

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

PROGRAM NAME		BIOSTATISTICS	
CODE	BIS 607	TITLE	MATRIX ALGEBRA
LECTURER (S)		PROF. REHA ALPAR, PhD INSTRUCTOR PINAR ÖZDEMİR GEYİK, PhD INSTRUCTOR ERDEM KARABULUT, PhD	
TYPE	<input type="checkbox"/> COMPULSORY <input checked="" type="checkbox"/> SELECTIVE	LANGUAGE	<input checked="" type="checkbox"/> TURKISH <input type="checkbox"/> ENGLISH
LEVEL		<input checked="" type="checkbox"/> MASTER OF SCI. <input type="checkbox"/> DOCTORATE <input type="checkbox"/> PREREQ. PREP.	

THEORETICAL (HRS/WK)	2	PRACTICAL (HRS/WK)	0	H.U. CREDIT	2	ECTS CREDIT	5
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WHAT IS THE IMPORTANCE OF THIS COURSE IN THE PROGRAM'S LEARNING OBJECTIVES																									
PRE-REQUISITE(S)	NONE																								
COURSE OBJECTIVES	Basic matrix operations those used frequently in statistical analysis are thought to students who don't have a statistical background. The course will be carried out by lectures given by the lecturer and discussions of the students asked to study to the relevant lectures beforehand.																								
LEARNING OUTCOMES AND ACQUIRED COMPETENCES	Students of this course will learn the basic matrix operations and carry out these operations by related software programs.																								
COURSE CONTENT	Basic arithmetic operations on matrices, some basic properties of matrices for basic arithmetical operations, minors, cofactors, adjoint matrix, orthogonal matrix, definition and calculation of determinant, inverse, transpose of a matrix, linear equation systems. Use of matrices in statistical calculations																								
COURSE SCHEDULE	<table border="1"> <tr> <td>Week 1</td> <td>Necessity and definition of matrices</td> </tr> <tr> <td>Week 2</td> <td>Types of matrices</td> </tr> <tr> <td>Week 3</td> <td>Basic arithmetic operations on matrices</td> </tr> <tr> <td>Week 4</td> <td>Determinants</td> </tr> <tr> <td>Week 5</td> <td>Minors, cofactors and adjoint matrix</td> </tr> <tr> <td>Week 6</td> <td>Inverse of a matrix</td> </tr> <tr> <td>Week 7</td> <td>Practice on matrix operations by means of different software I</td> </tr> <tr> <td>Week 8</td> <td>Orthogonal matrix</td> </tr> <tr> <td>Week 9</td> <td>Partitioning matrices</td> </tr> <tr> <td>Week 10</td> <td>Concepts of linear independency and dependency</td> </tr> <tr> <td>Week 11</td> <td>Definition of ranks and maximal nonsingular matrices</td> </tr> <tr> <td>Week 12</td> <td>Linear Equations</td> </tr> </table>	Week 1	Necessity and definition of matrices	Week 2	Types of matrices	Week 3	Basic arithmetic operations on matrices	Week 4	Determinants	Week 5	Minors, cofactors and adjoint matrix	Week 6	Inverse of a matrix	Week 7	Practice on matrix operations by means of different software I	Week 8	Orthogonal matrix	Week 9	Partitioning matrices	Week 10	Concepts of linear independency and dependency	Week 11	Definition of ranks and maximal nonsingular matrices	Week 12	Linear Equations
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	Week 13	Eigenvalues and eigenvectors
	Week 14	Practice on matrix operations by means of different software II
	Week 15	Practice – Discussion
SUGGESTED COURSE MATERIAL	<p>1. Hacısalıhođlu HH. Matris İşlemleri. Schaum's serisinden çeviri. Nobel Yayın, Ankara, 2000.</p> <p>2. Searle SR. Matrix Algebra useful for statistics. John-Wiley, New York, 1982</p> <p>3. Barnett S. Matrices: Methods and Applications. Clarendon, Oxford, 1990.</p>	
TEACHING METHODS	<p>The students are encouraged to discuss the current week's topics with their classmates and told to be prepared for the following week's topics. Assignments are evaluated on the basis of discussions held within classes.</p>	
ASSESSMENT METHODS	<p>I. mid-term examination (20%), II. Mid-term examination (20%), homework (10%), final examination (50%).</p>	