MISSOURI S&T University of Science & Technology

# Stat 3115C
# Engineering Statistics

TR 6-7:15pm, Centennial 104

**Instructor:** Brittany Cuchta
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Rolla 303
Office Hours: WF 10-12, and by appointment

**Course Description:** An introduction to statistical methods in engineering and the physical sciences dealing with basic probability, distribution theory, confidence intervals, significance tests, and sampling. Credit will only be given for one of Stat 3111, 3113, 3115, or 3117.

**Prerequisite:** Competence in calculus as demonstrated by the successful completion of Math 1215 or Math 1221 with a grade of C or better.

**Text:** *Probability and Statistics for Engineering and the Sciences*, $8^{\text{th}}$ Edition by Jay L. Devore

**Computing:** Each student should have a portable calculator capable of finding roots, logarithms and exponentials. You are expected to bring this to class as well as all exams.

**Topics Covered:** This course will start with an introduction of probability, including interpretations of probability, axioms of probability, and the use of counting methods for solving probability problems. We will then move to conditional probability, Bayes theorem, independence, and expected value. Both discrete and continuous distributions will be covered, such as the Binomial, Poisson, normal and other distributions, the law of large numbers and the central limit theorem. Finally, we will cover applications of the above to the theory of statistical inference, including estimation, confidence intervals, and hypothesis tests. Additional topics, such as simple linear regression, may be covered if time permits.

**Grade Distribution:** The standard grading scale will be used to determine your letter grade at the end of the semester. Your final grade depends on the following weights:

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| Homework | 20% |
| Exam 1 | 25% |
| Exam 2 | 25% |
| Final Exam | 30% |

You will need least 90% for an A, 80% for a B, etc.
Note that attendance is not a part of your grade. However, there is strong correlation between attendance and performance in the class. For this reason, I suggest coming to every class when possible. If you know you will need to leave early for a valid reason, please speak to me before class starts. If you miss class, you are responsible for finding out what was covered during your absence (check Blackboard materials, discuss with others in the class, etc.).

**Homework:** There will be assigned problem sets every week. Homework will be due at the beginning of class. *Late homework will not be accepted under any circumstances and will result in an immediate zero for that assignment.* In order to mitigate damage from situations beyond your control (e.g., illness, family emergencies) the lowest homework score will be dropped. If you know in advance

that you will be unable to turn in the assignment on the due date, please make arrangements with me *prior* to the due date. Homework solutions submitted for grading should be legible and neat. Both the correctness of the answer and the work that you show are considered in grading. I reserve the right to not grade homework which I cannot read.

**Exams:** There will be two midterm exams and a common final exam. The midterm exams are *tentatively* scheduled for the class periods on **Thursday, February 19**, and **Tuesday, April 7**. The final exam will be cumulative and is scheduled for **Thursday, May 14, 10am-12pm**. The location will be announced at a later date.
Exams are closed book, but you will need a calculator for the exams. You may not share calculators during an exam. If you fail to bring a calculator to an exam, one will not be provided for you. You will be allowed a handwritten "crib sheet" for the final exam (details to follow), but *not for the hour exams*. Exams *must* be taken in pencil, not pen. Using pen on an exam will result in an immediate loss of 5 points on the exam.
In the event that you must miss an exam for a university excused reason, you must notify me by email *at least one week* prior to the exam and provide documentation in order to take a make-up exam that will be administered with a different section of Stat 3115. If you are missing the exam due to an emergency, you must email me with details of your situation within 24 hours of the exam and follow up with appropriate documentation. Please note that airline schedules, family trips, work, or social engagements do not constitute valid reasons to miss an exam. Further, there will not be a make-up exam administered after an exam date for any reason, valid or otherwise. *Students with a valid excuse that cannot take a make-up exam before the 3115 testing period is over will substitute their final exam score for the exam they missed.*

**Math Learning Center:** The Department of Mathematics and Statistics provides learning assistance in Centennial 105 for calculus and pre-calculus courses. A schedule of times when statistics assistance is available will be provided at a later date.

**Grievances:** If you have a situation that you cannot resolve through discussion with the instructor, you may contact the course coordinator, Dr. Gayla Olbricht, Rolla 215, 341-4913. If your situation is still not resolved, you may contact the department chair of mathematics, Dr. Stephen Clark, Rolla 202. If you still feel that further action is necessary, you may contact the Vice Provost for Undergraduage Studies on the 2nd floor of Norwood Hall.

**Disability Support Services:** If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation. You may contact Disability Support Services for required documentation or general questions about their many services.

**Academic Dishonesty:** Academic dishonesty is not tolerated and will be dealt with as specified in the Missouri S&T Student Academic Regulations policy. This is located online. Academic dishonesty includes, but is not limited to, cheating, plagiarism, and sabotage.

**Changes to Syllabus:** I reserve the right to make changes to the syllabus during the semester. Any such changes will be announced in class.