



Programme syllabus

Master's Programme, Distributed Computing, 120 credits

Masterprogram, distribuerade system

120.0 credits

Valid for students admitted to the education from autumn 14 (HT - Autumn term; VT - Spring term).

Programme objectives

The program's main area is Distributed Computing which relate to the design and analysis of applications realized on networks of heterogeneous nodes. The goal of education is to give students the understanding and skills needed to participate in development work and research in the area.

After having finished the program a student should:

Knowledge and understanding

show theoretical as well as practical knowledge in how distributed systems are constructed with respect to scalability, reliability and consistency,

show in-depth knowledge in the area of: algorithms, modeling and analysis of distributed systems and,

show insight in current research and development work with in the area.

Skills and abilities

show the ability to develop distributed systems,

show the skill to identify, formulate and handle current and real problems from industry, society and research, with care taken to the possibilities and limitations of the technology,

show the skill to judge the viability of solutions and compare and evaluate alternative solutions,

show skills in performing simulations, technical calculations and analysis of distributed systems,

show skills in gathering and compiling relevant information to gain increased knowledge and support analysis,

show skills, in oral and written form, in English, present and discuss ideas and results and communicate with persons with or without technical-scientific knowledge and,

show skills to efficiently work in group and to plan and pursue a project within given limitations.

Ability to judgements and adopt a standpoint

show the ability to within the main area of the education do judgement taking into account relevant scientific, social and ethical aspects and to show awareness of ethical aspects in research and development,

show insight in the possibilities and limitations of science, its role in society and peoples responsibility in how it is used and,

show ability to identify his or her needs of additional knowledge and take responsibility for his or her advancement in knowledge.

Extent and content of the programme

The master program is a Erasmus Mundus program named "European Master in Distributed Computing". The program is a collaboration between:

Royal Institute of Technology – KTH

Universitat Politècnica de Catalunya – UPC

Instituto Superior Técnico - IST

Above mentioned universities have in a consortium agreement decided to jointly control and deliver the program. The above mentioned universities will below be called "participating universities" and the collaboration "the consortium"

Students enrolled in the Erasmus Mundus program will conduct their studies at two of the participating universities and will thereby obtain a dual degree. First years studies are done at either UPC or IST and the third semester at KTH. Concluding thesis project is performed at the students original place of study or at KTH-

The study period is 2 years, that is 120 ECTS on advanced level. The language of the education is English.

Eligibility and selection

The requirements to be eligible to the program are, in addition to the general requirements at KTH, the following special requirements:

The degree of the bachelor should be Computer Science or equivalent. Excellent grades from courses in operating systems, networking, programming languages, computer architectures and theory of computing.

Evidence of English proficiency equivalent to

TOEFL paper based test, total of 575, 4.5 writing section

TOEFL internet based test, total of 90, 20 writing section

IELTS score of at least 6.5, no band lower than 5.5 (only academic training accepted) or Cambridge Grade C.

The selection process is performed by the consortium and follows the rules that apply to selection to programs at KTH.

Implementation of the education

Structure of the education

The education at the participating universities is conducted according to local rules and regulations.

The third semester follows the two period semester scheme adopted at KTH but courses will also span two periods in length and then only have one examination period at the end of the second period.

Courses

The programme is course-based. Lists of courses are included in [appendix 1](#).

Grading system

Courses in the first and the second cycle are graded on a scale from A to F. A-E are passing grades, A is the highest grade. The grades pass (P) and fail (F) are used for courses under certain circumstances.

For courses given by KTH and IST a seven level scale A-F, where A-E is passed, is used. Courses may also use the grades passed (P) or failed (F).

UPC uses a grading scale from 0 to 10 where the following conversion table will be used:

UPC	ECTS
9.5 – 10.0	A
8.5 – 9.4	B
7.0 – 8.4	C
6.0 – 6.9	D
5.0 – 5.9	E
-4.9	F

Conditions for participation in the programme

For participation in the program local rules at the participating universities apply.

For the selection of courses and the conditions local rules at the participating universities apply.

For course enrolment local rules at the participating universities apply

Recognition of previous academic studies

For recognition of previous academic studies local rules at the participating universities apply with the amendment that whole courses must be approved by the consortium.

Degree project

For degree projects local rules at the participating universities apply. The degree project is examined at one university only. Representatives from the university giving the double degree should be invited to the examination of the student.

Degree

Degree after having finished the program is:

Teknologie Masterexamen

Master of Science (Two Years)

The procedure to apply for the exam is given by the local rules at the participating universities.

[Appendix 1 - Course list](#)

[Appendix 2 - Programme syllabus descriptions](#)



Appendix 1: Course list

Master's Programme, Distributed Computing, 120 credits (TDISM), Programme syllabus for studies starting in autumn 2014

General courses

Year 1

Supplementary information

Courses given at UPC during the first year

First semester

<i>Mandatory courses:</i>	30 ECTS
Distribute and Networked Systems	6
Security in Information Technology Systems	6
Parallel Programming Models and Algorithms	6
Performance Tuning and Analysis Tools	6
Concurrent and Distributed Programming	6

Second semester

<i>Elective courses equivalent to:</i>	30 ECTS
Execution Environments for Distributed Computing	6
Decentralized Systems	6
Scalable Distributed Systems	6
Measurement Tools and Techniques	6
Mathematical Concepts Applied to Computer Networks	6
Internet and Multimedia Application Protocols	6

Courses given at IST during the first year

First semester

<i>Mandatory courses:</i>	30 ECTS
Middleware for Distributed Internet Applications	7.5
Network and Computer Security	7.5
Peer-to-Peer Systems and Overlay Networks	7.5
Parallel and Distributed Computing	7.5

Second semester

<i>Elective courses equivalent to:</i>	30 ECTS
Fault-Tolerant Distributed Systems	7.5
Cloud Computing	7.5
Virtual Execution Environments	7.5
Mobile Computing	7.5
Applications and Implementations of Cryptographic Algorithms	7.5
Database Administration and Tuning	7.5

Year 2

Mandatory courses (60.0 credits)

Course code	Course name	Credits	Edu. level
IC2002	Philosophy of Science	7.5	Second cycle
ID2219	Implementation of Distributed Systems	7.5	Second cycle
ID2220	Advanced Topics in Distributed Systems	7.5	Second cycle
II221X	Degree Project in Information and Software Systems, Second Cycle	30.0	Second cycle
LS2439	English for Writing and Presenting a Degree Project in Science and Engineering	7.5	Second cycle



Appendix 2: Specialisations

Master's Programme, Distributed Computing, 120 credits (TDISM), Programme syllabus for studies starting in autumn 2014

This programme has no specialisations.