Blekinge Institute of Technology
Department of Computer Science

COURSE SYLLABUS

Introduktion till Cloud Computing

Introduction to Cloud Computing

7,5 ECTS credit points (7,5 högskolepoäng)

Course code: DV1566
Educational level: First cycle
Course level: G2F
Field of education: Technology
Subject group: Computer Technology

Subject area: Computer Science
Version: 5
Applies from: 2017-08-01
Approved: 2017-03-01

1 Course title and credit points
The course is titled Introduction to Cloud Computing/Introduktion till Cloud Computing and awards 7,5 ECTS credits. One credit point (högskolepoäng) corresponds to one credit point in the European Credit Transfer System (ECTS).

2 Decision and approval
This course is established by Dean 2017-02-21. The course syllabus was revised by Head of Department of Computer Science and Engineering and applies from 2017-08-01.
Reg.no: BTH-4.1.1-0216-2017.
Replaces: DV1562.

3 Objectives
The purpose of the course is to give students the basic concepts of distributed systems and cloud computing. The course cover theoretical and practical aspects with a focus on real examples. At the end of the course students are supposed to be capable to chose, setup and use basic cloud resources (e.g. computing and storage as a service) and to design and deploy scalable architectures and elastic applications.

4 Content
The course will cover the topics that follow.
(1) Introduction to distributed sytems: Client-Server multilayer architectures; P2P architectures
(2) Introduction to Cloud Computing: Origins and motivations, Service models, Deployment models, Elasticity, Scalability, SLA, Cloud Applications.
(3) Virtualization: Virtualization, Paravirtualization, O.S. Level Virtualization (docker containers), Memory Virtualization, Storage Virtualization, VM migration.
(4) Communication in distributed systems: RPC, Java RMI, Streaming, Multicast, …
(5) Cloud data storage systems: an overview on systems such as Amazon Dynamo DB, Google File System, Cassandra
(6) Data Intensive computing: basic concepts of Map-reduce paradigm and stream processing paradigms
The course foreseen practical exercices (2 labs and 1 Projects) to experience the to use virtualized environments at infrastructure and platform layer. Labs and project will require the use of the amazon web service platform.

5 Aims and learning outcomes
Knowledge and understanding
On completion of the course the student will:
•be able to describe and explain the general concept related to distributed systems
•be able to describe and explain the concept of resource virtualization
•be able to describe and explain the general concept of cloud computing.
Skills and abilities
On completion of the course the student will:
•be able to write and present laboratory results in a short report
•be able to select, to configure and to run/launch cloud resources by using management GUI and API offered by IaaS providers
•be able to configure elastic infrastructure and to deploy elastic applications.
Approach and ability to evaluate
On completion of the course, the student will:
•be aware of the main service and deployment model for cloud computing
•be aware of the main type and models for virtualization
•be aware of the main cloud computing technologies
•be able to compare different cloud services/solutions and technologies.

6 Learning and teaching
The theoretical basics in the course is presented in

lectures and / or exercises. The student is also expected to independently gain theoretical knowledge through independent study of relevant literature. Theoretical knowledge is then applied practical both in teacher-led mandatory laboratory exercises and partly in project assignments carried out individually or in groups within a given time frame.
English

7 Assessment and grading
Examination of the course

Code	Module	Credit	Grade
1710	Written exam	2 ECTS	A-F
1720	Laboratory 1	1.5 ECTS	G-U
1730	Laboratory 2	1.5 ECTS	G-U
1740	Project	2.5 ECTS	A-F

The course will be graded A Excellent, B Very good, C Good, D Satisfactory, E Sufficient, FX Fail, supplementation required, F Fail.The final grade for the course is determined as an average of the grades obtained in the Project and in the Exam. The final grade will only be issued when all components have been approved.

8 Course evaluation
The course coordinator is responsible for systematically gathering feedback from the students in course evaluations and making sure that the results of these feed back into the development of the course.

9 Prerequisites
Admission to the course requires completed course in Programming, 15 ECTS credits and Datastructures and Algorithms, 6 ECTS credits and operatingsystems 6 ECTS credits.

10 Field of education and subject area
The course is part of the field of education and is included in the subject area Computer Science.

11 Restrictions regarding degree
The course cannot form part of a degree with another course, the content of which completely or partly corresponds with the contents of this course.

12 Course literature and other teaching material
Main literature
Cloud Computing: Concepts, Technology & Architecture, Thomas Erl, Ricardo Puttini, Zaigham Mahmood, 2013, Prentice-Hall, ISBN: 9780133387520.
Reference literature
Mastering Cloud Computing: Foundations and Applications Programming Buyya, Rajkumar / Vecchiola, Christian / Selvi, 2013 ISBN13: 9780124114548.
Distributed and Cloud Computing: From Parallel Processing to the Internet of Things Hwang, Kai / Dongarra, Jack / Fox, Geoffrey C. , 2011 ISBN13: 9780123858801.
Cloud Computing: Principles and Paradigms, Rajkumar Buyya; James Broberg; Andrzej Goscinski, John Wiley & Sons, 2011, ISBN: 978-0-470-88799-8.
Dan Marinescu, Cloud Computing: Theory and Practice, Morgan Kaufmann, 2013.
Andrew S. Tanenbaum and Maarten van Steen, Distributed Systems: Principles and Paradigms - 2nd Edition, Pearson-Prentice Hall, 2007. ISBN13: 9780132392273.
For the labs and the final project will be used resources obtained joining the AWS learning program as BTH student member. This is for free, but require the use of a valid credit card number.
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