

ENGT 3320 QUALITY CONTROL TECHNOLOGY

Spring 2022

Texas A&M University-Central Texas

COURSE DATES, MODALITY, AND LOCATION

This is a Synchronous Distributed Course that meets from Jan 18 – May 14

For lecture on T and Th from 6:00 – 7:15 pm

Online via Webex (meeting links in the WebEx Meeting tab in Canvas)

with up to 25% potential asynchronous online content

Assignments and lectures will be required each week throughout the semester.

Supplemental materials will also be made available online through the A&M-Central Texas Canvas Learning Management System [<https://tamuct.instructure.com/>]

INSTRUCTOR AND CONTACT INFORMATION

Instructor: Tyler D. Hurst

Office: <https://tamuct.webex.com/meet/tylerdhurst>

Phone: 979-575-6529

Email: tylerdhurst@tamuct.edu

Office Hours

Available by appointment.

Student-instructor interaction

Communication is essential for clarifying any questions or concerns you may have. Please reach out to me via email, text message, or phone. For anything specific in the material please include a screenshot, photo or detailed explanation via email or voicemail. One-on-one sessions via webex are also available though limited during the week. (<https://tamuct.webex.com/meet/tylerdhurst>).

WARRIOR SHIELD

Emergency Warning System for Texas A&M University-Central Texas

Warrior Shield is an emergency notification service that gives Texas A&M University-Central Texas the ability to communicate health and safety emergency information quickly via email, text message, and social media. All students are automatically enrolled in Warrior Shield through their myCT email account.

Connect to Warrior Shield by [911Cellular](https://portal.publicsafetycloud.net/Account/Login) [<https://portal.publicsafetycloud.net/Account/Login>]

to change where you receive your alerts or to opt out. By staying enrolled in Warrior Shield, university officials can quickly pass on safety-related information, regardless of your location.

COURSE INFORMATION

Course Overview and description

Statistical concepts and analysis, control charts, and data analysis to establish quality control systems for manufacturing industries.

Course Objective or Goal

Student Learning Outcomes

1. Describe the organization and responsibility for quality and quality engineers in business/industry environment.
2. Describe the characteristics of a sample, or a population using the statistics of data distribution, central tendency, and dispersion.
3. Define control charts for variables and attributes.
4. Demonstrate the concepts of probability of events occurring in discrete and continuous data distributions.
5. Explain how to sample lots for continuous production and reliability.

Required Reading and Textbook(s)

Introduction to Statistical Quality Control, Enhanced eText, Douglas C. Montgomery, 2019. 8TH Edition, ISBN# 978-1-119-39930-8

Supplemental: Chapter 12 of UNDERSTANDING STATISTICAL PROCESS CONTROL, Donald J Wheeler, SPC Press, 2010. 3RD Edition, ISBN# 9780945320692

COURSE REQUIREMENTS

The course will involve homework, exams, canvas discussions, and a project.

Periodic **homework** (10 weighted pts in total) will be assigned throughout the semester. (SLO 1-5).

One large-scale **project** will be conducted during the semester (10 weighted pts)

Project Using a web-based simulator each student will be given distance coordinates to try and land a projectile within the LCL and UCL. Recording the data, each student will plot their results with up to 4 variables.

Project Student Learning Outcomes

1. Demonstrate how to graph results on a probability plot given LCL, UCL and variables defined.
2. Define and explain the degrees of freedom for the experiment.

3. Define the Kutzbach equation for the trebuchet.
4. Describe what the data function the results look like.
5. Describe the relationship between DoE and probability.

Two **midterm exams** (20 weighted pts each) and a **comprehensive** final exam (30 weighted pts) will be given during the semester. (SLO 1-5).

Online Discussion will be encouraged (10 weighted pts) throughout the semester. (SLO 1-3, 5).

Grading Criteria Rubric and Conversion

Activity	% of Final Grade
Midterm Exams (2 @ 20%)	40
Homework	10
Online Discussion	10
Trebuchet Project	10
Final Exam	30

Course Grades will be assigned by the following scale based on weighted grade percentage

Grade	Weighted Grade (%)
A	>= 90.00
B	80.00 - 89.99
C	70.00 - 79.99
D	60.00 - 69.99
F	< 60.00

Posting of Grades

All turned in work will be graded within 2 weeks and results posted on Canvas.

Grading Policies

Webex Participation

Students are encouraged to participate during Webex sessions. Participation includes leaving videos feed on and unmuting mics often to ask or respond to questions.

Late Work

Late work will not be accepted. You must plan your time well to turn things in on time. If there are extenuating circumstances, an individual extension may be granted after speaking with the instructor. Emergencies will be accommodated.

Missed exams

If you cannot make an exam session, you **must** schedule an alternative time beforehand. Missed exams should be taken before the scheduled time but must be taken within a week of

the actual exam.

Appeals

If the student wishes to appeal a grade, they must do so within 1 week of receiving the graded paper. Students should save all their work to ensure that no clerical errors are made in grade reporting.

COURSE OUTLINE AND CALENDAR

Complete Course Calendar (tentative)

Week	Dates	Chapters	Homework	Topics
1	Jan 18, 20	1	Ch1	Introduction to Quality - Six Sigma
2	Jan 25, 27	2	Ch2	DMAIC Process
3	Feb 1, 3	3	Ch3	Discrete vs. Cont. Distributions
4	Feb 8, 10	3	Ch3	Probability Plots
5	Feb 15			Exam 1
5/6	Feb 17,22,24	4	Ch4	Sampling Data Distributions
7	Mar 1, 3	5, 12	Ch5	Statistical Process Control (SPC)
8	Mar 8, 10	6	Ch6	Control Charts for Variables
9	Mar 15, 17			*Spring Break*
10	Mar 22,24	7	Ch7	Control Charts for Attributes
11	Mar 29			Exam 2
11	Mar 31			Trebuchet Project
12	Apr 5, 7	8	Ch8	Process Capability Analysis (C_p , C_{pk})
13	Apr 12, 14	15	Ch15	Lot-by-Lot Acceptance Sampling
14/15	Apr 19,21,26	16	Ch16	Acceptance Sampling Techniques
15/16	Apr 28, May 3, 5	Supp. Ch.12 - Wheeler	TBD	Pareto, Flow Charts, C&E Diag. Industry Practices (APC, PDCA, etc.)
17	May 10			Final Exam/ Trebuchet project PPT due

Important University Dates

See the Academic Calendar: <https://www.tamuct.edu/registrar/academic-calendar.html>

TECHNOLOGY REQUIREMENTS AND SUPPORT

Computer access will be needed to attend lectures and complete homework and projects.

Technology Requirements

This course will use the A&M-Central Texas Instructure Canvas learning management system. We strongly recommend the latest versions of Chrome or Firefox browsers. Canvas no longer

supports any version of Internet Explorer.

Logon to A&M-Central Texas Canvas [<https://tamuct.instructure.com/>] or access Canvas through the TAMUCT Online link in MyCT [<https://tamuct.onecampus.com/>]. You will log in through our Microsoft portal.

Username: Your MyCT email address. Password: Your MyCT password

Canvas Support

Use the Canvas Help link, located at the bottom of the left-hand menu, for issues with Canvas. You can select “Chat with Canvas Support,” submit a support request through “Report a Problem,” or call the Canvas support line: 1-844-757-0953.

For issues related to course content and requirements, contact your instructor.

Online Proctored Testing

A&M-Central Texas uses Proctorio for online identity verification and proctored testing. This service is provided at no direct cost to students. If the course requires identity verification or proctored testing, the technology requirements are: Any computer meeting the minimum computing requirements, plus web camera, speaker, and microphone (or headset). Proctorio also requires the Chrome web browser with their custom plug in.

Other Technology Support

For log-in problems, students should contact Help Desk Central

24 hours a day, 7 days a week

Email: helpdesk@tamu.edu

Phone: (254) 519-5466

[Web Chat](http://hdc.tamu.edu): [<http://hdc.tamu.edu>]

Please let the support technician know you are an A&M-Central Texas student.

UNIVERSITY RESOURCES, PROCEDURES, AND GUIDELINES

Drop Policy

If you discover that you need to drop this class, you must complete the [Drop Request](#) Dynamic Form through Warrior Web.

[<https://dynamicforms.ngwebsolutions.com/casAuthentication.ashx?InstID=eaed95b9-f2be-45f3-a37d-46928168bc10&targetUrl=https%3A%2F%2Fdynamicforms.ngwebsolutions.com%2Fsubmit%2FForm%2Fstart%2F53b8369e-0502-4f36-be43-f02a4202f612>].

Faculty cannot drop students; this is always the responsibility of the student. The Registrar’s Office will provide a deadline on the Academic Calendar for which the form must be completed. Once you submit the completed form to the Registrar’s Office, you must go into Warrior Web

and confirm that you are no longer enrolled. If you still show as enrolled, FOLLOW-UP with the Registrar's Office immediately. You are to attend class until the procedure is complete to avoid penalty for absence. Should you miss the drop deadline or fail to follow the procedure, you will receive an F in the course, which may affect your financial aid and/or VA educational benefits.

Academic Integrity

Texas A&M University -Central Texas values the integrity of the academic enterprise and strives for the highest standards of academic conduct. A&M-Central Texas expects its students, faculty, and staff to support the adherence to high standards of personal and scholarly conduct to preserve the honor and integrity of the creative community. Academic integrity is defined as a commitment to honesty, trust, fairness, respect, and responsibility. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing grade for the course. Academic misconduct is any act that improperly affects a true and honest evaluation of a student's academic performance and includes, but is not limited to, working with others in an unauthorized manner, cheating on an examination or other academic work, plagiarism, and improper citation of sources, using another student's work, collusion, and the abuse of resource materials. All academic misconduct concerns will be referred to the university's Office of Student Conduct. Ignorance of the university's standards and expectations is never an excuse to act with a lack of integrity. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action.

For more [information regarding the Student Conduct process](https://www.tamuct.edu/student-affairs/student-conduct.html),
[https://www.tamuct.edu/student-affairs/student-conduct.html].

If you know of potential honor violations by other students, you may [submit a report](https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=0),
[https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=0].

Academic Accommodations

At Texas A&M University-Central Texas, we value an inclusive learning environment where every student has an equal chance to succeed and has the right to a barrier-free education. The Office of Access and Inclusion is responsible for ensuring that students with a disability receive equal access to the university's programs, services and activities. If you believe you have a disability requiring reasonable accommodations, please contact the Office of Access and Inclusion, WH-212; or call (254) 501-5836. Any information you provide is private and confidential and will be treated as such.

For more information, please visit our [Access & Inclusion](https://tamuct.instructure.com/courses/717) Canvas page (log-in required)
[https://tamuct.instructure.com/courses/717]

Important information for Pregnant and/or Parenting Students

Texas A&M University-Central Texas supports students who are pregnant and/or parenting. In

accordance with requirements of Title IX and related guidance from US Department of Education's Office of Civil Rights, the Dean of Student Affairs' Office can assist students who are pregnant and/or parenting in seeking accommodations related to pregnancy and/or parenting. Students should seek out assistance as early in the pregnancy as possible. For more information, please visit [Student Affairs](https://www.tamuct.edu/student-affairs/index.html) [https://www.tamuct.edu/student-affairs/index.html]. Students may also contact the institution's Title IX Coordinator. If you would like to read more about these [requirements and guidelines](http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf) online, please visit the website [http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf].

Title IX of the Education Amendments Act of 1972 prohibits discrimination on the basis of sex and gender—including pregnancy, parenting, and all related conditions. A&M-Central Texas is able to provide flexible and individualized reasonable accommodation to pregnant and parenting students. All pregnant and parenting students should contact the Associate Dean in the Division of Student Affairs at (254) 501-5909 to seek out assistance. Students may also contact the University's Title IX Coordinator.

Tutoring

Tutoring is available to all A&M-Central Texas students, on a remote online basis. Visit the Academic Support Community in Canvas to view schedules and contact information. Subjects tutored on campus include Accounting, Advanced Math, Biology, Finance, Statistics, Mathematics, and Study Skills. Student success coaching is available online upon request.

If you have a question regarding tutor schedules, need to schedule a tutoring session, are interested in becoming a tutor, success coaching, or have any other question, contact Academic Support Programs at (254) 501-5836, visit the Office of Student Success at 212F Warrior Hall, or by emailing studentsuccess@tamuct.edu .

Chat live with a tutor 24/7 for almost any subject from on your computer! Tutor.com is an online tutoring platform that enables A&M-Central Texas students to log in and receive online tutoring support at no additional cost. This tool provides tutoring in over 40 subject areas except writing support. Access Tutor.com through Canvas.

University Writing Center

The University Writing Center (UWC) at Texas A&M University–Central Texas (TAMUCT) is a free service open to all TAMUCT students. For the Spring 2021 semester, all services will be online as a result of the COVID-19 pandemic. The hours of operation are from 10:00 a.m.-5:00 p.m. Monday thru Thursday with satellite hours Monday thru Thursday from 6:00-9:00 p.m. The UWC is also offering hours from 12:00-3:00 p.m. on Saturdays.

Tutors are prepared to help writers of all levels and abilities at any stage of the writing process. By providing a practice audience for students' ideas and writing, our tutors highlight the ways in which they read and interpret students' texts, offering guidance and support throughout the various stages of the writing process. While tutors will not write, edit, or grade papers, they will

assist students in developing more effective composing practices. Whether you need help brainstorming ideas, organizing an essay, proofreading, understanding proper citation practices, or just want a quiet place to work, the UWC is here to help!

Students may arrange a one-to-one session with a trained and experienced writing tutor by making an appointment via [WCOonline](https://tamuct.mywconline.com/) [https://tamuct.mywconline.com/]. In addition, you can email Dr. Bruce Bowles Jr. at bruce.bowles@tamuct.edu if you have any questions about the UWC and/or need any assistance with scheduling.

University Library

The University Library provides many services in support of research across campus and at a distance. We offer over 200 electronic databases containing approximately 250,000 eBooks and 82,000 journals, in addition to the 85,000 items in our print collection, which can be mailed to students who live more than 50 miles from campus. Research guides for each subject taught at A&M-Central Texas are available through our website to help students navigate these resources. On campus, the library offers technology including cameras, laptops, microphones, webcams, and digital sound recorders.

Research assistance from a librarian is also available 24 hours a day through our online chat service, and at the reference desk when the library is open. Research sessions can be scheduled for more comprehensive assistance and may take place on Skype or in-person at the library. Assistance may cover many topics, including how to find articles in peer-reviewed journals, how to cite resources, and how to piece together research for written assignments.

Our 27,000-square-foot facility on the A&M-Central Texas main campus includes student lounges, private study rooms, group workspaces, computer labs, family areas suitable for all ages, and many other features. Services such as interlibrary loan, TexShare, binding, and laminating are available. The library frequently offers workshops, tours, readings, and other events. For more information, please visit our [Library website](http://tamuct.libguides.com/index) [http://tamuct.libguides.com/index].

For Spring 2021, all reference service will be conducted virtually. Please go to our [Library website](http://tamuct.libguides.com/index) [http://tamuct.libguides.com/index] to access our virtual reference help and our current hours.

OPTIONAL POLICY STATEMENTS

A Note about Sexual Violence at A&M-Central Texas

Sexual violence is a serious safety, social justice, and public health issue. The university offers support for anyone struggling with these issues. University faculty are mandated reporters, so if someone discloses that they were sexually assaulted (or a victim of Domestic/Dating Violence or Stalking) while a student at TAMUCT, faculty members are required to inform the Title IX Office. If you want to discuss any of these issues confidentially, you can do so through Student Counseling (254-501-5955) located on the second floor of Warrior Hall (207L).

Sexual violence can occur on our campus because predators often feel emboldened, and victims often feel silenced or shamed. It is incumbent on ALL of us to find ways to actively create environments that tell predators we don't agree with their behaviors and tell survivors we will support them. Your actions matter. Don't be a bystander; be an agent of change. For additional information on campus policy and resources visit the [Title IX webpage](https://www.tamuct.edu/compliance/titleix.html) [https://www.tamuct.edu/compliance/titleix.html].

Behavioral Intervention

Texas A&M University-Central Texas cares about the safety, health, and well-being of its students, faculty, staff, and community. If you are aware of individuals for whom you have a concern, please make a referral to the Behavioral Intervention Team. Referring your concern shows you care. You can complete the [referral](https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=2) online [https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=2].

Anonymous referrals are accepted. Please see the [Behavioral Intervention Team](https://www.tamuct.edu/student-affairs/bat.html) website for more information [https://www.tamuct.edu/student-affairs/bat.html]. If a person's behavior poses an imminent threat to you or another, contact 911 or A&M-Central Texas University Police at 254-501-5800.

OTHER POLICIES

Copyright Notice

Students should assume that all course material is copyrighted by the respective author(s). Reproduction of course material is prohibited without consent by the author and/or course instructor. Violation of copyright is against the law and Texas A&M University-Central Texas' Code of Academic Honesty. All alleged violations will be reported to the Office of Student Conduct.

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Trebuchet Project: Grading Rubric				
Category	Outstanding	Acceptable	Needs Improvement	Score
Introduction (10 pt)	Clear, concise introduction.	Clear and mostly complete.	Vague, incomplete, or missing support statements.	
Summary (20 pt)	Clearly describes thesis, argument, and conclusions of text. Shows good understanding of relevant main points and avoids extraneous detail.	Describes some elements of thesis and argument, but misses or misunderstands some parts of the text	Misses or misunderstands major parts of text. Lacks basic understanding of the issues.	
Organization and Mechanics (30 pt)	Report is well organized and clearly written. The underlying logic is clearly articulated and easy to follow. Words are chosen that precisely express the intended meaning and support reader comprehension. Diagrams or analyses enhance and clarify presentation of ideas. Sentences are grammatical and free from spelling errors.	Report is organized and clearly written for the most part. In some areas the logic or flow of ideas is difficult to follow. Words are well chosen with some minor exceptions. Diagrams are consistent with the text. Sentences are mostly grammatical and only a few spelling errors are present, but they do not hinder the reader.	Report lacks an overall organization. Reader must make considerable effort to understand the underlying logic and flow of ideas. Diagrams are absent or inconsistent with the text. Grammatical and spelling errors make it difficult for the reader to interpret the text in places.	
Presentation (40 pt)	Slides are error-free and logically present the main components of the process and recommendations. Material is readable and the graphics highlight and support the main ideas. Data is correct and well defined.	Slides are error-free and logically present the main components of the process and recommendations. Material is mostly readable, and graphics reiterate the main ideas. Data is mostly correct. Some mistakes	Slides contain errors and lack a logical progression. Major aspects of the analysis or recommendations are absent. Diagrams or graphics are absent or confuse the audience. Mistakes throughout.	