STAT 208 has the following course objectives:

- To develop a basic notion of statistics and its role in today's world;
- An introduction to basic probability; its role in various disciplines and its usage in statistical calculations;
- To understand the concept of statistical inference of generalizing from a sample to the whole, while controlling the amount of error incurred in the process;
- To develop statistical reasoning and an ability to apply this reasoning to real-life problems;
- To appreciate the universal applications of statistical methods in every aspect of modern life;
- To interpret the statistical results appearing in the public media and other places.

GRADING

- Your final grade will be based on the following components:
  - Three midterm exams, each worth 100 points.
  - The final exam is cumulative and worth 150 points.
  - Average of homework assignments weighted to 50 points. The three lowest assignment grades will be dropped before computing the average.
    (e.g. After your drops, if your homework average = 90%, then you'll receive 0.9 x 50 = 45 pts.)
- There is no extra credit except for what is mentioned in this syllabus.
- With a total of 500 points possible, the cut points for letter grades A, B, C, and D will be no higher than 450, 400, 350 and 300 points, respectively.
- Please note that mistakes in grading your homework assignments, quizzes, and/or exams may occur. You have one week from the time the paper has been handed back to notify the instructor of the mistake. If you wait longer than the one week, no change will be made to the grade.
- A grade of incomplete (I) will only be considered for students who are passing the course, but cannot complete the course due to reasons of health, family, etc.

EXAMS

- The midterm exams will be given during regular class time. The exact dates for these exams will be announced in lecture.
- All exams are closed-book, but relevant formulas will be provided at the exams. You may also use a hand-held calculator at the exams.
- It is your responsibility to bring (i) an NIU picture ID, (ii) a pencil, (iii) an eraser, and (iv) a calculator for the exams. Sharing any of these items is not allowed. You would be expected to do all calculations by hand if you do not have a calculator. You cannot use calculators in cell-phones, iPods, PDAs, laptops, etc. Cell phones are to be turned off (not just muted) and kept away during exams.
- It is important to be on time for the exams. If you arrive late and one or more students have already submitted their exams and left the room, then you may be denied the opportunity to take the exam. In such cases, the possibility of a make-up exam will be at your instructor’s discretion.
- Make-up exams will only be given when a student has a planned, documentable, and excusable absence on a test date and personally negotiates the make-up in advance. For sudden, documentable, and excusable absences (illness, death, etc), the points from the missed exam will be added to the final exam. Unexcused absences (oversleeping, forgetting, etc) will result in a score of zero.
• The final exam is on Friday, December 14 from 8:00 – 9:50 am. This is a mass exam with different timing from the standard final exam schedule. The final exam room will be announced in lecture.

HOMEWORK
• Homework assignments (even numbered problems only) are due in your recitation period in the weeks indicated by the tentative schedule. No late assignments will be accepted. Please do not give any assignments to your instructor.

• Assignments are to be neat and presented logically on loose-leaf paper. Paper from spiral notebooks is unacceptable. If more than one sheet of paper is used, the pages must be stapled together. Please do not ask your instructor or TA for use of a stapler. You are to show all your work; just stating an answer (for example, from the back of book) will not ensure full credit. If your assignments are messy, disorganized or do not follow the stated instructions, you may not receive credit for them.

• Students are allowed to discuss homework assignments, but you should not look at another student's paper. Each student must write his/her solutions in their own way, using their own words.

• Please note that because of the quick pace of this course it is unlikely that all of your assignments will be graded and returned to you before the exams. You may want to make copies of your assignments before turning them in.

QUIZZES
• Announced quizzes and/or pop quizzes will be given. The average of all quizzes will be weighted to 25 points. These points will be added to your total at the end of the semester as extra credit. No makeup quizzes will be given.

MISCELLANEOUS
• You are encouraged to ask questions and to participate in class discussions, however talking in class while the instructor is lecturing is highly frowned upon.

• Cell phones are to be muted or turned off during lectures, recitations, and visits to office hours and kept away during exams and quizzes. Violations will be considered as class disruptions, or worse, and will be treated accordingly. In particular, texting during class is prohibited. If you are seen using your cell phone during class, it will be confiscated for the remainder of the class period.

• It is your responsibility to be sure that your work is turned in and that you receive the notes and announcements. Missing an announcement will not be accepted as a valid excuse for missing an event (test, quiz etc.). If you frequently miss class the instructor reserves the right to deny office hour privileges to you.

• Late arrivals, repeated or frequent breaks, and/or early departures from class are strongly discouraged, except in cases of emergency.

• NIU's updated policies on Academic Integrity, Attendance, and Accommodations for Students with Disabilities are now available at http://www.niu.edu/stat/courses/pdfs/Policy-Academic-Integrity-Attendance-Accommodations-for-Students-with-Disabilities-Fall2012.pdf
Please read carefully this important document, as your full compliance with the updated policies in this document is required in this class.

• The syllabus may be changed at any time. Changes will be announced in lecture.

• Suggestions
  o Attend all the lectures. Many students find lecture easier to understand than reading the text book.
  o Write all the lecture notes carefully and completely. Review your notes frequently.
  o Submit all the homework assignments. You are allowed to drop your three lowest assignment grades, but don't waste them; use them only when it's absolutely necessary!
  o Do not fall behind. If you need extra help:
    • See your instructor during their office hours.
    • Go to recitation and/or see your TA during their office hours.
    • Go to the Statistics Assistance Center (DuSable 326). Each semester a schedule is posted there showing when help is available for Stat 208.
\[
\bar{y} = \frac{\sum y}{n} \\
s = \sqrt{\frac{\sum (y - \bar{y})^2}{n-1}} \\
Z = \frac{y - \mu}{\sigma} \\
y = z\sigma + \mu \\
Z = \frac{y - \bar{y}}{s}
\]

\[
r = \frac{\sum z_x \cdot z_y}{n-1} = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}} = \frac{\sum (x - \bar{x})(y - \bar{y})}{(n-1)s_x \cdot s_y}
\]

\[
\hat{y} = b_0 + b_1x \\
b_1 = \frac{r \cdot s_y}{s_x} \\
b_0 = \bar{y} - b_1\bar{x} \\
e = y - \hat{y}
\]

If events A and B are disjoint, then \(P(A or B) = P(A) + P(B)\)

If events A and B are independent, then \(P(A and B) = P(A) \cdot P(B)\)

\[
P(A) = 1 - P(A^C)
\]

\[
\mu_\hat{p} = p \\
\sigma_\hat{p} = \sqrt{\frac{p(1-p)}{n}} \\
Z = \frac{\hat{p} - \mu_\hat{p}}{\sigma_\hat{p}}
\]

\[
\mu_\bar{y} = \mu \\
\sigma_\bar{y} = \frac{\sigma}{\sqrt{n}} \\
Z = \frac{\bar{y} - \mu_\bar{y}}{\sigma_\bar{y}}
\]

\[
\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \\
\sigma = \left(\frac{z^*}{M.E.}\right) \hat{p}(1-\hat{p}) \\
\]

\[
Z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} \\
\]

\[
\bar{y} \pm t^* \frac{s}{\sqrt{n}} \\
T = \frac{\bar{y} - \mu}{s} \\
df = n - 1
\]
**What's My Grade?**

**My Homework Grade**

<table>
<thead>
<tr>
<th>Homework</th>
<th>Chapter</th>
<th>My Score</th>
<th>Homework</th>
<th>Chapter</th>
<th>My Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 and 3</td>
<td></td>
<td>8</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
<td>9</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5 and 6</td>
<td></td>
<td>10</td>
<td>18</td>
<td></td>
</tr>
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<td>4</td>
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<td>5</td>
<td>7</td>
<td></td>
<td>12</td>
<td>20</td>
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<td>6</td>
<td>8</td>
<td></td>
<td>13</td>
<td>23</td>
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</tr>
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<td>7</td>
<td>12</td>
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</tbody>
</table>

- Drop your three lowest scores
- Average your remaining scores
- Divide your average by 2
- For example
  - If (after dropping your three lowest scores) your average is 80, then your
    Hwk Grade = \( \frac{80 \div 2}{2} = 40 \) points

**My Exam Grade**

<table>
<thead>
<tr>
<th>Exam 1</th>
<th>Exam 2</th>
<th>Exam 3</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

- Exam Grade = \( \frac{\text{Total of your points so far}}{\text{Total possible points so far}} \) \cdot 450
- For example
  - Suppose your Exam #1 = 95/100 and Exam #2 = 80/100.
  - Then your Exam Grade = \( \frac{95 + 80}{100 + 100} \) \cdot 450 = 393.75

**My Course Grade**

\[ \text{Course Grade} = \text{Hwk Grade} + \text{Exam Grade} + \text{Extra Credit Points} \]

Grading Scale:

- A = 450 - 500
- B = 400 - 449
- C = 350 - 399
- D = 300 - 349
<table>
<thead>
<tr>
<th>Week of</th>
<th>Material Covered</th>
<th>Homework - Submit even-numbered problems (Odds are for your practice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 27</td>
<td>Chapters 1, 2 &amp; 3: Data/Variables &amp; Categorical Variables</td>
<td>Read Chapters 1 &amp; 2</td>
</tr>
</tbody>
</table>
| September 3       | Chapters 3 & 4: Categorical Variables & Displaying and Summarizing Quantitative Data | Ch 2: 15, 16, 17, 22, 23  
| (NIU closed       |                                                                                  | Ch 3: 13, 14, 19, 25 thru 29, 31                                     |
| Sep. 3 - Labor Day) |                                                                                  |                                                                       |
| September 10      | Chapters 4, 5 & 6: Understanding and Comparing Distributions & The Standard Deviation as a Ruler | Ch 4: 5 thru 9, 11, 12, 23, 24, 29, 30, 31, 34, 37, 38  
| September 17      | Chapter 6: The Normal Model, Exam 1                                             | Ch 5: 20, 21, 29, 30, 33, 34  
| September 24      | Chapter 7: Scatter plots, Association and Correlation                           | Ch 6: 7, 8, 9, 11, 12, 14, 19 thru 22, 27, 28, 32, 33              |
| October 1         | Chapter 8: Linear Regression                                                    | Ch 7: 1, 4, 5, 6, 11, 12, 23 thru 26, 36, 39                        |
| October 8         | Chapters 12 & 13: Sample Surveys & Experiments and Observational Studies       | Ch 8: 11, 12, 15, 16, 19, 20, 27 thru 30, 33, 34, 39, 40, 55(omit f), 62(a thru d) |
| October 15        | Chapter 13: Experiments and Observational Studies, Exam 2                      | Ch 12: 1 thru 4, 7, 8, 13, 14, 19, 20, 21, 23, 25, 29, 30, 31, 34, 36 |
| October 22        | Chapter 14: Probability                                                          | Ch 13: 1, 2, 7 thru 10, 16, 17                                     |
| October 29        | Chapter 18: Sampling Distribution Models                                         | Ch 14: 1, 2, 4, 6, 7, 11 thru 16, 19, 21, 23, 26, 28, 31 thru 38   |
| November 5        | Chapter 19: Confidence Intervals for Proportions                                | Ch 18: 5 thru 8, 11, 16, 21, 22, 28, 29, 30, 33, 37, 38, 48 thru 51 |
| November 12       | Chapter 20: Testing Hypotheses about Proportions, Exam 3                        | Ch 19: 1 thru 10, 13, 14, 17, 22, 24, 28, 35, 38, 40               |
| November 19       | Chapters 20 & 23: Inferences about Means                                         | Ch 20: 1 thru 5, 8, 15, 16, 19, 23, 25, 27, 28, 30, 32, 34        |
| (No classes Nov. 21 - 23 - Break) |                                                                                  | Ch 23: 1, 2(round df down to a value in the table), 5, 6, 13, 14, 18, 33, 34, 35(only b), 36(only b), 37, 38, 42(remove outlier, s=3.55) |
| November 26       | Chapters 23 & 24: Comparing Means                                               |                                                                       |
| December 3        | Chapter 24 & Review                                                              | Ch 24: 7, 9, 11, 27, 29, 33, 35, 43                               |

**Final Exam:** Friday, December 14, 8:00 - 9:50 am, Room TBA