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**PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA**

**Faculty of Economics**

**Department of Economic and Mathematical Modeling**

**COURSE SYLLABUS**

**Econometrics  
(advanced course)**

**Educational-methodical complex**

**Master Program “International Business”**

**field 38.04.01 “Economy”**

**specialization “International Business”**

**2022**

## 1. Goals and objectives of discipline:

**The goal of the course** Econometrics (advanced course) is to familiarize students with modern econometrics and its applications. Studied are the methods of analysis of spatial data, time series and panel data. The emphasis is given to modern research methods, illustrated by applications from micro- and macroeconomics, as well as from finance. A special feature of the course is the use of specialized software that allows to perform econometric modeling at a professional level.

### **The main objectives of the study subjects are:**

Mastering the modern methods of econometric analysis. To learn to apply various methods of econometric analysis to solve problems in the field of micro-and macroeconomics, and in the field of finance and to use special software for solving econometric problems. Acquiring methods for constructing forecasts for economic processes based on econometric models.

## 2. Requirements for the results of the studying of disciplines are:

*Table 2.1. The list of competencies formed by students in the course of mastering the discipline (the results of mastering the discipline)*

Шифр	Компетенция	Индикаторы достижения компетенции (в рамках данной дисциплины)
UC-2.	Able to manage the project at all stages of its life cycle.	UC-1.1. Analyzes the task, pointing out its basic components;
		UC-1.2. Determines and ranks the information required to solve the task;
		UC-1.3. Searches for information to solve the task by various types of queries;
		UC-1.4. Offers solutions to the problem, analyzes the possible consequences of their use;
UC-7	Able to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from	UC-7.1. Searches for the necessary sources of information and data, perceives, analyzes, remembers and transmits information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems;
		UC-7.2. Evaluates information, its reliability, builds logical conclusions based on incoming information and data.

Шифр	Компетенция	Индикаторы достижения компетенции (в рамках данной дисциплины)
GPC-2.	Able to apply advanced instrumental methods of economic analysis in applied and/or fundamental research.	GPC- 2.1. Has knowledge of advanced instrumental methods of economic analysis.
		GPC- 2.2 Able to apply knowledge of advanced instrumental methods of economic and financial analysis when conducting applied and/or fundamental research.
GPC-6.	Able to critically evaluate the possibilities of digital technologies for solving professional tasks, work with digital data, evaluate their sources and relevance.	GPC- 6.1 Able to use modern digital and information technologies in solving professional tasks.
		GPC- 6.2 Able to find and use relevant digital data to solve practical tasks of professional activity.

### 3. Place of discipline in the structure of the study plan:

This theoretical course is a core course of the economic block for master students with specialization in International Business. There are no prerequisites for the course of "Econometrics" (advanced course). The discipline "Econometrics" refers to the mandatory part in the educational relations of block B1 of the EP HE.

### 4. The work load of discipline and types of training activities

Credit hours for the discipline are **3 credit units (one semester)**

Type of school work	Total hours	Semester			
		1	2	3	4
	<b>51</b>		<b>51</b>		
Including:					
Lectures	17		17		
Seminars (C)	34		34		
Self-study (total)	<b>57</b>		<b>57</b>		
Including:					
Course project (individual project)					
<i>Other types of independent work:</i>					
Preparation of 2 creative projects					

Independent study of recommended literature	40		40		
Preparation for the final certification	17		17		
Type of interim assessment (test, exam)					
The overall credit hours	<b>108</b>		<b>108</b>		
	<b>3</b>		<b>3</b>		

**Topic 1: Introduction to econometrics. Statistical inference and hypothesis testing**

The nature of econometrics data. Statistical inference and hypothesis testing. The confidence-interval approach. The test-of-significance approach. Some practical aspects.

**Topic 2: The Simple Regression Model**

Assumptions of the classical linear model. Ordinary Least Squares (OLS) as a minimization problem. Assumptions of OLS. Properties of OLS. Examples of OLS.

**Topic 3. Multiple Regression**

Goodness of Fit; Interpretation. Inference and estimation in the OLS model.

**Topic 4: Violation of the Assumptions of the Classical Regression Model**

Multicollinearity. Autocorrelation. Heteroskedasticity. Weighted least squares method. Instrumental variables. Maximal likelihood method.

**Topic 5: Univariate time series**

Stationary time series. Autocorrelation. Autoregressive-Moving average models. Unit roots. ARCH and GARCH models.

**Topic 6. Multivariate time series**

Dynamic models for stationary and not stationary time series. Cointegration.

**Topic 7: Panel data methods**

Fixed effect models and random effect models.

**5.3. Workload composition**

TOPIC	lectures (h)	seminars (h)
Topic 1: Introduction to econometrics. Statistical inference and hypothesis testing.	1,5	3
Topic 2: The simple regression model.	2	4
Topic 3: Multiple regression.	2,5	5
Topic 4: Violation of the assumptions of the classical regression model.	3	6

Topic 5: Univariate time series.	3	6
Topic 6: Multivariate time series.	3	6
Topic 7: Panel data methods	2	4
Total	36	34

## 6. Laboratory workshop. Not provided.

## 7. Practical exercises (seminars)

TOPIC	seminars (h)
Topic 1: Introduction to econometrics. Statistical inference and hypothesis testing.	3
Topic 2: The simple regression model.	4
Topic 3: Multiple regression.	5
Topic 4: Violation of the assumptions of the classical regression model.	6
Topic 5: Univariate time series.	7
Topic 6: Multivariate time series.	6
Topic 7: Panel data methods. Final test.	3

## 8. Methodical and informational support

### **BASIC SOURCES:**

1. *Dougherty Christofer*. Introduction to Econometrics. 5<sup>th</sup> edition. Oxford University Press, 2016.
2. Green W.H. Econometric Analysis. 8<sup>th</sup> edition, 2018.
3. *Балашова С.А., Лазанюк И.В.* Эконометрика в задачах и решениях: учебное пособие для магистров. М.: РУДН, 2-е изд., 2017.

### **ADDITIONAL SOURCES:**

1. *Berndt Ernst*. The Practice of Econometrics: Classic and Contemporary. Addison Wesley Publishing Company, 1991.
2. *Gujarati Damodar, Porter Dawn*. Basic Econometrics. 5<sup>th</sup> edition. McGraw-Hill Education, 2008
3. *Verbeek Marno*. A Guide to Modern Econometrics. 4<sup>th</sup> edition. Wiley, 2012.
4. *Елисеева И.И.* Эконометрика: учебник для магистров – М.: Юрайт, 2014.
5. *Матюшок В.М., Балашова С.А., Лазанюк И.В.* ОСНОВЫ эконометрического моделирования с использованием Eviews. – М.: изд-во РУДН, 2015.

### ***DATABASES, REFERENCE AND RETRIEVAL SYSTEMS:***

1. [www.gks.ru](http://www.gks.ru) - Federal State Statistics Service of the Russian Federation
2. [www.cbr.ru](http://www.cbr.ru) - Central Bank of the Russian Federation
3. <http://censtats.census.gov/> - U.S. Census Bureau
4. <http://www.bls.gov/> - U.S. Bureau of Labor Statistics
5. <http://data.worldbank.org/> - World Bank database
6. <http://pwt.econ.upenn.edu/> - database for cross-country comparisons

### **10. Software**

MSOffice, Eviews 7.0, Eviews 10.0

### **Logistical support discipline:**

- classrooms (rooms) at the workplace for lectures (depends on the number of students) and for seminars (the number of students in separate groups);
- board;
- desktop PC with Microsoft Office 2010;
- multimedia projector;
- portable equipment - a laptop and a projector;
- screen (stationary or portable floor).

<b>№ aud.</b>	<b>Name-equipped classrooms</b>	<b>List of main equipment</b>
17	Classroom	Multimedia Projector - 2 pcs., Sound Tribune - 1 pc., Screen - 2 pcs.
19	Computer Class	Computers Pentium 4-1700/256MB/cd/audio - 21 pcs., Multimedia projector PanasonicPT-LC75 - 1 pc., The screen is 1 unit.
103	Classroom	Multimedia Projector - 1 pc.,
105	Classroom	Multimedia Projector - 1 pc.,
1	Classroom	Multimedia Projector - 1 pc.,
2	Classroom	Multimedia Projector - 1 pc.,
Conference hall	Classroom	Multimedia Projector - 1 pc., Sound equipment
Hall 4 Library	Classroom	Multimedia Projector - 1 pc.,

There are 770 library workstations in the reading rooms of PFUR library. Reading and lending rooms of the Academic and Research Library are located in 5 university buildings. Some rooms are used for group work, 3 rooms are equipped with multimedia devices. Internet access is provided in the library via Wi-Fi.

There are more than 17000 Library readers. Library fund contains 1.800.000 books and is increased monthly. The funds are universal, they are formed by the discipline principle. It is increased due to departments' orders. The library staff counts 43, 36 of them have university degrees, 90% are computer competent.

Electronic catalogue has been compiled since 1990. Since 2010 PFUR e-library system has provided readers with information and full-text document access.

Book lending is done automatically. The free access room is equipped with self-service lending station applying RFIT-technology.

All PFUR computers provide access to PFUR e-library system and electronic sources.

The platform for information, service and resource access is available at the library website <http://lib.rudn.ru/>.



## 11. Guidelines on the organization of the discipline:

The implementation of the course includes interactive lectures, practical sessions (workshops) including multimedia equipment and an interactive tutorial, the independent creative works and their subsequent presentation, testing, group discussions on topics of the course.

<https://esystem.rudn.ru/course/index.php?categoryid=833>

Associate Professor \_\_\_\_\_ O.I. Pavlov

**Руководитель программы**

к.э.н., доцент



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P.O. Voskerichyan

**Заведующий кафедрой**

**«Национальная экономика»**

д.э.н., профессор



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Ю.Н. Мосейкин