## Course Syllabus

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| **Code - Course Title** | **SAY607 - Advanced Regression Techniques** |
| **Course Type** | I. SEMESTER |
| **Laboratory + Practice** | 3+0 |
| **ECTS** | **7.5** |
| **Language of Instruction** | Türkçe |
| **Course Type** | Elective Courses |
| **Course Instructor(s)** | PROF. DR. HÜSEYİN GÜRBÜZ |

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| **Mode of Delivery** | The mode of delivery of this course is face to face |
| **Place of Delivery** | On Campus |
| **Used Educational Platforms** | Face-to-face |
| **Prerequisites** | There is no prerequisite or co-requisite for this course. |
| **Courses Recomended** | It is recommended that students have taken a course in Statistics. |
| **Recommended Resources** | Damodar N. Gujarati (1999), Basic Econometrics. Literatür Publishing, Istanbul.; Mustafa Sevültekin (2013), Introduction to Econometrics. Dora Publishing, Bursa.; Şahin Akkaya and M. Vedat Pazarlıoğlu (1995), Econometrics I- II, Izmir.; Aziz Kutlar (2005), Applied Econometrics, Nobel Publishing, Istanbul.; Şıklar, E. (2000). Introduction to regression analysis. Eskişehir: Anadolu UniversityAydın, D. (2014). Applied regression analysis. Ankara: Nobel |
| **Work Placement** | N/A |
| **Aims of the Course** | The objective of the Advanced Regression Analysis course is to teach students advanced regression methods and to provide them with the skills to examine relationships between variables through mathematical and statistical models, construct models, make predictions, and interpret results. Furthermore, it aims to enable students to use appropriate regression models in solving real-life problems by ensuring they acquire knowledge and practical competence in topics such as multiple regression, non-linear regression, dummy variable models, multicollinearity, heteroscedasticity, autocorrelation, and model selection methods. |

## Course Syllabus

| Weeks | Learning Outcomes | Topics | Teaching Methods |
|---|---|---|---|
| **Week - 1** | | Description of Regression Analysis | |
| **Week - 2** | | Assumptions of Linear Regression Model | |
| **Week - 3** | | Simple Linear Regression | |
| **Week - 4** | | Multiple Linear Regression | |
| **Week - 5** | | Assessment of Goodness of Fit | |
| **Week - 6** | | Residual Analysis | |
| **Week - 7** | | Outliers Analysis | |

## Course Syllabus

| Weeks | Learning Outcomes | Topics | Teaching Methods |
|---|---|---|---|
| Week - 8 | | Dummy Variables in Regression Analysis | |
| Week - 9 | | Problems of Heteroscedasticity and Autocorrelation | |
| Week - 10 | | Variable Selection and Model Development | |
| Week - 11 | | Biased Estimation Methods | |
| Week - 12 | | Ridge Regresyon | |
| Week - 13 | | Principle Component Regression | |
| Week - 14 | | Logistic Regression | |

## Learning Outcomes

| # | Learning Outcome |
|---|---|
| 1 | Will be able to define fundamental concepts of regression analysis |
| 2 | Will be able to analysis the goodness of fit of regression models |
| 3 | Multiple linear regression models and the estimation of parameters using the Ordinary Least Squares method; hypothesis testing, confidence intervals, and the overall significance of the model in multiple regression; functional forms in regression models, logarithmic and polynomial regression models; regression models with dummy variables and the analysis of categorical variables; interaction terms and the examination of variable interactions in regression models; logistic regression and binary dependent variable models; introduction to panel data regression models: fixed and random effects models; applied regression analysis, model estimation, evaluation of results, and scientific reporting. |

## Sustainable Development Goals

✓ Quality Education

## Course Theme

✓ Economics, Finance and Management ✓ Data Science

## AKTS Workload

| Activity | Duration (Hour) | Count | Workload |
|---|---|---|---|
| Teorik Derse Katılım | 0 | 0 | 0 |
| Sınıf Dışı Çalışma (Ön Hazırlık & Pekiştirme Amaçlı) | 0 | 0 | 0 |
| Ödevler | 0 | 0 | 0 |
| Proje - Rapor - Sunum Hazırlama | 0 | 0 | 0 |
| Ara Sınav Hazırlığı (sınav süresi dahil) | 0 | 0 | 0 |
| Final Sınavı Hazırlığı (sınav süresi dahil) | 0 | 0 | 0 |

## AKTS Workload

| Activity | Duration (Hour) | Count | Workload |
|---|---|---|---|
| Uygulama (Laboratuvar, Müzik/Enstrüman Uygulaması, Atölye/Saha Çalışması vb.) | 0 | 0 | 0 |
| Staj Uygulaması | 0 | 0 | 0 |
| | | **Calculated ECTS** | **0** |

## Assessment Method and Passing Requirements

✓ Project ✓ Homework

| Assessment Method and Passing Requirements | Quamtity | Percentage (%) |
|---|---|---|
| 1.Midterm Exam | 1 | 40 |
| Final Exam | 1 | 60 |
| | **Sum (%)** | **100** |

## Community Service Activity

**External stakeholders collaborated with in community service activities within the course:**
✓ Educational institutions ✓ Other universities / academic institutions

**Target audience of the community service activities carried out within the course:**
✓ Local community / general public ✓ Public sector employees ✓ Private sector / industry employees ✓ Educators

**Type of community contribution arising from the course:**
✓ Awareness raising ✓ Education and knowledge sharing ✓ Skills development / capacity building ✓ Contribution to policy development ✓ Economic / employment contribution ✓ Research and knowledge production