

*STUDY SUBJECT DESCRIPTION*

***BUSINESS MATHEMATICS AND DATA ANALYSIS***

Title of Study Programme and Code	Type (compulsory/optional)	Cycle	Year of study when the component is delivered (if applicable)
<b><i>BUSINESS MANAGEMENT AND INNOVATIONS</i></b>	Compulsory	1 <sup>st</sup>	1 <sup>st</sup> year
Semester/trimester when the component is delivered	Number of ECTS credits allocated	Language of instruction	Mode of delivery (face-to-face/e- learning/...)
2 <sup>nd</sup>	8 ECTS	Lithuanian, English	face-to-face, e-learning
Learning outcomes		Study methods	Assessment methods
<p>After completion of the study subject, a student should be able:</p> <p><b>LO 1</b> to know financial mathematics, functions, differential and integral calculus, linear algebra, optimal planning, probability theory and mathematical statistics, and the ability to apply it to the analysis of practical problems</p> <p><b>LO 2</b> to describe simple economic situations in terms of functions and analyse the properties of functions</p> <p><b>LO 3</b> to perform simple mathematical calculations in financial economics</p> <p><b>LO 4</b> to select appropriate mathematical methods and apply them to economic problems</p> <p><b>LO 5</b> methodically justify, plan, organise and conduct research on business datasets</p> <p><b>LO 6</b> to understand the mathematical methods appropriate for building models for analysing business data, and an understanding and apply the steps and methodology of analysis</p> <p><b>LO 7</b> to analyse a given situation independently: select appropriate statistical methods to process data, calculate descriptive statistics, interpret the results and draw conclusions</p> <p><b>LO 8</b> to apply probabilistic methods to the collection, processing and analysis of information</p>		Presentation of theoretical material Task analysis Task modelling Problem solving Working with data visualisation software (e.g. Tableau) Maths exercises Consultation Self-study	Testing knowledge and skills - control work Defence of individual homework Examination

<p><b>LO 9</b> to formulate multidisciplinary economic analysis problems as an optimal planning problem</p> <p><b>LO 10</b> to apply optimal planning techniques to anticipate and select the most effective ways and options for developing the company's activities</p> <p><b>LO 11</b> to construct an equation of equilibrium for an economic system and determine when an economic system is productive</p> <p><b>LO 12</b> to model and analyse business, financial and economic phenomena using differential and integral calculation methods</p>		
<b>Prerequisites</b> (these courses must have successfully completed before she/he can take this course)		
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<b>Course content</b>		
<ol style="list-style-type: none"> <li>1. Fundamentals of financial mathematics</li> <li>2. Typical functions in the economy</li> <li>3. Differential and integral calculus</li> <li>4. Linear models of economic problems</li> <li>5. Mathematical models for optimal planning in linear programming</li> <li>6. Probability theory</li> <li>7. Mathematical statistics and data analysis. Data visualization.</li> </ol>		
<b>Recommended or required reading and other learning resources/tools</b>		
<ol style="list-style-type: none"> <li>1. Olivier J. (2021) Business Math: A Step-by-step Handbook. Lyryx. <a href="https://lila1.lyryx.com/textbooks/OLIVIER_1/marketing/Olivier-BusinessMath-2021A.pdf">https://lila1.lyryx.com/textbooks/OLIVIER_1/marketing/Olivier-BusinessMath-2021A.pdf</a></li> <li>2. Bagdonavičius V., Kruopis J. J., Levulienė R.(2019) Matematinės statistikos uždavinynas su sprendimais. Vilnius: Vilnius University <a href="http://www.statistika.mif.vu.lt/wp-content/uploads/2019/09/Matematines-statistikos-uzdavinyas.pdf">http://www.statistika.mif.vu.lt/wp-content/uploads/2019/09/Matematines-statistikos-uzdavinyas.pdf</a></li> <li>3. Kabašinskas A., Šutienė K., Kravčenkienė V. (2017) Matematika 1: Tiesinė algebra ir matematinė analizė. Technologija.</li> <li>4. Holmes A., Illowsky B., Dean S.(2017) Introductory Business Statistic. <a href="https://openstax.org/details/books/introductory-business-statistics">https://openstax.org/details/books/introductory-business-statistics</a></li> <li>5. Kabašinskas A., Šutienė K., Ragulskienė J. (2015) Matematika 2. Diferencialinės lygtys, tikimybių teorija ir matematinė statistika. Technologija.</li> <li>6. Krylovas A., Kriauzienė R. (2015) Matematika studijuojantiems ekonomiką ir verslą. Vilnius: Mykolo Riomerio Universitetas</li> <li>7. Bartkutė-Norkūnienė V. (2021) Applied Mathematics. Moodle Course. <a href="https://moodleen.utenacollege.eu/course/view.php?id=117">https://moodleen.utenacollege.eu/course/view.php?id=117</a></li> <li>8. Bartkutė-Norkūnienė V. (2021-2022) Verslo matematika ir duomenų analizė. Moodle kursas. <a href="https://moodle.utenos-kolegija.lt/course/view.php?id=242">https://moodle.utenos-kolegija.lt/course/view.php?id=242</a></li> <li>9. Kaulakytė K., Kriauzienė R. (2011) Tiesinės algebros ir matematinės analizės pagrindai. Vilnius: Mykolo Romerio universitetas. <a href="http://wdn.ipublishcentral.net/association_lithuania_serials/viewinside/267201294706980">http://wdn.ipublishcentral.net/association_lithuania_serials/viewinside/267201294706980</a></li> </ol>		