



## COURSE SYLLABUS

# Cloud Computing and Data Analytics, 6 credits

*Cloud Computing and Data Analytics, 6 högskolepoäng*

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<b>Course Code:</b>	TCCR26	<b>Education Cycle:</b>	Second-cycle level
<b>Confirmed by:</b>	Dean Mar 1, 2016	<b>Disciplinary domain:</b>	Technology (95%) and social sciences (5%)
<b>Valid From:</b>	Aug 1, 2016	<b>Subject group:</b>	DT1
<b>Version:</b>	1	<b>Specialised in:</b>	A1N
<b>Reg number:</b>	JTH 2016/1165-313	<b>Main field of study:</b>	Informatics

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- display knowledge of cloud-based architectures and cloud services
- display knowledge of the basic MapReduce framework, especially Hadoop
- display knowledge of the fundamental tasks in data mining, i.e., classification, regression, clustering and association rules
- display knowledge of the phases in a data analysis project, i.e. preprocessing, modeling and evaluation
- show familiarity with key research directions in data mining and machine learning

Skills and abilities

- demonstrate the ability to use a software tool for all parts of a data analysis project; i.e., preprocessing, modeling and evaluation
- demonstrate the ability to identify and apply a suitable technique based on a problem description

Judgement and approach

- demonstrate an understanding of how data analysis can be used as a tool in to support business and technical decision-making

### Contents

The exponential growth of the digital universe, particularly in the form of storage and computing power in recent decades, enables companies to accumulate huge amounts of data at moderate cost. Accompanying this technological shift is a widespread realization that collected data contain potentially valuable information. Exploiting this stored data, in order to extract useful and actionable information, is the overall goal of the generic activity termed data analytics. The course includes the following elements:

- Basics of cloud architecture,
- Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS)

- The MapReduce framework, especially Hadoop
- Fundamental tasks in data mining, i.e., classification, regression, clustering and association rules
- Basic machine learning techniques for classification, regression, clustering and association rules
- Organization of a data mining project, i.e., preprocessing, modeling and evaluation
- Software tools for data analytics
- Data analytics applied in different business domains
- Research directions in data mining and machine learning

### Type of instruction

The course consists of lectures, seminars and assignments with tutoring.

The teaching is conducted in English.

### Prerequisites

The applicant must hold the minimum of a bachelor's degree (ie. the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits within the major subject in Computer Engineering, Electrical Engineering (with relevant courses in Computer Engineering), Informatics, Computer Science, Interaction Design (with relevant courses in web programming) or equivalent. Proof of English proficiency is required (or the equivalent).

### Examination and grades

The course is graded 5,4,3 or Fail.

The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Written examination <sup>†</sup>	3 credits	5/4/3/U
Laboratory work	3 credits	U/G

<sup>†</sup> Determines the final grade of the course, which is issued only when all course units have been passed.

### Course literature

Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS) by Michael J Kavis, 2014.

Tan, Steinbach & Kumar (2005), Introduction to Data Mining, ISBN: 978-0321321367, Pearson  
Linoff & Berry (2011), Data Mining Techniques: For Marketing, Sales, and Customer Relationship Management, 3rd edition, ISBN:978-0470650936, Wiley.

The literature list for the course will be provided one month before the course starts.