RTU Course "Quantitative Methods for Economics"

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General data

Code	IĀS215
Course title	Quantitative Methods for Economics
Course status in the programme	Compulsory/Courses of Limited Choice; Courses of Free Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Mathematics and Statistics
Responsible instructor	Remigijs Počs
Academic staff	Māris Buiķis Velga Ozoliņa Vladimirs Ņikišins Una Pentjuša
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	The course includes characterisation of economic and mathematical methods and models and decision making process. Within the course, students learn forecasting methods by using time series, models for examining economic relationships, models of linear programming, simulation and elements of the queuing theory.
Goals and objectives of the course in terms of competences and skills	To illustrate the main quantitative methods, which are used in economics, and their role in analysis of economic situations and management problems, as well as during the decision-making process. To form understanding of the concept “model” and its different shapes. To form the ability to develop a model corresponding to a particular method and to obtain results, using the appropriate algorithms and software, as well as the ability to understand the results. To form the ability to interpret the most significant indicators, which are used to characterise models and situations.
Structure and tasks of independent studies	Individual work is organised in the form of laboratory assignments, quizzes and exercises. During laboratory assignments, students chose a model according to the given characterisation of situation and data, form the model, solve it and describe the obtained results, including answers to the stated questions. Additionally students can fill out quizzes and exercises, improving skills in applying quantitative methods.
Recommended literature	1. Počs R. Kvantitatīvās metodes ekonomikā un vadīšanā. Mācību līdzeklis. Rīga, RTU Izdevniecība, 2003. – 148 lpp. 2. Brīvers I. Lineārā programmēšana. Rīga: Rasa ABC, 2001. – 35 lpp. 3. Bandeviča L. Matemātiskā modelēšana ekonomikā un menedžmentā: teorija un prakse. Rīga: Izglītības soļi, 2009. – 443 lpp. 4. Kļaviņš D. Optimizācijas metodes ekonomikā. I, II. Rīga: Datorzinību centrs, 2003. – 271 lpp. 5. Krastiņš O. Statistika. Mācību grāmata augstskolām. Rīga, Latvijas Republikas centrālā statistikas pārvalde, 2003. – 267 lpp. 6. Krastiņš O. Ekonometrija. Mācību grāmata augstskolām. Rīga, Latvijas Republikas centrālā statistikas pārvalde, 2003. – 207 lpp. 7. Peļņa M. Optimizācijas uzdevumi ekonomikā. Rīga: Datorzinību centrs, 2003. – 159 lpp. 8. Šķiltere D. Pieprasījuma prognozēšana: Mācību līdzeklis. Rīga: Latvijas Universitāte, 2001, - 84 lpp. 9. Vasermanis E., Šķiltere D. Prognozēšanas metodes. Rīga: Izglītības soļi, 2004. - 121 lpp. 10.Vasermanis E., Šķiltere D. Statistika I. Mācību līdzeklis. Rīga: Latvijas Universitāte, 1996. - 76 lpp. 11. Andersen D. R., Sweeney D. J., Williams T. A. An Introduction to Management Science: Quantitative Approaches to Decision Making. USA, 2002. 12. Buglear J. Quantitative Methods for Business. Oxford: Elsevier Butterworth-Heinemann, 2005. – 685 p. 13. Dewhurst F. Quantitative Methods for Business and Management. Berkshire: McGraw-Hill Education, 2006. – 502 p. 14. Heizer J., Render B. Operations Management. New Jersey: Pearson Prentice Hall, 2007. – 614 p. 15. Oakshott L. Essential Quantitative Methods for Business, Management and Finance. Hampshire: Palgrave Macmillan, 2006. – 484 p. 16. Swift L., Piff S. Quantitative Methods for Business, Management and Finance. Hampshire: Palgrave Macmillan, 2005. – 882 p. 17. William G. Zikmund. Business Research Methods. 6th edn. The Dryden Press, 2000, 660 p. 18. Федосеев В.В., А.Н.Гармаш, Д.М. Дайитбегов и др. Экономико - математические методы и прикладные модели: Учеб. пособие для вузов/ Под ред.
Course prerequisites	Mathematics, information science, economics.

Course outline

Theme	Hours
Introduction – the most significant quantitative methods, the notion “model” and decision-making process	4
Time series methods for analysis and forecasting	6

Correlation-regression methods	4
Statistical quality control	2
Linear programming	8
Simulation modelling	4
Queuing theory	4
Laboratory assignments	16

Learning outcomes and assessment

Learning outcomes	Assessment methods
Students are able to list and characterise the main quantitative methods, which are used in economics. Students name the method, which corresponds to characterisation or describes a particular method.	Quiz, exam questions
Students know what model is and are able to construct a model, which corresponds to a particular method. Students define a model, develop it in accordance with a particular method, using the given information and data.	Quiz, laboratory assignments, tests, exam
Students are able to use the model for obtaining results. Students obtain results, using the appropriate algorithm and software.	Laboratory assignments, tests, exam
Students are able to analyse the obtained results. Students are able to explain the meaning of the obtained results.	Quiz, laboratory assignments, tests, exam
Students are able to interpret the values of indicators, which are used for characterisation of a particular model or situation. Students are able to evaluate the correspondence of a particular indicator to definite criteria.	Quiz, laboratory assignments, tests, exam

Study subject structure

Part	CP	ECTS	Hours per Week			Tests			Tests (free choice)		
			Lectures	Practical	Lab.	Test	Exam	Work	Test	Exam	Work
1.	3.0	4.5	2.0	0.0	1.0		*			*	