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|  | **ECTS COURSE INFORMATION FORM** |

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| **Faculty/Graduate School** | **Faculty of Economics, Administrative and Social Sciences** | |
| **Program** | **B.A. in Economics** | **Elective** |
| **All other undergraduate programs** | **Elective** |

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| **Course Code** | **ECON 439** | | | |
| **Course Title in English** | **Causality** | | | |
| **Course Title in Turkish** | **Nedensellik** | | | |
| **Language of Instruction** | **English** | | | |
| **Type of Course** |  | | | |
| **Level of Course** | **Undergraduate** | | | |
| **Semester** | **Summer** | | | |
| **Contact Hours per Week** | **Lecture: 3** | **Recitation: 0** | **Lab: 0** | **Other: 0** |
| **Estimated Student Workload** | **126 hours per semester.** | | | |
| **Number of Credits** | **5 ECTS** | | | |
| **Grading Mode** | **Standard Letter Grade** | | | |
| **Pre-requisites** | **MATH 126 or MATH 204 or MATH 224 or MATH 228** | | | |
| **Expected Prior Knowledge** | **Statistics and Non-formal Logic** | | | |
| **Co-requisites** | **None** | | | |
| **Registration Restrictions** | **Only Undergraduate Students** | | | |
| **Overall Educational Objective** | Understand the causal language and causal reasoning and apply these tools to real (non-fictitious) problems. | | | |
| **Course Description** | This is a one-semester undergraduate course into the science of cause and effect, designed to introduce students to the genesis, the fundamentals and the tools of causal reasoning. The course assumes familiarity with statistics and non-formal logic/reasoning. | | | |
| **Course Description in Turkish** | Bu ders katılımcılara neden-sonuç ilişkisini, nedensel muhakemenin doğuşunu, temellerini, ve araçlarını anlatmayı amaçlamaktadır. | | | |
| **Course Learning Outcomes and Competences** | **Upon successful completion of the course, the learner is expected to be able to:**   1. understand the causal language, causal reasoning and the distinction between traditional statistical approaches and counterfactuals; 2. relate concepts of causality with possible economic, legal and medical applications; 3. use causal framework to understand critical cause-and-effect questions. | | | |

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| **Relation to Program Outcomes and Competences: N=None S=Supportive H=Highly Related** | | | | |
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| **Program Outcomes and Competences** | | | **Level** | **Assessed by** |
|  | | | N/S/H | Exam, Project, HW, Lab, Presentation, etc. |
| 1. Has a broad understanding of economics with a deep exposure to other social sciences and mathematics. | | | N |  |
| 2. Demonstrates knowledge and skills in understanding the interactions of different areas of economics. | | | H | Flipped Learning Activities |
| 3. Displays a sound comprehension of microeconomic and macroeconomic theory. | | | N |  |
| 4. Applies economic concepts to solve complex problems and enhance decision-making capability. | | | H | Flipped Learning Activities |
| 5. Uses quantitative techniques to analyze different economic systems. | | | H | Exam |
| 6. Applies theoretical knowledge to analyze issues regarding Turkish and global economies. | | | N |  |
| 7. Demonstrates proficiency in statistical tools and mainstream software programs to process and evaluate economic data. | | | S | Exam, Quiz, software application |
| 8. Behaves according to scientific and ethical values at all stages of economic analysis: data collection, interpretation and dissemination of findings. | | | N |  |
| 9. Uses written and spoken English effectively (at least CEFR B2 level) to exchange scientific information. | | | S | Flipped Learning Activities |
| 10. Exhibits individual and professional ethical behavior and social responsibility. | | | S | Flipped Learning Activities |
| 11. Displays learning skills necessary for further study with a high degree of autonomy | | | N |  |
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| Prepared by and Date | Assoc. Prof. Firat Bilgel, 18.08.2020 | | | |
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| **Semester** | **Fall 2020-2021** | | | |
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| Name of Instructor | Assoc. Prof. Firat Bilgel | | | |
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| Course Contents | Week | Topic | | |
|  | 1. | Introduction to Causality | | |
|  | 2. | The Ladder of Causation | | |
|  | 3. | The Genesis of Causal Inference | | |
|  | 4. | Pearl’s Causal Framework: Directed Acyclic Graphs (DAG) – Part I | | |
|  | 5. | Pearl’s Causal Framework: Directed Acyclic Graphs (DAG) – Part II | | |
|  | 6. | DAGs in Action: Using the dagitty software | | |
|  | 7. | Paradoxes and Causation | | |
|  | 8. | Midterm | | |
|  | 9. | Rubin’s Causal Framework: Potential Outcomes – Part I | | |
|  | 10. | Rubin’s Causal Framework: Potential Outcomes – Part II | | |
|  | 11. | Randomized Controlled Trials | | |
|  | 12. | Counterfactuals | | |
|  | 13. | Counterfactuals and the Law | | |
|  | 14. | Machine Learning and Artificial Intelligence | | |
|  | 15. | Final Examination Period | | |
|  | 16. | Final Examination Period | | |
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| Required  Readings | Pearl, J. and Mackenzie, D. (2018) The Book of Why: The New Science of Cause and Effect, New York: Basic Books, Chapters 1-6, 8-10  Rubin, D.B. and Imbens, G.W. (2015) Causal Inference in Statistics and in the Social and Biomedical Sciences. New York: Cambridge University Press, Chapters 1-3  Pearl, J., Gylmour, M. and Jewell, N.P. (2016) Causal Inference in Statistics. A Primer. Wiley | | | |
| Teaching Methods | Flipped classroom | | | |
| Homework and Projects | Yes | | | |
| Laboratory Work | None | | | |
| Computer Use | Yes | | | |
| Other Activities | None | | | |
| Assessment Methods | * Active participation (10%) * Weekly Flipped Learning Activities (15%) * Quizzes (15%) * Midterm (30%) * Final exam (30%) | | | |
| Course Administration | Assoc. Prof. Firat Bilgel [bilgelf@mef.edu.tr](mailto:bilgelf@mef.edu.tr)  **IMPORTANT**: Full attendance is required for this course.  Academic Dishonesty and Plagiarism: [YOK Regulation](http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.16532&MevzuatIliski=0&sourceXmlSearch=Y%C3%BCksek%C3%B6%C4%9Fretim%20Kurumlar%C4%B1%20%C3%96%C4%9Frenci%20Disiplin%20Y%C3%B6netmeli%C4%9Fi) | | | |

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| ECTS Student Workload Estimation |  |