

**H.U. INSTITUTE OF HEALTH SCIENCES  
COURSE SYLLABUS**

<b>PROGRAM NAME</b>		BIOSTATISTICS			
<b>CODE</b>	BIS 654	<b>TITLE</b>	LINEAR REGRESSION ANALYSIS		
<b>LECTURER (S)</b>		PROF. REHA ALPAR, PhD ASSOC. PROF. OSMAN SARAÇBAŞI, PhD			
<b>TYPE</b>	<input type="checkbox"/> COMPULSORY <input checked="" type="checkbox"/> SELECTIVE	<b>LANGUAGE</b>	<input checked="" type="checkbox"/> TURKISH <input type="checkbox"/> ENGLISH	<b>LEVEL</b>	<input checked="" type="checkbox"/> MASTER OF SCI. <input type="checkbox"/> DOCTORATE <input type="checkbox"/> PREREQ. PREP.

<b>THEORETICAL (HRS/WK)</b>	3	<b>PRACTICAL (HRS/WK)</b>	0	<b>H.U. CREDIT</b>	3	<b>ECTS CREDIT</b>	7
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<b>WHAT IS THE IMPORTANCE OF THIS COURSE IN THE PROGRAM'S LEARNING OBJECTIVES</b>	
<b>PRE-REQUISITE(S)</b>	BIS535
<b>COURSE OBJECTIVES</b>	Some of the studies in health sciences are carried out for prediction of the dependent variable and/or determination of independent variables affecting the dependent variable. One of the methods used for this purpose is linear regression method. It will be much easier for the students of this course to learn and apply other statistical estimation methods.
<b>LEARNING OUTCOMES AND ACQUIRED COMPETENCES</b>	Students will learn the reasons of using simple and multiple linear regression methods, building and analyzing linear models and how to use different software programs for analyzing linear models. They will be able to analyze and interpret such problems individually. In addition, the students will also have introductory knowledge on non-linear regression models.
<b>COURSE CONTENT</b>	Aims, use and assumptions of linear regression analysis, hypothesis tests and confidence intervals regarding linear regression models, multiple partial correlation coefficients, sufficiency and validity measures of the models (measures of goodness of fit), methods of variable selection.
<b>COURSE SCHEDULE</b>	Week 1 Objectives, use, properties and assumptions of linear regression analysis and modules of different software programs on linear regression.
	Week 2 Simple linear regression analysis
	Week 3 Simple linear regression analysis
	Week 4 Non-linear regression models and non-linear regression models that can be linearized.

	Week 5	Multiple linear regression analysis, confidence intervals and hypothesis tests
	Week 6	Examining measures-residuals for adequacy of regression models (raw residuals, standardized residual, studentized residuals, and etc.) and graphical representations for residuals
	Week 7	Goodness of fit measures for (Cook distance, observation distance, Mahalanobis distance, DFBETA, DFITS and etc.) and graphical representations.
	Week 8	Problem of changing variability in regression
	Week 9	Problem of collinearity in regression
	Week 10	Normality of residuals and problem of autocorrelation
	Week 11	Measures used for validity of the models (PRESS statistic, and etc.)
	Week 12	Use of dummy variables in case of categorical variables
	Week 13	Methods of variable selection
	Week 14	Term project presentation
	Week 15	Practice – Discussion
<b>SUGGESTED COURSE MATERIAL</b>	<p>1. Chatterjee S. and Price B. Regression Analysis by Example. John Wiley and Sons, Inc., New York, 1991.</p> <p>2. Freund RJ. and Wilson Wj. Regression Analysis: Statistical Modeling of a response Variable. academic Press, New York, 1998.</p> <p>3. Montgomery C.M. and Peck E. Introduction to Linear Regression Analysis. John Wiley and Sons, Inc., New York, 1991.</p> <p>4. Alpar, R. Çok Değişkenli İstatistiksel Yöntemlere Giriş I. Nodel Yayın-Dağıtım, Ankara, 2003.</p>	
<b>TEACHING METHODS</b>	<p>Student orientated education: students are told to be prepared for the following week's topics. The students are encouraged to discuss the relevant topics with their classmates. Students' theoretical knowledge on specific topics is improved by exercises given as assignments. After the evaluation of these assignments, feedbacks are given to the students.</p>	
<b>ASSESSMENT METHODS</b>	<p>Final grade is calculated on the basis of participation in discussions (7.5%), assignments (22.5%), mid-term exams (20%) and a final exam (50%).</p>	