



at the Institute for Economic Research and Policy Consulting 

## Modeling agricultural policy effects with partial equilibrium model, AGMEMOD

**National University of Life and Environmental Sciences of Ukraine (NUBiP)**

*This course is offered to PhD students in agricultural economics in NUBiP by German-Ukrainian Agricultural Policy Dialogue (APD)*

### Instructor

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### Course description

This course aims at enabling the students to systematically understand the functioning of econometric partial equilibrium models (EPEM) and their application for policy analysis. Moreover, students will gain knowledge on modeling of policy scenarios with such models and impacts of scenario specification on the modeling results.

The course consists of three parts. The first part is dedicated to the theoretical background of EPEM. In the second part, the participants learn stages of model building, structure and principles of functioning of EPEM using the example of AGMEMOD model. Approaches of modeling of policy scenarios and interpretation of the respective results are studied in the third part of the course.

The students will receive all of the necessary materials, Power-point presentations and software. The course includes lectures, individual work, work in groups, PC-demonstrations, student presentations, exercises and practical tasks.

The course is structured for 28 astronomic hours, excluding the homework.

## Course content

Time	Content
4 days*	<p><i>Preparation for the course</i> (Read the material from the list «Materials for preparation»):</p> <ol style="list-style-type: none"> <li>1) about basic principles of microeconomics and international trade</li> <li>2) methods of modeling of agricultural policy</li> <li>3) AGMEMOD documentation</li> <li>4) Effects of agricultural policy</li> </ol>
4 hours	<p><i>Lecture 1</i> Theoretical background of EPEM for agricultural sector:</p> <ol style="list-style-type: none"> <li>1. Economic model – instrument for support of policy decisions</li> <li>2. Model types for policy modeling</li> <li>3. Schematic model of agricultural sector and „from farm to fork“ chain (The scheme is built together with the group for the use during the practical seminars)</li> <li>4. Market equilibrium theory               <ol style="list-style-type: none"> <li>a. Theory of decision- making</li> <li>b. Market supply                   <ol style="list-style-type: none"> <li>i. Production theory. Specificities for agricultural sector (plant and animal production)</li> </ol> </li> <li>c. Market demand                   <ol style="list-style-type: none"> <li>i. Specificities and types of market demand in the agricultural sector</li> </ol> </li> <li>d. Market price. Price transmission</li> </ol> </li> <li>5. International trade               <ol style="list-style-type: none"> <li>a. Net trade models</li> <li>b. Bilateral trade</li> </ol> </li> <li>6. «State distortion» in the economy/market               <ol style="list-style-type: none"> <li>a. Trade barriers</li> </ol> </li> </ol>
4 hours	<p><i>Lecture 2</i> Agricultural policy modeling with EPEM: combining theory and „reality“ using the example of AGMEMOD-UA</p> <ol style="list-style-type: none"> <li>1. Identification of goals, stakeholders and policy scenarios</li> <li>2. Stages of model building               <ol style="list-style-type: none"> <li>a. Building of model scheme and comparing it with the „real situation“ (The scheme of AGMEMOD-UA is built together with the group)</li> <li>b. Data collection and processing</li> <li>c. Building of a mathematical model                   <ol style="list-style-type: none"> <li>i. Combining methodologies</li> </ol> </li> <li>d. Software choice for programming of the model: availability, functionality, simplicity and user-friendliness</li> <li>e. Model calibration and validation. Interpretation of the first modeling results.</li> </ol> </li> <li>3. Values estimated and expert opinion</li> <li>4. Cycle of model update/improvement</li> </ol>
	<p><i>Homework „A“ for student groups (max 3 persons per group):</i> Create mathematic schemes of EPEM for Ukraine for different agric. sectors such as wheat, oil, meat etc. Demonstrate solution approaches of these schemes.</p>
5 hours	<p><i>Presentation and discussion of homework</i></p> <p><i>Practical seminar 1</i></p>

Time	Content
	<p>Econometric estimation of coefficient of price, production, consumption and trade functions using the example of AGMEMOD-UA</p> <p>The students will be taught how to use «R» econometric software:</p> <ol style="list-style-type: none"> <li>a. Installation of R</li> <li>b. Characteristics and functions of R</li> <li>c. Creation of database</li> <li>d. Econometric estimation of the coefficients</li> <li>e. Results interpretation</li> </ol>
	<p><i>Homework „B“ for student groups:</i> Estimate the coefficients of the functions of the models created for homework „A“</p>
5 hours	<p><i>Presentation and discussion of homework</i></p> <p><i>Practical seminar 2</i> Solving EPEM with «GAMS» software using the example of AGMEMOD-UA</p> <ol style="list-style-type: none"> <li>a. Installation of GAMS</li> <li>b. Characteristics and functions of GAMS</li> <li>c. Programming language</li> <li>d. Interpretation of modeling results</li> </ol>
	<p><i>Homework „B“ for students:</i> Program and solve your models in GAMS</p>
5 hours	<p><i>Presentation and discussion of homework</i></p> <p><i>Practical seminar 3</i> Learning AGMEMOD and interpretation of modeling results</p> <ol style="list-style-type: none"> <li>1. Learning AGMEMOD             <ol style="list-style-type: none"> <li>a. Functioning and software</li> <li>b. Technical structure</li> <li>c. Regional, time and economic structures</li> </ol> </li> <li>2. Group work             <ol style="list-style-type: none"> <li>a. Explain certain agricultural sector in AGMEMOD-UA: parameters, their interaction with other sectors, regions/countries and exogenous parameters</li> <li>b. Present the review</li> </ol> </li> <li>3. Modeling results of Baseline:             <ol style="list-style-type: none"> <li>a. Software for viewing of the results</li> <li>b. Results interpretation using the example of one of the agricultural sectors</li> </ol> </li> <li>4. Group work             <ol style="list-style-type: none"> <li>a. Presentation and interpretation of modeling results for one of the agricultural sectors of the Baseline</li> </ol> </li> <li>5. Interactive work with the group – criticism of AGMEMOD-UA and AGMEMOD</li> </ol>
	<p><i>Homework „Г“ for students:</i> Answer questions from the list «Questions for homework „Г“».</p>
5 hours	<p><i>Presentation and discussion of homework</i></p> <p><i>Practical seminar 4</i> Modeling of policy scenarios and interpretation of the respective results, AGMEMOD</p> <ol style="list-style-type: none"> <li>1. Interactive work with the group – modeling state support</li> </ol>

Time	Content
	2. Group work <ul style="list-style-type: none"> <li>a. Modeling of certain scenario</li> <li>b. Presentation and interpretation of the results</li> </ul> 3. Interactive work with the group – update and model validation

\*Hours – astronomic hours, 60 minutes.