UNIVERSITY "UKSHIN HOTI" PRIZREN
International Summer School (ISS) 2022 Edition
Faculty of Education

SYLLABUS

Academic unit / faculty:	**Faculty of Education**			ISS edition:	**2022**
Course title:	**Statistical Analysis**				
Course status:	**Obligatory**	Code:		ECTS credits:	**4**
Teaching days/weeks:	**14 days / 2 weeks**	Teaching hours:		Lectures:	Exercises:
				3	**1**
Office hours:	**Daily (Monday-Friday, 2 Weeks)**				
Course professor 1. / Supervisor:	**Erdoğan Tezci**		E-mail:	**etezci@balikesir.edu.tr; erdogan.tezci@hotmail.com**	
			Tel.:	**+90 505-6890512**	
Course co-professor 2. / Co-supervisor:	**Fatmir Mehmeti**		E-mail:	**fatmir.mehmeti@uni-prizren.com**	
			Tel.:	**+383 44 209 943**	

COURSE CONTENT:

1. Types of data (scale, ordinal, nominal), preparinghe the data for analysis with SPSS
2. Examining the distribution of the data (normal distribution, extreme values etc. Mean, Standard Deviation) 3. Parametric tests for independent samples: Independent Sample t Test, One Way ANOVA,
4- Parametric tests for independent samples: Two Way ANOVA, ANCOVA,
5- Parametric tests for independent samples: MANOVA
6. Parametric Tests for Dependent Samples: Paired Sample t Test, Repeated Measures ANOVA,
7- Parametric Tests for Dependent Samples: Two Way ANOVA,
8- Non Parametric Test: Mann Whitney U, Kruskall Wallis H, Chi-Square, Wilcoxon, McNemar
9. Regression Analysis
10. Factor Analysis
11. Structural Equation Modeling

Course objectives:	**Course learning outcomes:**

At the end of the course, Participants; conduct to based on basic statistical analyzes will comprehend multi-variabled statistical techniques, distinguish between univariate and multivariate analyzes will be able to apply validity and reliabilty analysis using data distinguish the features, analyze multi-variabled data with appropriate statistical techniques and interpret the results.	1-To be explain basic information on concepts of multi-variable statistics 2- To be able to distinguish between multi-variable data 3- Being able to arrange multi-variable data 4- To be able to explain statistical methods used in education, social sciences .. etc. 5- Being able to apply basic statistical techniques (T test, ANOVA, Mann Whitney U, Kruskall-Wallis H, Wicoxon Sign... etc) with commonly used statistics programs (SPSS) 6- Being able to apply advanced statistical techniques (ANCOVA, MANOVA) with commonly used statistics programs 7- To be able to conduct to analysis accordance with the characteristics of the measurement instrument. 7-To be able to conduct exploratory factor analysis and interpreting results 8-To be able to conduct confirmatory factor analysis and interpreting results 9- To be able to conduct correlation analysis and interpreting results 10 To be able to conduct simple regression analysis and interpreting results 11- To be able to conduct multiple regression analysis and interpreting results 12- To be able to conduct to structural equation model and interpreting results

TEACHING METHODS:

Lectures, explaining, class participation, memorization and demonstration., homeworks, excercises, office hours (consultation)

CONDITIONS FOR COURSE IMPLEMENTATION:

Personal computer, projector, white board,

STUDENT EVALUATION METHODS AND GRADING SCALE:

The course is subject to continuous evaluation. At regular intervals we also ask students to participate in a more comprehensive evaluation. Student evaluation is done by exam, and the final grade consists of the following components:

- Regular and active attendance: 10%,
- Midterm exam: 20%,
- Course project: 20%,
- Final exam: 50%,

GRADING SCALE

Evaluation in %	Final grade	
91 – 100	10	(ECTS – A)
81 – 90	9	(ECTS - B)
71 – 80	8	(ECTS - C)
61 – 70	7	(ETCS - D)
51 – 60	6	(ETCS - E)
0 – 50	5*	(ETCS – FX)

LANGUAGE OF EXAMINATION:

The examination tests are provided in English language, and students submit response in English.

STUDENT DUTIES AND OBLIGATIONS:

Lectures	**Exercises and other study activities**
▪ Regular and active lecture attendance ▪ Active participation in discussions ▪ Respect of the University Code of Ethics etc.	▪ Regular attendance of exercises and study activities ▪ Respect of the University Code of Ethics etc.

STUDENT WORKLOAD:			
Activity	**Hours**	**Days**	**Total hours**
Lectures	3	10	30
Exercises	1	10	10
Field work visits	3	4	12
Reading (Own study time)	3	10	30
Assignments (project, presentation, homework)	2	10	20
Total student workload:			**102**

Note: 1 ECTS credit = 25 hours, for example if the course has 4 ECTS credits a student must have workload of at least 100 hours during the International Summer School (ISS).

DAY	**LECTURES**		**EXERCISES**	
	Topic	**Hours**	**Topic**	**Hours**
1.	**(Example Title of the topic) Strategy of Statşstical Analysis** (Below list the main activities of the day) One example below - Choose a research problem and the properties of the sample dataset based on this problem are described for analysis. - Explain and demonstrate the data has been made available for analysis. - Distributions, multiple normality, extreme values, homogeneity of variances, how to test are explained using the SPSS program, - using data and the treatment steps are shown in SPSS - By giving sample data set, analysis is made - Results are interpreted - How to report the results is explained with the example - They are asked to report on the exercise performed	3	**Exercise topic 1.** Explanation and discussion of the course project topics.	1
2.	Using normality and homogeneous data: - Performing unrelated samples t-test and one-	3	**Exercise topic 2.** Assignments, exercise, quizzes	1

	way analysis of variance (ANOVA) hypothesis testing using SPSS. - Interpreting results - How to report the results is explained with the example - Giving a sample data set, both t test and ANOVA analysis is made - Creating a table in APA 6 style		and case studies related to the topic of the first day lecture.	
3.	Using normality and homogeneous data: - Performing related samples t-test and one way analysis of variance (related samples ANOVA) hypothesis testing using SPSS. - İnterpreting results - How to report the results is explained with example - Giving a sample data set, both related sample t test and ANOVA is made - Creating table in APA 6 style	3	**Exercise topic 3.** Assignments, exercise, quizzes and case studies related to the topic of the second day lecture.	1
4.	Using normality and homogeneous data: - Performing related and unrelated samples two-way ANOVA hypothesis testing using SPSS. - Interpreting results - How to report the results is explained with the example - Giving a sample data set, both related and unrelated ANOVA analysis is made - Creating a table in APA 6 style	3	**Exercise topic 4.** Assignments, exercise, quizzes and case studies related to the topic of the third day lecture.	1
5.	Using data that is not normally distributed and variances are not homogeneous; - Performing the steps of Mann Whitney U Test Analysis using SPSS for two independent samples - Performing the steps of Kruskal Wallis H Test Analysis using SPSS for three or more independent samples - Performing the steps of Wilcoxon and Sign test using SPSS for two related samples - Performing the steps of Friedman test using SPSS for three or more related samples - Interpreting results - How to report the results is explained with the example - Performing of non-parametric analysis for both related and unrelated samples on sample data - Creating a Table in APA 6 Style	3	**Exercise topic 5.** Assignments, exercise, quizzes and case studies related to the topic of the fourth day lecture.	1
6.	Using normality and homogeneous data: - Testing the assumptions of covariance analysis (ANCOVA)	3	**Exercise topic 5.** Assignments, exercise, quizzes,	1

	- Performing the steps of covariance analysis using SPSS - Testing the assumptions of MANOVA - Performing the steps of MANOVA using SPSS - Interpreting ANCOVA and MANOVA results - How to report results is explained with the sample - Giving sample data, performing ANCOVA and MANOVA - Creating a Table in APA style		and case studies related to the topic of the fifth day lecture.	
7.	**Factor Analysis for scale development** - The features of exploratory factor analysis (EFA) are explained. - Exploratory factor analysis assumptions are examined - Explain types of exploratory factor analysis: Principal component, unweighted least square, maximum likelihood methods - Usage patterns types of factor analysis - Determining how to decide the number of factors: Scree plot, map test, factor extracted, eigenvalue - Giving sample data, performing EFA using SPSS - Interpreting output - Determining the appropriate items	3	**Exercise topic 7.** Assignments, exercise, quizzes and case studies related to the topic of the sixth day lecture.	1
8.	**Confirmatory Factor Analysis for scale development** - Explaining what confirmatory factor analysis is - In which cases a confirmatory factor will be specified. - Concepts in confirmatory factor analysis: path coefficient, latent variable, latent variable, observed variable, error variance - It is specified how to interpret the fit indices. - Lisrel program for DFA analysis is introduced - Sentax spelling explained - DFA analysis is applied on the sample data set, - The output is interpreted - Giving sample data set, performing confirmatory analysis an interpreting fit index	3	**Exercise topic 8.** Assignments, exercise, quizzes and case studies related to the topic of the seventh day lecture.	1
9.	**Correlation and Regresyon** - Explaining correlational analysis - Types of correlational analysis - Interpreting results - Performing correlational analysis with sample data set using SPSS - Explaining linear regression analysis	3	**Exercise topic 9.** Assignments, exercise, quizzes and case studies related to the topic of the eighth day lecture.	1

	- Deciding how to determine the model - Testing model using SPSS - Interpreting results			
10.	**Multiple Regression Analysis** - The assumptions of multiple linear regression analysis are examined - Model selection for multiple linear regression: enter, forward, backward and step by step, - Examination of parameters for multiple linear regression: Durbin-Watson, collinearity diagnostics, Mahalanobis, Cook's and Leverage Values, DfFiT etc. - Testing a model using sample data - Performing a multiple regression given sample data using SPSS - Interpreting results - Creating a Table in APA style	3	**Exercise topic 10.** Assignments, exercise, quizzes and case studies related to the topic of the ninth day lecture.	1

LITERATURE:

Books:

- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. sage.
- Hinton, P. R. (2014). *Statistics explained*. Routledge.
- Hoyle, R. H. (1995). *Structural equation modeling: Concepts, issues, and applications*. Sage.
- Kinnear, P. R., & Gray, C. D. (1999). *SPSS for Windows made simple*. Taylor & Francis.
- Tabachnick, B. G., & Fidell, L. S. (2014). *Using multivariate statistics: Pearson new international edition*. Pearson.

Compendium reading list:

- Chau, P. Y. (1997). Reexamining a model for evaluating information center success using a structural equation modeling approach. *Decision Sciences*, *28*(2), 309-334.
- Field, A. P. (2001). Meta-analysis of correlation coefficients: A Monte Carlo comparison of fixed and random-effects methods. *Psychological Methods, 6*(2), 161–180.
- Howell, D. C. (2006). *Statistical methods for psychology (6th ed.).* Belmont, CA: Thomson.
- Howitt, D., & Cramer, D. (2020). *Understanding Statistics in Psychology with SPSS 8th edition pdf ebook*. Pearson Higher Ed.
- Kelloway, E. K. (1998). *Using LISREL for structural equation modeling: A researcher's guide*. Sage.
- Lomax, R. G. (1982). A guide to LISREL-type structural equation modeling. *Behavior Research Methods & Instrumentation*, *14*(1), 1-8.
- Pituch, K. A., & Stevens, J. P. (2015). *Applied multivariate statistics for the social sciences: Analyses with SAS and IBM's SPSS.* Routledge.
- Rutherford, A. (2000). *Introducing ANOVA and ANCOVA: A GLM approach.* London: Sage.
- Sardeshmukh, S. R., & Vandenberg, R. J. (2017). Integrating moderation and mediation: A structural equation modeling approach. *Organizational Research Methods*, *20*(4), 721-745.
- Twisk, J. W. R. (2006). *Applied multilevel analysis: a practical guide.* Cambridge: Cambridge University Press.
- Zwick, R. (1985). Nonparametric one-way multivariate analysis of variance: A computational approach based on the Pillai– Bartlett trace. *Psychological Bulletin, 97*(1), 148–152.

REMARKS FOR STUDENTS:

- Student should be aware of and respect the institution and Code of ethics.
- Student should respect the schedule of lectures, exercises and other study activities.
- Student should possess and show student ISS ID card during exam.
- Student course project/presentation/homework must comply with professor instructions.
- During the exam is strictly forbidden to use of mobile phone devices.