NONPARAMETRIC STATISTICS

Fall 2012, Tuesday, Thursday 2:40 – 4:05, KOM 160
Stat 5370, Call No. 87847, 3 Credits

This course is an introduction to nonparametric statistical inference. Most of the statistical methods studied will involve few or no assumptions about the distributional form of the population sampled. These statistical methods apply to a wider variety of situations than do parametric methods. Since fewer distributional assumptions are needed for their use, the statistical tools developed in a nonparametrics course are often the most appropriate tools for statistical inference.

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Math Department: 615-898-2669  Dept. fax: 615-898-5422

Office Hours: Monday, Wednesday 8:00 - 10:00, 12:00 - 4:00
              Tuesday 1:30 - 2:30
              Thursday 10:00 - 12:00
              Friday  8:00 - 10:00, 12:00 - 1:00
              (other hours by appointment)

Course Prerequisites: MATH 2050 or equivalent


Calculator: Scientific calculator with statistical functions

Objectives: Upon completion of this course, students will have

1. Recognized the importance of assumptions that underlie any statistical methodology
2. Understood the importance of using appropriate statistical methods in a given situation
3. Obtained important statistical tools that have wide applicability
4. Learned nonparametric procedures analogous to common parametric procedures
5. Appreciated the use of asymptotic distributions and the role of the central limit theorem
6. Gained familiarity with statistical software that assists in statistical analysis
7. Applied nonparametric techniques to problems arising in diverse areas, such as advertising, engineering, genetics, medicine, nutrition, pharmacy, psychology, sociology, etc.


**Topical Outline**  This course covers selected topics from Chapters 1 – 6, including:

1. Review of some basic results in statistics and probability, including the central limit theorem, estimation, and hypothesis tests; introduction to MINITAB statistical software.
2. Nonparametric procedures based on the binomial distribution, including tests and estimation for quantiles, the sign test, McNemar's test, correlation test.
3. Contingency tables and asymptotically chi-square tests, including tests for homogeneity, for independence, the median test, measures of dependence, goodness-of-fit tests, and Cochran's test.
4. Nonparametrics based on ranks, including the Mann-Whitney test, Kruskal-Wallis test, test for equal variances, nonparametric linear regression, Wilcoxon signed ranks test, Friedman test, Durbin test, and randomization tests.
5. Goodness-of-fit-tests, including Kolmogorov test, Lilliefors test, and Shapiro-Wilks test.

**Schedule**: Tests and assignment schedule (subject to revision):

<table>
<thead>
<tr>
<th>Quizzes/assignments</th>
<th>periodically throughout semester</th>
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<tbody>
<tr>
<td>Test 1</td>
<td>Sept 25</td>
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<tr>
<td>Test 2</td>
<td>Oct 25</td>
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<tr>
<td>Test 3</td>
<td>Nov 29</td>
</tr>
<tr>
<td>Final exam</td>
<td>Dec 11 (3:30 p.m.)</td>
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</tbody>
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**Requirements**: Activities required of students

1. Participate in class activities.
2. Read and study text assignments.
4. Succeed on tests.
5. Succeed on final examination.
6. Prepare a report based on a project to be assigned after consultation with the instructor. For example, a project assignment might entail reading a journal article that illustrates the use of nonparametric methods; or a project might involve conducting and analyzing a small scale experiment using nonparametric methods.

**Evaluation**: Grades will be based on a weighted average of tests, assignments, and the final exam. Tests will count for 3/5, quiz/assignments for 1/5, and the final exam for 1/5 of the semester average. The semester's letter grade will be based on the following scale:

- A for [90, ...], B for [80, 90), C for [70, 80), D for [60, 70), F for [0, 60).

If a test or quiz is missed due to an excused absence, the final exam will be reweighted or a make-up will be given (according to the instructor's discretion).
Absences: Attend every class. Prompt notification of an absence is required. If a student misses a test for a legitimate reason that is promptly reported, the instructor will either give a make-up test or give additional weight to the final exam. A grade of W or I will be given only in accordance with the University policy.

Disability: If you have a disability that may require assistance or accommodation, or if you have questions related to any accommodations for testing, note takers, readers, etc., please speak with me as soon as possible. Students may also contact the Office of Disabled Students Services (898-2783) with questions about such services.

Lottery Scholarships:
Do you have a lottery scholarship? To retain Tennessee Education Lottery Scholarship eligibility, you must earn a cumulative TELS GPA of 2.75 after 24 and 48 attempted hours and a cumulative TELS GPA of 3.0 thereafter. You may qualify with a 2.75 cumulative GPA after 72 attempted hours (and subsequent semesters), if you are enrolled full-time and maintain a semester GPA of at least 3.0. A grade of C, D, F, or I in this class may negatively impact TELS eligibility. Dropping a class after 14 days may also impact eligibility; if you withdraw from this class and it results in an enrollment status of less than full time, you may lose eligibility for your lottery scholarship. Lottery recipients are eligible to receive the scholarship for a maximum of five years from the date of initial enrollment, or until a bachelor degree is earned; students who first received the lottery scholarship in Fall 2009 or later will additionally be limited to 120 TELS attempted hours. For additional Lottery rules, please refer to your Lottery Statement of Understanding form via RaiderNet, review lottery requirements on the web at www.mtsu.edu/scholarships/telsconteligibility_scholarships.shtml, or contact the Financial Aid Office at 898-2830.

Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>September 3</td>
<td>Labor Day – no classes</td>
</tr>
<tr>
<td>September 7</td>
<td>Last day to drop or withdraw without a grade</td>
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<tr>
<td>October 13-16</td>
<td>Fall Break</td>
</tr>
<tr>
<td>October 30</td>
<td>Last day to drop or withdraw with a grade of “W”</td>
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<tr>
<td>November 22-25</td>
<td>Thanksgiving Holidays</td>
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<tr>
<td>December 5</td>
<td>Last day of classes</td>
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<td>December 6</td>
<td>Study Day</td>
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<tr>
<td>December 11</td>
<td>Final Exam (Tuesday 3:30-5:30)</td>
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<tr>
<td>December 15</td>
<td>Fall 2012 Commencement</td>
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