



# Course Specification

## (Postgraduate Programs)

Course Title:	Applied Statistics in Language Research
Course Code:	7505 ENG-3
Program:	Doctor of Philosophy in Applied Linguistics
Department:	English Department
College:	College of Languages and Translation
Institution:	King Khalid University
Version:	2
Last Revision Date:	10 March 2025

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## A. General information about the course:

### 1. Course Identification:

1. Credit hours: ( 3 )

#### 2. Course type

- A. ☐ University ☐ College ☒ Department ☐ Track
- B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: ( 2/1 )

#### 4. Course General Description:

The Applied Statistics in Language Research course covers fundamental statistical topics such as descriptive and inferential statistics, hypothesis testing, correlation analysis, regression models, and multivariate techniques. Students will explore statistical tests for comparing groups, factor analysis, and structural equation modeling, emphasizing their applications in applied linguistics research. A strong focus is placed on data analysis, results identification, reporting and interpretation. By the end of the course, students will be proficient in using statistical software (SPSS, JASP, Jamovi, R) to analyze linguistic data, critically evaluate their findings and apply rigorous statistical analyses in their research.

#### 5. Pre-requirements for this course (if any):

7502 ENG-3

#### 6. Pre-requirements for this course (if any):

NA

#### 7. Course Main Objective(s):

The Applied Statistics in Language Research course aims to

1. Equip students with the knowledge and skills to apply descriptive and inferential statistical techniques for analyzing linguistic data, including measures of central tendency, hypothesis testing, effect size calculation, and selecting appropriate statistical tests such as correlation analysis, t-tests, ANOVA, MANOVA, and regression models.
2. Enhance students' ability to conduct advanced multivariate statistical analyses, including factor analysis (EFA, CFA) and structural equation modeling (SEM), while developing proficiency in using statistical software (SPSS, JASP, Jamovi, R) for data analysis, interpretation, and visualization.
3. Train students to critically evaluate and effectively communicate research findings, assessing the validity, reliability, and methodological rigor of published studies and presenting statistical results following academic and publication standards, including APA guidelines.





4. Enable students to design and conduct rigorous research studies, integrating appropriate methodologies, data analysis techniques, and interdisciplinary applications to investigate linguistic, educational, and cognitive aspects of language learning and use.

## 2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>	36 9	80% 20%
4	Distance learning		

## 3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	15
5.	Others (specify).....	
	Total	45

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Explain key statistical concepts such as descriptive and inferential statistics, hypothesis testing, correlation analysis, regression models, and multivariate	K2	<ul style="list-style-type: none"> <li>Lectures and seminars</li> <li>Guided readings and critical analysis</li> <li>Hands-on workshops</li> </ul>	<ul style="list-style-type: none"> <li>Research projects</li> <li>Presentations</li> </ul>





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	techniques in the context of linguistic research.		<ul style="list-style-type: none"> <li>- Problem-solving exercises</li> <li>- Peer discussions</li> <li>- Case-based learning</li> <li>-</li> </ul>	
1.2	Critically discuss the theoretical foundations of validity, reliability, and ethical principles in scientific research, demonstrating an advanced understanding of their implications for the rigor and integrity of applied linguistics studies.	K2	<ul style="list-style-type: none"> <li>- Lectures and seminars</li> <li>- Critical reading and analysis of research studies</li> <li>- Case-based discussions on research validity and ethics</li> <li>- Debates on methodological approaches</li> <li>- Student-led presentations and peer reviews</li> <li>- Workshops on evaluating research rigor and integrity</li> <li>- Reflective writing and analytical essays</li> <li>- Problem-based learning with real</li> </ul>	<p>-Oral presentations</p> <p>Midterm exam</p>





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			research scenarios	
<b>2.0</b>	<b>Skills</b>			
2.1	Conduct and interpret statistical analyses using appropriate statistical techniques (e.g., t-tests, ANOVA, regression, SEM) to derive meaningful insights in applied linguistics research	<b>S3</b>	<ul style="list-style-type: none"> <li>- Practical workshops</li> <li>- Data analysis exercises</li> </ul>	<ul style="list-style-type: none"> <li>- Research portfolio</li> <li>- Statistical presentations</li> </ul>
2.2	Develop interdisciplinary applications of quantitative statistical methods in applied linguistics, integrating insights from education, psychology, and computational linguistics.	<b>S2</b>	<ul style="list-style-type: none"> <li>- Collaborative projects</li> <li>- Theoretical analysis</li> </ul>	<ul style="list-style-type: none"> <li>- Research proposal</li> <li>- Presentations</li> </ul>
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Advocate for reliable, replicable, and transparent research practices, contributing to interdisciplinary collaboration in applied linguistics.	<b>V2</b>	<ul style="list-style-type: none"> <li>- Open science discussions</li> <li>- Collaborative research projects</li> <li>- Interdisciplinary seminars</li> </ul>	<ul style="list-style-type: none"> <li>- Collaborative research assignments</li> <li>- Group discussions</li> <li>- Peer evaluation of research transparency</li> </ul>
3.2	Engage in academic and professional discourse, presenting quantitative data findings effectively in conferences, publications, and peer-reviewed journals.	<b>V3</b>	<ul style="list-style-type: none"> <li>- Conference-style presentations</li> <li>- Writing and publishing workshops</li> <li>- Peer review and feedback sessions</li> </ul>	<ul style="list-style-type: none"> <li>- Mock conference presentations</li> <li>- Research dissemination report</li> </ul>



## C. Course Content:

No	List of Topics	Contact Hours
1.	<p><i>1. Descriptive Statistics and Data Exploration</i></p> <ul style="list-style-type: none"> <li>Measures of central tendency (mean, median, mode)</li> <li>Measures of dispersion (range, variance, standard deviation, IQR)</li> <li>Checking for normality, skewness, and kurtosis</li> <li>Identifying and handling missing data</li> <li>Detecting and managing outliers</li> <li>Exploring Software: SPSS, JASP, Jamovi, R</li> </ul>	6
2.	<p><i>2. Inferential Statistics and Hypothesis Testing</i></p> <ul style="list-style-type: none"> <li>Developing research hypotheses (null vs. alternative)</li> <li>Significance levels (<math>\alpha</math>), p-values, and confidence intervals</li> <li>Type I and Type II errors</li> <li>Statistical power and sample size determination</li> <li>Effect sizes (Cohen's <math>d</math>, <math>\eta^2</math>) and their interpretation</li> <li>Selecting appropriate statistical tests</li> </ul>	6
3.	<p><i>3. Correlation Analysis: Pearson and Spearman</i></p> <ul style="list-style-type: none"> <li>Pearson vs. Spearman correlation coefficients</li> <li>Correlation matrix and scatterplot visualization</li> <li>Assumptions of correlation tests</li> <li>Interpreting correlation strength and direction</li> <li>Distinguishing between correlation and causation</li> <li>Reporting and writing correlation analysis results</li> </ul>	3
4.	<p><i>4. Comparing Two Groups: Independent and Paired t-tests &amp; Nonparametric Alternatives</i></p> <ul style="list-style-type: none"> <li>Independent t-tests: Assumptions, effect sizes, and interpretation</li> <li>Paired t-tests: When to use, assumptions, and analysis</li> <li>Nonparametric alternatives: Mann-Whitney U test, Wilcoxon signed-rank test</li> <li>Comparing parametric and nonparametric approaches</li> <li>Writing up results for academic reporting</li> </ul>	3
5.	<p><i>5. Comparing Three or More Groups: One-way ANOVA, Repeated Measures ANOVA, Two-way ANOVA &amp; Nonparametric Alternatives</i></p> <ul style="list-style-type: none"> <li>One-way ANOVA: Assumptions, post-hoc tests (Tukey, Bonferroni)</li> <li>Repeated-measures ANOVA: When to use, interpretation</li> <li>Two-way ANOVA: Interaction effects, main effects, and assumptions</li> <li>Nonparametric alternative: Kruskal-Wallis test</li> <li>Effect size calculations (partial <math>\eta^2</math>)</li> </ul>	3



	<ul style="list-style-type: none"> <li>Writing up results for academic reporting</li> </ul>	
6.	<p><i>6. Multivariate Methods: MANOVA &amp; ANCOVA</i></p> <ul style="list-style-type: none"> <li>MANOVA: Comparing multiple dependent variables</li> <li>ANCOVA: Controlling for covariates in comparisons</li> <li>Mixed-design ANOVA: Combining within- and between-subjects factors</li> <li>Interpreting multivariate effects</li> <li>Definition, objectives, underlying assumptions, data interpretation, and academic write-up</li> </ul>	3
7.	<p><i>7. Regression Analysis: Simple Linear Regression and Simple Logistic Regression</i></p> <ul style="list-style-type: none"> <li>Concept of regression in predicting outcomes</li> <li>Simple linear regression: Assumptions, interpretation, and visualization</li> <li>Simple logistic regression: Modeling categorical outcomes</li> <li>Checking model fit and residual analysis</li> <li>Multicollinearity and its impact</li> <li>Definition, objectives, underlying assumptions, data interpretation, and academic write-up</li> </ul>	3
8.	<p><i>8. Multiple Regression Analysis and Multiple Logistic Regression</i></p> <ul style="list-style-type: none"> <li>Multiple regression models: Enter, stepwise, and hierarchical methods</li> <li>Interaction terms and moderation analysis</li> <li>Dummy coding for categorical predictors</li> <li>Assumptions (linearity, independence, normality, homoscedasticity)</li> <li>Definition, objectives, underlying assumptions, data interpretation, and academic write-up</li> </ul>	3
9.	<p><i>9. Exploratory Factor Analysis (EFA) and Scale Reliability</i></p> <ul style="list-style-type: none"> <li>Concept and purpose of Exploratory Factor Analysis (EFA)</li> <li>Steps in factor extraction (PCA, PAF) and rotation methods (varimax, oblimin)</li> <li>Interpreting factor loadings and model fit</li> <li>Assessing scale reliability (Cronbach's alpha, composite reliability)</li> <li>Applications in language testing and survey validation</li> <li>Definition, objectives, underlying assumptions, data interpretation, and academic write-up</li> </ul>	6
10.	<p><i>10. Confirmatory Factor Analysis (CFA)</i></p> <ul style="list-style-type: none"> <li>Differences between CFA and EFA</li> <li>Model specification and parameter estimation</li> <li>Model fit indices (CFI, RMSEA, SRMR)</li> <li>Modification indices and model refinement</li> </ul>	3





	<ul style="list-style-type: none"> <li>• Application in second language acquisition research</li> <li>• Definition, objectives, underlying assumptions, data interpretation, and academic write-up</li> </ul>	
11.	<p><i>11. Structural Equation Modeling (SEM)</i></p> <ul style="list-style-type: none"> <li>• Path analysis and structural equation modeling</li> <li>• Defining latent variables and observed variables</li> <li>• Model identification and estimation methods</li> <li>• Evaluating model fit and modification indices</li> <li>• Applications of SEM in second language research</li> <li>• Definition, objectives, underlying assumptions, data interpretation, and academic write-up</li> </ul>	6
Total		45

#### D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments, presentations, projects, term papers included)	Continuous assessment	30%
2.	Mid-Term Test	6	20 %
3.	Final Exam (Research project, final presentation)	13	50%

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

#### E. Learning Resources and Facilities:

##### 1. References and Learning Resources:

Essential References	<ul style="list-style-type: none"> <li>• Loerts, H., Lowie, W., &amp; Seton, B. (2020). <i>Essential statistics for applied linguistics: Using R or JASP</i>. Bloomsbury Publishing.</li> <li>• Woodrow, L. (2014). <i>Writing about quantitative research in applied linguistics</i>. Palgrave Macmillan. <a href="https://doi.org/10.1057/9780230369955">https://doi.org/10.1057/9780230369955</a></li> <li>• Field, A. P., van Doorn, J., &amp; Wagenmakers, E.-J. (2025). <i>Discovering statistics using JASP</i>. SAGE Publications.</li> <li>• Field, A. P. (2024). <i>Discovering statistics using IBM SPSS statistics</i> (6th ed.). SAGE Publications.</li> <li>• Kessler, M., &amp; Çekmegeli, K. (2025). Quantitative designs in data-driven learning research. In L. McCallum &amp; D. Tafazoli (Eds.), <i>The Palgrave Encyclopedia of Computer-Assisted</i></li> </ul>
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	<p>Language Learning. Palgrave Macmillan.  <a href="https://doi.org/10.1007/978-3-031-51447-0_91-1">https://doi.org/10.1007/978-3-031-51447-0_91-1</a></p> <ul style="list-style-type: none"> <li>Fein, E. C., Gilmour, J., Machin, T., &amp; Hendry, L. (2022). <i>Statistics for research students</i>. University of Southern Queensland.  <a href="https://usq.pressbooks.pub/statisticsforresearchstudents/">https://usq.pressbooks.pub/statisticsforresearchstudents/</a></li> </ul>
Supportive References	<ul style="list-style-type: none"> <li>Salkind, N. J., &amp; Frey, B. B. (2019). <i>Statistics for people who (think they) hate statistics</i> (7th ed.). SAGE Publications.</li> <li>Davis, C. (2023). <i>Statistical testing with jamovi education</i> (2nd ed.). VOR Press.</li> <li>Gass, S., Loewen, S., &amp; Plonsky, L. (2021). Coming of age: The past, present, and future of quantitative SLA research. <i>Language Teaching</i>, 54(2), 245–258.  <a href="https://doi.org/10.1017/S0261444819000430">https://doi.org/10.1017/S0261444819000430</a></li> <li>Plonsky, L. (2021). Quantitative research methods and the reform movement in applied linguistics. In H. Mohebbi &amp; C. Coombe (Eds.), <i>Research questions in language education and applied linguistics</i> (pp. 130–145). Springer Texts in Education.  <a href="https://doi.org/10.1007/978-3-030-79143-8_130">https://doi.org/10.1007/978-3-030-79143-8_130</a></li> <li>University of Melbourne: Quantitative Research Methods in Applied Linguistics  <a href="https://handbook.unimelb.edu.au/2024/subjects/ling90005/further-information">https://handbook.unimelb.edu.au/2024/subjects/ling90005/further-information</a></li> <li>University of Queensland: SLAT7855 - Quantitative Research in Second Language Studies  <a href="https://course-profiles.uq.edu.au/course-profiles/SLAT7855-61069-7460#course-overview">https://course-profiles.uq.edu.au/course-profiles/SLAT7855-61069-7460#course-overview</a></li> <li>University of Hawai'i at Mānoa: SLS 670 - Second Language Quantitative Research  <a href="https://manoa.hawaii.edu/catalog/courses/sls-670-second-language-quantitative-research-3/">https://manoa.hawaii.edu/catalog/courses/sls-670-second-language-quantitative-research-3/</a></li> <li>San Diego State University Digital Collections: Quantitative Research in Linguistics  <a href="https://digitalcollections.sdsu.edu/do/b176724f-35c9-4dfc-a15b-ecaa74b92ca9">https://digitalcollections.sdsu.edu/do/b176724f-35c9-4dfc-a15b-ecaa74b92ca9</a></li> </ul>
Electronic Materials	<p><a href="https://www.edx.org/learn/statistics">https://www.edx.org/learn/statistics</a></p> <p><a href="https://www.statsmadeeasy.com/">https://www.statsmadeeasy.com/</a></p> <p><a href="https://statistics.laerd.com/">https://statistics.laerd.com/</a></p> <p><a href="https://sagepub.libguides.com/research-methods">https://sagepub.libguides.com/research-methods</a></p>
Other Learning Materials	





## 2. Educational and Research Facilities and Equipment Required:

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with multimedia capabilities
<b>Technology equipment</b> (Projector, smart board, software)	Computer with Internet access, Smart board, PowerPoint capabilities, Overhead projector, Statistical software (SPSS, JASP, JAMOV or SmartPLS), AI-assisted language learning tools
<b>Other equipment</b> (Depending on the nature of the specialty)	Desks, chairs, tables, Language recording devices, Audio transcription tools

## F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
<b>Effectiveness of teaching</b>	Students, Faculty, Peer Reviewer	Student surveys (Indirect), Classroom observations (Direct), Peer teaching evaluations (Direct)
<b>Effectiveness of students' assessment</b>	Faculty, Program Leaders	Exam performance analysis (Direct), Assignment rubrics (Direct), Student feedback (Indirect)
<b>Quality of learning resources</b>	Students, Faculty, Program Leaders	Course material reviews (Direct), Student resource usage surveys (Indirect)
<b>The extent to which CLOs have been achieved</b>	Faculty, Program Leaders	Course outcome mapping (Direct), Student self-assessments (Indirect), Capstone projects (Direct)
<b>Other</b>	Faculty, IT Support, Peer Reviewer	Evaluation of digital learning tools (Direct), Feedback on e-learning platforms (Indirect)

**Assessor** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval Data:

<b>COUNCIL /COMMITTEE</b>	ENGLISH DEPARTMENT COUNCIL
<b>REFERENCE NO.</b>	8-17-46
<b>DATE</b>	16 MARCH 2025

