

SYLLABUS

I. Course Title

TECH 5329-RP61: Research Trends in Industry

II. Course Credit

3 credit hours

III. Placement in Curriculum

Research Core

IV. Prerequisites

None

V. Course Professors

Lead Professor

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Preferred Method of Contact: Email

VI. Course Description

The study and research of new and developing industrial techniques. Currently, Lean Six Sigma is a burgeoning technique. An in-depth analysis of the Minitab software package and how it can be used to analyze Six Sigma projects. The DMAIC approach and most topics currently covered on Lean Six Sigma certification exams will be discussed. A mini-research project is required and presented at the end of the course.

VII. Course Rationale

This graduate-level course provides an advanced examination of emerging and evolving industrial methodologies, with a particular focus on Lean Six Sigma, a leading approach for driving process improvement and organizational efficiency across modern industries. As contemporary manufacturing and service sectors increasingly demand data-driven decision-making, the course emphasizes rigorous analytical techniques using the Minitab software package to support Six Sigma project evaluation and execution. Students will develop a deep understanding of the DMAIC framework and engage with the core concepts and competencies currently emphasized in Lean Six Sigma certification standards. To cultivate applied research skills and industry-ready expertise, the course culminates in a mini-research project that requires students to investigate a real-world problem, apply analytical methods, and present their findings. This rationale positions the course as a critical component of graduate education for professionals seeking mastery in continuous improvement, operational excellence, and evidence-based industrial practice.

VIII. Course Objectives

Upon successful completion of this course, participants will be able to:

- CLO1. Interpret statistical analyses and outputs generated through Minitab.
- CLO2. Apply Six Sigma statistical formulas and tools using Minitab to solve analytical problems.
- CLO3. Evaluate data and predict outcomes to support decision-making within the Six Sigma framework.
- CLO4. Demonstrate proficiency in Minitab through successful completion of applied assignments and quizzes.
- CLO5. Manipulate and analyze statistical datasets to derive meaningful conclusions and targeted outcomes that support organizational quality objectives.

IX. Materials

Textbook

1. Khan, M. R. (2022). Six Sigma Statistics Using Minitab 21: Green Belt Edition. UK: Independently published. ISBN: 979 8427845953

(This book includes user-friendly instructions that are easy to follow when using Minitab. With only a few minor exceptions, it remains applicable to Minitab 22.)

Required Software

Minitab Statistical Software: Cloud App & Windows Desktop (06-Mo Rental), Mac (06-Mo Rental) may be purchased for \$35.99 at (<https://onthehub.com/minitab>)

1. **Note**—Please be aware that the Minitab Mac version may not have all the interfaces required for completing assignments. Also, do not just get a free 30-day or other free copies, as they are time-sensitive and come with functionality constraints.

X. Course Outline and Expectations

Participation/Attendance

1. Attendance Policy

Attendance is mandatory and will be assessed through the submission of quizzes, assignments, and exams. Make-up work will only be permitted in the case of documented illness or the death of an immediate family member (mother, father, brother, or sister). In such cases, a doctor's note or a signed statement from the authority responsible is required. For face-to-face classes, any student who arrives five minutes or more after the scheduled start time will be considered late. A student will lose one letter grade in the course for every three instances of absences or tardiness.

2. Religious Observance

Students who expect to miss class due to a religious observance must inform the instructor by the second class meeting of the semester. Following university policy, appropriate accommodation will be made.

3. University-Sponsored Events and Activities

Suppose a student plans to be absent due to participation in a university-sponsored event or activity. In that case, either the student or the event sponsor must notify the instructor at least two weeks before the scheduled absence. The instructor will then establish a date and time to complete any make-up assignments.

4. Talking

While the instructor is talking (in a face-to-face class), it is understood that no one should be talking. Students talking in class prevent other students from hearing the instructor and learning the required material to pass the course. You will earn a zero on your daily quiz grade if you are caught talking. On the second offense, you will be **asked to leave**. This behavior is rude and disruptive, and most students who speak in class typically earn lower grades. It should be noted that students who have been granted permission to speak by the instructor should not be interrupted as well. If a student does not wish to listen to the lecture or a personal issue arises, they may leave the classroom gently, but are not allowed to disturb or distract their classmates. Please respect your classmates who have paid for this course and wish to attend the lecture and learn the content.

5. Cell Phones

Cell phones are to be seen and not heard (in a face-to-face class). Please turn off your cell phone during class or turn it to vibrator mode. A cell phone ringing is a distraction and is inappropriate for the classroom. Allowing your cell phone to ring and then answering it is very rude. It is not fair to your classmates who have paid for this course. Please be considerate and ensure your cell phone is turned off during class. Students will be asked to leave for the day if this behavior continues.

Academic Honesty

1. UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace Honor and integrity that will not allow me to lie, cheat, or steal, nor will I accept the actions of those who do.

2. Students' Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>.

3. Artificial Intelligence Use Policy

UT Tyler is committed to exploring and using artificial intelligence (AI) tools appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Students must not use protected information, data, or copyrighted materials using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional research approaches. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

I expect all work students submit for this course to be their own. I have carefully designed all assignments and class activities to support your learning. Doing your own work, without assistance from human or artificial intelligence, is best for your efforts in mastering the course's learning objectives. For this course, I expressly forbid the use of ChatGPT or any other artificial intelligence (AI) tools at any stage of the work process, including brainstorming. Deviations from these guidelines will be considered a violation of UT Tyler's Honor Code and academic honesty values.

Special Accommodations

1. Disability/Accessibility Services

By Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA), and the ADA Amendments Act (ADAAA), the University of Tyler at Texas offers accommodations to students with learning, physical and psychological disabilities. Suppose you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, or ADHD, or you have a history of modifications or accommodations in a previous educational environment. In that case, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with an Accessibility Case Manager. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150, or call 903.566.7079.

2. Student Absence Due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

3. Student Absence for University-Sponsored Events and Activities

Suppose you intend to be absent for a university-sponsored event or activity. In that case, you (or the event sponsor) must notify the instructor at least two weeks before the planned absence date. The instructor will set a date and time when make-up assignments will be completed.

Course Communication Policy

The Instructor is available to students both electronically and in person—via Canvas email at any time and in person during scheduled office hours. Historically, the lead professor responds to email inquiries no later than the next business day.

Course Communication Guidelines (Netiquette)

Much of our communication in this course will take place in the forums and through email. Here are some guidelines for online communication in this course:

- Be sensitive to different cultural and linguistic backgrounds, as well as different political and religious beliefs.
- Use good taste when composing your responses. Swearing and profanity should be avoided. Also, consider that slang terms can be misunderstood or misinterpreted.
- Don't use all capital letters when composing your responses. This is considered "shouting" on the Internet and is regarded as impolite or aggressive. It can also be stressful on the eyes when trying to read your message.
- Respect others' views and opinions. Avoid "flaming" (publicly attacking or insulting) others.
- Be careful when using acronyms. If you use an acronym, it is best to spell out its meaning first, then put it in parentheses afterward, such as Frequently Asked Questions (FAQs). After that, you can use the acronym freely throughout your message.
- Use good grammar and spelling, and avoid using text messaging shortcuts.
- In emails, always identify yourself and your class and section. Putting your course and section in the subject line is a good practice. This helps your instructor identify course-related emails.

XI. Technology Requirements

Computer/Technology Requirements

This is an online course and will require reliable technology. Online students will need regular access to a personal computer that runs on a broadband Internet connection. Required technology includes:

Hardware:

- Desktop or laptop computer with internet access.
- Note: if your internet connection is down, you must gain access to avenues such as the UTT computer lab (BEP249 or HPR 134) and a public library to complete and submit your work on time.
- A camera, microphone, and sound speakers.

Software:

- A current operating system (Microsoft or Apple)
- A web browser (Internet Explorer, Chrome, Safari, Firefox, etc.)
- Access to Canvas and Patriot Mail. Note: Google Chrome does not support JAVA. Please do not use it for Soft Chalk lessons.
- Microsoft Office (Available at no charge to the student at <https://www.uttyler.edu/it/office365/proplus.php>)
 - Note: Do NOT use Google Docs for writing assignments
 - Also, standard plug-ins such as Java, Flash, QuickTime, Adobe Reader, or another FDF reader such as Preview on the Mac.
- Other software, as noted in each module, such as E-Portfolio

Technical Support:

Technology-related problems (e.g., Patriot email, Canvas, access problems with myUTTyler, etc.) can often be solved by calling the UT Tyler Information Technology Hotline at (903) 565-5555 x2 or by emailing them at itsupport@patriots.uttyler.edu. In your email, be sure to include the following:

- The title and number of the course
- The Canvas page in question
- A description and message number for any error message that you receive
- What were you doing at the time you got an error message

Learning Management System

When an LMS (e.g., Canvas) issue arises, students are provided with guides and an online ticketing service. To access the 24/7 help desk and resources, access the Help option by clicking on the question mark icon in the navigation bar on the left side of your course page.

Web Conferences/Synchronous sessions

The Zoom links will be provided in advance for web conferences or synchronous sessions. Besides, the instructor is available to students both electronically and in person—via email at any time and in person during scheduled office hours. Historically, the professor responds to

email inquiries no later than the next business day. The course's Canvas email is the fastest way to contact him if you have any course-related questions.

XII. Grading and Evaluation

Final Grade Calculation

Assessments	Percentages
Assignments and Classroom Participation	21%
Textbook Quizzes	39%
Research Article Review	5%
Research Project	20%
Comprehensive Final Exam	15%
Total Percentage for the Course	100%

Grading

In determining the final course grade, the following scale is used:

90 – 100% = A

80 – 89% = B

70 – 79% = C

60 – 69% = D

Below 60% = F

Grading Notes

Students can expect to receive their scores or feedback on assignments and assessments within three to five business days of the following week. A student can always estimate their grades according to the procedure outlined above, and ALL email requests to confirm or verify grades will be IGNORED. The instructor is not allowed to disclose grades using email.

Canvas has a grade calculation feature that produces a percentage, which is different from what is shown above. Specifically, extra credit assignments are factored into consideration for the total number of points. The instructor reserves the right to amend this policy; however, Canvas will always maintain the most up-to-date syllabus and gradebook during the semester.

Lectures, Quizzes, and Exams

Lectures are posted under the Modules section in Canvas. Each PowerPoint Lecture Note is accompanied by a timed quiz (30-40 minutes, based on difficulty and mathematical calculation). There are approximately 13 quizzes in total. These will be available for approximately one week and will not reopen after the deadline has passed. Because this course emphasizes statistical analysis and quantitative methods, students will complete one comprehensive final exam

covering all studied chapters as well as the Minitab exercises and assignments, ensuring focused learning and mastery of key concepts. Exam content will be drawn from lectures, worksheets, quizzes, reading and writing assignments, laboratory exercises (if applicable), and audio-visual materials, including films, tapes, slides, etc.

Mini Research Project

This course requires the study and research of new and developing industrial techniques. Currently, Lean Six Sigma is a burgeoning technique. A mini research project is needed to create and present as a partial fulfillment of this course. Using Minitab software, students are required to analyze a real-life Six Sigma (6σ) project. Project deliverables include part 1 report in Microsoft Word (Arial/Times New Roman 11 or larger font size, double space) and part 2 or final report. The final report has two parts. Microsoft Word full report contains part 1, plus updates on detail analysis using additional statistical methods, my suggestions, and a PowerPoint presentation (max 20 slides) of the project.

Using Worksheets to Support Your Learning

This course stresses statistical analysis and quantitative methods, which some students may find challenging. I developed a worksheet for each chapter to support your learning and reduce anxiety. These worksheets offer concise, clear, and practical summaries of key concepts, helping you focus on essential material and strengthen your understanding.

I recognize that many of you juggle responsibilities—jobs, families, hobbies, and other coursework. Still, since you've enrolled in this course with the intention of succeeding, I strongly encourage you to dedicate at least a couple of hours per chapter to engage meaningfully with the content.

Each worksheet is designed to direct your attention to specific areas in the textbook for MCQ clues, allowing you to study more efficiently and effectively, based on your own learning pace and capacity. I understand that every student is unique, and abilities vary, so the worksheets help you maximize your efforts within your available time.

The summary description of the chapter topic and knowledge-check questions in the worksheets is self-explanatory. If you encounter any difficulty understanding a concept, please do not hesitate to email me via Canvas. I will do my best to respond within a few hours or by the end of the day. Let's make this a smooth and enriching learning experience together.

Rubrics

Grading rubrics for all assignments will be provided within the assignment instructions to help students understand the evaluation criteria. Quizzes and exams are assessed automatically upon submission, and scores will be visible immediately on Canvas. In cases of approved make-up assignments, quizzes, or exams, the instructor will post the corresponding scores following the course policy.

Format for Assignment Reports:

Each assignment must be written so the reader can quickly examine the contents. Materials that are hard to read or require special handling will not be graded. The cover page must contain the following:

1. Assignment Title in bold font
2. Your Name: Prepared by Joe Student
3. Your University I.D. Number
4. Course Name and Number
5. The Date
6. Submitted to Dr. Mohammed Ali

Your grade will reflect the quality of the presentation/paper.

Late Work Policy

All work **not turned in on time will automatically reduce its value to 50% of its total value.** **Exceptions to this will be as per the University Policy concerning absences from class. The student is responsible for taking the quizzes and submitting assignments by the due date or the date administered. The instructor is NOT accountable for reminding students about missed quizzes, assignments, or exams.** If you know a quiz/assignment/exam will be late for a valid reason, inform your instructor to avoid unnecessary penalties.

Make-up quizzes and examinations are the student's responsibility. **No excuses will be accepted after the due date has passed.** The instructor must be notified **before** the scheduled exam. If not, the student forfeits their right to take the exam. However, make-up exams will be on a different set of questions. *Quizzes and assignments will not be made up unless the instructor has received a prior acceptable excuse for an absence.*

XIII. Course Evaluation

Students are encouraged to complete a course evaluation at the end of the term. The Information Analysis office at the University of Texas at Tyler establishes and manages the evaluation period. Students will receive an email notification once the evaluation period opens, providing access to the evaluation form. They are eligible to complete the evaluation until the officially listed end date.

XIV. Course Topics

Module 0	This section provides an overview of the course, including a welcome and introduction, strategies for completing Minitab assignments before attempting the quizzes, and the benefits of starting the research project early, as it must be developed from scratch and require significant critical thinking.
Module 1	Introduction to six sigma concepts, methodology and application; Minitab boot camp (ch1-2)
Module 2	Data manipulation; Building graphs (ch3-4)

Module 3	Core statistics; Overview of hypothesis testing (ch5-6)
Module 4	Hypothesis testing; Analysis of variance (ch7-8)
Module 5	Control charts; Process Capability (ch9-10)
Module 6	Evaluating measurement systems; Regression; Design of experiments (ch11-13)
Module 7	Research project presentation and final report; Comprehensive final exam.

XV. Additional Course Information

Campus Carry

We respect the rights and privacy of students 21 and over duly licensed to carry concealed weapons in this class. License holders must behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>.

Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler campus, branch campuses, or any property owned by UT Tyler. This applies to all University community members, including students, faculty, staff, university affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs, please visit <http://www.uttyler.edu/tobacco-free>.

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the semester's Census Date in which the course will be repeated. Refer to the university's academic calendar to find the exact Census Date. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in the original and repeated grades being used to calculate your overall grade point average. Undergraduates can exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date (refer to the Academic Calendar) is the deadline for many forms and enrollment actions that students must be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, and approvals for taking courses as Audit, Pass/Fail, or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)

- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits students who begin college for the first time in Fall 2007 or after that from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For this rule, a dropped course is any course dropped after the census date (See the Academic Calendar for the specific date).

The catalog lists exceptions to the 6-drop rule. Petitions for exemptions must be submitted to the Enrollment Services Center and accompanied by documentation of the extenuating circumstance. Please get in touch with the Enrollment Services Center if you have any questions.

Disability/Accessibility Services

By Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA), and the ADA Amendments Act (ADAAA), the University of Tyler at Texas offers accommodations to students with learning, physical and psychological disabilities. Suppose you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, or ADHD, or you have a history of modifications or accommodations in a previous educational environment. In that case, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with an Accessibility Case Manager. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150, or call 903.566.7079.

Social Security and FERPA Statement:

The University of Texas at Tyler has a policy of protecting the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violating the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation:

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you need assistance during an evacuation, inform your instructor during the first week of class. Do not re-enter the building unless given permission by the University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct: Disciplinary proceedings may be initiated against any student who engages in academic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give an unfair advantage to a student or the attempt to commit such acts.

(i) "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;

- possession during a test of materials that are not authorized by the person giving the test, such as class notes or specifically designed “crib notes.” The presence of textbooks constitutes a violation if they have been expressly prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination to preserve questions for use by another when the instructor has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution, or computer program;
- falsifying research data, laboratory reports, and other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, to obtain an academic or financial benefit or injure another student academically or financially.

(ii) “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining another’s work and submitting it as one’s academic work offered for credit.

(iii) “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to violate any section of the rules on academic dishonesty.

(iv) All written work that is submitted will be subject to review by SafeAssign™, available on Canvas.

UT Tyler Resources for Students:

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu, <http://www.uttyler.edu/writingcenter/>
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu, <https://www.uttyler.edu/tutoring/>
- The Mathematics Learning Center, RBN 4021: This is the open-access computer lab for math students, with tutors on duty to assist students enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254) <https://www.uttyler.edu/counseling/>

Syllabus Subject to Change

While information and assurances are provided in this course syllabus, it should be understood that content may change in keeping with new research and literature and that events beyond the control of the instructor could occur. Students will be informed of any substantive occurrences that will produce syllabus changes.