Department of Mathematics and Statistics

STA 525 – Applied Nonparametric Statistics
Course Syllabus

Course description: An introduction to nonparametric analysis of the following: dichotomous data problems, one and two sample location problems, dispersion problems, and the one and two way layout. Nonparametric measures of association and basic nonparametric methods in regression.

Credit hours: 3

Course Prerequisites and Corequisites: STA 520

Course outline:	Approximate time spent
• **Dichotomous Data Problem**	10%
o Binomial Test	
o Point and interval estimation	
• **One-Sample Location Problem**	15%
o Signed Rank Statistic	
o Sign Statistic	
• **Two-Sample Location Problem**	15%
o Rank Sum Test	
• **Dispersion Problem**	
o Distribution free rank test	
• **The One-Way Layout**	20%
o Kruskal-Wallis Test	
o Test for Ordered Alternatives	
o Multiple Comparisons	
• **The Two-Way Layout**	20%
o Analyses associated with Friedman Rank Sums	
o Analyses associated with Wilcoxon Signed Ranks	
• **Association**	20%
o Tests for Independence and Homogeneity	
o Regression Problems	

Student Learning Outcomes (SLO): At the end of STA 525, a student who has studied and learned the material should be able to:
1. Apply non-parametric techniques to statistical inference situations in which the normal-based statistics do not apply. [PLO: 1, 4, 5]
2. Identify and use software appropriate for nonparametric methods. [PLO: 1, 2, 3]
3. Explain the relationship between parametric tests and nonparametric tests. [PLO: 1, 2, 5]

Program Learning Outcomes (PLO):

Students graduating from SFASU with an M.S. degree and a major in statistics will demonstrate:

1. A command of core probability and statistical concepts through major definitions and theorems. **[*Concepts*]** (Probability and Statistical Inference)
2. Strategic competence in formulating a standard probabilistic/statistical model for a given problem. **[*Modeling*]** (Model Choice and Model Interpretation)
3. Skill in using statistical software in order to process and interpret data. **[*Data Processing*]** (Computational Skills and Model Validation)
4. The ability to independently apply principles of probability and statistics to model and solve new or non-standard problems. **[*Independent Thinking and Application*]** (Existing Literature Comprehension, Independent Progression, Resourcefulness)
5. Proficiency in communicating probability and statistics in a format appropriate to expected audiences. **[*Communication*]** (Written Communication, Oral Communication)

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