Instructor: Rob Culverhouse  
E-mail: rculverh@wustl.edu  
Phone: (314) 454-8712 (Office)  
Office Hours: 6:00 - 6:30 in the classroom and by Appointment.  
Contact me by phone or email for an appointment.  

Course Description:  
Basic concepts of statistics. Data collection (sampling and designing experiments), data organization (tables, graphs, frequency distributions, numerical summarization of data), statistical inference (elementary probability and hypothesis testing).

Prerequisites: High school algebra. Be able to add, subtract, multiply, divide, factor. Be comfortable with properties of squares and square roots, negative numbers, percentages, and points and slopes.

Important Dates:  
January 15 – First day of class  
January 28 – Last day to drop and get full refund  
March 4 – Midterm Exam  
March 11 – Spring Break (No Class)  
April 29 – Final Exam

Class Format:  
Each class will cover a lot of information – about 2-3 chapters each lecture. The textbook is easier to read than most math textbooks and contains a lot of examples. My lectures will highlight the points I think are most important, work through some of the examples, and provide alternate ways to think about the concepts presented.

Exams:  
There will be a midterm examination and a final. Exams will be a mixture of short and extended-response questions and will occupy the entire class period on their scheduled days. Let me know in advance if you will be unable to make either exam so that other arrangements can be made.

The final exam will not be comprehensive.

Canvas:  
The Canvas course management system will be used for this course. Homework assignments will be posted to Canvas and all materials for the course will be archived there.
Homework (40% of your grade):
Homework is assigned weekly via Blackboard. Doing the homework is essential for your success in learning the material. I will discard your two lowest scores. It is best to work on the homework throughout the week, so you have time to ask questions before the night it is due.

Homework is due by the beginning of each class session and may be turned in in three ways:
1. **Turn it in to me at the beginning of class.** (This is preferred)
2. **Turn it in to my office on the Med School Campus** (before class)
   600 South Taylor
   General Medical Science (very back of the ground floor of the building)
   Leave it at the front desk with a note saying “Attention: Rob Culverhouse, Math 1011”
3. **Type it up and email it to me** (before class)
   Put “Math 1011 Homework # X” in the subject line of your message.
   Put your Last Name and “Math 1011 HW#X” in the file name.
   Acceptable formats are plain text, .doc, .docx.
   **IF YOU ADD A SCAN or PICTURE:** Review before submission to ensure it is readable

Abbreviated solutions will be posted online after each assignment it turned in. Because of this, **NO LATE HOMEWORK WILL BE ACCEPTED.**

Each HW assignment will list practice problems that are not turned in. Most will have answers in the back of the book. If you have trouble with the assigned problems, the practice problems may help. Try to work through them before looking at the answers. This will improve your understanding and be good preparation for the exams.

What constitutes “the answer” to a homework problem?

<table>
<thead>
<tr>
<th>The solution to each problem (HW or exam) is a short essay, not just a conclusion. This includes</th>
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</thead>
<tbody>
<tr>
<td>1. A description (or list) of the key factors of the problem, e.g. “X = height in inches, mean(X) = 63”</td>
</tr>
<tr>
<td>2. A statement of question you are trying to answer, e.g. “What is the chance that event Y occurs?”</td>
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<tr>
<td>3. The reasoning you used to reach your conclusion</td>
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<tr>
<td>4. Your conclusion.</td>
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</tbody>
</table>

A reader should be able to look at what you have written, understand the problem you were trying to solve, and be convinced that you reached the correct conclusion.

This class will require discussion of statistical issues in an extended response format. Your ability to express your ideas in a clear manner is very important (both in this class and in life). My ability to grade your homework and exams is limited by my ability to understand what you write.

(1) A series of equations is usually a clear & concise way to express mathematical reasoning.
(2) Avoid FALSE statements in your arguments (either in words or equations). e.g. $3 \neq 3/100$

Participation:
U College only requires you to attend the first 2 classes and the exams. A very small group of students may be able to understand everything in the book (and get great scores on the homework and midterms) without attending lectures. Most people benefit from the lectures, which often provide a different perspective on the material than found in the book.

You will get the most out of class if you are an active learner: ask questions in class and outside of class to ensure you understand the concepts.

Study groups:
I strongly recommend that you meet regularly with your classmates to study and work on homework. Even if you think you understand a concept, participation in a study group is beneficial. Explaining a problem to someone else is an effective way to cement your understanding (& identify where you are shakier than you thought).
Grading:
Your total score in this class will be determined by weighting your homework, midterm, and final examination as follows:

- **Homework/Quizzes**: 40%
- **Midterm**: 30%
- **Final**: 30%

Your two lowest homework grades will be dropped to compute your Homework score. There will be an opportunity for some bonus points on the exams, but no bonus projects.

Your total score will determine a Final Grade for the course on a scale no more severe than:

- **A**: ≥ 90%
- **B**: ≥ 80%
- **C**: ≥ 70%
- **D**: ≥ 60%
- **F**: < 60%

If you are taking the class Pass/Fail, a grade of D or better is required to receive a Pass.

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**Tentative Schedule** (Subject to Change)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Chapters</th>
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<tbody>
<tr>
<td>1/15</td>
<td>Introduction, Experiments and Observational Studies, Confounding</td>
<td>1-2</td>
</tr>
<tr>
<td>1/22</td>
<td>Descriptive Statistics</td>
<td>3-4</td>
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<tr>
<td>1/29</td>
<td>The Normal Curve, Bias and Chance Error</td>
<td>5-6</td>
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<tr>
<td>2/5</td>
<td>Correlation</td>
<td>8-9</td>
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<tr>
<td>2/12</td>
<td>Regression</td>
<td>10-12</td>
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<tr>
<td>2/19</td>
<td>Introduction to Probability</td>
<td>13-14</td>
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<tr>
<td>2/26</td>
<td>Binomial Formula, Chance Processes, Law of Averages</td>
<td>15-16</td>
</tr>
<tr>
<td>3/4</td>
<td><strong>MIDTERM EXAM (Chapters 1-16)</strong></td>
<td></td>
</tr>
<tr>
<td>3/11</td>
<td><strong>Spring Break</strong> (no class)</td>
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<tr>
<td>3/18</td>
<td>Expected Value, Standard Error, Probability Histograms, and the</td>
<td>17-18</td>
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<td></td>
<td>Central Limit Theorem</td>
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<tr>
<td>3/25</td>
<td>Expected Values and Standard Errors for Percentages</td>
<td>19-20</td>
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<tr>
<td>4/1</td>
<td>Sampling, EV and SE for Averages</td>
<td>21, 23</td>
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<tr>
<td>4/8</td>
<td>Hypothesis Testing (part 1) and introduction of the t-distribution</td>
<td>26, 29</td>
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<tr>
<td>4/15</td>
<td>Hypothesis Testing (part 2) Two-Sample Tests, Chi-Square Tests</td>
<td>27-28</td>
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<tr>
<td>4/22</td>
<td>Review for Final</td>
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<tr>
<td>4/29</td>
<td><strong>FINAL EXAM (Chapters 17-29)</strong></td>
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