



AYDIN ADNAN MENDERES UNIVERSITY
GRADUATE SCHOOL OF HEALTH SCIENCES
BIOSTATISTICS
BIOSTATISTICS (MEDICAL)
BIOSTATISTICS (MEDICAL) MASTER
COURSE INFORMATION FORM

Course Title	Multidimensional Data Analysis								
Course Code	BİS540			Course Level		Second Cycle (Master's Degree)			
ECTS Credit	4	Workload	104 (Hours)	Theory	2	Practice	0	Laboratory	0
Objectives of the Course	Description of dimension reduction and machine learning techniques in multidimensional data.								
Course Content	Mathematical distance, dimension reduction, singular value decomposition and principal component analysis, multiple dimensional scaling plots, factor analysis, dealing with batch effects, clustering, heatmaps, basic machine learning concepts.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Individual Study								
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading

1	Lohnes, P. R. (1971). Multivariate data analysis. J. Wiley.
2	Li, K. C., Jiang, H., Yang, L. T., & Cuzzocrea, A. (Eds.). (2015). Big data: Algorithms, analytics, and applications. CRC Press.
3	Lohnes, P. R. (1971). Multivariate data analysis. J. Wiley.
4	Bühlmann, P., & Van De Geer, S. (2011). Statistics for high-dimensional data: methods, theory and applications. Springer Science & Business Media.

Week	Weekly Detailed Course Contents	
1	Theoretical	General information
2	Theoretical	Data pre-processing techniques
3	Theoretical	Linear Algebra
4	Theoretical	Multivariate Distributions
5	Theoretical	Statistical Inference
6	Theoretical	MANOVA
7	Theoretical	Regression
8	Intermediate Exam	Midterm exam
9	Theoretical	Multiple Regression
10	Theoretical	Principal Component Analysis
11	Theoretical	Factor Analysis
12	Theoretical	Canonical Correlation Analysis
13	Theoretical	Statistical-based Classification Methods
14	Theoretical	Statistical-based Clustering Methods
15	Theoretical	Literature review and discussion
16	Theoretical	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	2	42
Assignment	10	0	2	20
Quiz	10	1	1	20
Midterm Examination	1	10	1	11



Final Examination	1	10	1	11
Total Workload (Hours)				104
[Total Workload (Hours) / 25*] = ECTS				4
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	To learn the basic concepts of multivariate data analysis
2	Learning multivariate data preprocessing methods
3	To be able to analyze multivariate data with statistical techniques
4	Learning the learning methods of statistics
5	To have knowledge about regression methods

Programme Outcomes (*Biostatistics (Medical) Master*)

1	To be able to understand the interdisciplinary interaction related with biostatistics.
2	to be able to use Theoretical and practical knowledge at the level of expertise.
3	To be able to interpret the information by integrating information from different disciplines and create new information
4	To be able to analyze the problems encountered by using research methods
5	to be able to conduct a study as an independent specialist
6	To be able to formulate solutions for complex unpredictable problems encountered by developing new approaches and taking responsibility.
7	To be able to resolve problems in environments that require leadership.
8	To be able to evaluate and direct knowledge and skills with a critical approach at the level of expertise.
9	To be able to give statistical advise at the beginning stages of preparing health related projects
10	To be able to get the knowledge and the ability of using statistical packages

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	4	4	3	4	3
P2	4	4	4	4	3
P3	4	4	4	4	3
P4	3	4	3	3	4
P5	4	4	4	4	5
P6	3	4	4	4	4
P7	3	3	4	3	4
P8	4	4	3	4	4
P9	3	4	4	4	4
P10	3	3	4	4	4

