



**THE UNIVERSITY OF TEXAS AT EL PASO**  
**COLLEGE OF SCIENCE**  
**DEPARTMENT OF MATHEMATICAL SCIENCES**  
*¡BIENVENIDOS (WELCOME)!*

*note:* From the top of <http://www.math.utep.edu/Faculty/lesser/schedule.html> or our Bb course shell, you can access this syllabus if you misplace yours, want to [explore its links](#), or see any updates to it. Syllabus is subject to change by instructor to meet course needs, especially if there are unexpected disruptions or changes in class size, resources, etc.

**Course Number:** MATM 5364-001 (CRN 28693)

**Course Title:** Quantitative Methods in Mathematics Education Research

**Credit Hours:** 3

**Term:** Spring 2017

**Prerequisite:** Departmental Approval

**Course Fee:** none

**Course Meetings & Location:** W 5-7:50pm (except March 15) in Bell 130. In a major disruption (e.g., H1N1 epidemic, subzero weather), be prepared to maintain course progress via other means (e.g., Internet, our Blackboard shell, etc.) and check email (especially your UTEP miners account) regularly. UTEP set our final on May 10, 7-9:45pm.

**Instructor:** Dr. Larry Lesser (rhymes with “professor”, spelled like “<”). I began teaching (especially statistics!) university classes in 1988, and I’ve also worked in Texas as a state agency statistician (see Oct. 2012 *Mathematics Teacher*) and as a full-time high school teacher! I have served on national statistics education journal editorial and research advisory boards and have published in selective research journals such as *Statistics Education Research Journal* and *Journal of Statistics Education* as well as in teacher-oriented outlets such as *Teaching Statistics*, *Mathematics Teacher*, *Statistics Teacher Network*, and *STEW: Online Journal of K-12 Statistics Lesson Plans*. See background on my homepage <http://www.math.utep.edu/Faculty/lesser/> or hear my introductory rap at <https://www.youtube.com/watch?v=sFizdFK0918>

**Office Location:** Bell Hall 213

**Contact Info:** Phone: (915) 747-6845

Email **Lesser (at) utep.edu** (include “5364” in the subject line)

emailing me from your [miners.utep.edu](http://miners.utep.edu) address is better because it provides more security and minimizes the chance of the UTEP server rejecting it

Homepage: <http://www.math.utep.edu/Faculty/lesser/>

Fax: (915) 747-6502 (note: this is a math department fax, so be sure to have my name clearly on it; be aware that staff are not available to relay faxes to me outside the math dept’s hours of M-F 8-12, 1-5)

Emergency Contact: (915) 747-5761 (during math dept office hours)

**Office hours:** the half-hour after each class and by appointment; additional office hours or changes will be announced or posted later; you are also welcome to try stopping by or emailing anytime for easy questions; for questions requiring live conversation, just email me several possible times that would work and I will reply with which option works in my schedule.

**Textbook:** Vogt, W. P. (2007). *Quantitative Research Methods for Professionals*. Boston: Pearson. Chapters will be covered in an order (1-11, 17, 16, then 15 & 12-14) and with relative emphases to support the goals of preparing you to interpret and conduct education research. This outline is subject to modification by the instructor to take into account interests, backgrounds, resource availability, logistics, scheduling/sequencing issues, and balance between depth and breadth. I may provide supplementary material for which you will also be responsible. Since you know the order of chapters now, you are expected to read each chapter (and assess your understanding by taking that chapter's Self-Test and checking your answers in the Appendix) before the class meeting it will be discussed, and bring your book to each class. Corrections to known typos in the book's first printing are posted in our class Blackboard shell. Pearson kindly granted permission for this (now out-of-print) book to be available to this class this semester in our Bb shell (because it may take a few days to get this posted there, you can access the first two chapters now via the UTEP Library home page, go to "Search and Find", choose "Course Reserves", then choose "Math 5364").

### **Required technology:**

\* **graphing calculator brought to each class.** Because the TI-83/84+ calculator is the one most commonly used in secondary school classes like AP statistics, etc., this is the one I will use when demonstrating many basic procedures. If you use a different calculator, you will need to take responsibility for learning how it does the things we will be using it for, consulting online resources such as

[www.prenhall.com/esm/app/calc\\_v2/](http://www.prenhall.com/esm/app/calc_v2/). You'll be allowed to use your calculator on virtually all assessments and activities (but it really has to be a separate calculator, because you aren't allowed to use devices such as a laptop or cell phone on tests). You still need to be able to show enough work so I can follow your process. Example: to find mean of {3, 4, 5, 5, 8}, don't just say "5", but write out  $(3 + 4 + 5 + 5 + 8) / 5 = 5$ .

Of course, not everything can be readily done on just a calculator, and we will also dive in and compute statistics using tools such as applets, spreadsheet (Excel), and software (Minitab). On Minitab, the Calc, Stat, and Graph pulldown menus have about everything you'd need (and then some)! Minitab is in some on-campus labs (e.g., <http://utep.edu/chs/ilc>) and should be in our classroom (Bell 130), and you can actually access it anytime *anywhere* (even at home!) using UTEP MY.APPS (see <http://admin.utep.edu/Default.aspx?tabid=74328> and <http://admin.utep.edu/Default.aspx?tabid=74340>) and its Calc, Stat, and Graph pulldown menus have about all you'd need (and more)!

(other technology resources you may want to explore on your own include: <http://codap.concord.org>, <https://www.jake4maths.com/grapher/>, <https://www.stat.auckland.ac.nz/~wild/iNZight/index.php>, <https://tuvalabs.com/>; also, students can get free time-limited licenses of <http://fathom.concord.org/> or <https://www.tinkerplots.com/>)

**Course Objectives (Learning Outcomes):** Students will...

- Gain an overview of quantitative research methods in mathematics education research, including: descriptive and inferential statistics, surveys, experiments, psychometrics, simple and multiple regression, ANOVA, chi-squared, logistic regression.
- Improve critical thinking and conceptual understanding of these methodologies.
- Learn better how to generate and interpret technology output in the context of reporting the results of mathematics education research, including  $p$ -values and effect sizes.
- Learn how to align methods with research question in mathematics education and to investigate the assumptions of the statistical models.

**Course Activities/Assignments:** Students will participate in in-class activities, read assigned articles and chapters, facilitate/participate in discussions, take exam/quizzes, and do homework exercises/projects. The instructor will make clear which assignments or assessments may be done in pairs (or small groups) and which must be done individually.

**Assessment of Course Objectives:** Assessments include written reflections, exam, team write-ups, quizzes, class discussions, oral presentations.

**Course Schedule:** Census Day: Feb. 1 for UTEP  
Deadline to Drop with a “W”: March 30  
Last Regular Class Meeting: Wed., May 3  
Final Exam: as scheduled by UTEP registrar (Wed., May 10, 7-9:45pm), unless there is approval and consensus to change it

*weightings (within given ranges) were finalized by collective student vote on Jan. 18:*

**Grading Policy:** after any rescaling needed for all components to be on the 0-100 scale, the grade is determined by the usual cutoffs of 90-80-70-60 based on these parts:

**Projects** (68%): these include labs, papers, reflections, article reviews, or chapter presentations (see **resources for giving oral presentations**). All assignments must be word processed with double-spacing and a standard 12-point font (e.g., Times New Roman), checked for spelling and grammar, and have any appropriate output/graphics electronically pasted into the document. Exercises/sections should be clearly marked, assembled in order, and stapled (*not* put into a folder or sleeve) with a meaningfully-titled identification coversheet on top. Many projects will be assigned to be done in teams.

**Final** (32%): you’ll be allowed your calculator and provided appropriate tables and formulas as announced

**Attendance:** Subject to change if required by UTEP policy, your final course average will have  $2 - 3U - E$  points added to it, where  $U$  = number of unexcused absences and  $E$  = number of excused absences. This reflects how crucial participation is for a course with “beyond-the-book” discussion/experiences, but without penalizing someone with  $\leq 2$  (excused) absences.

**Quizzes:** occasional unannounced quizzes will be taken into account only if your final average falls a point below a letter grade cutoff (i.e., they can only help)

**Makeup Policy:** If a written assignment is due in class and you are not able to get to UTEP, you are still responsible for emailing or faxing the assignment by the start of that day’s class.

In general (out of fairness and logistics), **late work will not be accepted**, and may be subject to a penalty in the rare borderline cases that it is accepted at the instructor's discretion. If an in-class quiz or exam is missed, the instructor will consider a "makeup arrangement" (i.e., the instructor will choose to either offer a makeup assessment or simply replace that part of the grade with the final exam) only if: (1) the student relays to me (by email or voicemail) within 24 hours (or the earliest medically possible opportunity) why missing the assessment was unavoidable for a serious reason, and hand me or email me a written statement or document (e.g., doctor's note) for my file within 7 calendar days, and (2) the student takes the initiative to contact me by email with available days/times for a makeup exam as soon as possible (if it takes 2 or more days just to get an appropriate email response from the student, I would consider a makeup only in extreme circumstances with written documentation).

**Attendance Policy: Attendance is expected** and here's why: Much of this course involves beyond-the-book group activities, experiences or discussions that are virtually impossible to recreate or "make up." Successful completion of this course is intended not only to imply you have demonstrated sufficient knowledge acquisition, but also that you have been exposed to key processes, modeling, and experiences (which are especially important for future teachers, for example). Therefore, if you are now in a situation where you expect to have frequent absences, you might consider taking this class in another section or another semester. Attendance is generally taken each meeting using a sign-in sheet and it's your responsibility to sign it each day you attend *before the end* when I am busy packing up materials. Late arrival, early departure, or blatant nonparticipation may be counted as a half-absence or even a full absence, depending on what is missed.

As the UTEP *Catalog* says, "When in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with grade of "W" before the course drop deadline [March 30] and with a grade of "F" after the course drop deadline." In practical terms, this means a student is **subject to being dropped for 4 or more absences** (unless you have given me a written or emailed reason I have approved). If you choose to withdraw, you should submit the formal paperwork (and send me an email to let me know) rather than just stop attending class and assume you will be withdrawn automatically. On a positive note, a strong record of attendance will be taken into account if your final average is a point below a letter grade cutoff.

It's **your responsibility** to....

- (1) give me a written note or email by the 15<sup>th</sup> day of the semester [Feb. 6] if you will have absence for religious holy days (which are excused, of course).
- (2) give me an email or written documentation as soon as possible if you anticipate the possibility of missing large parts of class due to exceptional circumstances such as military service/training, childbirth, or competing on official UTEP athletic teams.
- (3) let me know by email (**Lesser (at) utep.edu**) or voicemail (747-6845) or daytime math dept. fax (747-6502) at the *earliest opportunity* if you have a serious situation which may affect a test, major assessment deadline, the final exam week meeting, or a large number of "regular" class days. If you miss a single "regular class meeting," you don't need to contact me, but you **DO** need to get copies of notes and announcements from a classmate: be sure to have contact info for at least 3 classmates for this purpose

**Academic Integrity Policy:** It's UTEP's policy (and mine) for all suspected violations to be referred to the Dean of Students for investigation and disposition (see the Handbook of

Operating Procedures, <http://admin.utep.edu/Default.aspx?tabid=73922>). Cheating, plagiarism and collusion in dishonest activities are serious acts which erode the university's purpose and integrity and cheapen the learning experience for us all. Don't resubmit work completed for other classes without specific acknowledgment and permission from me. It is expected that work you submit represents your own effort (or your own group's effort, if it is a group project), will not involve copying from or accessing unauthorized resources or people (e.g., from a previous year's class). You must cite references that you do consult, using **APA style** with complete citations even for websites and people you consult.

**For Group Work:** Within a group, members are allowed to divide up subsets of the project for which individuals will take the initial responsibility for coordinating efforts, but it is assumed that by the time a group turns in a writeup that all members have read, discussed, contributed to, and understand what is being turned in. Group members may even discuss general ideas and strategies with members of other groups, but NOT share parts of actual written work. At a minimum, to be safe, put away all written notes and writing materials and recording devices before having any intergroup conversations. And if you still see a "gray area," play it safe and ask the instructor! Conversations between teams are not allowed during in-class quizzes taken as teams.

**Civility Statement:** You are expected to follow basic standards of courtesy (<http://admin.utep.edu/Default.aspx?tabid=73922>) and may be dismissed from class for blatant or sustained disruptive behavior. Your comments during classroom discussions need to focus constructively and respectfully on the intellectual merit of a position, *not* critiquing the person expressing it. You should avoid side conversations when one person (me, or another student) is talking to the whole class. If you need to have a laptop open (for taking notes during lectures or appropriately accessing an electronic copy of our textbook), please minimize distractions to other students by sitting against a back wall or side wall. Whether the "weapon of math disruption" is a phone or laptop, engaging in activities such as texting, Facebook, YouTube, phone conversations, or emailing are inappropriate because they distract and impact class participation. If you are expecting an urgent call on your cell phone, ***please keep your phone on vibrate*** instead of anything loud, let me know and sit near the door to minimize disruption, and have the phone handy so you don't have to dig around for it. Or you might give your family member or childcare provider the phone number for the campus police (747-5611) or an office near our classroom so you can rest assured that staff can quickly let you know if there is an emergency.

**Student Accommodations Statement:** If you have or believe you have a disability requiring accommodations, you may wish to self-identify by contacting the Center for Accommodations and Support Services (CASS; 747-5148; East Union Building 106; [cass@utep.edu](mailto:cass@utep.edu); <http://sa.utep.edu/cass/>) to show documentation or register for testing and services. CASS will ask you to discuss needed accommodations with me within the first 2 weeks of the semester or as soon as disability is known, and at least 5 working days before an exam. You are responsible to make sure I receive any CASS instructions and accommodation letters. CASS provides note taking, sign language, interpreter, reader and/or scribe services, priority registration, adaptive technology, diagnostic testing for learning disabilities, assistance with learning strategies/tutoring, alternative testing location and format, and advocacy.

**Military Statement:** Give me an email or written documentation as soon as possible if you anticipate the possibility of missing large parts of class due to military service.

## ADDITIONAL INFORMATION

**Campus Concealed Carry:** <http://sa.utep.edu/campuscarry/>

**Professionalism:** Beyond the previously mentioned Civility Statement, students in this course are required to exhibit professionalism that goes beyond avoiding negative behaviors. This includes making a good faith effort in preparation for and participation in individual and collaborative class activities. A classroom culture must be actively supported that understands that “wrong answers” are usually correct answers to a different question or valuable learning opportunities to address a common misconception. Also, be open to local opportunities for professional growth or service. For example, teachers may consider encouraging K-12 students to enter an **ASA Project or Poster** (due April 1) or may consider joining (at cheaper student rates!) professional organizations -- local (**GEPCTM**), state (**TCTM**), or national (**NCTM**, **TODOS**, or **ASA**). You might consider attending (or even presenting at) the Graduate Student Research Expo (<http://gradexpo.utep.edu>).

**Other Resources:** For those who may be helped by consulting statistics books for additional mathematical theory, conceptual intuition, or real-world connections, go to the UTEP library circulation desk and ask them to look under “MATH/MATM 5364” (or, for even less mathematical versions, what I put under “STAT 1380”). Also, be aware that there are lots of free statistics textbooks online that can be consulted as references as well (in GOOGLE, type: online statistics textbooks) and there are various resources at [www.math.utep.edu/Faculty/lesser/STATResources.html](http://www.math.utep.edu/Faculty/lesser/STATResources.html).

My “welcome to the wonderful world of STAT ED website” (<http://www.math.utep.edu/Faculty/lesser/StatEdIntro.html>) has resources that not only will help your own understanding in this course, but also offer further context and connections with some topics you might teach (at a more basic level). Speaking of teaching, here are standards and guidelines for teaching statistics to high school students:

TEKS: <http://ritter.tea.state.tx.us/rules/tac/chapter111/>,

ASA: [http://www.amstat.org/education/gaise/GAISEPreK-12\\_Full.pdf](http://www.amstat.org/education/gaise/GAISEPreK-12_Full.pdf),

NCTM: [http://www.nctm.org/uploadedFiles/Standards\\_and\\_Positions/PSSM\\_ExecutiveSummary.pdf](http://www.nctm.org/uploadedFiles/Standards_and_Positions/PSSM_ExecutiveSummary.pdf)

COMMON CORE: <http://www.corestandards.org/Math>,

[http://www.corestandards.org/assets/CCSSI\\_Math%20Standards.pdf](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf)

Please let me know of any other resources you find helpful that I may not know about.

As a K-12 teacher, you get a FREE trial ASA membership:

<http://www.amstat.org/k12trial>

**Student Support:** My training is limited to academic resources (e.g., my chapter on statistics anxiety on (e)reserve in the UTEP library under “MATH 5364”), but I want anyone who feels overwhelming stress/crisis to know about these broader resources:

- UTEP Counseling Center (free to all students): 747-5302 (after-hours goes to a crisis line)
- Mental Health Crisis Line: 779-1800
- National Suicide Prevention Hotline: 1-800-273-8255
- Veterans Crisis Line: 1-800-273-8255
- NAMI (National Alliance Against Mental Illness) of El Paso: 534-5478
- <http://caringeducators.tumblr.com/survival>