

### COURSE PROFILE

Course Name	Code	Semester	Term	Theory +PS+Lab. (hour/week)	Local Credits	ECTS
Statistics II	MATH 232	Spring	4	(3+0+0)	3	5

<b>Prerequisites</b>	Math231
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<b>Course Language</b>	English
<b>Course Type</b>	Elective
<b>Course Lecturer</b>	<ul style="list-style-type: none"> <li>Prof. Dr. Mùjgan Tez</li> </ul>
<b>Course Assistant</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Course Objectives</b>	The course is the continuation of MATH231. The purpose of the course is to provide the students with tools that help us understand how some more advanced techniques in statistics such as two sample tests of hypothesis, analysis of variance as well as linear regression and correlation, multiple regression and chi-square applications are constructed, developed and applied.
<b>Course Learning Outcomes</b>	<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. demonstrate an understanding of two-sample hypothesis testing</li> <li>2. compute and interpret correlation between two variables</li> <li>3. distinguish between one-sample and two-sample tests of hypothesis</li> <li>4. interpret and use a linear and multiple regression model for purposes of description and prediction</li> <li>5. recognize the basic logic of ANOVA</li> <li>6. interpret and use ANOVA tables to draw conclusions about populations</li> <li>7. interpret and use the chi-square goodness of fit test to ascertain whether the data from a process fit a specified distribution</li> <li>8. demonstrate the ability to apply appropriate statistical techniques to analyze data .</li> </ol>
<b>Course Content</b>	Two-sample hypothesis testing; analysis of variance; linear regression and correlation; multiple regression and correlation analysis; chi-square applications for nominal data; timeseries analysis.

### COURSE CONTENT

Week	Subjects	Related Preparation

1	Continuous Probability Distributions, The family of Uniform Distributions, The Standard Normal Distribution	10
2	Finding Areas Under the Normal Curve, Sampling Methods , Reasons to sample, Simple Random Sampling, Systematic Random Sampling, Sampling Error	10, 11
3	Sampling Distribution of the Sample Mean, The Central Limit Theorem	11
4	Estimation and Confidence Intervals, Point Estimates and Confidence Intervals , Known Sigma or a Large Sample	12
5	A confidence Interval for a Proportion, Finite population Correction Factor, Choosing an Appropriate Sample Size	12, 13
6	One Sample Tests of Hypothesis, Five step Procedure for Testing a Hypothesis	14
7	One-Tailed and Two-Tailed Tests of Significance, Testing for a population Mean with a Known Population Standard Deviation	14
8	p-value in Hypothesis Testing, Testing for a Population Mean: Large Sample, Population Standard Deviation Unknown, Test Concerning Proportions	15
9	Two Sample Tests of Hypothesis, Independent Samples, Two-Sample Tests about Proportions, Comparing Dependent and independent Samples	15, 16
10	Analysis of Variance, The F Distribution, Comparing Two Population Variances	16
11	Anova Assumptions, The Anova Test, Inferences about Pairs of Treatment Means	16
12	Linear Regression and Correlation , The Coefficient of Correlation, The Coefficient of Determination, Testing the significance of the correlation coefficient,	17
13	Regression Analysis, Least Square Principle, The Standard Error of Estimate, Confidence and Prediction Intervals	17
14	Multiple Regression and Correlation Analysis, The Anova table, Evaluating the Regression Equation	17

<b>Course Textbooks</b>	DA Lind, WG Marchal, SA Wathen, <i>Statistics for Business and Economics</i> , 8 <sup>th</sup> ed. McGraw-Hill  KELLER , G., STATISTICS FOR MANAGEMENT AND ECONOMICS, 8th ed., South-Western College Pub (January 8, 2008).
<b>Recommended References</b>	<ol style="list-style-type: none"> <li>1. MCCLAVE-SINCICH., STATISTICS, Eleventh Edition., Pearson Prentice Hall (2009)</li> <li>2. KELLER , G., STATISTICS FOR MANAGEMENT AND ECONOMICS, 8th ed., South-Western College Pub (January 8, 2008).</li> </ol>

<b>Semester Requirements</b>	<b>Number</b>	<b>Percentage of Grade</b>
Attendance/Participation	14	5
Laboratory	-	-
Application	-	-
Special Course Internship (Work Placement)	-	-
Quizzes/Studio Critics	-	-
Homework Assignments	13	-
Presentation	-	-
Project	-	-
Seminar/Workshop	-	-
Midterms/Oral Exams	2	60
Final/Resit Exam	1	35
<b>Total</b>	<b>30</b>	<b>100</b>

<b>PERCENTAGE OF SEMESTER WORK</b>	29	65
<b>PERCENTAGE OF FINAL WORK</b>	1	35
<b>Total</b>	<b>30</b>	<b>100</b>

Course Category	Core Courses	
	Major Area Courses	X

	Supportive Courses	
	Media and Management Skills Courses	
	Transferable Skill Courses	

### COURSE'S CONTRIBUTION TO PROGRAM

#	Program Qualifications / Outcomes	* Level of Contribution				
		1	2	3	4	5
1	To have a grasp of basic mathematics, applied mathematics and theories and applications of statistics.					X
2	To be able to use theoretical and applied knowledge acquired in the advanced fields of mathematics and statistics,					X
3	To be able to define and analyze problems and to find solutions based on scientific methods,					X
4	To be able to apply mathematics and statistics in real life with interdisciplinary approach and to discover their potentials,				X	
5	To be able to acquire necessary information and to make modeling in any field that mathematics is used and to improve herself/himself,				X	
6	To be able to criticize and renew her/his own models and solutions,					X
7	To be able to tell theoretical and technical information easily to both experts in detail and nonexperts in basic and comprehensible way,				X	
8	To be able to use international resources in English and in a second foreign language from the European Language Portfolio (at the level of B1) effectively and to keep knowledge up-to-date, to communicate comfortably with colleagues from Turkey and other countries, to follow periodic literature,				X	
9	To be familiar with computer programs used in the fields of mathematics and statistics and to be able to use at least one of them effectively at the European Computer Driving Licence Advanced Level,					X
10	To be able to behave in accordance with social, scientific and ethical values in each step of the projects involved and to be able to introduce and apply projects in terms of civic engagement,				X	
11	To be able to evaluate all processes effectively and to have enough awareness about quality management by being conscious and having intellectual background in the universal sense,				X	

<b>12</b>	By having a way of abstract thinking, to be able to connect concrete events and to transfer solutions, to be able to design experiments, collect data, and analyze results by scientific methods and to interfere,					X
<b>13</b>	To be able to continue lifelong learning by renewing the knowledge, the abilities and the competencies which have been developed during the program, and being conscious about lifelong learning,			X		
<b>14</b>	To be able to adapt and transfer the knowledge gained in the areas of mathematics and statistics to the level of secondary school,				X	
<b>15</b>	To be able to conduct a research either as an individual or as a team member, and to be effective in each related step of the project, to take role in the decision process, to plan and manage the project by using time effectively.					X

\*1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

#### ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Number	Duration (Hours)	Total Workload
<b>Course Hours (Including Exams)</b>	14	3	48
<b>Tutorials</b>	-	-	-
<b>Laboratory</b>	-	-	-
<b>Application</b>	-	-	-
<b>Special Course Internship (Work Placement)</b>	-	-	-
<b>Field Work</b>	-	-	-
<b>Study Hours Out of Class</b>	14	2	28
<b>Presentations / Seminar</b>	-	-	-
<b>Project</b>	-	-	-
<b>Preparatory reading</b>	13	1	13
<b>Homework Assignments</b>	13	1	13
<b>Quizzes</b>	-	-	-
<b>Midterm Exams</b>	2	6	12

<b>Final / Resit Exam</b>	1	11	11
		<b>Total Workload</b>	<b>125</b>

**COURSE CATEGORY**

<b>ISCED GENERAL AREA CODES</b>	<b>GENERAL AREAS</b>	<b>ISCED BASIC AREA CODES</b>	<b>BASIC EDUCATIONAL AREAS</b>	
1	Education	14	Teacher Training and Educational Sciences	0
2	Humanities and Art	21	Art	0
2	Humanities and Art	22	Humanities	0
3	Social Sciences, Management and Law	31	Social and Behavioral Sciences	0
3	Social Sciences, Management and Law	32	Journalism and Informatics	0
3	Social Sciences, Management and Law	38	Law	0
4	Science	42	Life Sciences	0
4	Science	44	Natural Sciences	0
4	Science	46	Mathematics and Statistics	100
4	Science	48	Computer	0
5	Engineering, Manufacturing and Civil	52	Engineering	0
5	Engineering, Manufacturing and Civil	54	Manufacturing and Processing	0
5	Engineering, Manufacturing and Civil	58	Architecture and Structure	0
6	Agriculture	62	Agriculture, Forestry, Livestock, Fishery	0
6	Agriculture	64	Veterinary	0
7	Medicine and Welfare	72	Medical	0
7	Medicine and Welfare	76	Social Services	0
8	Service	81	Personal Services	0
8	Service	84	Transport Services	0

8	Service	85	Environment Protection	0
8	Service	86	Security Services	0