COURSE DESCRIPTION CARD

NOTE: If the course includes lectures and classes, the Course Description Card applies to both types of instruction.

1. Course title:
in Polish / in English: Modele ekonometryczne i prognozowanie / Econometric Models & Forecasting

2. Course code:
Number of ECTS credits: 6,0
Course completion mode: E
Course commenced / Year 2019/20

3. Major: Finance and Accounting

4. Department of major coordinator: Department of Banking and Financial Markets

5. Name of course instructor: Lecture: dr Stanisław Barczak
Lab. Classes: dr Stanisław Barczak
Examiner: dr Stanisław Barczak

6. Department of course instructor: Department of Applied Mathematics

7. Number of contact hours with students:

Type of instruction	Full-time study	Part-time study
lectures	30	-
classes	30	-
foreign language classes	-	-
lab classes	-	-
seminars	-	-
e-learning	-	-
other	-	-
Total hours	60	0
examination (hours)	-	-

8. Course timeframe - no. of semesters: 1

Course commencement / Year 2

Course commencement / Semester 1 Winter

9. Level of tertiary education: Bechelor

10. Course status
□ Compulsory for the specialisation Finance and Accounting for Business

11. Course prerequisites
Compulsory: Quantitative Methods For Finance And Accounting, Business Statistic
Recommended:

12. Course objectives:
1) Transfer of knowledge in the field of econometrics theory and practical econometric analysis of economic processes using single-equation linear econometric models with one and many explanatory variables 2) Developing skills in solving decision-making problems by using single-equation linear econometric models with one and many explanatory variables 3) Education of social competences related to the development and application of the above-mentioned econometric methods

13. Teaching and learning methods:

A. Direct student-instructor contact:

No.	Teaching methods	Description	Number of hours	
			Full-time study	Part-time study
1.	Solve tasks and tests	Acquiring proficiency in making the necessary calculations, identifying the econometric model, its estimation and interpretation of obtained results.	20	0
2.	Classic lecture	Presentation of the theoretical foundations of econometrics.	16	0
3.	Teamwork	Ability to work in a team: solving econometric problems.	10	0
4.	Lecture using multimedia techniques	Multimedia presentation of practical use in economic processes.	6	0
5.	Other	Automation of analytical work using the Gretl and Excel packages	4	0
6.	Project development	Choosing an econometric model from among alternative models.	4	0
Total			AS: 60	AN: 0

B. Self-study:

No.	Learning methods	Description	Number of hours	
			Full-time study	Part-time study
1.	Solving tasks	Acquiring proficiency in making the necessary calculations, identifying the econometric model, its estimation and interpretation of obtained results.	32	0
2.	Analysis of lecture and class notes	Getting to know the content of lectures on the presented theory of econometrics and its practical applications.	25	0

3.	Preparing the project	Proposing an econometric method and its use to solve a given economic problem.	25	0
4.	Solving case studies	Ability to solve a given problem using econometric methods and the ability to assess the correctness of econometric analyzes.	10	0
Total			BS: 92	BN: 0

Total AS+BS = 152
Examination (E) = 0
Total AS+BS+E= 152

Total AN+BN = 0
Examination (E) = 0
Total AN+BN+E = 0

14. Key words: econometrics, dynamic econometrics, forecasting

15. Course content:

1. Matrix operations, matrix determinant, inverse matrix.
2. The canonical form of the matrix; matrix row; elementary operations on matrices.
3. The subject of econometrics. Goals and methods of econometrics. Economic model and econometric model: examples and comparisons.
4. One-equation econometric model. Classification. Stages of econometric study. Prognostic properties. Case study: market processes, business applications.
5. Methods for choosing an analytical form: a priori analysis, scatter analysis, a posteriori specification. Basic market dependencies.
6. Methods for selecting explanatory variables for the single-equation linear econometric model: correlation coefficient method.
7. The classical least squares method. Function of purpose, properties, assumptions, assumptions in relation to the random component
8. Linear econometric model with one explanatory variable: model assumptions, parameter estimation, interpretation of structural parameters of the model. Case study: the issue of choosing an econometric model.
9. Linear econometric model with many explanatory variables: assumptions of the regression model of many variables, estimation of model parameters, the problem of collinearity of explanatory variables. Case study: the application of multiple variable regression on financial markets.
10. Verification of the one-equation econometric model: measures of the stochastic structure of the model, measures of fit of the chemical model added (assessing the model quality), testing the significance of structural parameters of the econometric model - Student's t test. Identification and testing of the first order autocorrelation of the random component - Durbin-Watson test.
11. Construction of point and interval forecasts based on the descriptive econometric model. The essence of the econometric forecast theory - econometric prediction, construction of point forecast, construction of interval forecast. Ex ante forecast errors: average and relative prediction error.
12. Linear development tendency model. Identification, estimation, interpretation of structural parameters, construction of point and interval forecasts. Ex ante and ex post errors of forecasts.
13. Modeling on the basis of a linear trend and trends reduced to linear: taking into account additive seasonality. Applications and forecasts.
14. Modeling and forecasting using mechanical methods: adaptive models, ex-post forecast errors.

16. Course learning outcomes as related to the learning outcomes of the major and methods for assessing student attainment

Intended learning outcomes of the major / Symbols	Intended learning outcomes of the course	Methods for assessing student learning outcomes	Documentation
	Knowledge		
FiR1_W01#	1. The student knows at an advanced level the principles of describing economic processes using linear single-equation econometric models of one and many variables. The student is able to characterize and define the basic terminological and classification arrangements in the field of science methodology and econometric analysis.	1. Written test. 2. Written exam	Student exam work
FiR1_W02#	The student knows and understands the methods used in finance, in particular basic econometric and statistical methods, methods of analysis and effective processing of financial data, using modern Microsoft Excel IT tools.	1. Written test. 2. Written exam	Student exam work
	Skills		
FiR1_U01#	1. Analyzes various economic and financial phenomena by verifying relevant statistical and econometric models 2. Can use methods of process analysis in time 3. Can propose solutions to problems based on statistical and econometric analyzes.	1. Written test. 2. Written exam	Student exam work
FiR1_U02#	Student is able to properly use statistical and econometric methods and tools suitable for economic processes, including processes on financial markets.	1. Written test. 2. Written exam	Student exam work
FiR1_U05#	He speaks English at B2 level in the field of vocabulary related to econometrics and statistics.	1. Written test. 2. Written exam	Student exam work
	Social competences		
FiR1_K02#	The student is ready to recognize the importance of knowledge in solving practical problems in the field of statistical and econometric methods.	1. Written test. 2. Written exam	Student exam work

17. Method for determining the final course grade:

No.	Methods for awarding credits and course completion requirements	Description	Percentage of the final course grade*
1.	Written exam without the possibility of using textbooks	It contains all types of practical tasks in the field of econometric methods and forecasting resulting from the course content of the subject. It contains questions in the field of econometrics theory and its applicability in solving econometric tasks.	50%
2.	Written test	It contains only practical tasks related to the ability to assess the model, verify, interpret and build forecasts.	30%

3.	Project	Conducting a short econometric analysis of the given problem.	20%

* If students are required to obtain both a class grade and an exam grade, the class grade constitutes at least 30% of the final course grade.

18. Reading list

Mandatory readings:

1. Jeffrey M. Wooldridge: Introductory Econometrics. A Modern Approach.. Wyd. Australia : South-Western Cengage Learning, 2009.

Suggested readings:

1.Michael P. Murray: Econometrics: A modern introduction . Wyd. Pearson Education, Boston, 2006.

2.Brockwell P.J., Davis R.A.: Introduction to Time Series and Forecasting. Springer Verlag; New York, 1996.

3.Paweł Dittmann: Forecasting. Wyd. Publishing House of Wrocław University of Economics, Wrocław, 2010.

19. Language of instruction:

English

20. Course instructors' recommendations:

- Microsoft Office Software: MS Excel
- Gretl