

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Forecasting and Simulation</b>		Code <b>1011105341011130604</b>
Field of study <b>Management - Part-time studies - Second-cycle</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 4</b>
Elective path/specialty <b>Interpersonal Communication Engineering</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>elective</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>14</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art  <b>the sciences</b> <b>Mathematical sciences</b>  <b>social sciences</b> <b>Economics</b>		ECTS distribution (number and %)  <b>1 50%</b> <b>1 50%</b> <b>1 50%</b> <b>1 50%</b>
<b>Responsible for subject / lecturer:</b>  dr Tomasz Brzęczek email: tomasz.brzeczek@put.poznan.pl tel. 61 665 33 92 Wydział Inżynierii Zarządzania ul. Strzelecka 11 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Student knows economics terms and laws. Knows ordinary least squares method.
2	<b>Skills</b>	Student can use computer and Excel.
3	<b>Social competencies</b>	Student works in team for project preparation.
<b>Assumptions and objectives of the course:</b> C1 Forming skills of simulating and forecasting of economic variables. C2 Acquiring knowledge about forecasting theory and methods.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Student knows forecasting theory terms (forecast, simulation, forecasting process, error, accuracy). - [-] 2. Knows methods classification. - [-] 3. Knows methods appropriate for stationary time series. - [-] 4. Knows methods appropriate for nonstationary time series, including trends. - [-] 5. Knows seasonality effects and their types and methods of estimation. - [-] 6. Knows software useful in forecasting. - [-]		
<b>Skills:</b>		
1. Student can forecast and assess forecasts in scientific way. - [-] 2. Can forecast with smoothing methods (naive, moving average, exponential average, Holt - [-] 3. Can forecast analytically trends, seasonality and correlated random effects (OLS, GLS). - [-] 4. Can forecast using Excel and GRET. - [-] 5. Can estimate error of forecast ex ante and ex post. - [-]		
<b>Social competencies:</b>		

1. Student is conscious about forecasting role and meaning in management. - [-]
2. Promotes forecasting in management. - [-]
3. Is ready to work in forecasting field projects and teams. - [-]

### Assessment methods of study outcomes

Formulating mark:

on basis of questions about current themes.

Summary mark:

on basis of written project entitled "Revenues forecasting in a chosen enterprise? or on the simulation or forecasting of other economic variable in enterprise.

### Course description

1. Forecasting theory. Terms, forecast, simulation, forecasting process, error, accuracy.
2. Examination of autocorrelation and unity roots. Stationary series forecasting (average and autoregression) and non-stationary variance forecasting (naive method, moving average, exponential smoothing).
3. Trends. Linear and non-linear. Residuals autocorrelation.
4. Seasonality effects. Additive (mechanical and seasonal dummies method) and multiplicative (seasonality indices).
5. Case of revenue forecasting with software assistance.
6. Smoothing models with trends: Holt's and Winters'.
7. Simulation in econometric deterministic model.

### Basic bibliography:

1. Prognozowanie gospodarcze. Metody i zastosowania, Cieślak M. (red.), WN PWN, Warszawa 2002.
2. Gujarati D.N., Basic Econometrics, McGraw-Hill 2002.
3. Kufel T., Ekonometria. Rozwiązywanie problemów z wykorzystaniem programu GRETl WN PWN, Warszawa 2011.
4. Witkowska D., Podstawy ekonometrii i teorii prognozowania, Oficyna Ekonomiczna, Kraków 2006.
5. Prognozowanie gospodarcze. Metody i zastosowania, Cieślak M. (red.), WN PWN, Warszawa 2002.
6. Gujarati D.N., Basic Econometrics, McGraw-Hill 2002.
7. Kufel T., Ekonometria. Rozwiązywanie problemów z wykorzystaniem programu GRETl WN PWN, Warszawa 2011.
8. Witkowska D., Podstawy ekonometrii i teorii prognozowania, Oficyna Ekonomiczna, Kraków 2006.

### Additional bibliography:

1. Borkowski B., Dudek H., Szczesny W., Ekonometria. Wybrane zagadnienia, Wydawnictwo Naukowe PWN, Warszawa 2004.
2. Dittmann P., Prognozowanie w przedsiębiorstwie, PWE, Warszawa 2003.
3. Kufel T., Ekonometryczna analiza cykliczności procesów gospodarczych o wysokiej częstotliwości obserwowania, WN UMK, Toruń 2010.
4. Borkowski B., Dudek H., Szczesny W., Ekonometria. Wybrane zagadnienia, Wydawnictwo Naukowe PWN, Warszawa 2004.
5. Dittmann P., Prognozowanie w przedsiębiorstwie, PWE, Warszawa 2003.
6. Kufel T., Ekonometryczna analiza cykliczności procesów gospodarczych o wysokiej częstotliwości obserwowania, WN UMK, Toruń 2010.

### Result of average student's workload

Activity	Time (working hours)	
1. Lectures	14	
2. Consultations	30	
3. Student	16	
Student's workload		
Source of workload	hours	ECTS
Total workload	60	2
Contact hours	44	2
Practical activities	20	1