



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fundamentals of Econometrics [N1Log2>PE]

### 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

part-time

Requirements

elective

### Number of hours

Lecture

10

Laboratory classes

0

Other

0

Tutorials

10

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 knowledge about estimation of economic relations. To create skills of econometric modelling and learn how to use it in practice.

### Course-related learning outcomes

Knowledge:

1. Student knows terms of econometric linear model, linearisable model, goodness of fit, significance and typical implementations of econometric models in logistics [P6S\_WG\_04]
2. Student knows terms of forecasting theory (forecast, error, feasibility and accuracy) and terms of econometric model, goodness of fit and significance [P6S\_WG\_04]
3. Student knows ordinary and general least squares methods (OLS and GLS) of data analysis [P6S\_WG\_04]
4. Student knows time series components: sample average, moving average, random component [P6S\_WG\_04]

5. Student knows methods of seasonal components and factors estimation [P6S\_WK\_08]
6. 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 significance and the fitness of model to data [P6S\_UW\_03]
3. Student 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 conscious 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

Econometrics with its terms and basic methods of quantitative analyzis. Econometric model concept and usage. Regression and correlation.

### Course topics

Lecture. Estimation and verification of econometric model, ordinary least squares method, determination coefficient, multiple regression. Forecasting theory. Terms, forecast, simulation, forecasting process, error, accuracy. Forecasting software. Functionality and examples. Analysis of time series and choice of an appropriate model. Trends. Calculus of safe stock quantity to ensure a given level of demand service. 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   | 20    | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 30    | 1,00 |