UNIWERSYTET IM. ADAMA MICKIEWICZA W POZNANIU

Economic Modelling and Control Theory

Educational subject description sheet

Basic information

Study programme Matematyka **Speciality** - **Organizational unit** Faculty of Mathematics and Computer Sciences **Study level** Second-cycle programme **Study form** Full-time **Education profile** General academic	**Didactic cycle** 2024/25 **Subject code** 06MATS.24K.11716.24 **Lecture languages** English **Course type** Elective **Block** Major subjects

Subject coordinator	Yoichi Uetake
Lecturer	Yoichi Uetake

Period	**Activities and hours**	**Number of ECTS points**
Semester 3	• Lecture: 30, Exam • Classes: 30, Graded credit	6

Goals

Code	Goal
C1	The main purpose of the course is to present an interaction of modern macroeconomics theory and mathematical control theory. Basic notions of macroeconomics and control theory will be explained from scratch. Thanks to this one can learn a rigorous design scheme and analysis of monetary and fiscal policies. In the exercise/laboratory classes we will focus on practical implementation of the theory using real economic data.

Subject learning outcomes

Code	Outcomes in terms of	Learning outcomes	Examination methods
Knowledge – Student:			
W1	understands mechanism of macroeconomic systems	MAT_K2_W03	Written exam, Report
W2	understands basic notions of control theory in the context of macroeconomic modelling	MAT_K2_W03	Written exam, Report

Study content

No.	Course content	Subject learning outcomes	Activities
1.	IS-LM Model (Static Keynesian macroecomic model)	W1	Lecture, Classes
2.	Control theory in the context of macroeconomic theory	W2	Lecture, Classes

Additional information

Activities	Teaching and learning methods and activities
Lecture	Conversation lecture
Classes	Conversation lecture

Activities	Credit conditions
Lecture	Required to take a written exam to get a final grade. The condition for taking the exam (written form) is to obtain passing grades in exercises. Grading scale with applied percentage distribution: excellent (5.0): achievement of the student's expected learning outcomes at a minimum of 90.0%. very good (4.5): achievement by the student of the desired learning outcomes ranging from 80.0% - 89.9%. good (4.0): achievement of student learning outcomes 70.0% - 79.9%. average (3.5): achievement of student learning outcomes 60.0% - 69.9%. satisfactory (3.0): attainment of the student learning outcomes within 50.0% - 59.9%. unsatisfactory (2.0): failure of the student to achieve the expected learning outcomes below 50.0%.
Classes	Required to pass the written colloquium. Grading scale with applied percentage distribution: excellent (5.0): achievement of the student's expected learning outcomes at a minimum of 90.0%. very good (4.5): achievement by the student of the desired learning outcomes ranging from 80.0% - 89.9%. good (4.0): achievement of student learning outcomes 70.0% - 79.9%. average (3.5): achievement of student learning outcomes 60.0% - 69.9%. satisfactory (3.0): attainment of the student learning outcomes within 50.0% - 59.9%. unsatisfactory (2.0): failure of the student to achieve the expected learning outcomes below 50.0%.

Literature

Obligatory

1. N. G. Mankiw, Principles of Macroeconomics (6th Edition), South-Western College Pub, 2011

Calculation of ECTS points

Activities	**Activity hours***
Lecture	30
Classes	30
Report preparation	60
Preparation of a project	60
Student workload	**Hours** 180
Number of ECTS points	**ECTS** 6

* academic hour = 45 minutes

Efekty uczenia się dla kierunku

Kod	Treść
MAT_K2_W03	The graduate knows and understands podstawy konstruowania modeli matematycznych przydatnych w zastosowaniach matematyki w różnych dziedzinach wiedzy