Faculty of Science and Engineering

STUDY GUIDE 2016-2017

MASTER'S PROGRAMMES IN

- **COMPUTER SCIENCE**
- **SOFTWARE ENGINEERING**
- **EMBEDDED COMPUTING**
  (including Double Master´s degree programme in Embedded Systems)

This guide has been compiled for students that study at Åbo Akademi University in one of the Master's Programmes: **Computer Science** (CS), **Embedded Computing** (EC) and **Software Engineering** (SE). Its purpose is to give information about the Faculty and certain procedures, the study programme and the structure of the studies.

Contents

1 The Faculty of Science and Engineering

The education on undergraduate and graduate levels is organized into five Study Programmes in which several subjects work together. For each study programme, the Dean has appointed a Head of Education who is responsible for planning of the syllabus, preparation of the student admission (e.g. entrance examination) and the pedagogical development in the study programme.

The Study programmes at the Faculty of Science and Engineering are

Biosciences
Chemical Engineering
Information Technology
Natural Sciences
Pharmacy

The IT subjects operate in the Agora-building, at University Hill 20014 Åbo. Building T6 on the campus map:
http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf

1.1 The Faculty and decision making

The governing body of the faculty is the Faculty Council. The Dean, professor Tapio Salmi, chairs the council which has 12 members representing the professors, other employees and students of the faculty in equal numbers.

In organizational terms, subjects are located beneath the faculty and led by a Head of Subject. The Heads of Subjects are appointed by the Dean and have both scientific and administrative responsibilities. At the Faculty of Science and Engineering there are 23 subjects.

1.2 The Faculty office

The Faculty office (*fakultetskansliet)* is located in the Axelia-building, Biskopsgatan 8, 20500 Åbo. The office is open Monday-Thursday at 10.00-15.00, Friday closed.

Academic Affairs coordinator Ulla Bäckström is available at the Faculty office by mutual agreement.
Telephone (02) 215 4516, e-mail: fnt-utbildningskoordinator@abo.fi

The Study Advisors are available at the Faculty office by mutual agreement:

Heidi Karlsson, Telephone (02) 215 3540, e-mail: it-studieradgivare@abo.fi
Jessica Lindroos, Telephone (02) 215 4517, e-mail: jessica.lindroos@abo.fi

Contact information for the rest of the Faculty Office personnel is found here:
http://www.abo.fi/fakultet/en/fnt_administration

It is recommended that you book an appointment with the Academic Affairs coordinator 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.

Finland has two official languages; Finnish and Swedish. At Åbo Akademi University Swedish is the official language.

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 2016-2017:

Period I	weeks 36-43	5.9.2016-28.10.2016
Period II	weeks 44-51	31.10.2016-23.12.2016
Period III	weeks 2-11	9.1.2017-17.3.2017
Period IV	weeks 12-21	20.3.2017-26.5.2017

2.2 Registration for the academic year

New students register for their first academic year according to these instructions (*please read the instructions carefully!*) http://www.abo.fi/?lang=en > Studies > Information for new students:
http://www.abo.fi/student/en/infofornyastud#document3

In order to be registered as present and have the right to study, receive credits and have your study results registered, you must pay the Student Union fee. The Student Union fee for the academic year **2016-2017 is 116 €.** After registration you should order your student card at www.myfrank.fi/en

2.3 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.
There are tutorials on how to use MinPlan at this address:
https://www.abo.fi/student/en/minplanmanualer

2.4 Course registration

Course registration at Åbo Akademi University
Course registration might be required. In these cases registration is done in MinPlan: http://www.abo.fi/minplan (ÅA courses). Instructions for course registration are found at the following address: https://www.abo.fi/student/en/minplanmanualer If you missed a registration for a course or exam you can register by email to our Department secretary Christel.Engblom@abo.fi

Course registration at the University of Turku
Course registration might be required. In these cases registration is done in a Virtual Study Register called Nettiopsu: https://nettiopsu.utu.fi. More information about Nettiopsu can be found:
https://intranet.utu.fi/en/unit/student-services/systems/Students/Pages/Course-Registration-in-Nettiopsu.aspx. Accessing these pages requires that the student has a valid user ID issued by the University of Turku Computing Centre.
In order to get the student ID at the University of Turku the student should first apply for a study right through http://www.joopas.fi

2.5 Examinations

Examinations at Åbo Akademi University
The general exams take place on Fridays. Students should register for the general exams at least eight days in advance. The registration is done in MinPlan: http://www.abo.fi/minplan. Instructions concerning registration for examinations are found at the following address: https://www.abo.fi/student/en/minplanmanualer.

Please Note! The registration procedure can vary at different Departments, subjects and courses - you can always check with the teacher or the department secretary.

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 examinations are given typically in up to 10 days since the examinations are taken.

The results of the ÅAU courses are registered in Åbo Akademi's study register (STURE). If several weeks have passed since the course finished but the result is still not in the register, contact the lecturer of the course.

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

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

The dates for the **course and general exams** in Software Engineering, Computer Science and Embedded Computing are found here (page in Swedish): https://www.abo.fi/student/undervisningsprogram

The examination dates for the IT subjects can also be found at the end of this document.

Each course in the IT subjects 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 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.

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)

Examinations at the University of Turku

The first course exam is arranged at the end of the course. The course exams do not necessarily require registration. In addition to the course exams there should be 3 general exams arranged for each course every academic year. For general exams, the student should register for the exam.

Please find the examination dates either through NettiOpsu or from the responsible course teacher. NettiOpsu: https://nettiopsu.utu.fi/

Information about exam registration can be found at:
http://www.utu.fi/en/units/sci/units/it/studying/Exams/Pages/home.aspx

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

2.6 Flexible study right: studies at the University of Turku

Åbo Akademi University has an agreement of flexible study right with the University of Turku. According to this agreement students from Åbo Akademi University can take courses that are offered by the University of Turku.

The student sends in an electronic application for flexible study right which has to be approved by Åbo Akademi University as well as by the University of Turku. 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 and will not get the credits registered.

Credits (study points) from the University of Turku are not transferred automatically to Åbo Akademi University. *The student must get a study transcript from the University of Turku and bring it to the Study Advisor, who will make certain that the study achievements are transferred into the study register at Åbo Akademi University.*

2.7 Certificates 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-building, ground floor (Tavastgatan 13) or from the Faculty office in the Axelia-building, 3rd floor (Biskopsgatan 8). An unofficial transcript can be requested on the Internet at the following address: http://www.abo.fi/stodenhet/en/minsture

Study achievements from other Universities (e.g. the University of Turku) 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 make certain that the study achievements are transferred into the register of studies at Åbo Akademi University.

2.8 The thesis, graduation and diploma

In order to graduate, all study credits including the thesis have to be noted in the study register.

The students are advised to find a topic and start working on their master theses at least 6 months before the planned submission date. The following steps are recommended:

- Identify a topic by contacting a teacher (lecturer or professor).
- Work on the thesis and have regular meetings with your supervisor to check progress,
- When the thesis is ready:
    - Decide on a deadline to submit the thesis for grading based on the Language Check deadlines at http://www.abo.fi/stodenhet/en/csklanguagecheck#document2
    - Agree with your supervisor how long before the language check the thesis should be submitted for grading (usually more than 2 weeks).

- The thesis must include an abstract that has a length of about 2500 characters.
- Submit the thesis for grading (via the Urkund system for plagiarism detection, indicating the supervising teacher). All theses should go through a check for plagiarism. More information can be found here: https://www.abo.fi/student/en/etik_plagiat
- The supervisor will submit your thesis, abstract and thesis evaluation to language check

In order to shorten the time needed for writing the thesis and potentially securing a higher grade, it is highly recommended that students take advantage of the courses and advice on academic writing provided by the Centre for Language and Communication:
- Course on Academic Skills in English for Masters Students I (903840.0), 3 ECTS
- Text consultation in English (free of charge)
http://www.abo.fi/stodenhet/en/csktextconsultation

When all your courses are completed, and your thesis is sent to the Centre for Language and Communication for language check, you can apply for your Master's degree certificate. Fill in the application for certificate form found here: http://www.abo.fi/fakultet/en/fnt_slutskedet and bring/send it to the Study Advisor at the Faculty office in Axelia, 3rd floor.

When the language check for the thesis is approved, the student brings **two hardback copies** of the thesis to the Faculty Office in Axelia. The thesis will then be officially approved by the Dean. After this approval, the thesis will be registered in the study register.

Certificates are issued approximately once a month during the period September-June. More information about graduating and getting the diploma is found here: http://www.abo.fi/fakultet/en/fnt_slutskedet

3 Services

3.1 Computers, printers and copying machines

The computers in the computer classes located in the University buildings are available for all the students studying at Åbo Akademi University.

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), Fänriksgatan 3, 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: http://www.abo.fi/stodenhet/en/klasser. Always remember to log off after use, so that no one else can use your computer domain.

Students can print about 360 pages for free in a six-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 by e-mail.
Copying machines are available in the university buildings. More information about printing and copying can be found at: http://www.abo.fi/stodenhet/en/utskrifter

3.2 Libraries

To be able to borrow from the libraries students need to have a library card which they will receive at the library. Student cards (studiekort) that were issued before the autumn semester 2013 can also be used as library cards. The loan time for books is usually 2–4 weeks. More information is found at http://www.abo.fi/bibliotek/en

The main library of Åbo Akademi is located in Domkyrkogatan 2-4, 20500 Åbo, telephone (02) 215 4180, e-mail: biblioteket@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, Fänriksgatan 3 A, 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 Hanken-building, Henriksgatan 7, 20500 Åbo. They provide information for both graduates and students. Their main task is to help students enter the labour market and to give advice 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 and the Turku
Employment Office. More information can be found at
http://www.abo.fi/stodenhet/en/arbetsforum.

3.4 Student tutor and teacher tutor

All MSc 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.
Student tutors (academic year 2016-2017) for students admitted to the programme at Åbo Akademi are:
Computer Science: Gohar Shah and Abdul Rasheed. E-mail: gohar.shah@abo.fi, abdul.rasheed@abo.fi
Software Engineering: Junaid Iqbal and Tanwir Ahmad. E-mail: semester_tutor@abo.fi
Embedded Computing: Uzair Ahmed Noman and Taisia Sycheva. E-mail: uzair.ahmednoman@abo.fi, taisia.sycheva@abo.fi

Teacher tutors and programme coordinators:
Computer Science: Vladimir Rogojin
Software Engineering: Dragos Truscan
Embedded Computing: Sébastien Lafond

3.5 Student activities

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 116 € for the Academic year 2016-2017. By being a member you receive a student card which you can use to 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*) http://www.yths.fi/en/contact_details/units/turku at Kyrkovägen 13, 20540 Åbo.

4 Master's Programme in Computer Science

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 about 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 and the registration for exams at Åbo Akademi University are done in MinPlan.

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

Free optional studies (30 cr)	Master's thesis in Computer Science (30 sp)
Advanced studies in Computer Science (60 cr)	

4.2 Main subject

The main subject studies consist of:

4.2.1 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:
456513.0 Advanced computational modeling† 5 cr
456402.0 Computational modeling techniques† 5 cr
456504.0 Network software† 5 cr
455303.0 Parallel Programming, ** 5 cr
456505.0 Program Derivation** 5 cr
456502.0 Software Architectures† 5 cr
456406.0 Advanced Text Algorithms** 5 cr
456506.0 Cryptography and Network Security** 5 cr
456512.0 Databases 2** 5 cr
455301.0 Introduction to computer graphics** 5 cr
456501.0 Software Safety** 5 cr
456503.0 Software Quality** 5 cr
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
452501.0 Development of Web Applications and Web Services 5 crb
456508.0 Computability and Computational Complexity* 5 cr
424511.0 Evolutionary Algorithms
424501.0 Neural Networks* 5 cr
455302.0 Advanced computer graphics and graphic hardware* 5 cr
456400.8 Local Networks* 5 cr
456400.5 Distributed systems and algorithms* 5 sp
456314.0 Approximation and randomized algorithms* 5 cr
456400.9 Reliable distributed systems* 5 sp
453600.0 Introduction to Manycore programming 5 cr

* **Courses that will only be lectured during odd academic years, e.g. 2017-2018**
**** Courses that will only be lectured during even academic years, e.g. 2016-2017**
Please note that the courses that are lectured every second year might change. Always check each year which courses will be lectured that year.
† **Courses that will NOT be lectured the academic year 2016-2017**

4.2.2 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

Please see Section 2.8 regarding the thesis writing and graduation process.

4.2.3 Free optional studies

The student has the opportunity to complete free optional courses to an extent of 30 cr. These courses can be any courses offered by any subject at Åbo Akademi University. A language course in Swedish is available and recommended for Computer Science master students: 909970.0 Swedish as a foreign language, level 1, 5 cr. The course offers a basic understanding of the Swedish language and of cultural aspects related to Swedish-speaking Finns.
Language courses are offered by the Centre for Language and Communication (*språkcentret*), http://www.abo.fi/csk
Please note that language courses always require registration through MinPlan.

4.3 Course information: lecture dates and times

At the end of this guide you will find the course schedules for courses offered by Åbo Akademi University.

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: http://mars.cs.utu.fi/julkkari/opetus/

4.4 General information about studies

Detailed information about the Master's Programme in Computer Science can be found here: www.abo.fi/computerscience
General information about the studies at Åbo Akademi University can be also be found in this Study guidebook, the Teaching Programme (*Undervisningsprogram*) and in MinPlan.

The Teaching Programme
The Teaching Programme (*Undervisningsprogram*) gives information about all the courses offered at Åbo Akademi University, i.e. lecture dates and times, as well as information about exam dates for the courses.
The Teaching Programme for the Faculty of Science and Engineering can be found at the address (Swedish pages): http://www.abo.fi/fakultet/fnt_undervisningsprogram

5 Master's Programme in Computer Engineering / Software Engineering

5.1 Structure of the studies

The Master's Programme in Computer Engineering/ Software Engineering 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 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:

Advanced studies in Software Engineering (60 cr)	
Master´s Thesis in Software Engineering (30 cr)	Free optional studies (30 cr)

5.1.1 Advanced studies in Software Engineering

The courses in the advanced module (60 cr) consist of 4 mandatory courses (25 cr) and a number of selectable courses of which 35 cr should be chosen.

Mandatory		*25 cr*
452501.0	Development of Web Applications and Web Services	5 cr
456502.0	Software Architectures†	5 cr
456516.0	Experimentation on Software Engineering	5 cr
451000.0	Project course	10 cr

Selectable (35 cr are chosen)

456309.0	Specification Methods*	5 cr
452502.0	Software Testing	5 cr
456512.0	Databases 2**	5 cr
455304.0	Code Optimization*	5 cr
455302.0	Advanced Computer Graphics and Graphics Hardware*	5 cr
456401.0	Advanced Text Algorithms**	5 cr
452400	Special course(s) in Software Engineering	5 cr
456400	Special course(s) in Computer Science	5 cr
424501.0	Neural Networks*	5 cr
424511.0	Evolutionary Algorithms	5 cr
453600.0	Introduction to Manycore programming	5 cr
453505.0	Multimedia Algorithm Implementation	5 cr

453306.0	Real Time Systems	5 cr
456501.0	Software Safety**	5 cr
456503.0	Software Quality**	5 cr
456504.0	Network Software†	5 cr
456506.0	Cryptography and Network Security**	5 cr
455301.0	Introduction to Computer Graphics**	5 cr
456505.0	Program Derivation**	5 cr
456513.0	Advanced computational modelling†	5 cr
456314.0	Approximation and randomized algorithms*	5 cr
456400.8	Local Networks*	5 cr
456400.9	Reliable distributed systems*	5 cr
456309.0	Specification methods*	5 cr
456400.5	Distributed systems and algorithms*	5 cr
456511.0	Introduction to computational and systems biology*	5 cr
456508.0	Computability and Computational Complexity*	5 cr
456504.0	Computational Modeling techniques†	5 cr
455303.0	Parallel Programming**	5 cr

* **Courses that will only be lectured during odd academic years, e.g. 2017-2018**
**** Courses that will only be lectured during even academic years, e.g. 2016-2017**
Please note that the courses that are lectured every second year might change. Always check each year which courses will be lectured that year.
† **Courses that will NOT be lectured the academic year 2016-2017**

5.1.2 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 or Docent Dragos Truscan to discuss a possible topic for the thesis.

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

Please see Section 2.8 regarding the thesis writing and graduation process.

5.1.3 Free optional studies

The student has the opportunity to complete free optional courses to an extent of 30 cr. These courses can be any courses offered by any subject at Åbo Akademi University. A language course in Swedish is available and recommended for Computer Science master students: 909970.0 Swedish as a foreign language, level 1, 5 cr. The course offers a basic understanding of the Swedish language and of cultural aspects related to Swedish-speaking Finns.
Language courses are offered by the Centre for Language and Communication (*språkcentret*), http://www.abo.fi/csk
Please note that language courses always require registration through MinPlan.

5.2 Course information: lecture dates and times

At the end of this guide you will find the course schedules for courses offered by Åbo Akademi University.

In addition to the above courses, the students can take the following Universtity of Turku as advanced courses in Software Engineering:

TKO_2102 Project 15 ECTS
TKO_3115 Learning Analytics 5 ECTS
TKO_5459 Approximative and Randomized Algorithms 5 ECTS
TKO_8925 Advanced Course on Operating Systems 5 ECTS
TKO_2099 Text Mining 5 ECTS
TKO_5071 Advanced Course on Databases 5 ECTS
TKO_2081 Introduction to Game Development Tools 5 ECTS
TKO_5725 Multiplayer Computer Games 5 ECTS
TKO_3112 Game Design 5 ECTS
TKO_5061 Project Course on Game Development 5 ECTS
TKO_3109 Advanced Algorithm Design, 5 op
TKO_5710 Algorithms for Computer Games, 5 ECTS

DTEK1054 Advanced Course on Software Engineering, 5 ECTS
DTEK1055 Software Testing, 5 ECTS
DTEK1056 Software Architectures, 5 ECTS
DTEK0025 Designing Object Oriented Software, 5 ECTS
DTEK8025 System and Application Security, 5 ECTS

TKO_3102 Machine Learning and Neural Networks, 5 ECTS
TKO_5519 Pattern Recognition, 5 ECTS
TKO_2097 Machine Learning Seminar, 5 op

DTEK8063 Firewall and IPS Technology, 5 ECTS
ETT_3072 Human element in information security, 5 ECTS
DTEK0039 Security Engineering, 5 ECTS
TKO_3103 Data Analysis and Knowledge Discovery, 5 ECTS
TKO_2096 Applications of Data Analysis, 5 op
TKO_3108 Algorithm Design, 5 op

5.3 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.

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

of Science and Engineering can be found at the address: (Swedish pages): http://www.abo.fi/fakultet/fnt_undervisningsprogram

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

Computer Engineering/ Software Engineering emailing list
The mailing list for students in the Computer Engineering/ Software Engineering Masters Programme is SEMaster-AA@abo.fi. Subscription address: https://mailman.abo.fi/mailman/listinfo/semaster-aa

6 Master's Degree Programme in Embedded Computing

6.1 Structure of the studies

The Master's Degree Programme in Embedded Computing 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 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>Advanced module I
in Embedded Systems
(20 cr)</td><td>Advanced module II
in Embedded Systems
(30 cr)</td></tr>
<tr><td colspan="2">Master's thesis in Embedded Systems
(30 sp)</td></tr>
<tr><td>Minor subject:
Innovation and Business Creation
(25 cr)</td><td>Free optional studies
(15 cr)</td></tr>
</table>

6.1.1 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

6.1.2 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			*20 cr*
453503.0	Modeling of Embedded Systems ÅAU		5 cr
453506.0	Design Methods for Energy Efficient Embedded Systems ÅAU		5 cr
451000.0	Project course ÅAU		10 cr
Selectable (10 cr are chosen)			*10 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_2061	System Verification	UTU	5 cr
DTEK8053	Seminar on Energy Efficient Computing	UTU	5 cr
ETT_2014	SoC Design	UTU	5 cr
ETT_3053	Reconfigurable Computing	UTU	5 cr
DTEK8048	FPGA Prototyping	UTU	5 cr

6.1.3 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

Please see chapter 2.8 Graduation and Diploma for more information about the Thesis and the graduation process.

6.1.4 Minor subject: Innovation and Business Creation

The minor subject Innovation and Business Creation (25 cr) is mandatory. The courses are offered by Business and Innovation Development unit at University of Turku.

Innovation and Business Creation Study Module (25 cr):

Mandatory (16, 19 or 21 cr)
BIDI0002 Introduction to Innovation and Business, 3 or 5 ECTS
BIDI1002 Business Management of Start-ups, 3 ECTS (for non-business majors only)
BIDI0004 Special Topic Studies, 3 or 6 ECTS
BIDI0003/MAS25/TJS23/YRS9/LRS19 Business Development Laboratory, 7 ECTS
Selectable (4-9 cr)
BIDI1005 Start-up Journey, 10 ECTS
BIDI0005 Advanced Special Topic Studies, 4-9 ECTS
KVS54 Special Themes in Innovation Management, 2 or 4 ECTS
TJS17 Enterprise Architecture, 6 ECTS
TJS6 Software Business, 6 ECTS

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 and https://nettiopsu.utu.fi/opas

6.1.5 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 any subject at Åbo Akademi University. A language course in Swedish is available and recommended for Embedded Computing master students: 909970.0 Swedish as a foreign language, level 1, 5 cr. The course offers a basic understanding of the Swedish language and of cultural aspects related to Swedish-speaking Finns.
Language courses are offered by the Centre for Language and Communication (*språkcentret*), http://www.abo.fi/csk
Please note that language courses always require registration through MinPlan.

6.2 Course information: lecture dates and times

An online calendar for the 2016-2017 courses is available from the programme web page at http://www.abo.fi/fakultet/it_embc_studyinformation

At the end of this guide you will also find the course schedules for courses offered by Åbo Akademi University.

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

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 Embedded Computing web pages.

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.
The Teaching Programme for the Faculty of Science and Engineering can be found at the address: (Swedish pages): http://www.abo.fi/fakultet/fnt_undervisningsprogram

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

6.4 Double degree in Embedded Systems

Åbo Akademi University offers a double degree programme in Embedded Systems with ESIGELEC in Rouen, France. Students do half of their studies at their home university and half at Åbo Akademi University/Esigelec. Students that complete the whole programme get a Master of Science degree in Technology (Diplomingenjör,120 ECTS) from Åbo Akademi and a Master of Science degree (Diplôme d'Ingénieur, 300ECTS) from ESIGELEC. The duration of the programme is 5-6 terms and the languages of instruction are English, Swedish and French. More information can be found on **www.abo.fi/ddes** or from **ddes@abo.fi**

6.4.1 Students from ESIGELEC going to Åbo Akademi University

Åbo Akademi and ESIGELEC requirements:

Module	Required ECTS		Total
	From ÅA	From Esigelec	
1. Advanced module	15	5	20
2. Compulsory advanced module		20	20
3. Project course	10	-	10
4. Compulsory intermediate studies	10	15	25
5. Compulsory language courses	3	-	3
6. Free optional courses	6	6	12
7. Master's thesis	30		
TOTAL	**120**		

Structure of the modules:

• **Advanced module in Embedded Systems 20 ECTS**

• From Esigelec: a minimum of 5 ECTS selectable from:
  - o (SE2C1-F) Microprocessor Architecture (Y2,S1): 3 ECTS
  - o (ISE202-A) Real-time Operating Systems (Y2, S2): 2 ECTS
  - o (ISE203-A) Tools and methods for software (Y2,S2): 2 ECTS

- From Åbo Akademi: a minimum of 15 ECTS selectable from:
    - o 453501.0 Digital Television Techniques: 5 ECTS
    - o 453503.0 Modeling of Embedded Systems: 5 ECTS
    - o 453506.0 Design methods for energy efficient embedded systems: 5 ECTS
    - o 454506.0 Applied signal processing: 5+4 ECTS
    - o 455304.0 Code Optimization: 5 ECTS
    - o 453600.0 Introduction to Manycore Programming: 5 ECTS
    - o 453505.0 Multimedia Algorithm Implementation: 5 ECTS
    - o Special work in Embedded Systems: 2-5 ECTS

- **Compulsory advanced module: 20 ECTS**

- From Esigelec: 20 ECTS
    - o Applied discrete mathematics: 6 ECTS
        - (MA1C1-F) Math for Engineering (Y1, S1): 2 ECTS
        - (MA1C2-F) Probability Theory (Y1, S2): 2 ECTS
        - (PH1C2-F) Electromagnetism (FR)(Y1, S1): 2 ECTS

    - o Design of experiments: 5 ECTS selectable from
        - (GE1C2-F) (GE1C3-F) Industrial Control Systems (1st Y 1st S): 3 ECTS
        - (SE201-F) Instrumentation and system (Y1, S1): 5 ECTS
        - (GE2C1-F)(GE2C2-F) Automation Engineering I (Y2, S1): 2 ECTS

    - o Basic Signal Processing: 5 ECTS selectable from:
        - (TS2C1-F) Signal processing (Y2, S1): 2 ECTS
        - (EL2C1-F) Analog filters (Y2, S1): 2 ECTS
        - (EL2C3-F) Analog to digital conversion (Y2, S1): 2 ECTS
        - (EL2C5-F) Modulation (Y2, S1): 2 ECTS

    - o Logic control: 5 ECTS
        - (GE1C1-F) Combinatory and sequential logic (Y1, S2): 2 ECTS
        - (ISE201-A) Binary Logic and VHDL (2nd Y 2nd S): 3 ECTS

- **Compulsory project course: 10 ECTS**

- From Åbo Akademi: 10 ECTS
    - o 451000.0 Project course: 10 ECTS

- **Compulsory Intermediate Studies: 20 ECTS**

- From Esigelec (Electrical Engineering): a minimum of 15 ECTS selectable from:
    - o (IN1C2-F) UML for analysis (Y1, S2) : 2 ECTS
    - o (IN2C1-F) Network interconnections (Y2, S1) : 2 ECTS
    - o (PI2C1-F) Engineering project (Y2, S2) : 4 ECTS

- o (GE1C4-F) (GE1C5-F) Electrical Engineering (Y1, S2): 3 ECTS
- o (GE1C6-F)(GE1C7-F) Power electronics (Y1,S2): 3 ECTS
- o (EL1C5-F) Electrical Engineering & Electronics project (Y1,S2): 4 ECTS
- o (ISE204-A) Communication buses (Y2,S2): 2 ECTS

• From Åbo Akademi: a minimum of 10 ECTS selectable from:
- o *In English:*
- o 452502.0 Software Testing: 5 ECTS
- o 455303.0 Parallel Programming: 5 ECTS
- o 456512.0 Databases II: 5 ECTS
- o 456504.0 Network Software: 5 ECTS
- o 456514.0 Experimentation in engineering: 5 ECTS

- o *In Swedish:*
- o 452303.0 Practicum in Software Engineering: 5 ECTS
- o 452306.0 Programming paradigms: 5 ECTS
- o 452307.0 System design II: 5 ECTS
- o 456306.0 Compiler technology: 5 ECTS

• **Compulsory language courses: 3 ECTS**

• From Åbo Akademi: 3 ECTS
- o 903840.0 Academic skills for Masters Students: 3 ECTS

• **Free optional courses 12 ECTS**

• From Åbo Akademi: 6 ECTS
- o Any courses offered by Åbo Akademi University.

• From ESIGELEC: 6 ECTS
- o Any courses offered by Esigelec

• **Master's thesis 30 ECTS**
• Has to be graded and approved by Åbo Akademi and by ESIGELEC

The above structure of modules is based on 2015-2016 syllabus of ESIGELEC and 2015-2016 syllabus of Åbo Akademi. It is subject to possible annual updates and modifications.

6.4.2 Students from Åbo Akademi University going to ESIGELEC

Åbo Akademi requirements:

Module	**Required ECTS**		**Total**
	From ÅA	**From Esigelec**	
1. Advanced module	8	12	20
2. Compulsory advanced module	15	5	20
3. Project course	10	-	10

4. Compulsory intermediate studies	5	15	20
5. Compulsory language courses	-	8	8
6. Free optional courses	6	6	12
7. Master's thesis	30		
TOTAL	**120**		

Structure of the modules:

• **Advanced module in Embedded Systems 20 ECTS**

• From Esigelec: 12 ECTS selectable from
- o (ISE201-A) Binary Logic and VHDL (in English) (Y2,S2): 3 ECTS
- o (ISE202-A) Embedded Linux and Real-time (in English) (Y2, S2): 2 ECTS
- o (SE2C1-F) Microprocessor architecture (Y2,S1): 3 ECTS
- o (ISE302-A) Reconfigurable Systems (in English) (Y3,S1): 2 ECTS
- o (ISE301-A) Embedded Systems (in English) (Y3,S1): 2 ECTS
- o (ISE303-F) Linux and Embedded Systems (Y3,S1): 1 ECTS
- o (ES21-A) Methodology using case studies (in English) (Y3,S1): 1 ECTS
- o (ES22-F) EMC for Embedded Systems (Y3,S1): 1ECTS
- o (ES23-F) DSP (Y3,S1): 1ECTS
- o (ES24-A) Embedded applications for Android (in English) (Y3,S1): 1 ECTS
- o (ES25-A) Advanced LabView development (Y3,S1): 1 ECTS

• From Åbo Akademi: a minimum of 8 ECTS selectable from:
- o 453501.0 Digital Television Techniques: 5 ECTS
- o 453503.0 Modeling of Embedded Systems: 5 ECTS
- o 453506.0 Design methods for energy efficient embedded systems: 5 ECTS
- o 454506.0 Applied signal processing: 5+4 ECTS
- o 453600.0 Introduction to Manycore Programming: 5ECTS
- o 453505.0 Multimedia Algorithm Implementation: 5 ECTS
- o Special work in Embedded Systems: 2-5 ECTS

• **Compulsory advanced module: 20 ECTS**
• From Åbo Akademi: 15 ECTS selectable from:
- o 400107.0 Applied discrete mathematics: 5 ECTS
- o 456514.0 Experimentation in engineering: 5 ECTS
- o 454300.0 Basic course in signal processing: 5 ECTS
- o 455303.0 Parallel programming: 5 ECTS

• From Esigelec:
- o Signal Processing: a minimum of 5 ECTS selectable from:
  - o *In French*
    - (TS2C1-F) Signal processing (Y2, S1): 2 ECTS
    - (EL2C1-F) Analog filtering (Y2, S1): 2 ECTS
    - (EL2C3-F) Analog to digital conversion (Y2,S1): 2 ECTS
    - (EL2C5-F) Modulation (Y2, S1): 2ECTS

• **Compulsory project course: 10 ECTS**
• From Åbo Akademi: 10 ECTS
    o 451000.0 Project course: 10 ECTS

• **Compulsory Intermediate Studies: 20 ECTS**
• From Esigelec: a minimum of 15 ECTS selectable from:
    o (IN2C1-F) Network interconnections (Y2, S1) : 2 ECTS
    o (GE2C1-F)(GE2C2-F) Automation Engineering I (Y2, S1): 2 ECTS
    o (ISE203-A) Tools and Methods for Software (in English) (Y2,S2): 3 ECTS
    o (ISE204-A) Communication buses (in English) (Y2,S2): 2 ECTS
    o (ISE205-A) Innovation with Android (in English) (Y2,S2): 3 ECTS
    o (ISE207-A) Localisation and trajectory (in English) (Y2,S2): 3 ECTS
    o (ISE306-F) Communication systems (Y3,S2): 1 ECTS
    o (ISE307-F) Lab. communication systems (Y3,S2): 1 ECTS
    o (PI2C1-F) Engineering project (Y2,S2): 4 ECTS
    o (C02C1-F) Project management (Y2,S2): 2 ECTS

• From Åbo Akademi (*in Swedish*): a minimum of 5 ECTS selectable from:
    o 452303.0 Practicum in Software Engineering: 5 ECTS
    o 452306.0 Programming paradigms: 5 ECTS
    o 452307.0 System design II: 5 ECTS
    o 456306.0 Compiler technology: 5 ECTS

• **Compulsory language courses: 8 ECTS**

• From ESIGELEC: 8 ECTS
    o French as a foreign language: 5 ECTS
    o English: 3 ECTS

• **Free optional courses 12 ECTS**

• From Esigelec: 6 ECTS
    o Any courses offered by Esigelec
• From Åbo Akademi: 6 ECTS
    o Any courses offered by Åbo Akademi University.

• **Master's thesis 30 ECTS**
• Has to be graded and approved by Åbo Akademi and by ESIGELEC

The above structure is based on 2015-2016 syllabus of ESIGELEC and 2015-2016 syllabus of Åbo Akademi. It may be subject to possible annual updates and modifications.

Computer science - Autumn 2016									
Code	Course	Credits	Lecturer	Weeks	Time and place				
				Period	Mon	Tue	Wed	Thu	Fri
	Lecture hours at ÅAU if nothing else is mentioned: 8-10 = 8.15-9.45, **10-12**= 10.15-11-45, **13-15**= 13.30-15.00, **15-17**= 15.15-16.45								
451000.0	Project Course	10	Björkqvist Neovius Truscan Rönnholm	36-51					8-12, 110A&B
909970.0	Swedish as a foreign language level 1 (The course is not mandatory but is recommended for Computer Science students)	5	Sandberg						
	The course requires registration in MinPlan.								
	-Group 1 (period 1-2)			36-50	8.15-9.45		8.15-9.45		
	-Group 2 (period 1-2)			36-50		8.15-9-45		8.15-9-45	
	-Group 3 (period 1-2)			36-50	10.15-11.45		10.15-11.45		
	-Group 4 (period 3-4)			3-17		8.15-9-45		8.15-9-45	
	-Group 5 (period 3-4)			3-17		10.15-11.45		10.15-11.45	
456318.0	Data Analysis with Visual Basic	5	Azimi, Petre	36-43	*internet course, intermediate level - can be included in the free optional studies*				
452501.0	Development of Web Applications and Web Services	5	Truscan	36-43			13-15, Aud. XX	10-12, 126A&B	
456406.0	Advanced Text Algorithms	5	Rogojin	36-43	13-15, 332A Simon		15-17, 332A Simon		
456794.0	Masters Thesis and Seminar in Computer Science	30	Waldén	36-51		10-12, 332A Simon			
456408.0	Machine Learning	5	Azimi, Petre	44-51	*internet course*				
452502.0	Software Testing	5	Truscan	44-51		13-15, Aud. XX	15-17, K126A&B		
455303.0	Parallel programming	5	Aspnäs	44-51		15-17, Aud. XX		15-17, Aud. XX	
453600.0	Special Course in ES: Introduction to Many-Core Programming	5	Lilius	44-51			13-15, 115A	10-12, 115A	
456505.0	Program derivation	5	Waldén	44-51	*Self studies*				
456502.0	Software Architectures	5	Porres		*self study course with book exam, contact ivan.porres@abo.fi*				
456309.0	Specification Methods	5	Troubitsyna	Not 2016-2017					
455304.0	Code optimization	5	Aspnäs	Not 2016-2017					
456511.0	Introduction to computational and systems biology	5	I. Petre	Not 2016-2017					
456405.0	Special Course in CS: Molecular Computing	5	Rogojin	Not 2016-2017					
456508.0	Computability and Computational Complexity	5	I. Petre	Not 2016-2017					
456513.0	Advanced computational modeling	5	I. Petre	Not 2016-2017					
456402.0	Computational modeling techniques	5	I. Petre	Not 2016-2017					
456504.0	Network software	5	L. Petre	Not 2016-2017					

Computer science - Spring 2017									
Code	Course	Credits	Lecturer	Weeks	Time and place				
				Period	Mon	Tue	Wed	Thu	Fri
	Lecture rooms 110A/B, 115A, 332A, 347, K124B, K 126A&B, Aud. XX are in the buildning Agora on the University Hill								
451000.0	Project Course, continues.	10	Björkqvist Neovius Truscan Rönnholm	2-11					8-12, 110A&B
456509.0	Logic for Computer Science	5	Sibelius	2-11	13-15, 115A			10-12, 115A	
	- excercises (mandatory attendance)						13-15, K124B		
456506.0	Cryptography and Network Security	5	Rogojin	2-11	10-12, K124B	13-15, K124B			
455301.0	Introduction to computer graphics	5	Westerholm	2-11		15-17, 115A		15-17, 115A	
456503.0	Software Quality	5	Troubitsyna	2-11	15-17, Aud. XX		15-17, 115A		
424511.0	Evolutionary Algorithms	5	Pettersson	period 3-4	*internet course*				
453505.0	Multimedia Algorithm Implementation	5	Lilius	12-21	13-17, 115A			10-12, K124B	
455305.0	Introduction to Scientific Computing	5	Westerholm	12-21	10-12, 110A&B		15-17, Aud. XX		
456512.0	Databases 2	5	Aspnäs	12-21		15-17, Aud. XX		15-17, Aud. XX	
456501.0	Software Safety	5	Troubitsyna	12-21			10-12, K124B		10-12, 110A
456400.5	Special Course in CS: Distributed systems and algorithms	5	Troubitsyna	Not 2016-2017					
456314.0	Approximation and randomized algorithms	5	L. Petre	Not 2016-2017					
455302.0	Advanced computer graphics and graphic hardware	5	Westerholm	Not 2016-2017					
456404.0	Special Course in CS: Graph Algorithms	5	Rogojin	Not 2016-2017					
456400.9	Special Course in CS: Reliable Distributed Systems	5	Waldén	Not 2016-2017					
456400.8	Local Networks	5	L. Petre	Not 2016-2017					
424501.0	Neural Networks	5	Saxén	Not 2016-2017					
Campus map: http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf									

Computer/Software engineering - Autumn 2016									
Code	Course	Credits	Lecturer	Weeks	Time and place				
				Term	Mon	Tue	Wed	Thu	Fri
	Lecture hours at ÅAU if nothing else is mentioned: 8-10 = 8.15-9.45, **10-12**= 10.15-11-45, **13-15**= 13.30-15.00, **15-17**= 15.15-16.45								
451000.0	Project Course	10	Björkqvist Neovius Truscan Rönnholm	36-51					8-12, 110A&B
452400.0	Special Course in Software Engineering	5		See notice					
909970.0	Swedish as a foreign language level 1 (The course is not mandatory but is recommended for Software Engineering students)	5	Sandberg						
	The course requires registration in MinPlan.								
	-Group 1 (period 1-2)			36-50	8.15-9.45		8.15-9.45		
	-Group 2 (period 1-2)			36-50		8.15-9-45		8.15-9-45	
	-Group 3 (period 1-2)			36-50	10.15-11.45		10.15-11.45		
	-Group 4 (period 3-4)			3-17		8.15-9-45		8.15-9-45	
	-Group 5 (period 3-4)			3-17		10.15-11.45		10.15-11.45	
456318.0	Data Analysis with Visual Basic	5	Azimi, Petre	36-43	*internet course, intermediate level - can be included in the free optional studies*				
452501.0	Development of Web Applications and Web Services	5	Truscan	36-43			13-15, Aud. XX	10-12, 126A&B	
456516.0	Experimentation in Software Engineering	5	Porres	37-43		8-10, 115A		8-10, 115A	
456406.0	Advanced Text Algorithms	5	Rogojin	36-43	13-15, 332A Simon		15-17, 332A Simon		
456408.0	Machine Learning	5	Azimi, Petre	44-51	*internet course*				
452502.0	Software Testing	5	Truscan	44-51		13-15, Aud. XX	15-17, K126A&B		
453600.0	Special Course in ES: Introduction to Many-Core Programming	5	Lilius	44-51			13-15, 115A	10-12, 115A	
455303.0	Parallel programming	5	Aspnäs	44-51		15-17, Aud. XX		15-17, Aud. XX	
456505.0	Program Derivation	5	Waldén	44-51	*Self studies*				
456502.0	Software Architectures	5	Porres		*self study course with book exam, contact ivan.porres@abo.fi*				
455304.0	Code optimization	5	Aspnäs	Not 2016-2017					
456309.0	Specification Methods	5	Troubitsyna	Not 2016-2017					
456513.0	Advanced computational modeling	5	I. Petre	Not 2016-2017					
456504.0	Network software	5	L. Petre	Not 2016-2017					

Computer/Software engineering - Spring 2017									
Code	Course	Credits	Lecturer	Weeks	Time and place				
				Period	Mon	Tue	Wed	Thu	Fri
	Lecture rooms 110A/B, 115A, 332A, 347, K124B, K 126A&B, Aud. XX are in the buildning Agora on the University Hill								
451000.0	Project Course (continues)	10	Björkqvist Neovius Truscan Rönnholm	2-11					8-12, 115A
456506.0	Cryptography and Network Security	5	Rogojin	2-11	10-12, K124B	13-15, K124B			
455301.0	Introduction to computer graphics	5	Westerholm	2-11		15-17, 115A		15-17, 115A	
456503.0	Software Quality	5	Troubitsyna	2-11	15-17, Aud. XX		15-17, 115A		
424511.0	Evolutionary Algorithms	5	Pettersson	period 3-4	*internet course*				
455305.0	Introduction to Scientific Computing	5	Westerholm	12-21	10-12, 110A&B		15-17, Aud. XX		
453505.0	Multimedia Algorithm Implementation	5	Lilius	12-21	13-15, 115A			10-12, K124B	
453101.0	Wireless Digital Communication	5	Björkqvist	12-21		10-12, K124B	13-15, K124B		
453306.0	Real-Time Systems	5	Lilius Holmbacka	12-21		13-15, 115A			10-12, 115A
456512.0	Databases 2	5	Aspnäs	12-21		15-17, Aud. XX		15-17, Aud. XX	
456501.0	Software Safety	5	Troubitsyna	12-21			10-12, K124B		10-12, 110A
455302.0	Advanced computer graphics and graphic hardware	5	Westerholm	Not 2016-2017					
424501.0	Neural Networks	5	Saxén	Not 2016-2017					
456400.8	Local Networks	5	L. Petre	Not 2016-2017					
Campus map: http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf									

Embedded Computing - Autumn 2016									
Code	Course	Credits	Lecturer	Weeks	Time and place				
				Period	Mon	Tue	Wed	Thu	Fri
	Lecture hours at ÅAU if nothing else is mentioned: 8-10 = 8.15-9.45, **10-12**= 10.15-11-45, **13-15**= 13.30-15.00, **15-17**= 15.15-16.45								
451000.0	Project Course	10	Björkqvist Neovius Truscan Rönnholm	36-51					8-12, 110A&B
909970.0	Swedish as a foreign language level 1 (The course is not mandatory but is recommended for Embedded Computing students)	5	Sandberg						
	The course requires registration in MinPlan.								
	-Group 1 (period 1-2)			36-50	8.15-9.45		8.15-9.45		
	-Group 2 (period 1-2)			36-50		8.15-9-45		8.15-9-45	
	-Group 3 (period 1-2)			36-50	10.15-11.45		10.15-11.45		
	-Group 4 (period 3-4)			3-17		8.15-9-45		8.15-9-45	
	-Group 5 (period 3-4)			3-17		10.15-11.45		10.15-11.45	
453506.0	Design methods for Energy Efficient Embedded Systems	5	Lafond	36-43	13-15, 115A		13-15, 115A		
453600.0	Special Course in ES: Introduction to Many-Core Programming	5	Lilius	44-51			13-15, 115A	10-12, 115A	
455304.0	Code optimization	5	Aspnäs	Not 2016-2017					

Embedded Computing - Spring 2017									
Code	Course	Credits	Lecturer	Weeks	Time and place				
				Period	Mon	Tue	Wed	Thu	Fri
	Lecture rooms 110A/B, 115A, 332A, 347, K117, K124B, K 126A&B, Aud. XX are in the buildning Agora on the University Hill								
451000.0	Project Course (continues)	10	Björkqvist Neovius Truscan Rönnholm	2-11					8-12, 115A
453502.0	Programming Embedded Systems	5	Björkqvist	2-11	10-12, 110A				
454506.1	Applied Signal Processing, theory	5	Toivonen	2-11		10-12, 115A		13-15, 115A	
454506.2	Applied Signal Processing, laboratory course	4	Björkqvist			13-17, K117			
453503.0	Modeling of Embedded Systems	5	Lafond	2-21			10-12, 110A		
453306.0	Real-Time Systems	5	Lilius Holmbacka	12-21		13-15, 115A			10-12, 115A
453505.0	Multimedia Algorithm Implementation	5	Lilius	12-21	13-17, 115A			10-12, K124B	
Campus map: http://www.abo.fi/public/en/media/2141/campuskartaengelska.pdf									

Study programme in Information Technology, Examination dates 2016-2017

All general exam dates in the IT subjects are listed below. Course exam dates in Computer Science, Software Engineering and Embedded Computing

Registration in MinPlan is required **eight (8)** days before the examination. Examinations are held on Fridays at **12.30-16.30**.
Examinations are held in aud. XXII in the buildning Agora, University Hill (Vattenborgsvägen 5), 20500 Åbo.

Courses that are not included in the list can be taken on general exam dates by agreement with the examiner.
Examination in the summer is held 9.6.2017 and 11.8.2017. Registration is to be submitted to Christel Engblom (cengblom@abo.fi) at least two (2) weeks before the examination.

o= Kurstentamen / Course Exam
x = Allmän tentamen / General Exam
x / o = Kurstentamen och allmän tentamen / Course exam and general exam

		Autumn 2016														Spring 2017																					
Code	Course	09.09	16.09	23.09	30.09	07.10	14.10	21.10	28.10	04.11	11.11	18.11	25.11	02.12	09.12	16.12	13.01	20.01	27.01	03.02	10.02	17.02	24.02	03.03	10.03	17.03	24.03	31.03	07.04	21.04	28.04	05.05	12.05	19.05	02.06
455302.0	Advanced computer graphics and graphic hardware (not held 2016-2017)																																		
456406.0	Advanced text algorithms								o		o							x							x								x		
456313.0	Algoritmer				x						o		o									x								x					
456314.0	Approximation and randomized algorithms (not held 2016-2017)							x																					x						
455304.0	Code Optimization (not held 2016-2017)			x																															
456508.0	Computability and computational complexity (not held 2016-2017)																																		
456402.0	Computational modeling techniques (not held 2016-2017) (not held 2016-2017)																																		
456506.0	Cryptography and Network Security			x									x														o			o		x			
456302.0	Databaser							x					x													o		o				x			
456512.0	Databases 2		x											x										x									o	o
456312.0	Datastrukturer (nya studerande)		x											x					x								o		o						
456311.0	Datornätverk		x												x				x														o		o
456301.0	Datorteknik						x													x														o	o
456400.5	Distributed systems and algorithms (not held 2016-2017)																																		
456516.0	Experimentation in Software Engineering									o		o											x								x			x	
452302.0	Formella språk och automater			x																			x										x/o		o
456404.0	Graph Algorithms (not held 2016-2017)																																		
454300.0	Grundkurs i signalbehandling					x											o				o								x					
456112.0	Grundläggande strukturer							x								o	o						x								x				
271009.0	Ingenjörsmatematik I									o		o								x									x						
400202.0	Ingenjörsmatematik I 4 sp (gamla)				x																	x													
271010.0	Ingenjörsmatematik II															o	o							x							x				

		Autumn 2016														Spring 2017																				
Code	Course	09.09	16.09	23.09	30.09	07.10	14.10	21.10	28.10	04.11	11.11	18.11	25.11	02.12	09.12	16.12	13.01	20.01	27.01	03.02	10.02	17.02	24.02	03.03	10.03	17.03	24.03	31.03	07.04	21.04	28.04	05.05	12.05	19.05	02.06
400203.0	Ingenjörsmatematik II 4 sp (gamla)										x																		x						
456511.0	Introduction to computational and system biology (not held 2016-2017)																																		
455301.0	Introduction to Computer Graphics							x					x														o			o				x	
451303.0	Introduktion till system- och reglerteknik (OBS! Se tentdagar för kemiteknik!)																																		
456316.0	Invariantbaserad programmering				x							x																						o	o
456107.0	Kombinatorik och problemlösning			x												o	o				x									x				
456306.0	Kompilatorteknik					x									x										x								x/o		o
453314.0	Konstruktion av inbyggda datorsystem (has been removed)			x																															
451105.0	Kravhantering av mjukvarusystem			x									x													o			o		x			
456400.8	Local Networks (not held 2016-2017)					x							x						x																
456509.0	Logic for Computer Science						x															x				o		o			x				
456109.0	Logik		x							o		o										x							x						
456405.0	Molecular Computing (not held 2016-2017)																																		
453302.0	Operativsystem					x								x									x			o		o						
456110.0	Programmering I			x					o		o										x									x					
453308.0	Programmering i C/C++		x						o		o								x											x					
456111.0	Programmering II				x										x						o			o							x				
451106.0	Programmering IV								o		o							x						x									x		
452306.0	Programmeringsparadigm							x					x									x									o		o		
453502.0	Programming Embedded Systems					x								x							x					o		o						
452304.0	Programvaruutveckling och -projekt					x																			x								x/o		o
453306.0	Realtidssystem				x						x											x											o		o
456400.9	Reliable Distributed Systems (not held 2016-2017)				x								x					x																	
400201.0	Repetitionskurs i matematik (gammal)										x																		x						
456502.0	Software Architectures (not held 2016-2017)																																		
452502.0	Software Testing		x													o			o						x							x			
456309.0	Specification Methods (not held 2016-2017)							x																											
452307.0	Systemdesign, fortsättningskurs (has been removed)						x																												
456315.0	Tal och sannolikheter						x			x																o		o			x				
400107.0	Tillämpad diskret matematik														o		o									x									
453101.0	Trådlös digital kommunikation (ersätter Digital Television Techniques)							x						x																			x/o		o