I. Course Description:
An understanding and application of the basic concepts of modern manufacturing process management systems, with regards to quality, just-in-time, lean manufacturing and six sigma. This three graduate hour course will present techniques for the planning, measuring, and implementation of Six Sigma Quality efforts. Key elements for company-wide strategic quality planning such as identifying customers and their needs, designing quality services, establishing optimal quality goals, statistical based improvement methods, and implementing six sigma tools to include DMAIC.

II. Textbook:

Additional hand-outs may be required (this will be provided by the instructor)

III. Course Objectives:
A. The student will be able to perform problem solving, using statistical tools and techniques.
B. The student will better understand the connection between quality assurance, manufacturing, and management practices.
C. The student will gain knowledge in the areas of Just-In-Time and Lean Manufacturing techniques.
D. The student will learn how to change those processes that contain unacceptable quality deficiencies through the use of Six Sigma quality improvement program methods.
E. The student will learn how to design experiments.

IV. Topics Covered in the Course:
1. Six Sigma Origins
2. Quality Masters
3. Leadership and Strategic Planning
4. Creating a Customer Focus
5. Teams
6. Project Management
7. Measures and Metrics
8. Problem Solving
9. Statistics
10. Variable Control Charts
11. Process Capability
12. Probability
13. Attribute Control Charts
14. Reliability
15. Failure Modes and Effects Analysis
16. Design of Experiments
17. Lean Enterprises

V. Course Competencies:

A. Computer-based skills – By use software the student will store and manipulate data and perform statistical based quality improvement studies through the presentation of SPC charts and graphs.

B. Communication skills – The student will conduct, write, and present a term research project related to a variety of subject areas found within six sigma quality methods.

C. Interpersonal skills – students will work in quality improvement teams to experience the use of graphical problem solving techniques.

D. Problems solving – Each student will interpret statistical charts to determine the status of industrial processes by gathering data and using statistical analyses. Through the use of six sigma improvement tools, students will solve problems and implement improvement processes by using the plan-do-check-evaluation cycle.

E. Ethical issues in decision making and resolution – This competency will not be addressed in TECH 5310.

F. Personal accountability for achievement – Each student will follow the designated suspense dates for course work as listed in the course syllabus.

G. Competence in basic technology principles –
   • by the study of the major “quality gurus”, the student will develop a foundation for the total quality management movement.
VI. Course Requirements:

A. Assignments
   A. six written topic summaries
   B. complete assigned Case Study work
   C. complete final exam/presentation
   D. complete quality improvement team project

B. Weighted grade distributions
   1. Topic summaries (x6) 60pts
   2. Project 100pts
   3. Exams (x2) 130pts
   4. Homework assignments (x11) 424pts

C. Suspense Dates:
   Class Start Date: M, Jan 13
   Topic Summary #1 Thur, Feb 6
   Topic Summary #2 Thur, Feb 20
   Topic Summary #3 Thur, Mar 6
   Topic Summary #4 Thur, Mar 27
   Topic Summary #5 Thur, Apr 10
   Topic Summary #6 Thur, May 1
   Homework Assignments as scheduled
   Study Day: May 5
   Final Exam Week May 5-10

Any make up course work or exams due to a student not submitting it is considered on a case by case basis. Which means the professor reserves the right to decline make up course work or exams.

VII. IDEA Statement

If you have a disability, including a learning disability, for which you request disability support services/accommodation(s), please contact Ida MacDonald in the Disability Support Services office so that the appropriate arrangements may be made. In accordance with the federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. In order to assure approved services the first week of class, diagnostic, prognostic, and prescriptive information should be received 30 days prior to the beginning of the semester services are requested. For more information, call or visit the student Services Center located in the University Center, Room 282. The telephone number is 903.566.7079 (TDD 565-5579). Additional information may also be obtained at the following UT Tyler Web address: http://www.utttyler.edu/disabilityservices.

VIII. Academic Honesty Statement
“Academic dishonesty, such as unauthorized collusion, plagiarism and cheating, as outlined in the Handbook of Operating Procedures, The University of Texas at Tyler, will not be tolerated”. University regulations require the instructor to report all suspect cases of academic dishonesty to the Dean of students for Disciplinary action. In the event disciplinary measures are imposed on the student, it becomes part of the student’s official school records. Also, please note that the handbook obligates you to report all observed cases of academic dishonesty to the instructor.

IX. Grade Replacement Statement

If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the Registrar by the 12th day of class. Failure to file an intent to use grade forgiveness will result in both the original and repeated grade used to calculate your overall grade point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) and two (graduate student) course repeats during this/her career at UT Tyler. (2006-08 Catalog, p. 35).

X. University Policies Regarding Academic Processes:

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://www2.uttyler.edu/wellness/rightsresponsibilities.php

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 Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.utttyler.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 both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to 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 is the deadline for many forms and enrollment actions that students need to be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, 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 a student who began college for the first time in Fall 2007 or thereafter 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 purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

**Disability Services**

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University offers accommodations to students with learning, physical and/or psychiatric disabilities. If you have a disability, including non-visible disabilities such as chronic diseases, learning disabilities, head injury, PTSD or ADHD, or you have a history of modifications or accommodations in a previous educational environment you are encouraged to contact the Student Accessibility and Resources office and schedule an interview with the Accessibility Case Manager/ADA Coordinator, Cynthia Lowery Staples. If you are unsure if the above criteria applies to you, but have questions or concerns please contact the SAR office. For more information or to set up an appointment please visit the SAR office located in the University Center, Room 3150 or call 903.566.7079. You may also send an email to cstaples@utttyler.edu

**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.

**Student Absence for University-Sponsored Events and Activities**

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

**Social Security and FERPA Statement:**

It is the policy of The University of Texas at Tyler to protect 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 violation of 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 require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

XI. References for TECH 5310: books


websites

www.asq.org
www.astm.org
www.business.com
www.qa-inc.com
www.itl.nist.org
www.quality.nist.org
www.isixsigma.com

XII. Topic Summaries:

Directions: Write article summaries from the following topics listed below (other topics may be approved per the professor’s discretion). These articles should be taken from recent periodicals, not handbooks or textbooks. Each summary shall be one (1) page in length. Each summary must come from a separate periodical of a different titled publication. The articles you choose to review must have relevance to principles of Six Sigma and reflect current trends in the quality movement. See example of topic summary on last page.
1. just-in-time production technology
2. quality circles, teams, and work groups
3. supplier quality and certification programs
4. process capability studies and applications
5. DMAIC
6. integrating quality control into manufacturing
7. KANBAN
8. statistical process control charts and applications
9. integrating quality control into the service industry
10. cost of poor quality
11. KAIZEN
12. quality function deployment
13. employee empowerment and quality management
14. attribute & variable data sampling systems
15. Five S’s (5 S’s)
16. Benchmarking processes
17. MRP or MRP II
18. Just-in-time (JIT)
19. Poka-yoke
20. Gemba
21. Project Charter
22. Six Sigma Black Belt
23. Six Sigma Green Belt

XIII. Project:

Project: To Be Announced later on in the semester.

Note: The instructor reserves the right to modify the syllabus. All modifications will be communicated to the students in a timely manner.
Additional Grading Schematic (Not applicable for this semester)

This rubric will be used in combination with the above mentioned grading scale to determine your final grade. It will be used throughout the course to evaluate your understanding of the material.

<table>
<thead>
<tr>
<th>TRAIT</th>
<th>Below expectations</th>
<th>Meets expectations</th>
<th>Exceeds expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem Framing</strong></td>
<td>Important issues are not identified or specified so poorly that identifying relevant information needs is difficult.</td>
<td>Most issues are identified. Issues are specified such that identifying relevant information is feasible.</td>
<td>All issues are identified. Specification is defined so well that identification of relevant information is evident.</td>
</tr>
<tr>
<td><strong>Data Organization</strong></td>
<td>Fails to organize relevant data or includes irrelevant date. Data may be in improper format.</td>
<td>Organizes sufficient relevant and properly-formatted data to resolve problem.</td>
<td>Organizes sufficient relevant and properly-formatted data to resolve problem and test its robustness.</td>
</tr>
<tr>
<td><strong>Problem Modeling</strong></td>
<td>Model contains numerous errors and does not reflect understanding of the problem.</td>
<td>Model contains some errors but reflects understanding of the problem.</td>
<td>Model contains no errors and reflects great understanding of the problem.</td>
</tr>
<tr>
<td><strong>Problem Resolution</strong></td>
<td>Student incorrectly identified output.</td>
<td></td>
<td>Student correctly identified output.</td>
</tr>
</tbody>
</table>

8
Vehicular Systems


The author believes active suspension will replace springs and shocks with a computer and high speed hydraulics. The primary benefit of the system is to isolate one suspension characteristic from another. Essentially, MacPherson struts are replaced with hydraulic struts which can react within $3/1000^{th}$ of a second, and can cycle up to 1500 times/minute. A computer responds to tiny changes in body and wheel movement by controlling double-acting struts. As well as sensing bumps, the system reads the forces acting on the car body preventing it from banking to the outside of a curve. The idea of active suspension is credited to Britain’s great interest in its application. American auto manufacturers have characterized the system as expensive, noisy, and consuming power, however, it may appear on some “expensive” U.S. automobiles.

*Reaction*

This article has good appeal for automobile enthusiasts who want to keep abreast of the latest automotive technology. The reporting of this innovative suspension system was very consistent and well documented through interviews. Several pictures of the system components were shown as well as a pictorial schematic of the complete suspension system. Upon reading this article, anyone would have a good working knowledge of the computer-controlled suspension.

*Note:* Margins are to be set at the following dimensions:

- Left = 1.25”
- Right = 1.00”
- Top = 1.00”
- Bottom = 1.00”