

Course Descriptions NonDegree 2017-2018

Course Title Descriptive and Predictive Analytics
 Course Code EBC4222
 ECTS Credits 5,0
 Assessment Whole/Half Grades

Period	Start	End	Mon	Tue	Wed	Thu	Fri
4	5-2-2018	6-4-2018		X			X

Level Advanced
 Coordinator Nalan Bastürk For more information:n.basturk@maastrichtuniversity.nl
 Language of instruction
 Goals

The course aims to introduce advanced probabilistic models and statistical techniques for descriptive and predictive analytics for business cases. Time series models, discrete choice models and panel data models constitute the core of the probabilistic and statistical techniques introduced in the course.
 After successfully finishing this course, you will be able to:
 * Use several statistical and econometric models for time series data, discrete choice data and panel data.
 * Evaluate the applicability of different econometric models for a given business problem.
 * Translate business problems to canonical time series, discrete choice or panel data models.
 * Understand and use fundamental concepts of hypothesis testing and model comparison in analyzing business data.
 * Apply time series, discrete choice and panel data models for describing and summarizing business data and for evaluating the potential future outcomes in a business problem.
 * Interpret and communicate the numerical results of time series, discrete choice and panel data models in a business context.

Description Descriptive and predictive analytics tools are used in several application areas for explaining and forecasting data patterns such as purchasing patterns of customers, credit payments of individuals, planning of operations and inventory levels where data patterns are linked to potential causal factors, including time. The methods and techniques covered in this course are particularly relevant for business applications where data are collected over time and/or the data represent choices from multiple alternatives. In addition, when multiple cross-sectional instances of the same phenomena – e.g. from different individuals, customers, companies or inventory locations – are observed over time, panel data models covered in this course allow for characterizing individual patterns as well as data patterns over time to improve data description and prediction. Such time-dependence and cross-sectional dependence in data are not accounted for in conventional data analysis methods, hence the course provides advanced knowledge in data analysis. This course specifically aims to provide hands-on experience in using these statistical models in business cases.

Literature Instructor's slides
 * Shumway, R. H., & Stoffer, D. S. (2010). Time series analysis and its applications: with R examples. 2nd Edition. Springer New York. Chapters 1-3.
 * Train, K. E. (2009). Discrete choice methods with simulation. 2nd Edition. Cambridge University Press. Chapters 2-4.
 * Croissant, Y. (2012). Estimation of multinomial logit models in R: The mlogit Packages. R package version 0.2-2. URL: <http://cran.r-project.org/web/packages/mlogit/vignettes/mlogit.pdf>.
 * Croissant, Y., & Millo, G. (2008). Panel data econometrics in R: The plm package. Journal of Statistical Software, 27(2), 1-43.
 * Pfaff, B. (2008). VAR, SVAR and SVEC models: Implementation within R package vars. Journal of Statistical Software, 27(4), 1-32.
 * Rossi, P., & McCulloch, R. (2010). Bayesm: Bayesian inference for marketing/micro-econometrics. R package version, 2, 357-365.

Prerequisites Business Analytics (2017-100-EBC4220). Recommended background knowledge includes statistics, econometrics, probability theory and elementary programming skills.

Keywords
 Teaching methods PBL / Presentation
 Assessment methods Participation

Evaluation in previous academic year For the complete evaluation of this course please click <http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM>

This course belongs to the following programme / specialisation

MSc Business Intelligence and Smart Services	No specialisation
MSc Business Intelligence and Smart Services	Specialisation Courses Analytics
SBE Non Degree Courses	No specialisation