

## FUC - Ficha de Unidade Curricular

### Curricular Unit's File

<b>Code</b>	L0109
<b>Name (PT)</b>	Métodos de Previsão
<b>Name (EN)</b>	Forecasting Methods
<b>Regime</b>	Semestral
<b>Level</b>	1.º Ciclo
<b>Teaching language</b>	Inglês
<b>School</b>	Escola de Gestão (EG)
<b>Departament</b>	DMQGE
<b>Scientific area</b>	Estatística e Análise de Dados (EAD)
<b>Responsible academic staff</b>	José Manuel Gonçalves Dias
<b>Pre-requisites</b>	Basic statistics
<b>Objectives</b>	The main purpose is to gain knowledge and experience in order to obtain good quality forecasts for cross-section and time series data (univariate and multivariate).
<b>Learning outcomes</b>	<ol style="list-style-type: none"> <li>1. To give a general overview of the different forecasting methods and techniques and of their use and limits (LG1).</li> <li>2. To identify the needs for forecasting in Management and Business and the way the forecasts can be obtained, matching the method to the situation.</li> <li>3. To obtain the required capability to apply the forecasting methods and techniques (linear regression, decomposition and smoothing models, ARMA/ARIMA) and evaluate the results.</li> <li>4. To gain familiarity with some statistical software packages (EXCEL, SPSS, and MATLAB).</li> </ol> <p>All classes will be held at the computer classroom.</p>
<b>Syllabus</b>	<ol style="list-style-type: none"> <li>1. Introduction             <ol style="list-style-type: none"> <li>1.1 Forecasting needs and the importance of forecasting in the enterprise.</li> <li>1.2 The different forecasting methods.</li> <li>1.3 Choosing a forecasting method. Guidelines.</li> </ol> </li> <li>2. Causal models             <ol style="list-style-type: none"> <li>2.1 The classical model of linear regression.</li> <li>2.2 Extensions of the classical model. Violation of the basic assumptions - heteroscedasticity, autocorrelation and multicollinearity.</li> <li>2.3 Other topics: Dummy variables, nonlinear models, information criteria: AIC and SBC, Wald, Likelihood ratio and Lagrange Multiplier tests</li> </ol> </li> <li>3. Time Series models             <ol style="list-style-type: none"> <li>3.1 Decomposition methods.</li> <li>3.2 Smoothing methods.</li> <li>3.3 Auto-regressive and moving average models. The Box-Jenkins methodology.</li> </ol> </li> </ol>
<b>Assessment</b>	<p>Continuous evaluation includes:</p> <ul style="list-style-type: none"> <li>- a written individual test (35%);</li> <li>- an individual report (35%);</li> <li>- a group (3 or 4 elements) coursework (30%).</li> </ul> <p>Continuous evaluation requires an attendance of at least 80% of classes. Approval means a final average grade equal or more than 10, provided that they did not had a grade lower than 7.5 in exam.</p> <p>The evaluation can be made through a final examination. Students that obtain a grade between 7.5 and 9.5 can undergo an oral examination to pass.</p>

<b>Teaching methodology</b>	<p>During the learning-teaching term each student should acquire analytical, information gathering, written and oral communication skills, according to the established learning outcomes for this unit.          To contribute to the acquisition of these skills the following learning methodologies (LM) will be used:</p> <ol style="list-style-type: none"> <li>1. Expository</li> <li>2. Participative</li> <li>3. Active</li> <li>4. Experimental laboratory</li> <li>5. Self-study</li> </ol>
<b>Demonstration of the syllabus coherence with the curricular unit's objectives</b>	<p>This "demonstration of consistency" stems from the interconnection of the syllabus with learning goals (LG) and is explained as follows:</p> <p>LG1 ? Introduction to forecasting methods: Syllabus points: 1.1 to 1.3          LG2 ? Linear Regression models: Syllabus points: 2.1 to 2.3          LG3 ? Introduction to time series models (decomposition and smoothing): Syllabus points: 3.1 to 3.2          LG4 ? ARMA/ARIMA models: Syllabus points: 3.3          LG5 ? All</p>
<b>Demonstration of the coherence between the teaching methodologies and the learning outcomes</b>	<p>The learning-teaching methodologies are aimed at the development of the students' main learning competences that allow to fulfill each of the learning goals, therefore, in the grid below, it is presented the main interlinks between the learning-teaching methodologies and the respective goals.</p> <p>Learning-Teaching Methodologies(LTM) / Learning Goal (LG)</p> <ol style="list-style-type: none"> <li>1. Expository, to the presentation of the theoretical reference frames / All</li> <li>2. Participative, with analysis and resolution of application exercises / LG2 to LG4.</li> <li>3. Active, with the realization of group works. / LG2 to LG4</li> <li>4. Experimental laboratory, with development and operation of computer models / LG2 to LG4.</li> <li>5. Self-study, related with autonomous work by the student, as is contemplated in the Class Planning. / All</li> </ol>
<b>Main Bibliography</b>	
<b>Complementary Bibliography</b>	