



**LUND**  
UNIVERSITY

School of Economics and Management

## **DABN14, Data Analytics and Business Economics: Advanced Machine Learning, 7.5 credits**

*Dataanalys och ekonomi: Avancerad maskininlärning, 7,5  
högskolepoäng*  
Second Cycle / Avancerad nivå

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### **Details of approval**

The syllabus is an old version, approved by The Board of the Department of Economics on 2020-09-15 and was valid from 2020-09-15, autumn semester 2020.

### **General Information**

This is a single subject master course in data analytics and business economics. The course is mandatory in the master programme Data Analytics and Business Economics. The course is optional within a number of master programmes at Lund University.

(Teaching may be in Swedish if all registered students have a good knowledge of Swedish.)

*Main field of studies*

Data Analytics and Business Economics

*Depth of study relative to the degree requirements*

A1F, Second cycle, has second-cycle course/s as entry requirements

### **Learning outcomes**

#### **Knowledge and understanding**

Students shall have an understanding of:

- bootstrap methods,
- classification and regression trees,
- ensemble methods,
- unsupervised learning methods,
- applications of machine learning to problems that are relevant in business and economics.

## Competence and skills

Students shall have the ability to independently:

- apply the methods covered using the R software package,
- appropriately choose between a set of methods for a given empirical problem,
- evaluate the suitability of the chosen method,
- generalise their knowledge to empirical problems that have not been treated during the course,
- draw conclusions from empirical results and provide advice.

## Judgement and approach

Students shall have developed the ability to pursue further studies in the subject and should be able to search for and evaluate subject related information with a high degree of independence. Students shall also have developed the ability to write an empirical report where machine learning is an essential element.

## Course content

This course covers advanced machine learning methods that are relevant for applications in business and economics, and is intended as a continuation of Machine Learning from a Regression Perspective. Some of the topics covered include bootstrapping, ensemble methods such as boosting and random forests, unsupervised machine learning methods such as principal components analysis and clustering algorithms as well as applications of machine learning methods to problems that are relevant for business and economics, such as causal inference and text analysis. Theoretical studies are interwoven with empirical applications to problems in business and economics, which are carried out using the R software.

## Course design

1. Teaching: Teaching consists of lectures and exercises.

## Assessment

1. Examination: The examination consists of a written exam and home assignments. The written exam takes place at the end of the course. There will be further opportunities for examination close to this date. Points gained on the home assignments count at exams during the current term. Other forms of examination may be used to a limited extent.

2. Limitations on the number of examination opportunities: –

The University views plagiarism and other academic dishonesty very seriously, and will take disciplinary action against students for any kind of attempted malpractice in connection with examinations and assessments. Plagiarism is considered to be a very serious academic offence. The penalty that may be imposed for this, and other unfair practices in examinations or assessments, includes suspension from the University for a specified period.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

*Subcourses that are part of this course can be found in an appendix at the end of this document.*

## **Grades**

Marking scale: Fail, E, D, C, B, A.

### 1. Grading:

A (Excellent) A distinguished result that is excellent with regard to theoretical depth, practical relevance, analytical ability, and independent thought.

B (Very good) A very good result with regard to the above-mentioned aspects.

C (Good) The result is of a good standard with regard to the above-mentioned aspects and lives up to expectations.

D (Satisfactory) The result is of a satisfactory standard with regard to the above-mentioned aspects and lives up to expectations.

E (Sufficient) The result satisfies the minimum requirements with regard to the above-mentioned aspects, but not more.

F (Fail) The result does not meet the minimum requirements with regard the above-mentioned aspects.

To pass the course, the student must have been awarded the grade of E or higher.

2. Weighting grades from different parts of the course: –

3. Grading scales for different parts of the course: –

## **Entry requirements**

Students admitted to the master programme Data Analytics and Business Economics are eligible for this course. Students admitted to the Master Programmes in Economics with at least 30 ECTS-credits in economics at the advanced level including Advanced Econometrics and Machine Learning from a Regression Perspective are eligible for the course. For other students, a Bachelor degree including at least 30 ECTS-credits in statistics of which 7.5 ECTS-credits in econometrics or regression analysis, and Machine Learning from a Regression Perspective, or a Bachelor degree in economics or business administration and at least 15 ECTS-credits in statistics of which 7.5 ECTS in econometrics or regression analysis, and Machine Learning from a Regression Perspective.

## **Further information**

1. Transitional regulations: –

2. Limitations in the period of validity: –

3. Limitations: –

4. Similar courses: –

5. Limitations in renewed examination: –

Subcourses in DABN14, Data Analytics and Business Economics:  
Advanced Machine Learning

Applies from H21

2101 Advanced Machine Learning, 7,5 hp  
Grading scale: Fail, E, D, C, B, A