

**UNIVERSITY OF TEXAS AT EL PASO**  
**IE 3373 – ENGINEERING PROBABILITY AND STATISTCAL MODELS**  
**Syllabus**

Instructor:	Amit Joe Lopes, Ph. D.														
How to Reach:	Office: College of Engineering, A-244 E-mail:ajlopes@utep.edu														
Office Hours:	8:30am-9:30am T&R or By Appointments														
Classroom Details	Liberal Arts 107; TR 10:30 – 11:50am														
Prerequisite:	Calculus I, II & III														
Textbook:	<b>Engineering Statistics</b> , Fifth Edition; Authors: Douglas C. Montgomery, George C. Runger and Norma F. Hubele. Publisher: Wiley. ISBN-13: 978-0-470-63147-8; Hardcover commercial version. ISBN-13: 978-1-119-92746-4; Paperback custom text.														
Software:	Minitab														
Assignments:	Homework Problems will be assigned during class. They are due one week later after they have been assigned. Assignment will be graded. Assignments will not be accepted after the due date and Solution to the problems must be <b>hand written</b> . When computer outputs are needed the conclusions must be <b>hand written</b> .														
Class Attendance:	Attendance will have impact on the class participation portion of your grade.														
Exams:	There will four exams during the semester, as well as two pop quizzes. Exam dates will be announced in class.														
Class Content:	Data summary and Presentation. Probability, Random Variables and Distributions. Hypotheses Testing for One and Two Samples Simple Linear Regression Chapters 1 through 6.														
Grading scheme:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">First Exam</td> <td style="text-align: right;">17.5%</td> </tr> <tr> <td>Second Exam</td> <td style="text-align: right;">17.5%</td> </tr> <tr> <td>Third Exam</td> <td style="text-align: right;">17.5%</td> </tr> <tr> <td>Fourth Exam</td> <td style="text-align: right;">17.5%</td> </tr> <tr> <td>Assignments</td> <td style="text-align: right;">20%</td> </tr> <tr> <td>Attendance</td> <td style="text-align: right;">10%</td> </tr> <tr> <td><b>Total</b></td> <td style="text-align: right;"><b>100%</b></td> </tr> </table>	First Exam	17.5%	Second Exam	17.5%	Third Exam	17.5%	Fourth Exam	17.5%	Assignments	20%	Attendance	10%	<b>Total</b>	<b>100%</b>
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Third Exam	17.5%														
Fourth Exam	17.5%														
Assignments	20%														
Attendance	10%														
<b>Total</b>	<b>100%</b>														
Plagiarism:	Plagiarism or cheating will not be tolerated, anyone caught cheating will receive a <b>failing grade</b> for the class.														

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Academic Dishonesty

Academic dishonesty is prohibited and is considered a violation of the *UTEP Handbook of Operating Procedures*. It includes, but is not limited to, cheating, plagiarism, collusion, and fabrication.

- Cheating can involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports.
- Plagiarism occurs when someone intentionally or knowingly represents another person's words or ideas as his or her own.
- Collusion involves unauthorized collaboration with another person or group to commit any academically dishonest act.
- Fabrication occurs when false information is included on a works-cited page.

Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be taken seriously and will be referred to the Office of Student Conduct and Conflict Resolution for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions. You can find more information in the *UTEP Handbook of Operating Procedures*, under the heading "4.14: Alleged Student Scholastic Dishonesty," and in the Regents' Rules and Regulations.

No food or drinks will be allowed in the examination room.

Departmental policy allows for the use of assigned seats. All students must present their UTEP issued ID prior to and during every exam and may be required to sign in. Not having a UTEP issued ID when asked will result in forfeiture of the exam.

Scholastic dishonesty on homework, lab assignments and all other class assignments will be held to the same standards and requirements of academic honesty as quizzes and exams.

**Class Attendance Policy**

**Attendance is mandatory. Anyone with 5 or more absences will be dropped from the class.** A drop for not attending will count toward the State Allowed Six Drop Limit. If you are failing the class at the time of the drop you may also be given a WF designation. Be advised that a drop could adversely impact visa status, financial aid and other programs. As per UTEP rules, you may be asked to show a UTEP ID at any time during class.

Policy on Copyright and Fair Use

The University requires all members of its community to follow copyright and fair-use requirements. Students are individually and solely responsible for violations of copyright and fair-use laws. The University will neither protect nor defend students and will not assume any responsibility for students who violate fair-use laws. Violations of copyright laws can result in federal and state civil penalties and criminal liability, as well as disciplinary action under University policies.

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Other References

- UTEP Handbook of Operating Procedures @ <http://admin.utep.edu/Default.aspx?alias=admin.utep.edu/hoop>
- UTEP Office of Student Life @ <http://sa.utep.edu/studentlife/#student-conduct>
- UTEP Office of Institutional Compliance @ <http://admin.utep.edu/Default.aspx?alias=admin.utep.edu/hoop>
- UT Regents' Rules and Regulations @ <http://www.utsystem.edu/bor/rules/#A6>

Disability Statement

If you have a disability and need classroom accommodations, please contact the Center for Accommodations and Support Services (CASS) at 747-5148, or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit the office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass).

Software Requirements

You will need the following software on your computers to efficiently work in this course. In some cases your computer may already have some of these programs installed.

- Adobe Acrobat Reader. You can get the program by going to <http://www.adobe.com/> and then clicking on the icon on the center of the screen which says 'Get Adobe Reader'? Follow instructions to install the reader.
- Adobe Flash Player. You can get the player by going to <http://www.adobe.com/> and then clicking on 'Get Adobe Flash Player?'. Follow instructions to install the player.
- Apple QuickTime Player. You can get this player by going to <http://www.apple.com/>. Once there, click on the 'Downloads'? tab on the top of the page and then click on QuickTime 'Download'? and follow instructions.
- Microsoft Office. I recommend buying this if you do not have any word processing software or presentation software. As students, you can generally buy this whole package for about \$25, far less than the store price of approximately \$400.
- Email tool with file attachment capability. Please use your UTEP email account.
  - If you do not have a UTEP e-mail account, please get one immediately. Here is how:
    - Go to <https://newaccount.utep.edu/>.
    - Create your account (remember that your date of birth is in the form mm/dd/yyyy: two digits for the month and day, and four digits for the year).
    - After you create your account, you must wait 48 hours, then go back to the site and click on “Check on existing account.” Enter your UTEP Student ID Number (e.g. 80XXXXXX) and date of birth, and you will get your login name and password. Please let

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one of us know if you have any difficulty. You may also call the UTEP HELP desk at (915) 747 - 5257.

- The HELP desk hours are given below:  
Mon-Fri 7:00am - 8:00pm (Mountain Time)  
SAT 9:00am - 1:00pm (Mountain Time)  
SUN CLOSED

**Harassment Policy**

The department has a zero-tolerance policy for harassment. Engagement in any behavior considered harassment will be reported to the proper authorities. In addition to generally understood forms of harassment, the department also treats the following behavior as harassment:

- Repeated emails and/or calls regarding subjects that have already been addressed. Once a decision has been made or a question answered, a student who continues to ask the same question will be given a warning by the recipient of the email/call. If the student continues, the behavior will be reported. Questions that seek understanding of course material are not harassment; but repeated questions about a grade or an administrative decision are.
- Grades are NOT negotiable, ever. If you believe a grading mistake has been made, you must follow the process described in the UTEP catalog. Any request for a grade elevation that is NOT based on a mistake is considered harassment and will be reported immediately.
- Remaining in an office after the occupant requests you leave is considered harassment and potentially threatening. You will be reported immediately without warning and depending on the severity, may be reported to law enforcement.
- Similar behavior towards department staff, and student advisors will also be treated as harassment, including persistent phone calls, emails, and badgering. Department staff and student advisors are there to help students, and should be treated with due respect.

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**Topics to be covered**

The Following sections are taken from the Textbook “**Engineering Statistics**, Fifth Edition by Douglas C. Montgomery, George C. Runger and Norma F. Hubele.

**1. Summarizing and Presenting Data**

- 1.1. Collecting Engineering Data
- 1.2. Stem-and-Leaf Diagram
- 1.3. Histograms
- 1.4. Box Plot
- 1.5. Scatter Plot

**2. Probability**

- 2.1. Introduction
- 2.2. Basic Ideas
- 2.3. Conditional Probability
- 2.4. Random Variables

**3. Commonly Used Distributions**

- 3.1. The Normal Distribution
- 3.2. The Lognormal Distribution
- 3.3. The Binomial Distribution
- 3.4. The Poisson Distribution
- 3.5. The Exponential Distribution
- 3.6. Probability Plots
- 3.7. The Central Limit Theorem

**4. Hypothesis Tests for a Single Sample**

- 4.1. Point Estimation
- 4.2. Hypothesis t Testing
- 4.3. Inference on the Mean of a Population, Variance Known
- 4.4. Inference on the Mean of a Population, Variance Unknown
- 4.5. Inference on the Variance of a Population
- 4.6. Inference on the Population Proportion

**5. Inference for Two Samples**

- 5.1. Inference on the Means of a Two Population, Variances Known
- 5.2. Inference on the Means of a Two Population, Variances Unknown
- 5.3. Inference on the Variances of Two Populations
- 5.4. Inference on the Difference Between Two Proportions
- 5.5. Inference Using Paired data

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Tentative Course Calendar:

<b>Date</b>	<b>Class Topic</b>	<b>Readings/ Assignments/ Activities</b>
Week 1	Course Introduction: Data Models Data Representation	Lecture 1
Week 1	Probability and Distributions: Bayes Theorem; Binomial Distribution	Lecture 1,2 HW 1
Week 2	Distributions Continued; Poisson Distribution	Lecture 2
Week 2	Distributions Continued; Geometric, Normal, Distribution	Lecture 3 HW 2
Week 3	Distributions Continued; Normal, Exponential	Lecture 3
Week 3	Distributions Continued; Cumulative Distribution Function, Lognormal	HW 3
Week 4	Distributions Continued; Gamma, Weibull	Lecture 4 Exam 1 Review
Week 4	<b>Homework Discussion - Exam 1</b>	
Week 5	Distributions: Normal Approximations – Binomial and Poisson; Probability Plots	Lecture 5
Week 5	<b>Exam 1</b>	
Week 6	Hypothesis Testing Z test	Lecture 5
Week 6	Hypothesis Testing Z test	Lecture 6
Week 7	Hypothesis Testing T test	Lecture 6
Week 7	Hypothesis Testing T test	Lecture 6 Exam 2 Review
Week 8	<b>Exam 2</b>	
Week 8	Exam 2 Discussion; Beta Error T, Binomial Proportions	Lecture 7
Week 9	Chi-Square Test	Lecture 7
Week 9	Chi Square Test Beta Error – Confidence Interval	Lecture 8
Week 10	Hypothesis Testing on two samples means - Variance Known	Lecture 8
Week 10	Using Minitab	Lecture 9
Week 11	Exam 3 Review	Lecture 9
Week 11	Exam 3	
Week 12	Hypothesis Testing on two samples means - Variance Known	
Week 12	Hypothesis Testing on two samples means - Variance Unknown	Lecture 10
Week 13	Hypothesis Testing on two samples Variances	Lecture 10
Week 13	Inferences on two proportions	Lecture 11
Week 14	Exam 4 Prep	Lecture 11
Week 14	Exam 4	Lecture 12

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Week 15	ANOVA Basics	Lecture 12
Week 15	ANOVA/Non Parametric	Lecture 12
Week 16	Make Up Lecture	