



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

Course Title	Bayesian Data Analysis								
Course Code	BİS528			Course Level		Second Cycle (Master's Degree)			
ECTS Credit	8	Workload	202 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The goal of the course is to give an introduction to the theory behind and the tools of Bayesian data analysis.								
Course Content	Bayes' theorem, base concepts of Bayesian data analysis, theory and applications of Bayesian data analysis, comparison of Bayesian and classical statistical methods.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Project Based 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	Gelman, A., Stern, H. S., Carlin, J. B., Dunson, D. B., Vehtari, A., & Rubin, D. B. (2013). Bayesian data analysis. Chapman and Hall/CRC.
2	Sivia, D., & Skilling, J. (2006). Data analysis: a Bayesian tutorial. OUP Oxford.
3	Hoff, P. D. (2009). A first course in Bayesian statistical methods (Vol. 580). New York: Springer.
4	Congdon, P. (2007). Bayesian statistical modelling (Vol. 704). John Wiley & Sons.

Week	Weekly Detailed Course Contents	
1	Theoretical	Review of Probability Concepts
2	Theoretical	Bayes' Law and the Basic Bayesian Framework
3	Theoretical	Bayesian Analyses for Basic One-Sample Models
4	Theoretical	Bayesian Linear Models
5	Theoretical	General Classes of Prior Distributions and Prior Elicitation
6	Theoretical	Some Useful Monte Carlo Methods (along with use of R)
7	Theoretical	Assessing Model Quality
8	Intermediate Exam	Midterm exam
9	Theoretical	Bayesian Hypothesis Testing
10	Theoretical	Bayesian Analyses for Two- and k-Sample Models-1
11	Theoretical	Bayesian Analyses for Two- and k-Sample Models-2
12	Theoretical	Hierarchical Bayesian Models
13	Theoretical	Advanced Bayesian Models: Count Regression, Mixed Models, Models for Clustered/Longitudinal Data (Time permitting)-1
14	Theoretical	Advanced Bayesian Models: Count Regression, Mixed Models, Models for Clustered/Longitudinal Data (Time permitting)-2
15	Theoretical	Literature review and discussion
16	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42
Assignment	2	10	0	20
Seminar	2	15	2	34
Individual Work	10	0	2	20
Quiz	14	2	1	42



Midterm Examination	1	20	2	22
Final Examination	1	20	2	22
Total Workload (Hours)				202
[Total Workload (Hours) / 25*] = ECTS				8

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	To learn the concepts of Bayes theorem
2	To be able to comprehend the philosophy of Bayesian statistical modeling
3	To be able to comprehend Bayesian models for numerous common data analysis situations, including prior elicitation
4	To be able to use software such as R, SAS or SPSS to implement Bayesian analyses
5	To be able to comprehend basic principles of both conjugate analyses and MCMC-based Bayesian analyses

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 begining 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

	L2	L3	L4	L5
P1	3	3	2	3
P2	4	4	5	4
P3	4	3	3	4
P4	5	4	4	4
P5	4	3	5	4
P6	4	4	3	3
P7	4	3	3	3
P8	5	4	3	4
P9	5	3	5	4
P10	3	3	5	2

