## COURSE DESCRIPTION

<table>
<thead>
<tr>
<th>University:</th>
<th>Comenius University in Bratislava</th>
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<tr>
<td>Faculty:</td>
<td>Faculty of Management</td>
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<tr>
<td>Course ID:</td>
<td>FM.KIS/086AM/16</td>
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<tr>
<td>Course title:</td>
<td>Modeling of Economic Processes</td>
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### Educational activities:
**Type of activities:** lecture / seminar  
**Number of hours:**  
  - per week: 2 / 2  
  - per level/semester: 28 / 28  
**Form of the course:** on-site learning

### Number of credits: 6

### Recommended semester:

### Educational level: I., II.

### Prerequisites:

### Course requirements:

#### Attendance
Attendance of the seminars is absolutely necessary. In case of illness student must immediately notify me (the student must notify me about the absence prior to the seminar via e-mail). The student will get alternative assignment, which compensates the absence.

#### Homework
Some weeks you will have an assignment that is designed to assess your mastery of the topics and techniques covered the previous week(s) and provide feedback to improve your understanding of the material. You may work with your colleagues to figure out the underlying concepts and problem solving processes, but you are expected to work individually to answer the specific problems that are assigned. Completed assignments will be submitted in electronic form. Timely submission of the completed assignments is essential. The due date of each assignment will be stated clearly in the assignment description.

#### Group Project
In groups of 2 or 3 (the groups must be mixed in each group of two or three persons there must be at least one Slovak student and one incoming Erasmus student) you will prepare project that can be either a report or a research paper. Additional details about the project you can discuss in class.

#### Exams
There will be a midterm test (10pts) and a final test (20pts) (final test will be in that case during the examination period) or one longer test (30pts) at the end of the semester. These exams provide an opportunity for you to test your understanding of the techniques, processes, and problems associated with analyzing data for use in individual and organization decision making.

### Scale of assessment (preliminary/final): 1. Developing a group project. 2. Active participation in the exercises (Homework: solving problems and exercises with options). 3. Class attendance: The base is plus 2 points. If the student does not attend lecture and seminar, on a given week, it is counted minus one point (so the number of negative points can reach -10 points or even -11 or -12 depending on the number of seminars in the semester). 4. Exams: Midterm (10pts), Final (10pts) (or alternatively only one longer final test (20pts)). Altogether the student must collect during the semester minimum 30points in order to be admitted to the exam. 5. The project: The project should be sent electronically as a Wolfram Mathematica notebook files, if necessary accompanied by a
MS Word document (files should be clearly named: FirstName_LastName_MEP.docx, etc. to teacher's e-mail address not later than the date agreed upon on the first lecture. The data must accompany the previous files in a separate file, too. The document file must contain the detailed explanation the goal of the project, where the data come from, data structure and also it should be explained in sufficiently clearly the method of solution and the process of solution. The project evaluation will be sent to the student onto the faculty e-mail address or discussed directly during the examination. 6. The oral examination and presentation of the project (15Pts).

**Learning outcomes:**
The course cover mainly financial time series as an important topic for managers from econometrics. It provides tools for empirical work with time series data and is an introduction into the theoretical foundation of time series models. Much of statistical methodology is concerned with models in which the observations are assumed to be independent. However, many data sets occur in the form of time series where observations are dependent. In this course, we will concentrate on both univariate and multivariate time series analysis, with a balance between theory and applications. Students expected to prepare a project report on real life data. After completing this course, a student will be able to analyze univariate and multivariate time series data using available software as well as pursue research in this area. In order to emphasize application of theory to real (or simulated) data, we will use Wolfram Mathematica.

**Class syllabus:**
1. Introduction to time series modeling, decomposition of time series, trend analysis regression methods, global and adaptive approach
2. Practical analysis
3. Simple exponential smoothing. The seasonal component of time series
4. Practical analysis
5. ARIMA models. Autocorrelation properties of time series, identification of the AR, I, MA component of the model
6. Practical analysis
7. ARIMA models. Autocorrelation properties of time series, verification of the model, seasonal models
8. Capital Asset Pricing Model (CAPM)
9. Practical analysis
11. Practical analysis
12. Option strategies
13. Practical analysis

**Recommended literature:**
6. Hull: Options, Futures, and Other Derivatives, Prentice Hall

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 35

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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>FX</th>
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<td>8,57</td>
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Lecturers: prof. RNDr. Michal Greguš, PhD., Ing. Rastislav Kulhánek, PhD.

Last change: 05.10.2019

Approved by: