Course Syllabus

Code - Course Title	**EÖD510 - Introduction to Statistical Programming with R**
Course Type	II. SEMESTER
Laboratory + Practice	3+0
ECTS	**6.0**
Language of Instruction	Türkçe
Course Type	Elective Courses
Course Instructor(s)	DOÇ. DR. BAŞAK ERDEM KARA

Mode of Delivery	Face to face
Place of Delivery	On Campus
Prerequisites	There is no prerequisite for this course
Courses Recomended	There are no prerequisites or corequisites for this course.
Recommended Resources	• Atar, B., Atalay-Kabasakal, K., Ünsal-Özberk E. B., Özberk, E. H. & Kıbrıslıoğlu-Uysal, N. (2021) (4. Bs). R ile veri analizi ve psikometriUygulamaları. Pegem Akademi.• Aydın, B., Algina, J., Leite, W. L., & Atılgan, H. (2018). Sosyal bilimler için R'a giriş. Anı Yayıncılık.• Desjardins, C. D. & Bulut, O. (2017). Handbook of educational measurement and psychometrics using R. Chapman and Hall/CRC• Field. A, Miles. J & Field. Z, (2012). Discovering statistics using R. Sage Publications.• Koğar, H. (2020). R ile geçerlik ve güvenirlik analizleri: Klasik test kuramı, faktör analizi ve madde tepki kuramı uygulamaları. Pegem Akademi.• Learn R in R: https://swirlstats.com/
Work Placement	There is no work placement in the context of this course.
Aims of the Course	The aim is to develop students' ability to use the R programming language to organise, transfer and visualise data, and perform the desired statistical and psychometric operations on it.

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Weeks	Learning Outcomes	Topics	Teaching Methods
Week - 1	**LO-1** **LO-2**	Introduction to R: Installation of R and RStudio, RStudio Environment and Main Operations	Lecture, Case Study, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 2	**LO-1** **LO-2**	Main Prompts in RStudio, Installing Packages and Creating Working Directory	Lecture, Team/Group Work, Case Study, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 3	**LO-1** **LO-2**	Data Structures and Sample Applications	Lecture, Team/Group Work, Case Study, Demonstration and Practice, Practice/Practical Work/Workshop

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Week - 4	LO-1 LO-2	Data Structures and Sample Applications: Data Frames, Factors and Lists	Lecture, Team/Group Work, Case Study, Problem Solving, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 5	LO-1 LO-2	Transformations between Data Structures and Sample Applications	Lecture, Team/Group Work, Problem Solving, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 6	LO-1 LO-2	Data Transfer and Manipulation	Lecture, Team/Group Work, Case Study, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 7	LO-1 LO-2	Data Manipulation	Lecture, Team/Group Work, Problem Solving, Brain Storming, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 8	LO-1 LO-2 LO-3	Basic Descriptive Statistics and Data Visualization	Lecture, Team/Group Work, Case Study, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 9	LO-1 LO-2 LO-3	Hypothesis Testing	Lecture, Team/Group Work, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 10	LO-1 LO-2 LO-3	Functions, Conditions, and Loops	Lecture, Team/Group Work, Case Study, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 11	LO-1 LO-2 LO-5	Probability Distributions and Data Generation	Lecture, Case Study, Demonstration and Practice, Practice/Practical Work/Workshop

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Weeks	Learning Outcomes	Topics	Teaching Methods
Week - 12	LO-1 LO-2 LO-3	Measurement Theory Applications	Lecture, Question & Answer, Team/Group Work, Problem Solving, Brain Storming, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 13	LO-1 LO-2 LO-3	Measurement Theory Applications	Lecture, Question & Answer, Discussion, Team/Group Work, Brain Storming, Demonstration and Practice, Practice/Practical Work/Workshop
Week - 14	LO-1 LO-6	Reproducible analysis and reporting	Lecture, Question & Answer, Problem Solving, Brain Storming, Demonstration and Practice, Practice/Practical Work/Workshop

Learning Outcomes

#	Learning Outcome
1	Students will be able to develop codes for statistical operations using the fundamental structures of the R programming language.
2	Students will be able to organize datasets within the R environment in a manner appropriate for the purpose of analysis.
3	Students will be able to perform analyses appropriate to research problems within the R environment.
4	Students will be able to generate data through simulation in the R environment.
5	Students will be able to report the analysis processes they carry out with R in a reproducible manner.

Sustainable Development Goals

✓ Quality Education

Course Theme

✓ Educational Sciences and Educational Technologies ✓ Data Science ✓ Software, Cloud and Blockchain

AKTS Workload

Activity	Duration (Hour)	Count	Workload
Teorik Derse Katılım	3.00	14	42

AKTS Workload

Activity	Duration (Hour)	Count	Workload
Sınıf Dışı Çalışma (Ön Hazırlık & Pekiştirme Amaçlı)	3.00	14	42
Ödevler	5.00	4	20
Proje - Rapor - Sunum Hazırlama	30.00	1	30
Ara Sınav Hazırlığı (sınav süresi dahil)	10.00	1	10
Final Sınavı Hazırlığı (sınav süresi dahil)	0.00	0	0
Uygulama (Laboratuvar, Müzik/Enstrüman Uygulaması, Atölye/Saha Çalışması vb.)	0.00	0	0
Staj Uygulaması	0.00	0	0
		Calculated ECTS	**6.0**

Assessment Method and Passing Requirements

✓ Open-Ended Test ✓ Multiple Choice Test ✓ Short-Answer Test ✓ Performance Assessment (Individual/Panel-Based) ✓ Project ✓ Homework ✓ Take Home Exam