Stat 360(1) -- Fall 2019
Probability and Statistics

Instructor: Debasmita Das
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Office Hours: W:12-3 @ MLC or by appointment
Course Prerequisites: Math 172 or Math 182

Required Textbook and Required Course Materials:
- **Text**: Probability & Statistics for Engineering and the Sciences by Devore (9th edition)
  Available at the Bookie or Crimson & Gray: ISBN 978-0-538-73352-6
- **Course Packet**: Available at the Cougar Copies in the CUB.

Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework (9 @ 10pts)</td>
<td>90</td>
<td>22.5%</td>
</tr>
<tr>
<td>Attendance (10pts)</td>
<td>10</td>
<td>2.5%</td>
</tr>
<tr>
<td>Midterms (2 @ 100 pts)</td>
<td>200</td>
<td>50%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
<td>25%</td>
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<tr>
<td>Total</td>
<td>400</td>
<td></td>
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- **Homework**: 11 homework sets will be assigned. It is absolutely essential that you do the assigned homework - and additional problems if needed. It is advantageous to work in study groups, but students are expected to turn in their own write-ups. **Late homework will not be accepted.** Homework is due during lecture time of deadline date (Fridays usually).

  Hard/printed copies are required. Electronic copies are not accepted. If you are unable to attend lecture of due date, you should drop off a hard copy of your homework in my mailbox in Neill 103 by 5pm of due date. Homework will not be accepted if it is submitted after that time. Homework exercises are equally weighted. **The 2 lowest homework scores will be dropped.**

- **Exams**: There will 3 closed books/closed notes exams. Makeup exams are given only in exceptional cases when you are unable to take the exam and are able to provide official documentation. **For the exams, you should bring:**
  - A scientific calculator (no Bluetooth, no Wi-Fi)
  - Mobile, Bluetooth and Wi-Fi devices are not allowed and should be turned off during exams.

- **Final Exam Policy**: The final exam will be given as scheduled. University policy forbids offering the final exam before the officially scheduled time, so you should make any necessary travel plans with this in mind.
• **Grades:** This class will be graded using the top total number of points accumulated as a base. Using the top score as a base, roughly. 90%-100%= A, 80%-89% = B, 65%-79% = C, 55%-64% = D, 0-54%=F. There will also be “+” and “-“ grades as part of the grading system.

**Letter Grade Assignment:**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% = A range</td>
<td>(A- = 90-93, A =93 to 100)</td>
</tr>
<tr>
<td>80% = B range</td>
<td>(B- = 80-83, B = 83-87, B+ = 87-90)</td>
</tr>
<tr>
<td>70% = C range</td>
<td>(C- = 70-73, C = 73-77, C+ = 77-80)</td>
</tr>
<tr>
<td>60% = D range</td>
<td>(D = 60-65, D+ = 65-70)</td>
</tr>
</tbody>
</table>

• **CLASS ATTENDANCE:** You are expected to attend and actively participate in each and every scheduled class period. *Attendance will be checked randomly each week.* Reading assigned materials prior to each class, taking good notes during class, asking relevant questions, and working through activities both independently and in consultation with your classmates are just a few ways you can actively participate in class.

**Cheating:** Cheating will not be tolerated. Cheating will result in at least a failing grade on the assignment or examination in question and possibly a failing grade for the entire course.

**Calculators:** Calculators are useful for the hw and will be allowed for the Midterms and Final Exam.

**Missed Exams/Quizzes:** No compensation for missed exams or quizzes will be considered unless prior approved arrangements have been made.

**STUDY ASSISTANCE:** There are many opportunities on campus to get help including the following two:

1. We have FREE tutoring available in the Math Learning Center (MLC in Cleveland 130) and the computing lab in Thompson Hall (Room 1).

2. You are welcome to come see me during office hours!!! I am here to help you. It is my goal to see you succeed in this class.

**WSU CLASSROOM SAFETY:** “Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the “Alert, Assess, Act,” protocol for all types of emergencies and the “Run, Hide, Fight” ([https://oem.wsu.edu/emergency-procedures/active-shooter/](https://oem.wsu.edu/emergency-procedures/active-shooter/)) response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able).

Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI’s Run, Hide, Fight video
and visit the WSU safety portal

**STUDENTS WITH DISABILITIES:** Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Access Center. All accommodations MUST be approved through the Access Center (Washington Building, Room 217). Please stop by or call 509-335-3417 to make an appointment with a Access Advisor. For more information contact a Disability Specialist at [http://accesscenter.wsu.edu](http://accesscenter.wsu.edu) or Access.Center@wsu.edu.
## Course Schedule
### Course Outline and Learning Outcomes

<table>
<thead>
<tr>
<th>Week</th>
<th>Sections Covered</th>
<th>The student should be able to:</th>
</tr>
</thead>
</table>
| 1    | 1.2, 1.3, 1.4    | • Compute and interpret numerical data summaries.  
|      |                  | • Draw and interpret graphical presentations of data. |
| 2    | 2.1, 2.2         | • Compute probabilities using counting techniques and probability rules.  
|      |                  | • Compute and interpret probabilities. |
| 3    | 2.3, 2.4, 2.5    | • Compute conditional probability and total probability.  
|      | September 2-Holiday | • Compute probabilities under independence. |
| 4    | 3.1, 3.2, 3.3, 3.4, 3.5 | • Compute and interpret probabilities, mean and variance for discrete random variables.  
|      |                  | • Apply Chebyshev’s Inequality.  
|      |                  | • Compute probabilities for the Binomial, Hypergeometric, Negative Binomial random variables. |
| 5    | 3.6, 4.1         | • Compute probabilities for the Geometric and Poisson random variables.  
|      |                  | • Compute probabilities for continuous random variables. |
| 6    | 4.1, 4.2         | • Compute the cumulative distribution function and percentiles for continuous random variables. |

**Review, Exam 1 (September 27 Friday)**
The above outcomes will be assessed in assigned homework and Exam 1.
<table>
<thead>
<tr>
<th>Week</th>
<th>Sections</th>
<th>Outcomes</th>
</tr>
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</table>
| 7    | 4.2, 4.3 | • Compute mean and variance for continuous random variables.  
• Compute probabilities for the Normal using probability tables. |
| 8    | 4.5, 4.6 | • Compute probabilities for the Exponential, Weibull and Lognormal random variables.  
• Draw and interpret normal probability plots. |
| 9    | 5.1, 5.2 | • Compute probabilities with bivariate distributions.  
• Derive marginal probability density functions.  
• Derive conditional probability density functions.  
• Compute expected value, covariance and correlation for bivariate distributions. |
| 10   | 5.3, 5.4, 5.5, 7.1 | • Compute probabilities for the mean of a Normal sample.  
• Apply the Central Limit Theorem.  
• Compute the mean, variance and probabilities for a linear combination of random variables.  
• Compute and interpret an appropriate confidence interval for the population mean.  
• Understand what a confidence level means. |
| 11   | 7.2, 7.3, 8.1, 8.2 | • Compute and interpret an appropriate confidence interval for the population mean.  
• Set up appropriate test hypotheses for the population mean.  
• Carry out (i.e. determine the rejection region) and interpret a test of hypothesis for the population mean.  
• Understand what the significance level means. |
| 12   | 8.4 | • Compute and interpret P-values. |
|      | **Review, Exam 2 (October 25 Friday)** | **The above outcomes will be assessed in assigned homework and Exam 2.** |
| 13   | 8.3, 12.1, 12.2, 12.5 | • Carry out and interpret a test of hypothesis for the population proportion.  
• Compute and interpret a confidence interval for the population proportion.  
• Compute the least-squares line.  
• Understand how the least-squares criterion works in fitting a line through bivariate data. |
|      | **November 11 – Holiday** | |
| 14 | 12.5, Residual Plots | • Perform graphical (residual plots) and numerical diagnostics (correlation, coefficient of determination) for assessing the fit of a line through data.  
• Construct and interpret a confidence interval for the slope of a simple linear model.  
• Use the least-squares line for prediction.  
• Use the least-squares line to construct appropriate confidence intervals for the mean response or a new observation at a given value of the predictor. |
| 15 | 9.1, 9.2 (time permitting) | • Carry out (i.e. determine the rejection region or compute the P-value) and interpret a test of hypothesis for comparing 2 population means.  
• Compute and interpret a confidence interval for the comparing 2 population means. |
| Exam 3 | December 10 Tuesday 3.10-5.10 pm | The above outcomes will be assessed in assigned homework and Exam 3. |