# COURSE DESCRIPTION CARD - SYLLABUS

Course name
Economics Forecasting [S1Log2>PG]

## Course

Field of study
Logistics

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

## Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

## Number of credit points
2,00

## Coordinators

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## Lecturers

## Prerequisites

Student knows basics of statistics.

## Course objective

To teach student with terms of forecasting and rules of descriptive and mathematical statistics applied to time series analysis, extrapolation in logistic planning.

## Course-related learning outcomes

Knowledge:
1. Student knows terms of forecasting theory (forecast, error, feasibility and accuracy) and terms of econometric model, goodness of fit and significance [P6S_WG_04]
2. Student knows ordinary and general least squares methods (OLS and GLS) of data analysis [P6S_WG_04]
3. Student knows time series components: sample average, moving average, random component [P6S_WG_04]
4. Student knows methods of seasonal components and factors estimation [P6S_WK_08]
5. Student knows forecasting rules and forecast verification, and typical implementations in logistics.

Knows how calculate safety stock quantity to ensure given level of demand quantity satisfaction [P6S_WK_08]

Skills:
1. Student can estimate a model using OLS and GLS methods also with usage of Excel and GRETL [P6S_UW_02]
2. Student assess statistical significancy and the fitness of model to data [P6S_UW_03]
3. Estimates error of forecast ex ante and ex post [P6S_UO_02]
4. Student can use econometric modeling and forecasting in logistics with appropriate statistical methods, taking into account new advances in economics and logistics [P6S_UO_02; P6S_UU_01]

Social competences:
1. Student is concious about forecasting role and meaning in logistics [P6S_KO_01-02]
2. Student is ready to work in forecasting field projects and teams [P6S_KR_02]

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Partial and final grades at lecture based on mid-semester test including closed questions answering and short tasks solving. Each final grade has pass threshold of 60% of all complementing points.
Tutorial: Partial grade at tutorial: 1. tasks of model fitness to data measuring, forecasting errors calculus and of data deflating in Excel and 2. analysing case of modeling and forecasting of time series including seasonal effects. Final grade (pass) results from sum of points from activities (1-2).

## Programme content

The course of econimics forecasting starts with theory especially error term and measure. Introduces graphical and statistical analyzys of time series data and finishes with model applications: trend, seasonality, average, autoregression and moving average. An instructor presents e service level inventory concept.

## Course topics

Lecture: Forecasting theory. Terms, forecast, simulation, forecasting process, error, accuracy. Forecasting software. Functionality and examples. Analysis of time series and choice of an appropriate model. Stationary series forecasting: average, autoregression, seasonal fixed effects. Trends. Linear and non-linear. Residuals autocorrelation. Smoothing models: Brown's, Holt's and Winters'. Simulation of a level of stocks with a given level of demand satisfing.
Tutorial: Analyzes and tasks with the use of theories and methods discussed in the lecture.

## Teaching methods

Lecture: case study and theory review.
Tutorial: case study, project task.

## Bibliography

Basic:
1. Cieślak M. (red.), Prognozowanie gospodarcze. Metody i zastosowania, Wydawnictwo Naukowe PWN, Warszawa 2002.
2. Dittmann P., Prognozowanie w przedsiębiorstwie, PWE, Warszawa 2003.
3. Kufel T., Ekonometria. Rozwiązywanie problemów z wykorzystaniem programu GRETL, Wydawnictwo Naukowe PWN, Warszawa 2011.
4. Witkowska D., Podstawy ekonometrii i teorii prognozowania, Oficyna Ekonomiczna, Kraków 2006.

Additional:
1. Borkowski B., Dudek H., Szczesny W., Ekonometria. Wybrane zagadnienia, Wydawnictwo Naukowe PWN, Warszawa 2004.
2. Brzęczek T., Ocena efektów dywersyfikacji portfela produktowego w zakresie ryzyka sprzedaży całkowitej i trafności jej prognoz, Ekonometria I (55) 2017, s. 112-124.

3. Brzęczek T., Sales forecasting and newsboy model techniques integrated for merchandise planning and business risk optimization [w:] Steglich M., Mueller Ch., Neumann G., Walter M. (eds.), Communications of ECMS 34(1), 2020, s. 111-115 (https://doi.org/10.7148/2020-0111).
4. Kufel T., Ekonometryczna analiza cykliczności procesów gospodarczych o wysokiej częstotliwości obserwowania, WN UMK w Toruniu, Toruń 2010.

## Breakdown of average student's workload

|  | Hours | ECTS |
|---|---|---|
| Total workload | 50 | 2,00 |
| Classes requiring direct contact with the teacher | 30 | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 20 | 1,00 |