Course title and number  ISEN 350 Quality Engineering
Term (e.g., Fall 200X)  Fall 2016
Meeting times and location  TBD

Course Description and Prerequisites

Strategic approach to implementing quality, process and business improvement methods using data analysis tools; total quality management and six sigma approaches to define, measure, analyze, improve and control processes; principles of lean engineering; control charts; process capability analysis; basic metrology, applied statistics, lean principles and process capability.

Prerequisite: ISEN 310 and ISEN 230.

Learning Outcomes

At the end of this course, the student will be able to

- explain the importance of improving product quality through variance reduction, and six-sigma programs,
- illustrate the importance of reducing waste to improve product cycle time,
- apply statistical concepts, data analysis methods to help achieve high quality processes, and
- use lean-six sigma methods and tools to solve quality engineering problems.

Instructor Information

Name  TBD
Telephone number  TBD
Email address  TBD@tamu.edu
Office hours  TBD
Office location  TBD

Textbook and/or Resource Material
Grading Policies

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>23%</td>
<td>(100 points)</td>
</tr>
<tr>
<td>Test 2</td>
<td>23%</td>
<td>(100 points)</td>
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<tr>
<td>Final Examination (Comprehensive)</td>
<td>25%</td>
<td>(100 points)</td>
</tr>
<tr>
<td>Lab</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Homework</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Class Attendance, Participation &amp; Quizzes</td>
<td>8%</td>
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There will be 10 laboratory exercises and approximately 10 homework assignments. The total points (TP) which can be accumulated on labs, class quizzes and homework will be used to normalize total points earned (TPE) as follows:

\[ \text{Lab Grade} = \left( \frac{TPE}{TP} \right) \times 100 \]
\[ \text{Class Participation & Quizzes} = \left( \frac{TPE}{TP} \right) \times 100 \]
\[ \text{Homework Grade} = \left( \frac{TPE}{TP} \right) \times 100 \]

Course Grade = \(0.23(T1 + T2) + 0.25(\text{FE}) + 0.15(\text{Lab}) + 0.08(\text{Class Participation & Quizzes}) + 0.06 \text{Hwk}\)

Course grade will be assigned as follows:

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>100 &gt; AG &gt;= 90</td>
<td>A</td>
</tr>
<tr>
<td>90 &gt; AG &gt;= 80</td>
<td>B</td>
</tr>
<tr>
<td>80 &gt; AG &gt;= 70</td>
<td>C</td>
</tr>
<tr>
<td>70 &gt; AG &gt;= 60</td>
<td>D</td>
</tr>
<tr>
<td>60 &gt; AG &gt;= 0</td>
<td>F</td>
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</tbody>
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Attendance and Make-up Policies

No make-up labs, tests or in-class quizzes except for university allowed excuses. The university rule regarding excused absences can be found at http://student-rules.tamu.edu/rule07.

Please be punctual and display an attitude of professionalism and become actively engaged in class activities and discussions. Put away your cell phone and do not use computers during the lecture. Disruptive or unprofessional behavior will not be tolerated and the student will be asked to leave the classroom. There will be a short quiz most lecture days.
Homework

There will be homework problems assigned from the text or handed-out most lab periods. They may be done with others or in a cooperative setting, but each student must work through the problem themselves regardless of how much help they have received. The assignments will be collected and at least one problem graded. All problems assigned for the week are due in next week’s lab.

Lab Report

Class, lab attendance and participation will be noted and will influence your grade in borderline cases. Lab attendance and participation in labs is mandatory.

Students will be allowed one week after each lab exercise is returned to the student to discuss assigned grades. After one week, there will be no discussion.

It is likely that due to the lack of proper computer resources in the lab, teams of 2-3 may be necessary to work together on each lab exercise. Teams will be assigned at the beginning of each Lab by the lab instructor. If teams are formed, it is expected that all members of the team will equally share in the problem solving exercise. No copying between teams is allowed, each team must do its own work. Each team will only turn in one report. Lab report is due in a week. Late reports will be docked by 25% per calendar day it is late except for university excused absences. If plagiarism is detected, BOTH teams will be given a zero on that lab exercise with no debate or recourse. Those who miss a lab will NOT be allowed to be on any team.

Re-grading Policy

If you would like to have your homework/exam/report re-graded, you have to do so within one week from the time grades are assigned.

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
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<tbody>
<tr>
<td>1</td>
<td>Defining Quality and Quality Improvement, History of Quality; No labs in week 1</td>
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<tr>
<td>2</td>
<td>Statistical Methods of Quality; Lab 1: How to use MINITAB?</td>
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<tr>
<td>3</td>
<td>Statistical Methods of Quality; Lab 2: Penny experiment for discrete distributions</td>
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<tr>
<td>4</td>
<td>Management Aspects of Quality, Leaders in the Quality Movement; Lab 3: Test Central Limit Theorem experimentally</td>
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<tr>
<td>5</td>
<td>Zero defects, Value Engineering, TQM; Lab 4: pencil-and-board experiment</td>
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</table>
Origins of Six Sigma, Evolution of Six Sigma;
Lab 5: Keyboard experiment comparing two means

Six Sigma Belts, Variance Reduction;
Exam 1; no lab meeting

Six Sigma Deployment and Impact, DMAIC;
Lab 6: Probability review

Waste Reduction, Lean Engineering Principles;
Lab 7: Run length experiment in MINITAB

Lean-Six Sigma, Statistical Concepts used in Quality Engineering;
Lab 8: Paper helicopter production experiment – Part 1

Seven Process Improvement Tools;
Lab 9: Paper helicopter production experiment – Part 2

Control Chart Concepts; Variable Charts: X-Bar;
Lab 10: Bead inspection experiment

S and R charts; Process Capability Analysis;
Exam 2; no lab meeting

Attribute Charts: p, np, u, c charts; no lab meeting

Final exam during the finals week

Other Pertinent Course Information

N/A

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu
Academic Integrity

For additional information please visit: http://aggiehonor.tamu.edu

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: http://student-rules.tamu.edu/; http://student-rules.tamu.edu/aggiecode; and http://student-rules.tamu.edu/rule20. The complete information of university regulations regarding the handling of academic misconducts (including the appeal process) can be found at http://aggiehonor.tamu.edu/.

I, <insert instructor name>, as the rest of the Industrial & Systems Engineering Faculty, uphold the Aggie Honor Code as an axiom of our academic excellence. We consider its sincere observance to be essential for membership in our department and Texas A&M. We extend you the trust conferred to those who faithfully adhere to our honor code. Abuse of this trust is intolerable, thus I will report and assign an extreme penalty to those who do not stand with us in preserving the integrity symbolized by the Aggie Honor Code, “An Aggie does not lie, cheat, or steal or tolerate those who do.”

In this course the penalty for any violation of the Aggie Honor Code, as minimal as it may be, is F*.