# QUANTITATIVE METHODS FOR BUSINESSES

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| **1** | Course Title: | QUANTITATIVE METHODS FOR BUSINESSES | |
| **2** | Course Code: | ISL5311 | |
| **3** | Type of Course: | Optional | |
| **4** | Level of Course: | Second Cycle | |
| **5** | Year of Study: | 1 | |
| **6** | Semester: | 1 | |
| **7** | ECTS Credits Allocated: | 6.00 | |
| **8** | Theoretical (hour/week): | 3.00 | |
| **9** | Practice (hour/week): | 0.00 | |
| **10** | Laboratory (hour/week): | 0 | |
| **11** | Prerequisites: | | |
| **12** | Language: | Turkish | |
| **13** | Mode of Delivery: | Face to face | |
| **14** | Course Coordinator: | Doç. Dr. GÜL EMEL | |
| **15** | Course Lecturers: | Doç.Dr.Gül GÖKAY EMEL | |
| **16** | Contact information of the Course Coordinator: | Doç.Dr.Gül GÖKAY EMEL<br>ggokay@uludag.edu.tr<br>0 (224)294 10 55 | |
| **17** | Website: | | |
| **18** | Objective of the Course: | To teach basics of Linear Programming Models and Network Models and their solution techniques, how to create and apply the models to different business problems | |
| **19** | Contribution of the Course to Professional Development: | | |
| **20** | Learning Outcomes: | | |
| | | **1** | To know how to design linear programming models |
| | | **2** | To apply the Linear Programming Models to production, logistics, human resources and etc kinds of problems |
| | | **3** | To apply the models to finance and investment problems; |
| | | **4** | To understand solution techniques of Linear Programming Models, to solve the models and to interpret the results in the context of business administration |
| | | **5** | To use software for creating and solving the models |
| | | **6** | To understand the basic principles of network models and their applications and to solve this kind of problems |
| | | **7** | To understand, model, analytically solve and interpret results of business problems |
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| | | **10** | |
| **21** | Course Content: | | |

**Course Content:**

| Week | Theoretical | Practice |
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| **1** | Basic principles and the structure of Linear Programming Models with Continuous and Discrete Variables | |

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| **2** | To create Linear Programming Models for production planning and business management problems | |
| **3** | To create Linear Programming Models for financial and investment planning problems | |
| **4** | To create Transport, Transshipment, Assignment, Travelling Salesman and Vehicle Routing Linear Programming Models for logistics planning problems | |
| **5** | Graphic Method and Simplex Algorithm for Linear Programming Models with Continuous Variables, and Branch – Bound Algorithm for Linear Programming Models with Discrete Variables | |
| **6** | To interpret the results in the context of economics and business administration | |
| **7** | To solve the models with WinQSB and Excel Solver, to interpret the results in the context of economics and business administration | |
| **8** | Sensitivity analysis in Linear Programming Models, creating Parametric Linear Programming Models and interpreting the results in the context of business administration | |
| **9** | Fundamentals of Network Analysis | |
| **10** | Minimum Spanning Tree problems, Shortest Path problems Minimum Cost Flow problems | |

| Activites | | Number | Duration (hour) | Total Work Load (hour) |
|---|---|---|---|---|
| **13** | Resource Levelling | 14 | 3.00 | 42.00 |
| Practicals/Labs | | 0 | 0.00 | 0.00 |
| Self study and preperation | | 14 | 3.00 | 42.00 |
| **22** | Textbooks, References and/or Other | Wayne Winston, Operations Research | | |
| Homeworks | | 2 | 30.00 | 60.00 |
| Projects | | H.Tütek/Ş.Gümüşoğlu, Sayısal Yöntemler (Yönetsel Yaklaşım) | 0.00 | 0.00 |
| Field Studies | | 0 | 0.00 | 0.00 |
| **23** | Assesment | 0 | 0.00 | 0.00 |
| Others | | 0 | 0.00 | 0.00 |
| Final Exams | | 1 | 30.00 | 30.00 |
| Total Work Load | | | | 174.00 |
| Total work load/ 30 hr | | | | 5.80 |
| ECTS Credit of the Course | | | | 6.00 |

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| Midterm Exam | 0 | 0.00 |
| Quiz | 0 | 0.00 |
| Home work project | 2 | 40.00 |
| Final Exam | 1 | 60.00 |
| Total | 3 | 100.00 |
| Contribution of Term (Year) Learning Activities to Success Grade | | 40.00 |
| Contribution of Final Exam to Success Grade | | 60.00 |
| Total | | 100.00 |
| Measurement and Evaluation Techniques Used in the Course | | |

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| **24** | **ECTS / WORK LOAD TABLE** |

| 25 | CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS | | | | | | | | | | | | | | | |
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| | **PQ1** | **PQ2** | **PQ3** | **PQ4** | **PQ5** | **PQ6** | **PQ7** | **PQ8** | **PQ9** | **PQ10** | **PQ11** | **PQ12** | **PQ13** | **PQ14** | **PQ15** | **PQ16** |
| **ÖK1** | 3 | 5 | 1 | 5 | 2 | 2 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| **ÖK2** | 3 | 5 | 1 | 5 | 2 | 2 | 4 | 4 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| **ÖK3** | 1 | 5 | 1 | 5 | 1 | 1 | 1 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| **ÖK4** | 2 | 5 | 1 | 5 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| **ÖK5** | 5 | 5 | 1 | 5 | 5 | 5 | 5 | 2 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| **ÖK6** | 3 | 5 | 1 | 5 | 2 | 2 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| **ÖK7** | 5 | 4 | 1 | 5 | 1 | 1 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| **LO: Learning Objectives PQ: Program Qualifications** | | | | | | | | | | | | | | | | |
| **Contribution Level:** | **1 very low** | | **2 low** | | | **3 Medium** | | | **4 High** | | | **5 Very High** | | | | |