

MODULE DESCRIPTION

Module code	Z-ZIP2-0543
Module name	Ekonometria i prognozowanie
Module name in English	Econometrics and Forecasting
Valid from academic year	2016/2017

A. MODULE PLACEMENT IN THE SYLLABUS

Field of study	Management and Production Engineering
Level of education	2nd degree <i>(1st degree / 2nd degree)</i>
Studies profile	General <i>(general / practical)</i>
Form and method of conducting classes	Full-time <i>(full-time / part-time)</i>
Specialisation	All
Unit conducting the module	Department of Applied Computer Science and Applied Mathematics
Module co-ordinator	Artur Maciąg, PhD hab.
Approved by:	

B. MODULE OVERVIEW

Type of subject/group of subjects	Basic <i>(basic / major / specialist subject / conjoint / other HES)</i>
Module status	Compulsory <i>(compulsory / non-compulsory)</i>
Language of conducting classes	English
Module placement in the syllabus - semester	1st semester
Subject realisation in the academic year	Summer semester <i>(winter semester/ summer)</i>
Initial requirements	No requirements <i>(module codes / module names)</i>
Examination	Yes <i>(yes / no)</i>
Number of ECTS credit points	4

Method of conducting classes	Lecture	Classes	Laboratory	Project	Other
Per semester	20			15	

C. TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Module target	The aim of the module is to familiarise students with the tools of econometrics and forecasting. Students, on completion of the course, should be able to apply the selected quantitative methods to model real phenomena. Particularly, the largest emphasis is put on the structure, verification, and application of the econometric model describing a real problem. The achieved model should be used in prediction. Students should be able to choose proper model to the real data.
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Effect symbol	Teaching results	Teaching methods (l/c/lab/p/other)	Reference to subject effects	Reference to effects of a field of study
W_01	Knowledge of the econometric model, its structure - principles of construction of econometric models of dependences.	l/p	K_W01	T2A_W01 T2A_W02
W_02	Understanding the basics of the theory of estimation and verification of the linear regression model.	l/p	K_W02	T2A_W01 T2A_W02
W_03	Mastering the theoretical foundations on forecasting based on regression models and time series models.	l/p	K_W02	T2A_W01 T2A_W02
U_01	The student is able to effectively utilize and apply functions MS Excel spreadsheet for selecting variables for a linear regression model, estimation and verification of the model.	l/p	K_U09	S2A_U04
U_02	The student is able to interpret the obtained results.	l/p	K_U12 K_U01	T2A_U16 T2A_U18 T2A_U01
U_03	The student is able to forecast economic processes.	l/p	K_U03	T2A_U08 T2A_U15 T2A_U17
U_04	The student has the ability to work in a team and an individual (in preparation of the project).	l/p	K_U02	T2A_U02 T2A_U06
K_01	The student is aware of the importance and needs of knowledge of econometric modeling techniques.	l/p	K_K01	T2A_K01 T2A_K06
K_02	Student recognizes and understands the problems in econometric modeling.	l/p	K_K02	T2A_K02 T2A_K04 T2A_U19
K_03	Student appreciates the importance of a continuous process of learning and acquiring specialized knowledge and skills as the basis for creative and entrepreneurial thinking.	l/p	K_K01	T2A_K01 T2A_K06

Teaching contents:

1. Teaching contents as regards lectures

Lecture number	Teaching contents	Reference to teaching results for a module
1	Econometric modeling in economics. The concept of an econometric model. Classification of models: linear, nonlinear, one-equation multiple equations.	W_01 K_01 K_02 K_03
2	Stages of econometric modeling. Methods of selecting explanatory variables in the model.	W_01 W_02 U_01 K_03

3	Estimation of linear regression model - the method of least squares. Assumptions of the classical linear regression model.	W_01 W_02 U_01 K_01 K_02 K_03
4	Verification of an econometric model. The accuracy of estimation, analysis of model residuals, the coefficient of determination, the accuracy of estimation of model parameters, standard errors of respect, confidence intervals for the parameters.	W_01 W_02 U_01 U_02 K_01 K_02
5	The relevance assessment of the structural parameters of the model hypotheses about the random component, autocorrelation.	W_01 W_02 U_01 U_02 K_01 K_02
6	Methods of analysis of time series.	W_01 W_03 U_01 U_02 U_03 K_01 K_02
7	The use of computer programs in econometrics.	W_01 U_01 K_01
8	The use of econometric models for the analysis of economic phenomena. Examples of applications binary variables.	W_01 W_03 U_01 K_01
9	Forecasting on the basis of an econometric model. Analysis of the reliability of forecasts.	W_01 W_03 U_01 K_01
10	Introduction to the analysis and estimation of non-linear models.	W_01 W_02 U_01 K_01 K_03

2. Teaching contents as regards classes

Class number	Teaching contents	Reference to teaching results for a module

3. Teaching contents as regards laboratory classes

Laboratory class number	Teaching contents	Reference to teaching results for a module

4. The characteristics of project assignments

Project class number	Teaching contents	Reference to teaching results for a module
1	Stages of econometric modeling. Methods of selecting explanatory variables in the model. The elimination of quasi-constant variables. Analysis of the matrix of correlation coefficients. The use of correlation functions available in MS Excel.	W_01 U_04 K_01 K_02 K_03
2	The estimation of the linear regression model. The use of regression functions available in MS Excel. Interpretation of the results.	W_01 W_02 U_01 U_04 K_01 K_02 K_03
3	Verification of an econometric model. Analysis and interpretation of model, the average error of estimation. The significance of variables. The analysis of model residuals, confidence intervals for the parameters.	W_01 W_02 U_01 U_02 U_04 K_01 K_02
4	Methods of analysis of time series.	W_01 W_03 U_01 U_02 U_03 U_04 K_01 K_02
5	Forecasting on the basis of an econometric model. Analysis of the reliability of forecasts.	W_01 W_03 U_01 U_04 K_01
6	Econometric forecast. Examples of applications in economics and demography.	W_01 W_03 U_01 U_04 K_01
7	The use of econometric models for the analysis of economic phenomena. Examples of applications binary variables.	W_01 W_03 U_01 U_04 K_01
8	Presentation of the projects prepared by the students.	W_01 W_03 U_01 U_02 U_03 K_01 K_02 K_03

The methods of assessing teaching results

Effect symbol	<p style="text-align: center;">Methods of assessing teaching results (assessment method, including skills – reference to a particular project, laboratory assignments, etc.)</p>
W_01	<p>Discussion, project, oral exam. During the semester, students prepare their own econometric model for chosen economic problem. For a satisfactory grade, students should know the steps and techniques to build an econometric model. For evaluation of good, very good, the student should also be familiar with techniques for assessing the reliability of the econometric models, ways to modify them in order to improve the fit and methods of application.</p>
W_02	<p>Discussion, project, oral exam. During the semester, students prepare their own econometric model for chosen economic problem. For a satisfactory grade, students should know the steps and techniques to build an econometric model. For evaluation of good, very good, the student should also be familiar with techniques for assessing the reliability of the econometric models, ways to modify them in order to improve the fit and methods of application.</p>
W_03	<p>Discussion, project, oral exam. During the semester, students prepare their own econometric model for chosen economic problem. For a satisfactory grade, students should know the steps and techniques to build an econometric model. For evaluation of good, very good, the student should also be familiar with techniques for assessing the reliability of the econometric models, ways to modify them in order to improve the fit and methods of application.</p>
U_01	<p>Discussion, project, oral exam Students can independently develop information regarding the selected stage econometric modeling using MS Excel spreadsheet, manipulate concepts in this regard. In fact, interprets the results of estimation. He can build econometric forecast.</p>
U_02	<p>Discussion, project, oral exam Students can independently develop information regarding the selected stage econometric modeling using MS Excel spreadsheet, manipulate concepts in this regard. In fact, interprets the results of estimation. He can build econometric forecast.</p>
U_03	<p>Discussion, project, oral exam Students can independently develop information regarding the selected stage econometric modeling using MS Excel spreadsheet, manipulate concepts in this regard. In fact, interprets the results of estimation. He can build econometric forecast.</p>
U_04	<p>Discussion, project, oral exam Students can independently develop information regarding the selected stage econometric modeling using MS Excel spreadsheet, manipulate concepts in this regard. In fact, interprets the results of estimation. He can build econometric forecast.</p>
K_01	<p>Observation of behavior of the student during classes The student is able to work in a team and independently develop information on a chosen topic.</p>
K_02	<p>Observation of behavior of the student during classes The student is able to work in a team and independently develop information on a chosen topic.</p>
K_03	<p>Observation of behavior of the student during classes The student is able to work in a team and independently develop information on a chosen topic.</p>

D. STUDENT'S INPUT

ECTS credit points		
	Type of student's activity	Student's workload
1	Participation in lectures	20
2	Participation in classes	
3	Participation in laboratories	
4	Participation in tutorials (2-3 times per semester)	5
5	Participation in project classes	15
6	Project tutorials	
7	Participation in an examination	2
8		
9	Number of hours requiring a lecturer's assistance	42 <i>(sum)</i>
10	Number of ECTS credit points which are allocated for assisted work <i>(1 ECTS point=25-30 hours)</i>	1.7
11	Unassisted study of lecture subjects	18
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	
14	Unassisted preparation for laboratories	
15	Preparing reports	
15	Preparing for a final laboratory test	
17	Preparing a project or documentation	30
18	Preparing for an examination	10
19		
20	Number of hours of a student's unassisted work	60 <i>(sum)</i>
21	Number of ECTS credit points which a student receives for unassisted work <i>(1 ECTS point=25-30 hours)</i>	2.3
22	Total number of hours of a student's work	100
23	ECTS points per module <i>1 ECTS point=25-30 hours</i>	4
24	Work input connected with practical classes <i>Total number of hours connected with practical classes</i>	50
25	Number of ECTS credit points which a student receives for practical classes <i>(1 ECTS point=25-30 hours)</i>	2

E. LITERATURE

Literature list	<ol style="list-style-type: none"> Nowak E., <i>Zarys metod ekonometrii. Zbiór zadań</i>, PWN, Warszawa 2007. Kukuła K. (red.), <i>Wprowadzenie do ekonometrii w przykładach i zadaniach</i>, PWN, Warszawa 2003. Welfe A., <i>Ekonometria, metody i ich zastosowanie</i>, PWE, Warszawa 2003. Gajda J. B., <i>Ekonometria praktyczna</i>, Absolwent, Łódź 1998. Grysa K., Maciąg A., <i>Wstęp do ekonometrii</i>, Wyd. WSH, Kielce 1997. Plebania J., Marcinkowska-Lewandowska W., Podgórska M., <i>Ekonometria w zadaniach i ćwiczeniach</i>, Oficyna Wydawnicza SGH, Warszawa 2001. Zeliaś A., Pawełek B., Wanat S., <i>Prognozowanie ekonomiczne. Teoria, przykłady, zadania</i>, PWN, Warszawa 2003. Chow G. C., <i>Ekonometria</i>, PWN, 1995.
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	9. Borkowski B., Dudek H., Szczęsny W., <i>Ekonometria – wybrane zagadnienia</i> , PWN, Warszawa 2004. 10. Cieślak M., <i>Prognozowanie gospodarcze. Metody i zastosowania</i> , PWN, Warszawa 1999.
Module website	