Aalto University

Module on Analytics and Data Science

Name: Analytics and data science
Department: T3060
Module code: T280-C
Level: C-module (master's level studies)
Language: English
Extent of the module:

> 22 cr for students of the schools of technology at Aalto
> 24 cr for students of BIZ and ARTS

Responsible professors:

Associate professor Aristides Gionis ICS/SCI
Assistant professor Pekka Malo ISE/BIZ

Background

We live in the information age, where a deluge of data is being generated by human activity, scientific data collection processes, business transactions, and adoption of new technologies. Distilling the knowledge contained in such big volumes of data has the potential to transform science, technology, business, and arts, and it can revolutionize how the human society is organized and how it functions. Data science is a new discipline that has emerged and it has the objective to provide the underlying theory and the necessary tools to cope with the data revolution. The goal of the Analytics and data science module in Aalto is to educate students on how to become proficient in making sense of such big data, and how to apply data analysis skills on their domain of expertise.

Module description and target students

The Analytics and data science module is a Master-level module. It is targeted to all Aalto Master students, from all schools, who want to sharpen their data analysis skills and be educated on how data science methods are applied in different domains. The extent of the module is 22 or 24 ECTS according to student's degree requirements. Depending on the student's degree structure the module can be included as part of the master's degree as a personal special module (students of the schools of technology at Aalto) or as a minor subject (students of Aalto BIZ and Aalto ARTS). The module is structured in four subareas, and students need to complete courses from different subareas, as indicated in the course description below.

Prerequisites

There are no prerequisites for the module. However, many of the courses may have certain prerequisites. The prerequisites can be checked in the course descriptions; if in doubt, please consult the teacher of the course.

Enrollment:

If you are interested in taking the module, please contact the planning officer of the Degree Programme in CSE (https://into.aalto.fi/display/entik/Contact+information). The student needs to have confirmed her/his personal study plan (HOPS) before enrolling to the module.

Courses

The module is composed of elective courses on four subareas:

SF: Statistical foundations
CM: Computational methods
BA: Business analytics
AP: Applications

The specific courses, listed by subarea are the following:

SUBAREA CODE	CODE	COURSE	CREDITS	PERIOD
Compulsory course				
	ICS- E4010	Introduction to Analytics and Data Science	2	I
At least one course from the SF subarea:				
SF	Becs-114.1311	Introduction to Bayesian Statistics	3	III
SF	Becs-114.2601	Bayesian Modeling	5	I-II
SF	MS-C2104	Introduction to Statistical Inference (in Finnish only)	5	III-IV
SF	MS-C2128	Prediction and Time Series Analysis (in Finnish only)*	5	II
SF	30E00800	Time Series Analysis*	6	IV-V
At least one course from the CM subarea:				
CM	T-61.3050	Machine Learning: Basic Principles	5	I
CM	T-61.5060	Algorithmic Methods of Data Mining	5	I-II
CM	T-61.5010	Information Visualization	5	III
CM	CSE-E5430	Scalable Cloud Computing	5	I-II
CM	T-110.5121	Mobile Cloud Computing	5	I-II
Select at least one from the following:				
BA	Mat-2.3134	Decision Making and Problem Solving	5	I
BA	23E47000	Digital Marketing	6	I, V
BA	30E03000	Data science for Business	6	III
BA	37E01600	Data Resources Management	6	III
BA	57E00500	Capstone: Business Intelligence	6	I
AP	Becs-114.4150	Complex Networks	3-6	II
AP	Becs-E4101	Mathematical Modeling of Social Dynamics	3-6	II (2015)
AP	Maa-123.3585	Spatial Data Mining	3-5	V
AP	Maa-123.3530	Visual Analysis	4	II
AP	Mat-2.2103	Design of Experiments and Statistical Models (in Finnish only)	5	III
AP	Mat-2.4177	Seminar on Case Studies in Operation Research (in Finnish only)	5	III-IV
AP	S-89.5150	Speech Recognition	5	II

*The courses MS-C2128 and 30E00800 are alternative, i.e. student can include only one in the degree.

Some courses in the list above have space for only a limited number of students. If you are not admitted to a course, you will have to choose another course.

New course:

ICS- E4010 Introduction to Analytics and Data Science

Extent: 2 cr
Teaching period: I
Language of instruction: English

Grading scale: pass/fail
Content varies: no
Valid for post-graduate studies: no
Responsible teacher: Aristides Gionis