ECE 352 Engineering Probability and Statistics
Spring 2020 Course Syllabus

Instructor: Jon Klingensmith, Ph.D.
Office: EB 1064 (2nd Floor Design Center)
Office Hours: M 9:00 – 11:00 AM / T 11:00 AM – 12:00 PM
              W 3:00 – 5:00 PM / R 11:00 AM – 12:00 PM / or by appointment
E-mail: jokling@siue.edu
Phone: 650-5466

Class Hours: T / R 9:30 – 10:45 AM

Description: This course provides an introduction to probability, statistics, random variables, estimation theory, engineering decision, and random processes.

Prerequisites: ECE 351 Signals and Systems with a grade of C (corequisite).

Location: EB 2111


Quizzes: There will be (semi-)regular in-class quizzes during the semester that will be based on the assigned homework problems. In addition take-home quizzes may be used on occasion. They will be assigned at the end of one class session and collected for grading at the beginning of the next class. If you are not in attendance when the take-home quiz is assigned, you will not be able to turn in the quiz problem. With respect to grading, your lowest quiz score will be dropped.

Projects: There will be several (likely somewhere between 2 and 4) projects assigned during the semester involving the use of computer simulations and MATLAB. Late projects be subject to a 20% penalty per day.

Exams: There will be two (2) exams during the semester and one comprehensive final exam at the end of the course. Make-up exams will not be given. However, the days of the exams are not set at the beginning of the course as they may be adjusted based on the performance of the class. If you know in advance that you cannot attend class the day of the exam, please contact the instructor as soon as possible. Although it is rare, in extenuating circumstances alternate arrangements may be an option.
Grade Distribution:  
Quizzes/HW: 15%  
Exam #1: 22.5%  
Exam #2: 22.5%  
Projects/Simulations: 15%  
Final Exam: 25%  

Grading Scale:  
100% - 87.5% A  
87.5% - 75% B  
75% - 62.5% C  
62.5% - 50% D  

Communication with Class: At times, I will send email to the entire class list regarding assignments, solutions to homework, etc. I’m unable to send class related messages to any email accounts other than your SIUE account, so please get in the habit of checking your SIUE email, and please do not ask me to use alternative accounts.

Class Attendance Policy: Based on University Class Attendance Policy 119: It is the responsibility of students to ascertain the policies of instructors with regard to absence from class, and to make arrangements satisfactory to instructors with regard to missed course work. Failure to attend the first session of a course may result in the student’s place in class being assigned to another student.

Cheating: There will be NO TOLERANCE for cheating. Anyone caught cheating will AUTOMATICALLY FAIL the course and risks the possibility of being expelled from the university.

Academic Integrity / Plagiarism: Plagiarism is the use of another person’s words or ideas without crediting that person. Plagiarism and cheating will not be tolerated and may lead to failure on an assignment, in the class, or dismissal from the University, per the SIUE academic dishonesty policy. Students are responsible for complying with University policies about academic honesty as stated in the University’s Student Academic Conduct Code.

ACCESS: Students needing accommodations because of medical diagnosis or major life impairment will need to register with Accessible Campus Community and Equitable Student Support (ACCESS) and complete an intake process before accommodations will be given. Students who believe they have a diagnosis but do not have documentation should contact ACCESS for assistance and/or appropriate referral. The ACCESS office is located in the Student Success Center, Room 1270. You can also reach the office by e-mail at myaccess@siue.edu or by calling 618-650-3726. For more information on policies, procedures, or necessary forms, please visit the ACCESS website at www.siue.edu/access.

Course Topics:

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<thead>
<tr>
<th>Topic</th>
<th>Homework Assigned</th>
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<tbody>
<tr>
<td>1) Experiments, Models, and Probabilities</td>
<td>1.4.3, 1.6.5, 1.6.6</td>
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<tr>
<td>Set Theory</td>
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<td>Probability Axioms</td>
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<td>Conditional Probability</td>
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<td>Law of Total Probability</td>
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<td>Independence</td>
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<td>Section</td>
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<tr>
<td>2) Sequential Experiments</td>
<td>Counting Methods, Independent Trials</td>
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<tr>
<td>4) Continuous Random Variables</td>
<td>Continuous Sample Space, Cumulative Distribution Function, Probability Density Function, Expected Values, Families of Continuous Random Variables, Gaussian Random Variables</td>
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<tr>
<td>5) Multiple Random Variables</td>
<td>Joint Cumulative Distribution Functions, Joint Probability Mass Functions, Marginal PMF, Joint Probability Density Functions, Marginal PDF, Independent Random Variables, Expected Value of Function of Two Random Variables, Covariance, Correlation, and Independence, Bivariate Gaussian Random Variables</td>
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<tr>
<td>6) Probability Models of Derived Random Variables</td>
<td>PMF of a Function of Two Discrete Random Variables, Functions Yielding Continuous Random Variables, Continuous Functions of Two Random Variables, PDF of the Sum of Two Random Variables</td>
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<td>11) Hypothesis Testing</td>
<td>Binary Hypothesis Testing</td>
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<td>9) Sums of Random Variables</td>
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<td>Expected Values of Sums</td>
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<td>Central Limit Theorem</td>
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<td>10) Sample Mean</td>
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<td>10.1.1, 10.1.2, 10.2.1, 10.2.3 (a,b), 10.3.1, 10.5.2, 10.5.3</td>
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<td>Sample Mean: Expected Value and Variance</td>
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<td>Laws of Large Numbers</td>
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<td>Confidence Intervals</td>
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<td><strong>Time permitting...</strong></td>
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<td>13) Stochastic Processes</td>
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<td>TBD</td>
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<td>Definitions and Examples</td>
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<td>Random Variables from Random Processes</td>
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<td>Expected Value and Correlation</td>
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<td>Wide Sense Stationary Stochastic Processes</td>
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<td>Cross-Correlation</td>
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<td>7) Conditional Probability Models</td>
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<td>Conditioning a Random Variable by an Event</td>
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<td>Conditional Expected Value Given an Event</td>
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<td>Conditioning Two Random Variables by an Event</td>
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