Technologies: **Computer Science** (CS), **Electronic and Mobile Commerce** (EMC), **Embedded Computing** (EC) and **Software Engineering** (SE).

Its purpose is to give information about the department and certain procedures, the study programme and the structure of the studies.

1 The Department of Information Technologies

The Department of Information Technologies is part of the **Division for Natural Sciences and Technology** at Åbo Akademi University. The other three departments in the same division are: the Department of Biosciences, the Department of Chemical Engineering, and the Department of Natural Sciences.

The Department of Information Technologies is located in the ICT-building, Joukahainengatan 3-5, 20520 Åbo.

The Department of Information Technologies has its web pages at: https://www.abo.fi/institution/en/informationsteknologi

1.1 Department and decision making

The Department of Information Technologies is lead by the Department Council and the Head of Department.

The Department Council is the highest decision making body in the department. The Council consists of nine members together with deputies: three professors, three other employees and three students. The members are elected for a three-year period.

The Department Council elects a professor to be Head of Department and another person with a doctoral degree to be Deputy Head of Department. The Head of Department is the chairman of the board while the Deputy Head of Department is the deputy chairman of the board.

The Head of Department decides on educational matters and matters concerning research that are not dealt with in other administrative bodies. The Head of Department should make sure that the department's educational and research responsibilities are being carried into effect.

1.2 The Academic office

The Academic office (*Studiekansliet)* is located in the Gripen-building, Tavastgatan 13, 20500 Åbo. The office is open Monday-Thursday at 10.00-15.00, Friday closed.

Head of Academic Affairs Pia-Maria Kallio can be met at the Academic office during office hours or by mutual agreement.
Telephone (02) 215 4516, e-mail: it-studiechef@abo.fi

Study Advisor Heidi Karlsson can be met at the Academic office by mutual agreement.
Telephone (02) 215 3540, e-mail: it-studieradgivare@abo.fi

Student Affairs Officer, Jessica Lindroos can be met at the academic office from Monday to Thursday at 10 am-3 pm or by mutual agreement
Telephone (02) 215 4517, e-mail: jessica.lindroos@abo.fi

It is recommended that you book an appointment with the Head of Academic Affairs or the Study Advisor in advance by e-mail or telephone.

1.3 The academic neighbourhood

Åbo Akademi University is located in Åbo (Turku in Finnish), the oldest city in Finland, close to the medieval Cathedral. The Department of Information Technologies operates in the ICT-building, on the street Joukahainengatan, which is a bit further away from the other University buildings, near the Kupittaa train station. You can find a map over the campus at the following address:
http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf

2 Studies

2.1 Academic year

The academic year is divided into four periods, two during the autumn and two during the spring. These are the dates for the periods for the academic year 2013-2014:

Period I	weeks 36-43	2.9.2013-25.10.2013
Period II	weeks 44-51	28.10.2013-20.12.2013
Period III	weeks 2-10	7.1.2014-7.3.2014
Period IV	weeks 11-22	10.3.2014-28.5.2014

2.2 Registration for the academic year

New students register for their first academic year 26.8-6.9.2013 according to these instructions http://www.abo.fi/student/en/inskrivningnya

The Student Union fee (110 €) is paid into a bank account using the pre-printed payment slips included in the admission letter. All new students must register during the period defined above and must present an identification card (e.g. passport), receipt of the Student Union fee payment, your original secondary school certificate and your original bachelor's degree certificate as well as transcripts (or other documents required for eligibility, e.g. Master's degree certificate), as well as your Letter of admission.

In order to maintain their status as students at the university all students at Åbo Akademi University have to each year notify the Student Office of Åbo Akademi (Studentexpeditionen) whether they are present or not for the academic year. The Student Office is located in the Gripen-building, Tavastgatan 13, 20500 Åbo. Registration for second-year and older students can be done 1.8-13.9.2013 according to these instructions http://www.abo.fi/student/en/anmalan

2.3 Course registration

Course registration at Åbo Akademi University

Registration is required for many courses. In these cases registration is done in MinPlan: http://www.abo.fi/minplan. Instructions for course registration are found at the following address: https://www.abo.fi/student/en/minplanmanualer. The best policy, in any case, is to always attend to the first lecture or course meeting.

2.4 Examinations

Examinations at Åbo Akademi University

The general exams (in Swedish: allmän tentamen) at the IT-department are arranged on Fridays during the whole academic year. The exams are held in auditorium Alpha, ICT-building, ground floor, from 12 am to 4 pm. Students should register for exams at least eight (8) days before the day of the exam. The registration is done in MinPlan: http://www.abo.fi/minplan. Instructions for registration for examinations are found at the following address: https://www.abo.fi/student/en/minplanmanualer.

The person responsible for examinations in the Department of Information Technologies at Åbo Akademi University is Department Secretary Christel Engblom (christel.engblom@abo.fi).

Each course usually has 1-2 course exams (kurstentamen). The first course exam is arranged at the end of the course and the second course exam is usually arranged in about a month after the course has finished. In addition to the course exams there are usually 3 general exams arranged for each course every academic year. The general exams can be taken in the same academic year as the course is completed, but also in the following academic year.

Registration in MinPlan is required for course exams as well as general exams in Computer Science and Computer Engineering.

The course exams in Information Systems do not require registration. For general exams in Information Systems, however, the student should register for the exam in MinPlan.

There are only three opportunities to take an exam in the same course, after that the course lecturer should be contacted and the matter discussed. Registering for an exam counts as one of these three times even if the student does not show up at the actual exam occasion.

Students are usually not allowed to bring the course material with them to the exams, so always check with the course lecturer what material is allowed in each exam.

Coats, bags, mobile phones etc. should be left outside the exam room or at the back of the room. If requested by the exam supervisor, students should be prepared to show proof of identification, e.g. a student card.

The results of the exams are posted on the notice board at the 3rd floor of the ICT-building. The results of the courses are registered in Åbo Akademi's study register (STURE). Student Affairs Officer Jessica Lindroos registers the results of the courses at the IT-department. If several weeks have passed since the course finished but the result is still not in the register, please contact the lecturer of the course.

Please acquaint yourself with the rules and regulations for examination at Åbo Akademi University. The Åbo Akademi University Examination and Assessment Instructions are found here: http://www.abo.fi/student/en/regler

2.6 Flexible study right: studies at the University of Turku or Turku School of Economics

Åbo Akademi University has an agreement of flexible study right with the University of Turku and with Turku School of Economics. According to this agreement students from Åbo Akademi University can take courses that are offered by the University of Turku and by Turku School of Economics. Available courses are e.g. courses offered within TUCS: http://www.tucs.fi (Education → Courses).

The selection of courses should always be approved by the responsible professor or coordinator of the programme: Ion Petre (CS), Eija Karsten (EMC), Jerker Björkqvist (EC) or Ivan Porres (SE). When the selection of courses is approved by the professor, the student should send in an electronic application for flexible study right which has to be approved of by Åbo Akademi University as well as by the University of Turku or Turku School of Economics. The application is found at http://www.joopas.fi (→ Joopas Application System). Without this application the student does not have the right to study at the University of Turku or Turku School of Economics and will not get the credits registered.

Course registration at the University of Turku
Registration to courses at the IT-department is done through the department intranet. You will need your university provided user account and the e-mail password to log in there. More information can be found at http://www.it.utu.fi/en/studying/
Manuals for course registration can be found at:
http://www.utu.fi/en/studying/studies/studyregister/nettiopsu.html

Course registration at Turku School of Economics
Registration for courses is obligatory. You can register for courses using the WebOodi internet service, which requires a username and password: https://edu.tse.fi/weboodi.

Examinations at the University of Turku
The exams are held in ICT-building, in lecture rooms Alpha, Beta and Lambda. However, you should always check the location! Small, course specific exam sessions during the last week of a period are also arranged in lecture rooms at the ICT-building. The registration to exams held by the IT-department is done through "nettiopsu": https://nettiopsu.utu.fi/. Registration ends exactly one week before the

exam day. Late registrations are not accepted. After the registration has ended, a registration may be cancelled only in cases of sickness. A registration counts as taking the exam. Manuals exam registration can be found at:
http://www.utu.fi/en/studying/studies/studyregister/nettiopsu.html.

The person responsible for examinations in the Department of Information Technologies at the University of Turku is Maria Prusila (maria.prusila@it.utu.fi).

Examinations at Turku School of Economics
Each term consists of two periods, with an examination week between the periods. Examinations are also held during the term on Fridays. The examination schedule is available at http://www.tse.fi/en/studying/curriculum. The halls for the exams are announced in the main lobby approximately one hour before the exam begins.

You may participate in exams only if you have registered. The registration must be made latest 7 days before the exam. You can register for exams using the WebOodi internet service, which requires a username and password: https://edu.tse.fi/weboodi. Late registrations must be handed directly to the examiner, who will decide whether they will be accepted.

Credits (study points) from other Universities (e.g. the University of Turku or Turku School of Economics) are not transferred automatically to Åbo Akademi University. The student must get a study transcript from the other university and bring it to the Study Advisor, who will see to it that the study achievements are transferred into the study record at Åbo Akademi University.

2.7 Ceritificates and study transcripts

Certificates and copies regarding study achievements and other study related issues can be obtained from the Student office of Åbo Akademi University in the Gripen-buildning, ground floor (Tavastgatan 13) or from the Academic office in the Gripen-buildning, 2nd floor (Tavastgatan 13). An unofficial transcript can be requested on the Internet at the following address: https://www.abo.fi/personal/sv/minsture.

2.8 Graduation and diploma

When all courses are completed and the Master's thesis is approved, the student can graduate and get his or her diploma. The diplomas are handed out once a month during the semester. To obtain the diploma, please contact the Head of Academic Affairs at the Academic office in the Gripen-building, 2nd floor, Tavastgatan 13. More information about graduating and getting the diploma is found here: https://www.abo.fi/institution/en/it_nastanfardig

3 Services

3.1 Computers, printers and copying machines

The computers in the computer classes in the ICT-building, B-building, 3rd floor, rooms B3031 and B3032, as well as the computer classes located in other University

buildings, are available for all the students studying at the Department. A username, password and a license to use the computers are needed. These can be obtained from the Help Desk at the Computing Centre *(Datacentralen)* in the ASA-building, B-buliding, Fänriksgatan 3B, 20500 Åbo. With the password it is possible to log on to all of the public computers located in any of the University's computer classes. The following page lists all available computer classes: https://www.abo.fi/personal/en/klasser. Remember always to log off after use, so that no one else can use your computer domain.

Students can print about 180 pages for free in a three-month period. If this amount is exceeded the student will pay for the pages printed (3.3 cents per page). An invoice is then sent to the student via e-mail.

Copying machines are available e.g. in the libraries and in the Student office of Åbo Akademi University in the Gripen-building, ground floor. Copying cards can be bought e.g. at the Student office of Åbo Akademi University.

3.2 Libraries

To be able to borrow from the libraries students need to have a student card *(studiekort)*. The loan time for books is usually 2–4 weeks. More information about the libraries and opening hours is found at http://www.abo.fi/bibliotek/.

The Department has its own library on the ground floor in the ICT-building, Joukahaninengatan 3-5, 20500 Åbo, telephone (02) 215 4085, e-mail: ictlib@abo.fi.

The main library of Åbo Akademi is located in Domkyrkogatan 2-4, 20500 Åbo, telephone (02) 215 4180, e-mail: hblan@abo.fi. The main library offers reading facilities and a reference library. Certain books can also be borrowed, but have to be reserved in advance.

The student library in the ASA-building, Fänriksgatan 3A, 20500 Åbo, telephone (02) 215 4192, offers course books, which can be borrowed on site, and reading facilities.

3.3 Career Services

The Career Services at Åbo Akademi University *(Arbetsforum)* are located in the Agricola-building, Henriksgatan 1 b, 20500 Åbo. They provide information for both graduates and students. Their main task is to help students enter the labour market and to advice them on issues dealing with job-hunting. The Career Services offer employers direct access to highly skilled students and graduates. They work in close co-operation with the Career Services at the University of Turku, the Turku School of Economics and the Turku Employment office. More information can be found at http://www.abo.fi/public/en/arbetsforumaa.

3.4 Student tutor and teacher tutor

All first-year students are assigned a student tutor and a teacher tutor. The student tutor is an older student who helps the new students adapt to student life in Åbo whereas the teacher tutor gives advice in study-related matters.

3.5 Student activities

The Student Union at Åbo Akademi University

All students at Åbo Akademi University are required to be members of the Student Union (*Åbo Akademis Studentkår*), https://www.abo.fi/karen, which takes care of its members' interests in several ways. The annual membership fee of the Student Union is 109 € for the academic year 2012-2013. By being a member you receive a student card with which you obtain student discounts for trains, buses, hostels, students' restaurants, theatres etc. As a member, you are also entitled to use the services of the Student Health Care Centre (*Studenthälsan*) at Kyrkovägen 13, 20540 Åbo, telephone 043 710 1002.

Infå

Infå vid Åbo Akademi r.f. (Infå) is the student organization for all students at the department of Information Technologies *Computer Engineering*, *Computer Science* and *Information Systems*. The organization has its office in the ICT-building (in the basement). E-mail:infa@abo.fi, web page: http://www.infa.fi/home/

DaTe

Datateknologerna vid Åbo Akademi r.f. (DaTe) is the student organization for students of Computer Engineering. It organises both formal and informal events, varying from company and industry excursions to parties. The organization has its office in the Axelia-buildning, 3rd floor, Biskopsgatan 8, 20500 Åbo, e-mail: date@abo.fi.

MK

Merkantila Klubben r.f. (MK) is the student organization for students of economic subjects, i.e. student studying for a M.Sc. (Economics and Business Administration) degree. The organization has its own student premises and office in the Hanken-building, Henriksgatan 7, 20500 Åbo, telephone (02) 231 6255, e-mail: mk@abo.fi.

4 Master's Programme in Computer Science

Åbo Akademi follows the so called Bologna reform concerning studies and credits. According to the new degree structure starting in 2005, the studies will be measured in credits (cr) (*studiepoäng, sp*). Even if the term "credit" has already been used for a long time, these new credits do *not* have the same meaning as before. One old credit (*studievecka, sv*) is approximately equal to 1.8 new credits. One credit (*studiepoäng*) requires approximately 25-27 hours of work for the average student.

4.1 Structure of the studies

The Master's Programme in Computer Science has a duration of two academic years and accounts for 120 cr. This means that the student should complete 60 cr each academic year. The structure of the programme as well as the courses are available in MinPlan, http://www.abo.fi/minplan. The student is required to make his or her own study plan using MinPlan. Furthermore, the registration for courses (if registration is required) and the registration for exams are done in MinPlan.

The Master of Science degree in the Master's Degree Programme in Computer Science has the following structure:

Advanced studies in Computer Science, (60 cr)	Master's thesis in Computer Science (30 sp)
Swedish for foreigners (5 cr)	Free optional studies (25 cr)

4.1.1 Main subject

The main subject studies consist of:

Advanced studies
Mandatory (45 cr)
451000.0 Project course, 10 cr.
456509.0 Logic for computer science, 5 cr.
456794.0 Master's thesis in Computer Science, 30 cr

Selectable (45 cr are chosen)
Other studies, 45 cr**.** to be selected from the following courses and be combined into an individual study plan:

452502.0 Software testing, 5 cr
456309.0 Specification methods, 5 cr
455304.0 Code optimization, 5 cr
456511.0 Introduction to computational and systems biology, 5 cr

456502.0 Software Architecture, 5 cr
452501.0 Development of Web Applications and Web Services, 5 cr
456508.0 Computability and Computational Complexity, 5 cr
456402.0 Computational modelling techniques, 5 cr
456513.0 Advanced computational modelling, 5 cr
456506.0 Cryptography and Network Security, 5 cr
455301.0 Introduction to computer graphics, 5 cr
456504.0 Network software, 5 cr
424511.0 Evolutionary Algorithms, 5 cr
424501.0 Neural Networks, 5 cr
455302.0 Advanced computer graphics and graphic hardware, 5 cr
456400.8 Special Course in CS:Local Networks, 5 cr
456401.0 Advanced text algorithms, 5 cr
456512.0 Databases 2, 5 cr
455303.0 Parallel programming, 5 cr
456400.5 Distributed systems and algorithms, 5 cr
456314.0 Approximation and randomized algorithms, 5 cr
456400.9 Reliable distributed systems, 5 cr

4.1.2 Master's thesis in Computer Science

The Master's Thesis accounts for 30 cr and should be written in the last year of study, i.e. during the second academic year. Contact the coordinator of the program or any of the lecturers of the program to discuss a possible topic for the thesis.

456794.0	Master's Thesis in Computer Science includes Master's Thesis seminar	30 cr

When the thesis is completed and approved of by the supervisor it is sent to the Centre for Language and Communication (*språkcentret*) for language check. Then the student writes a Proficiency Test in English (this is given by the supervisor). When this test and the language check are approved of, the student brings **two hard backed copies** of the thesis to the Head of Academic Affairs at the Academic Office. After this it has to be approved of by the Head of Department. First after this approval it will be registered in the study register. In order to graduate, all studies including the thesis have to be noted in the study register.

4.1.3 Mandatory Swedish language course

A language course in Swedish is mandatory for all foreign students studying at Åbo Akademi University. Language courses are offered by the Centre for Language and Communication (*språkcentret*), http://www.abo.fi/csk

909970.0	Swedish as a foreign language, level 1	5 cr

4.1.4 Free optional studies

The student has the opportunity to complete free optional courses to an extent of 25 cr. These courses can be any courses offered by any subject at Åbo Akademi University.

4.2 Course information: lecture dates and times

Courses offered by Åbo Akademi University:

Autumn 2013

Period I

Course	Code	Lecturer	Weeks	Time	Place
Specification Methods	456309.0	Troubitsyna	36-43	Mon 15-17 Wed 13-15 Wed 15-17	Algol (B3039) Algol (B3039) Algol (B3039)
Project course (will continue in periods II - III)	451000.0	Rönnholm Björkqvist L. Petre Truscan	36-51 2-10	Fri 8-12	Fortran (A3058)
Introduction to computational and systems biology	456511.0	Petre	36-43	Mon 13-15 Mon 10-12 Wed 10-12	Catbert (B3028) Algol (B3039) Catbert (B3028)
Development of Web Applications and Web Services	452501.0	Truscan	36-43	Tue 13-15 Thu 13-15	Fortran (A3058) Dilbert (B3029)
Code Optimization	455304.0	Aspnäs	36-43	Tue 15-17 Thu 15-17	Fortran (A3058) Gamma (B1026)
Swedish as a foreign language level 1 (will continue in period II) *There are three groups available in periods I-II and two groups available in periods III-IV.* *Please choose <u>one</u> of these groups.* *Group 5 is recommended for CS students*	909970.0	Sandberg	37-51 37-51 37-51	Mon 13.15- 14.45 Wed 13.15- 14.45 Tue 8.30- 10.00 Thu 18.30- 10.00 Tue 10.15- 11.45 Thu 10.15- 11.45	

Algol, Catbert, Cobol, Dilbert (computer class), Fortran and Gamma are located in the ICT-building, Joukahainengatan 3
Salin and Ringbom are located in the Axelia II building, Biskopsgatan 8
B301, B302, B306 and M205 are located in the Arken-building, Fabriksgatan 2
Campus map: http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf

Period II

Course	Code	Lecturer	Weeks	Time	Place
Software Testing	452502.0	Truscan	44-51	Tue 13-15 Thu 13-15	Algol (B3039) Dilbert (B3029)
Project course (continues)	451000.0	Rönnholm Björkqvist L. Petre Truscan	44-51 2-10	Fri 8-12	Fortran (A3058)
Computability and Computational Complexity	456508.0	Petre	44-51	Mon 13-15 Wed 10-12 Thu 15-17	Catbert (B3028) Catbert (B3028) Catbert (B3028)
Software Architecture	456502.0	Petre	44-51	Wed 13-15 Thu 10-12	Fortran (A3058) Cobol (B3040)
Swedish as a foreign language level 1 (continues) *There are three groups available in periods I-II and two groups available in periods III-IV.* *Please choose <u>one</u> of these groups.*	909970.0	Sandberg	-51	See period I	

Spring 2014

Period III

Course	Code	Lecturer	Weeks	Time	Place
Project course (continues)	451000.0	Rönnholm Björkqvist L. Petre Truscan	2-10	Fri 8-12	Fortran (A3058)
Logic for Computer Science	456509.0	Sibelius	2-10	Thu 10-12	Cobol (B3040)
Advanced computer graphics and graphic hardware	455302.0	Westerholm	2-10	Tue 15-17 Thu 15-17	Catbert (B3028) Catbert (B3028)
Distributed systems and algorithms	456400.5	Troubitsyna	2-10	Mon 15-17 Tue 10-12	Algol (B3039) Algol (B3039)
Approximation and randomized algorithms	456314.0	L. Petre	2-10	Tue 13-15 Thu 13-15	Gamma (B1026) Fortran (A3058)
Swedish as a foreign language level 1 (will continue in period IV) *There are three groups available in periods I-II and two in periods III-IV.* *Please choose <u>one</u> of these groups.* *Group 5 is recommended for CS students*	909970.0	Sandberg	3-18 3-18	Mon 8.30-10.00 Wed 8.30-10.00 Mon 10.15-11.45 Wed 10.15-11.45	

Period IV

Course	Code	Lecturer	Weeks	Time	Place
Neural Networks	424501.0	Saxén	12-22	Intensive	

				course	
Local Networks	456400.8	L. Petre	11-22	Wed 10-12 Fri 10-12	Cobol (B3040) Cobol (B3040)
Databases 2	456512.0	Aspnäs	11-22	Mon 15-17 Wed 15-17	Fortran (A3058) Fortran (A3058)
Reliable distributed systems	456400.9	Walden	11-22	Tue 13-15 Tue 15-17 Thu 10-12	Cobol (B3040) Cobol (B3040) Cobol (B3040)
Evolutionary Algorithms	424511.0	Pettersson	12-22	Intensive course	
Swedish as a foreign language level 1 (continues) *There are three groups available in periods I-II and two in periods III-IV. Please choose one of these groups.*	909970.0	Sandberg	-18	See period III	

The following courses will be lectured during the academic year 2014-2015:

Computational modelling techniques
Advanced Computational modelling
Network Software
Introduction to computer graphics
Cryptography and Network Security
Advanced text algorithms
Parallel programming
Program derivation
Software Safety

Courses offered by the University of Turku:
The lecture dates and times for courses lectured in the autumn (period I and II) will be confirmed in August and lecture dates and times for courses lectured in the spring (period III and IV) will be confirmed in December. Please check the following web page for the updated information: http://mars.cs.utu.fi/julkkari/opetus/

4.3 General information about studies

General information about the studies at Åbo Akademi University can be found in this Study guidebook, the Teaching Programme (*Undervisningsprogram*), MinPlan and the Computer Science web pages.

Study guide – Master Studies in Computer Science
The Study guide gives general information about studies at the Department of Information Technologies as well as a description of certain procedures. The guide also gives information about the structure of the Master Studies, the courses that are included in the degree as well as information about lecture times and dates. The Study guide is handed out to all new students and can also be found at

The Teaching Programme
The Teaching Programme (*Undervisningsprogram*) gives information about all the courses offered by Åbo Akademi University, i.e. lecture dates and times, as well as information about exam dates for the courses offered by the Department of

Information Technologies. The Teaching Programme can be found at the address: https://www.abo.fi/student/en/undervisningsprogram

MinPlan

MinPlan is used to make individual study plans and for registering for courses and exams. MinPlan also contains information about all courses. MinPlan is found at http://www.abo.fi/minplan

5 Master's Degree Programme in Electronic and Mobile Commerce

Åbo Akademi follows the so called Bologna reform concerning studies and credits. According to the new degree structure starting in 2005, the studies will be measured in credits (cr) (*studiepoäng, sp*). Even if the term "credit" has already been used for a long time, these new credits do *not* have the same meaning as before. One old credit (*studievecka, sv*) is approximately equal to 1.8 new credits. One credit (*studiepoäng*) requires approximately 25-27 hours of work for the average student.

5.1 Structure of the studies

The Master's Degree Programme in Electronic and Mobile Commerce has a duration of two academic years and accounts for 120 cr. This means that the student should complete 60 cr each academic year. The structure of the programme as well as the courses are available in MinPlan, http://www.abo.fi/minplan. The student is required to make his or her own study plan using MinPlan. Furthermore, the registration for courses (if registration is required) and the registration for exams are done in MinPlan.

The Master of Science (Economics and Business Administration) degree in the Master's Degree Programme in Electronic and Mobile Commerce has the following structure:

Advanced studies in Information Systems (25 cr)	Master's thesis (35 cr)	Advanced seminars (7 cr)
Basic studies in minor subject (25 sp)	Bridge studies (5/10 cr)	Academic writing (3 cr)
Free optional studies (5/10 cr)	Swedish for foreigners (5 cr)	Philosophy (5 cr)

5.1.1 Main subject

The main subject studies consist of:

Bridge studies **5/10 cr**

Mandatory

457107.0 ICT bridge course for EMC students 5 cr or
457106.0 ICT bridge course for EMC students 10 cr

The ICT bridge course for EMC students 5 cr version is mandatory for all EMC students. The 10 cr version is mandatory for all students with no past experience in ICT.

Advanced studies		**67 cr**
Mandatory		
457790.0	Advanced Seminars in Information Systems	7 cr
457795.0	Master's thesis in Information Systems	35 cr
Selectable (25 cr are chosen)		
457502.0	Electronic Commerce	5 cr
457516.0	Mobile Value Services	5 cr
451000.0	Project course	10 cr
457511.0	ICT and the Changes in Work	5 cr
457512.0	Business Intelligence	5 cr
457513.0	Data Mining and Text Mining	5 cr
457517.0	Computational Intelligence and Management	5 cr
457515.0	Analytics and Soft Computing	5 cr
Additional studies		**3 cr**
Mandatory		
903840.0	Academic Skills for Masters Students	3 cr
Or		
903800.0	Academic Skills for Masters Students (Finnish or Swedish speaking students)	3 cr

5.1.2 Master's thesis

The Master's Thesis accounts for 35 cr and should be written in the last year of study, i.e. during the second academic year. Contact the professor to discuss a possible topic for the thesis.

457795.0	Master's Thesis in Information Systems includes Master's Thesis seminar	35 cr

When the thesis is completed and approved of by the supervisor it is sent to the Centre for Language and Communication (*språkcentret*) for language check. Then the student writes a Proficiency Test in English (this is given by the supervisor). When this test and the language check are approved of, the student brings **two hard backed copies** of the thesis to the Head of Academic Affairs at the Academic Office. After this it has to be approved of by the Head of Department. First after this approval it will be registered in the study register. In order to graduate, all studies including the thesis have to be noted in the study register.

5.1.3 Minor subject

The degree requires minor subject of 25 cr of basic studies in another subject than the major. The minor subject that is offered for Electronic and Mobile Commerce is the Innovation and Business Creation Study Module offered by the Business and Innovation Development (BID) unit at University of Turku.
The Innovation and Business Creation is a multidisciplinary study module that is based on diverse capabilities within different disciplines at Turku School of Economics.

Innovation and Business Creation Study Module (25 cr):

Mandatory

BIDI0002	Introduction to Innovation and Business (5 cr)
BIDI0003	Business Development Laboratory (7 cr)
BIDI1005	Intermediate course on Business Management of Start-ups (3 cr)

Selectable

BIDI0004	Special Topic Course 5-6 cr
BIDI1005	Start-up Journey, 10 cr
BIDI0005	Advanced Special Topic Course, 5-9 cr
KVS54	Special Themes in innovation management, 2-6 cr
TJS17	Enterprise architecture, 6 cr
TJS6	Software business, 6 cr

For this minor a flexible study right agreement is required via www.joopas.fi (see section 2.6 above). More information about this module and its courses is found at www.bid.utu.fi .

The minor subject can be replaced with basic or intermediate studies in Information Systems if the student lacks enough knowledge in Information Systems to immediately begin with the advanced studies. This decision is made at admission. It can also be applied for, but will only be granted if the Bachelor's degree has another major or minor than Information Systems. Please contact the Study Advisor to discuss this matter.

5.1.4 Mandatory Swedish language course

A language course in Swedish is mandatory for all foreign students studying at Åbo Akademi University. Language courses are offered by the Centre for Language and Communication (*språkcentret*), http://www.abo.fi/csk

909970.0	Swedish as a foreign language, level 1	5 cr

5.1.5 Mandatory course in philosophy

A course in philosophy is mandatory for everyone studying for a M.Sc. (Economics and Business Administration) degree.

100009.2	Philosophy of Science	5 cr

5.1.5 Free optional studies

The student has the opportunity to complete free optional courses to an extent of 5-10 cr. These courses can be any courses offered by a subject at Åbo Akademi University. The free optional studies can be replaced with basic or intermediate studies in Information Systems if the student lacks enough knowledge in Information Systems to

immediately begin with the advanced studies. This option is discussed with Pirkko Walden or Eija Karsten, who are responsible for the Master's Degree Programme.

5.2 Course information: lecture dates and times

Autumn 2013

Period I

Course	Code	Lecturer	Weeks	Time	Place
ICT Bridge course for EMC students	457106.0	Karsten	37-50	Thu 10-12	Catbert (B3028)
Project course (will continue in periods II and III)	451000.0	Rönnholm Björkqvist L. Petre Truscan	36-43	Fri 8-12	Fortran (A3058)
Business Intelligence	457512.0	Back	36-43	Tue 15-17 Thu 15-17	Catbert (B3028) Dilbert (B3029)
Computational Intelligence and Management	457517.0	Björk	36-43	Mon 10-12 Thu 13-15	Catbert (B3028) Catbert (B3028
Development of Web Applications and Web Services	452501.0	Truscan	36-43	Tue 13-15 Thu 13-15	Fortran (A3058) Dilbert (B3029)
Managing the Digital Enterprise	457304.0	Sell	36-43	Mon 13-15 Thu 10-12	Fortran (A3058) Fortran (A3058)
Advanced seminars in IS *There are two groups available, students should choose either the one in period I or the one in period III*	457790.0	Karsten Back Walden	36-43	Mon 15-17	Catbert (B3028)
Academic Skills for Masters Students I *There are two groups available, one in period I and one in period III. Please choose <u>one</u> of these groups.*	903840.0	Gattoni	37-42	Tue 17.00-18.30 Thu 17.00-18.30	
Swedish as a foreign language level 1 (will continue in period II) *There are three groups available in periods I-II and two groups available in periods III-IV. Please choose <u>one</u> of these groups.* *Group 1 is recommended for EMC students*	909970.0	Sandberg	37-51 37-51 37-51	Mon 13.15-14.45 Wed 13.15-14.45 Tue 8.30-10.00 Thu 18.30-10.00 Tue 10.15-11.45 Thu 10.15-11.45	

Algol, Catbert, Cobol, Dilbert (computer class), Fortran and Gamma are located in the ICT-building, Joukahainengatan 3
Salin and Ringbom are located in the Axelia II building, Biskopsgatan 8
B301, B302, B306 and M205 are located in the Arken-building, Fabriksgatan 2
Campus map: http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf

Period II

Course	Code	Lecturer	Weeks	Time	Place
ICT Bridge course for EMC students (continues)	457106.0	Karsten	37-50	Thu 10-12	Catbert (B3028)
Project course (continues)	451000.0	Rönnholm Björkqvist L. Petre Truscan	44-51	Fri 8-12	Fortran (A3058)
Data Mining and Text Mining	457513.0	Back Eklund	44-51	Tue 15-17 Thu 15-17	Catbert (B3028) Dilbert (B3029)
Analytics and Soft Computing	457515.0	Björk	44-51	Tue 13-15	Catbert (B3028)
User-centered design of information systems	457510.0	Karsten	44-51	Mon 10-12	Cobol (B3040)
Academic Skills for Masters Students II (For Swedish and Finnish speaking students) *There are two groups available, one in period II and one in period IV. Please choose <u>one</u> of these groups.*	903800.0	Gattoni	44-49	Tue 17.00-18.30 Thu 17.00-18.30	
Philosophy of Science	100009.2				
Swedish as a foreign language level 1 (continues) *There are three groups available in periods I-II and two groups available in periods III-IV. Please choose <u>one</u> of these groups.*	909970.0	Sandberg	-51	See period I	

Spring 2014

Period III

Course	Code	Lecturer	Weeks	Time	Place
Project course (continues)	451000.0	Rönnholm Björkqvist L. Petre Truscan	2-10	Fri 8-12	Fortran (A3058)
User-centered design of information systems (continues)	457510.0	Karsten	2-10	Mon 10-12	Fortran (A3058)
Electronic Commerce	457502.0	Walden	2 3 6 7 13	Thu-Fri 9-11 Mon-Wed 9-11 Thu-Fri 9-11 Mon-Wed 9-11 Thu 9-11	Catbert (B3028)
Advanced seminars in IS *There are two groups available, students should choose either the one in period I or the one in period III.*	457790.0	Karsten Back Walden	4-10	Mon 15-17	Catbert (B3028)
Academic Skills for Masters Students I *There are two groups available,*	903840.0	Gattoni	3-8	Tue 17-18.30 Thu 17-	

one each in periods I and III. Please choose <u>one</u> of these groups.				18.30	
Swedish as a foreign language level 1 (will continue in period IV) *There are three groups available in periods I-II and two in periods III-IV.* *Please choose <u>one</u> of these groups.* *Group 1 is recommended for EMC students*	909970.0	Sandberg	3-18 3-18	Mon 8.30-10.00 Wed 8.30-10.00 Mon 10.15-11.45 Wed 10.15-11.45	

Period IV

Course	Code	Lecturer	Weeks	Time	Place
Mobile Value Services	457516.0	Walden	11-21	Tue 10-12	Fortran (A3058)
ICT and the changes in work - Seminars *There are two groups available, students must choose Monday or Tuesday*	457511.0	Karsten	11-21 12-21	Tue 13-15 Mon 10-12 Tue 15-17	Catbert (B3028) Catbert (B3028) Catbert (B3028)
Data warehousing	457307.0	Eklund	11-21	Mon 13-15	Fortran (A3058)
Academic Skills for Masters Students II (for Swedish and Finnish speaking students) *There are two groups available, one in period II and one in period IV. Please choose <u>one</u> of these groups.*	903800.0	Gattoni	11-16	Tue 17.00-18.30 Thu 17.00-18.30	
Swedish as a foreign language level 1 (continues) *There are three groups available in periods I-II and two in periods III-IV.* *Please choose <u>one</u> of these groups.*	909970.0	Sandberg	-18	See period III	

5.3 General information about studies

General information about the studies at Åbo Akademi University can be found in this Study guide, the Teaching Programme (*Undervisningsprogram*), MinPlan and the Electronic and Mobile Commerce web pages.

Study guide - Master's Degree Programme in Electronic and Mobile Commerce
The Study guide gives general information about studies at the Department of Information Technologies as well as a description of certain procedures. The guide also gives information about the structure of the Master's Degree Programme, the courses that are included in the degree as well as information about lecture times and dates. The Study guide is handed out to all new students and can also be found at https://www.abo.fi/institution/en/emc_studyinformation

The Teaching Programme
The Teaching Programme (*Undervisningsprogram*) gives information about all the courses offered by Åbo Akademi University, i.e. lecture dates and times, as well as information about exam dates for the courses offered by the Department of Information Technologies. The Teaching Programme can be found at the address: https://www.abo.fi/student/en/undervisningsprogram

MinPlan
MinPlan is used to make individual study plans and for registering for courses and exams. MinPlan also contains information about all courses. MinPlan is found at http://www.abo.fi/minplan

Electronic and Mobile Commerce web pages
The Electronic and Mobile Commerce web pages give general information about the Master's Degree Programme in Electronic and Mobile Commerce and also contain study information and guides. Please visit the pages at https://www.abo.fi/emc

6 Master's Programme in Computer Engineering / Software Engineering

Åbo Akademi follows the so called Bologna reform concerning studies and credits. According to the new degree structure starting in 2005, the studies will be measured in credits (cr) (*studiepoäng, sp*). Even if the term "credit" has already been used for a long time, these new credits do *not* have the same meaning as before. One old credit (*studievecka, sv*) is approximately equal to 1.8 new credits. One credit (*studiepoäng*) requires approximately 25-27 hours of work for the average student.

6.1 Structure of the studies

The Master's Programme in Computer Engineering/ Software Engineering have a duration of two academic years and accounts for 120 cr. This means that the student should complete 60 cr each academic year. The structure of the programme as well as the courses are available in MinPlan, http://www.abo.fi/minplan. The student is required to make his or her own study plan using MinPlan. Furthermore, the registration for courses offered by Åbo Akademi University (if registration is required) and the registration for exams at Åbo Akademi University are done in MinPlan.

The Master of Science (Technology) degree in Computer Engineering/ Software Engineering has the following structure:

<table>
<tr><td colspan="3">Master's Thesis in Software Engineering
(30 cr)</td></tr>
<tr><td>Selectable Advanced studies
in Software Engineering
(30 cr)</td><td>Mandatory Advanced Studies in
Software Engineering
(10 cr)</td><td>Minor subject:
Information systems and Management Sciences
(20 cr)</td></tr>
<tr><td>Project course
(10 cr)</td><td>Swedish for foreigners
(5 sp)</td><td>Free optional studies
(15 cr)</td></tr>
</table>

6.1.1 Advanced studies in Software Engineering

The courses in the advanced module (40 cr) consist of two mandatory courses (10 cr) and a number of selectable courses of which 30 cr should be chosen.

Mandatory		*10 cr*
452501.0	Development of Web Applications and Web Services	5 cr
456502.0	Software Architectures	5 cr
Selectable (30 cr are chosen)		
456309.0	Specification Methods	5 cr
452502.0	Software Testing	5 cr

452400	Special course(s) in Software Engineering	5 cr
456400	Special course(s) in Computer Science	5 cr
456512.0	Databases 2	5 cr
455303.0	Parallel Programming	5 cr
455304.0	Code Optimization	5 cr
456504.0	Network Software	5 cr
456506.0	Cryptography and Network Security	5 cr
455301.0	Introduction to Computer Graphics	5 cr
455302.0	Advanced Computer Graphics and Graphics Hardware	5 cr
456401.0	Advanced Text Algorithms	5 cr
424501.0	Neural Networks	5 cr
456514.0	Experimentation in Engineering	5 cr
456501.0	Software Safety	5 cr
456503.0	Software Quality	5 cr
456513.0	Advanced computational modelling	5 cr

6.1.2 Master's thesis in Software Engineering

The Master's Thesis accounts for 30 cr and should be written in the last year of study, i.e. during the second academic year. Contact professor Ivan Porres to discuss a possible topic for the thesis.

452795.0	Master's Thesis in Software Engineering includes Master's Thesis seminar	30 cr

When the thesis is completed and approved of by the supervisor it is sent to the Centre for Language and Communication (*språkcentret*) for language check. Then the student writes a Proficiency Test in English (this is given by the supervisor). When this test and the language check are approved of, the student brings **two hard backed copies** of the thesis to the Head of Academic Affairs at the Academic Office. After this it has to be approved of by the Head of Department. First after this approval it will be registered in the study register. In order to graduate, all studies including the thesis have to be noted in the study register.

6.1.3 Mandatory Project course

A Project course is mandatory for students studying Software Engineering.

451000.0	Project course	10 cr

6.1.4 Minor subject: Information Systems and Management Sciences

The minor subject Information Systems and Management Sciences (20 cr) is mandatory. The minor subject consists of selectable courses from which 20 cr are chosen.

Selectable (20 cr are chosen)

457305.0	Management Science and Inventory Analysis	5 cr
457307.0	Data Warehousing	5 cr

457510.0	User-centred Design of Information Systems	5 cr
457512.0	Business Intelligence	5 cr
457513.0	Data Mining and Text Mining	5 cr
457306.0	ICT Business Models	5 cr
457516.0	Mobile Value Services	5 cr
457304.0	Managing the Digital Enterprise	5 cr

6.1.5 Mandatory Swedish language course

A language course in Swedish is mandatory for all foreign students studying at Åbo Akademi University. Language courses are offered by the Centre for Language and Communication (*språkcentret*), http://www.abo.fi/csk

909970.0	Swedish as a foreign language, level 1	5 cr

6.1.6 Free optional studies

The student has the opportunity to complete free optional courses to an extent of 15 cr. These courses can be any courses offered by a subject at Åbo Akademi University.

6.2 Course information: lecture dates and times

Courses offered by Åbo Akademi University:

Autumn 2013

Period I

Course	Code	Lecturer	Weeks	Time	Place
Specification Methods	456309.0	Walden	36-43	Mon 15-17 Wed 13-15 Wed 15-17	Algol (B3039) Algol (B3039) Algol (B3039)
Project course (will continue in periods II - III)	451000.0	Rönnholm Björkqvist L. Petre Truscan	36-43	Fri 8-12	Fortran (A3058)
Business Intelligence	457512.0	Back	36-43	Tue 15-17 Thu 15-17	Catbert (B3028) Dilbert (B3029)
Code Optimization	455304.0	Aspnäs	36-43	Tue 15-17 Thu 15-17	Fortran (A3058) Gamma (B1026)
Development of Web Applications and Web Services	452501.0	Truscan	36-43	Tue 13-15 Thu 13-15	Fortran (A3058) Dilbert (B3029)
Managing the Digital Enterprise	457304.0	Sell	36-43	Mon 13-15 Thu 10-12	Fortran (A3058) Fortran (A3058)
Swedish as a foreign language level 1 (will continue in period II) *There are three groups available in periods I-II and two groups available in periods III-IV.* *Please choose <u>one</u> of these*	909970.0	Sandberg	37-51 37-51	Mon 13.15-14.45 Wed 13.15-14.45 Tue 8.30-10.00	

groups. *Group 2 is recommended for SE students*			37-51	Thu 18.30-10.00 Tue 10.15-11.45 Thu 10.15-11.45	

Algol, Catbert, Cobol, Dilbert (computer class), Fortran and Gamma are located in the ICT-building, Joukahainengatan 3
Salin and Ringbom are located in the Axelia II building, Biskopsgatan 8
B301, B302, B306 and M205 are located in the Arken-building, Fabriksgatan 2
Campus map: http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf

Period II

Course	Code	Lecturer	Weeks	Time	Place
Software Architecture	456502.0	Petre	44-51	Wed 13-15 Thu 10-12	Fortran (A3058) Algol (B3039)
Software Testing	452502.0	Truscan	44-51	Tue 13-15 Thu 13-15	Algol (B3039) Dilbert (B3029)
Project course (continues)	451000.0	Rönnholm Björkqvist L. Petre Truscan	44-51	Fri 8-12	Fortran (A3058)
Management Science and Inventory Analysis	457305.0	Björk	44-51	Mon 8-10 Wed 10-12	Fortran (A3058)
Data Mining and Text Mining	457513.0	Back/Eklund	44-51	Tue 15-17 Thu 15-17	Catbert (B3028) Dilbert (B3029)
User-Centred Design of Information Systems (continues in period III)	457510.0	Karsten	44-51	Mon 10-12	Cobol (B3040)
Experimentation in Engineering	456514.0	Porres	44-51	Mon 13-15 Wed 15-17	Cobol (B3040) Fortran (A3058)
Swedish as a foreign language level 1 (continues) *There are three groups available in periods I-II and two groups available in periods III-IV.* *Please choose <u>one</u> of these groups.*	909970.0	Sandberg	-51	See period I	

Spring 2014

Period III

Course	Code	Lecturer	Weeks	Time	Place
Project course (continues)	451000.0	Rönnholm Björkqvist L. Petre Truscan	2-10	Fri 8-12	Fortran (A3058)
Advanced Computer Graphics	455302.0	Westerholm	2-10	Tue 15-17 Thu 15-17	Catbert (B3028) Catbert (B3028)
Project Management	414303.0	Liinamaa	2-8	Mon 15-17 Thu 10-12	Salin Ringbom

User-Centred Design of Information Systems (continues)	457510.0	Karsten	2-10	Mon 10-12	Fortran (A3058)
Swedish as a foreign language level 1 (will continue in period IV) *There are three groups available in periods I-II and two in periods III-IV.* *Please choose <u>one</u> of these groups.* *Group 2 is recommended for SE students*	909970.0	Sandberg	3-18 3-18	Mon 8.30-10.00 Wed 8.30-10.00 Mon 10.15-11.45 Wed 10.15-11.45	

Period IV

Course	**Code**	**Lecturer**	**Weeks**	**Time**	**Place**
Mobile Value Services	457516.0	Walden	11-21	Tue 10-12	Fortran (A3058)
Databases 2	456512.0	Aspnäs	11-21	Mon 15-17 Wed 15-17	Fortran (A3058) Fortran(A3058)
Neural Network	424501.0	Saxén	Per. 4	Intensive course	
Local Networks	456400.8	L. Petre	11-21	Wed 10-12 Fri 10-12	Cobol (B3040) Cobol (B3040)
Data Warehousing	457307.0	Eklund	11-21	Mon 13-15	Fortran (A3058)
Swedish as a foreign language level 1 (continues) *There are three groups available in periods I-II and two in periods III-IV.* *Please choose <u>one</u> of these groups.*	909970.0	Sandberg	-18	See period III	

The following courses will be lectured during the academic year 2014-2015:

Advanced Text Algorithms
Financial Planning
Introduction to Computer Graphics
Network Software
Cryptography and network security
Advanced Computational Modeling
Software Safety
Software Quality

6.3 General information about studies

General information about the studies at Åbo Akademi University can be found in this Study guidebook, the Teaching Programme (*Undervisningsprogram*), MinPlan and the Computer Engineering/ Software Engineering web pages.

Study guide – Master Studies in Computer Engineering/ Software Engineering
The Study guide gives general information about studies at the Department of Information Technologies as well as a description of certain procedures. The guide also gives information about the structure of the Master Studies, the courses that are included in the degree as well as information about lecture times and dates. The Study guide is handed out to all new students and can also be found at https://www.abo.fi/institution/en/se_studyinformation

The Teaching Programme
The Teaching Programme (*Undervisningsprogram*) gives information about all the courses offered by Åbo Akademi University, i.e. lecture dates and times, as well as information about exam dates for the courses offered by the Department of Information Technologies. The Teaching Programme can be found at the address: https://www.abo.fi/student/undervisningsprogram

MinPlan

MinPlan is used to make individual study plans and for registering for courses and exams. MinPlan also contains information about all courses. MinPlan is found at http://www.abo.fi/minplan

Computer Engineering/ Software Engineering web pages

The Computer Engineering/ Software Engineering web pages give general information about the Master Studies in Computer Engineering/ Software Engineering and also contain study information and guides. Please visit the pages at https://www.abo.fi/se

7 Master's Degree Programme in Embedded Computing

Åbo Akademi follows the so called Bologna reform concerning studies and credits. According to the new degree structure starting in 2005, the studies will be measured in credits (cr) (*studiepoäng, sp*). Even if the term "credit" has already been used for a long time, these new credits do *not* have the same meaning as before. One old credit (*studievecka, sv*) is approximately equal to 1.8 new credits. One credit (*studiepoäng*) requires approximately 25-27 hours of work for the average student.

7.1 Structure of the studies

The Master's Degree Programme in Embedded has a duration of two academic years and accounts for 120 cr. This means that the student should complete 60 cr each academic year. The structure of the programme as well as the courses are available in MinPlan, http://www.abo.fi/minplan. The student is required to make his or her own study plan using MinPlan. Furthermore, the registration for courses offered by Åbo Akademi University (if registration is required) and the registration for exams at Åbo Akademi University are done in MinPlan.

The Master of Science (Technology) degree in the Master's Degree Programme in Embedded Computing has the following structure:

<table>
<tr><td colspan="2">Advanced module I
in Embedded Systems
(20 cr)</td><td>Advanced module II
in Embedded Systems
(30 cr)</td></tr>
<tr><td colspan="3">Master's thesis in Embedded Systems
(30 sp)</td></tr>
<tr><td>Minor subject:
Innovation and Business Creation
(20 cr)</td><td>Swedish for
foreigners
(5 cr)</td><td>Free optional
studies
(15 cr)</td></tr>
</table>

7.1.1 Advanced module I in Embedded Systems

The courses in the advanced module I (20 cr) consist of mandatory courses offered by Åbo Akademi University (ÅAU) and the University of Turku (UTU).

Mandatory			*20 cr*
453306.0	Real-Time Systems	ÅAU	5 cr
453502.0	Programming Embedded Systems	ÅAU	5 cr
453600.0	Introduction to Many-Core Programming	ÅAU	5 cr
ETT_2006	HDL Based Design	UTU	5 cr

7.1.2 Advanced module II in Embedded Systems

The courses in the advanced module II (30 cr) consist of mandatory as well as selectable courses offered by Åbo Akademi University (ÅAU) and the University of Turku (UTU).

Mandatory			*15 cr*
453503.0	Modeling of Embedded Systems	ÅAU	5 cr
453506.0	Design Methods for Energy Efficient Embedded Systems	ÅAU	5 cr
ETT_2014	SoC Design	UTU	5 cr

Selectable (15 cr are chosen)			*15 cr*
454506.1	Applied Signal Processing, theory	ÅAU	5 cr
455304.0	Code Optimization	ÅAU	5 cr
453505.0	Multimedia Algorithm Implementation	ÅAU	5 cr
ETT_2062	Multiprocessor Architectures	UTU	5 cr
ETT_3053	Reconfigurable Computing	UTU	5 cr
ETT_2061	System Verification	UTU	5 cr
DTEK8053	Seminar on Energy Efficient Computing	UTU	5 cr
DTEK0036	Modelling Parallel Systems	UTU	5 cr

7.1.3 Master's thesis in Embedded Systems

The Master's Thesis accounts for 30 cr and should be written in the last year of study, i.e. during the second academic year. Contact professor Johan Lilius to discuss a possible topic for the thesis.

453795.0	Master's Thesis in Embedded Systems includes Master's Thesis seminar	30 cr

When the thesis is completed and approved of by the supervisor it is sent to the Centre for Language and Communication (*språkcentret*) for language check. Then the student writes a Proficiency Test in English (this is given by the supervisor). When this test and the language check are approved of, the student brings **two hard backed copies** of the thesis to the Head of Academic Affairs at the Academic Office. After this it has to be approved of by the Head of Department. First after this approval it will be registered in the study register. In order to graduate, all studies including the thesis have to be noted in the study register.

7.1.4 Minor subject: Innovation and Business Creation

The minor subject Innovation and Business Creation (20 cr) is mandatory. The courses are offered by Business and Innovation Development unit at University of Turku.

Innovation and Business Creation Study Module (20 cr):

Mandatory	
BIDI0002	Introduction to Innovation and Business (5 cr)

BIDI0003 Business Development Laboratory (7 cr)
BIDI1005 Intermediate course on Business Management of Start-ups (3 cr)

Selectable
BIDI0004 Special Topic Course 5-6 cr
BIDI1005 Start-up Journey, 10 cr
BIDI0005 Advanced Special Topic Course, 5-9 cr
KVS54 Special Themes in innovation management, 2-6 cr
TJS17 Enterprise architecture, 6 cr
TJS6 Software business, 6 cr

For this minor a flexible study right agreement is required via www.joopas.fi (see section 2.6 above). More information about this module and its courses is found at www.bid.utu.fi

7.1.5 Mandatory Swedish language course

A language course in Swedish is mandatory for all foreign students studying at Åbo Akademi University. Language courses are offered by the Centre for Language and Communication (*språkcentret*), http://www.abo.fi/csk

909970.0 Swedish as a foreign language, level 1 5 cr

7.1.6 Free optional studies

The student has the opportunity to complete free optional courses to an extent of 15 cr. These courses can be any courses offered by a subject at Åbo Akademi University.

7.2 Course information: lecture dates and times

Courses offered by Åbo Akademi University:

Autumn 2013

Period I

Course	Code	Lecturer	Weeks	Time	Place
Applied Signal Processing, theory	454506.1	*Not lectured 2013-2014*			
Code Optimization	455304.0	Aspnäs	36-43	Tue 15-17 Thu 15-17	Fortran (A3058) Gamma(B1026)
Design Methods for Energy Efficient Embedded Systems	453506.0	Lafond	36-43	Mon 13-15 Thu 13-15	Algol (B3039) Algol (B3039)
Swedish as a foreign language level 1 (will continue in period II) *There are three groups available in periods I-II and two groups available in periods III-IV.*	909970.0	Sandberg	37-51	Mon 13.15-14.45 Wed 13.15-14.45	

Please choose <u>one</u> of these groups. *Group 3 is recommended for EC students*			37-51 37-51	Tue 8.30-10.00 Thu 8.30-10.00 Tue 10.15-11.45 Thu 10.15-11.45	

Algol, Catbert, Cobol, Dilbert (computer class), Fortran and Gamma are located in the ICT-building, Joukahainengatan 3
Salin and Ringbom are located in the Axelia II building, Biskopsgatan 8
B301, B302, B306 and M205 are located in the Arken-building, Fabriksgatan 2
Campus map: http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf

Period II

Course	Code	Lecturer	Weeks	Time	Place
Introduction to Manycore programming	453600.0	Lilius	44-51	Mon 16-18 Tue 16-18	Cobol (B3040) Cobol (B3040)
Swedish as a foreign language level 1 (continues) *There are three groups available in periods I-II and two groups available in periods III-IV. Please choose <u>one</u> of these groups.*	909970.0	Sandberg	-51	See period I	

Spring 2014

Period III

Course	Code	Lecturer	Weeks	Time	Place
Programming Embedded Systems	453502.0	Björkqvist	2-10	Tue 8-10	Cobol (B3040)
Modelling of Embedded Systems (will continue in period IV)	453503.0	Lafond	2-10	Thu 13-15	Catbert (B3028)
Swedish as a foreign language level 1 (will continue in period IV) *There are three groups available in periods I-II and two in periods III-IV.* *Please choose <u>one</u> of these groups.* *Group 3 is recommended for EC students*	909970.0	Sandberg	3-18 3-18	Mon 8.30-10.00 Wed 8.30-10.00 Mon 10.15-11.45 Wed 10.15-11.45	

Period IV

Course	Code	Lecturer	Weeks	Time	Place
Modelling of Embedded Systems	453503.0	Lafond	11-21	Thu 13-15	Catbert (B3028)

(continues)					
Real-Time Systems	453306.0	Lilius	11-21	Mon 13-15 Wed 13-15	Catbert (B3028) Catbert (B3028)
Multimedia algorithms implementation	453505.0	Lilius	11-21	Mon 10-12 Tue 13-17	Fortran (A3058) Fortran (A3058)
Swedish as a foreign language level 1 (continues) *There are three groups available in periods I-II and two in periods III-IV.* *Please choose one of these groups.*	909970.0	Sandberg	-18	See period III	

Please note that some courses are lectured every second year.

Courses offered by the University of Turku:
The lecture dates and times for courses lectured in the autumn (period I and II) will be confirmed in August and lecture dates and times for courses lectured in the spring (period III and IV) will be confirmed in December. Please check the following web page for the updated information: https://nettiopsu.utu.fi/opas

7.3 General information about studies

General information about the studies at Åbo Akademi University can be found in this Study guidebook, the Teaching Programme (*Undervisningsprogram*), MinPlan and the Embedded Computing web pages.

Study guide - Master's Degree Programme in Embedded Computing
The Study guide gives general information about studies at the Department of Information Technologies as well as a description of certain procedures. The guide also gives information about the structure of the Master's Degree Programme, the courses that are included in the degree as well as information about lecture times and dates. The Study guide is handed out to all new students and can also be found at https://www.abo.fi/institution/en/ec_studyinformation

The Teaching Programme
The Teaching Programme (*Undervisningsprogram*) gives information about all the courses offered by Åbo Akademi University, i.e. lecture dates and times, as well as information about exam dates for the courses offered by the Department of Information Technologies. The Teaching Programme can be found at the address: https://www.abo.fi/student/en/undervisningsprogram

MinPlan
MinPlan is used to make individual study plans and for registering for courses and exams. MinPlan also contains information about all courses. MinPlan is found at http://www.abo.fi/minplan

Embedded Computing web pages
The Embedded Computing web pages give general information about the Master's Degree Programme in Embedded Computing and also contain study information and guides. Please visit the pages at https://www.abo.fi/ec