Course Syllabus
SSIE 561 Quality Assurance for Engineer

1. Course Contact
Class Meetings: MW 04:40 - 06:05 PM, Lecture Hall 012
Instructor: Dr. Changqing Cheng
E-mail: ccheng@binghamton.edu
Office: EB T14
Office hours: M 2:00 - 3:00 PM, or by appointment
TA: Hitul Shah hshah14@binghamton.edu

2. Required Textbook
Title: Statistical Quality Control
Author: Douglas C. Montgomery

3. Course Information

Apply quantitative statistical methods for process analysis, control, and improvement.

Course Description: This course will focus heavily on data analytics aspects of quality management, i.e., analysis, control, and improvement of processes. This course involves mathematical statistics, inferential statistics, and calculus. This is a graduate level course in applied statistical quality control, which means we will learn how to rigorously apply well-known statistical methods for process control and improvement.

Course Objectives: The objective of this course is to learn how to apply the fundamental concepts of probability models and statistical methods to real-world quality control-related problems. Students will acquire a deep understanding of randomness and uncertainty.

Treatment: This is a technical course. Lectures will be quantitative and involve hands-on problem solving. Students are expected to go through the class slides and reading material beforehand. It is highly recommended that students take notes and participate actively in solving problems with the professor during class. Students are NOT allowed to distribute the lecture notes outside the class (e.g., post on the internet). The instructor owns the copyright.

Prerequisite: BS in engineering (any field) and probability and statistics coursework (SSIE 505 Applied Probability and Statistics), or consent of department chair. This course draws heavily from SSIE 505 Applied Probability and Statistics.

Additional Reference Textbook
Besterfield, D.H., Quality Control, Prentice-Hall.

Major Course Topics
Quality “Gurus” – with special focus on Joseph Juran and his “Quality Trilogy”
Cost of Quality
Quality Techniques
Control charting for variable data and attribute data
Short-run and other special SPC techniques for variable and attribute data
Process capability and process capability indices
Taguchi’s quadratic loss function
Metrology (Gauge R&R)
Acceptance Sampling (Methods and Standardized Plans)
Reliability overview and ties to quality
Failure modes and effects analysis (FMEA)

Quality Assurance

4. Classwork, Homework, Quizzes, and Exams

Classwork (CW): The class will require students to complete the reading beforehand. Lectures will involve explanation of key concepts followed by some worked examples and classwork problems.

Homework (HW): Homework will be assigned regularly. HW is due in the first three seconds of class. Some discussion/solicitation of help on HWs is permitted. Discussion does not mean outright collaboration.

Quizzes: You will expect quizzes regularly. It is based on the HW and CW assignment. It also serves as the attendance check, and no makeup.

Exams: There are 2 exams, 1 midterm and 1 final. Depending on the students’ performance in the course and with the permission from the instructor, project can be taken in lieu of final exam. Under the supervision of the instructor, selected students have the options to apply the knowledge from the coursework on research projects to solve the challenging real-world problems. Makeup exams will not be given unless there is appropriate evidence of extreme circumstances. No exceptions.

5. Grading

Regrade: Any problem with the grading must be reported to the instructor or TA within one week of the graded assignment/exam have been passed back to the class. Failure to do so will invalidate a regrade request. Students are required to pick up their own assignments.

Course Performance Assessment: Performance on the course will be assessed based on HWs, Quizzes, midterm, and final/project. These are explicitly stated herewith.

<table>
<thead>
<tr>
<th>Grade Weightage</th>
<th>Date Assessed</th>
<th>Weight of Final Grade</th>
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<tbody>
<tr>
<td>Average of all Quizzes</td>
<td>Continuous</td>
<td>40%</td>
</tr>
<tr>
<td>Average of all HWs</td>
<td>Continuous</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm Exam Points</td>
<td>03/15/2017 (Wednesday)</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam Points</td>
<td>Final (check calendar)</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100%</td>
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Final course points (max 100)  
= \text{Avg. of Quiz Percentage} \times 40\% + \text{Avg. of HW Percentage} \times 20\%  
+ \text{Avg. of Midterm Percentage} \times 20\% + \text{Avg. of Final/Project Percentage} \times 20\%  

Grading Rubric: A curve should not be assumed. The following rubric will be strictly used for grading. Please do not contact the TA or instructor for grade calculations.

<table>
<thead>
<tr>
<th>Final Points</th>
<th>Grade</th>
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<tbody>
<tr>
<td>\geq 90.0</td>
<td>A</td>
</tr>
<tr>
<td>85.0 \leq \text{Final Points} &lt; 90.0</td>
<td>A-</td>
</tr>
<tr>
<td>80.0 \leq \text{Final Points} &lt; 85.0</td>
<td>B+</td>
</tr>
<tr>
<td>75.0 \leq \text{Final Points} &lt; 80.0</td>
<td>B</td>
</tr>
<tr>
<td>70.0 \leq \text{Final Points} &lt; 75.0</td>
<td>B-</td>
</tr>
<tr>
<td>65.0 \leq \text{Final Points} &lt; 70.0</td>
<td>C+</td>
</tr>
<tr>
<td>60.0 \leq \text{Final Points} &lt; 65.0</td>
<td>C</td>
</tr>
<tr>
<td>55.0 \leq \text{Final Points} &lt; 60.0</td>
<td>C-</td>
</tr>
<tr>
<td>&lt; 55.0</td>
<td>F</td>
</tr>
</tbody>
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Grade Discussions: Grades are confidential. Per Family Education Rights and Privacy Act, 1974 (FERPA) confidentiality rules, the instructor/TA cannot and will not discuss grades of a student with other students or family members (of the student). To avoid any violation of this federal law, the instructor will discuss grades, test points, student concerns only in the full privacy of his office, and NOT in the class. Students are strongly urged not to discuss their grades.

6. Teaching Enrichment Activity
Community Engagement Project: Under the supervision of the instructor, selected students have the options to apply the knowledge from the coursework on research projects to solve the challenging real-world problems.

Guest speakers: One or two guest speakers (depending on the budget) will be invited to class to talk about quality control research in practice.

7. Academic Honesty and Integrity
Academic integrity is of considerable importance as you continue in college and in your professional life. I expect and demand honesty. Ethical behavior is expected at all times. The expression of this responsibility in this class includes, but is not limited to, handing in your own work, not plagiarizing work of others, and working responsibly with your teammates. Anyone caught not acting ethically will receive a grade of ‘F’ for the entire semester.

Plagiarism is a serious offence, and will be treated as such. The instructor has a zero tolerance policy for cases of academic dishonesty. Academic dishonesty will be pursued to the fullest extent. Please read the university student code of conduct carefully.

- Any academic dishonesty will be documented and pursued.
- A ZERO will be given on that portion of the course. For instance, if an instance of cheating is identified on a quiz, a grade of zero will be assigned for ALL six quizzes. If cheating occurs on ANY exam, zero points will be assigned for BOTH exams. If cheating is detected on ANY homework, zero points will be allotted for ALL homeworks.
8. Professional Conduct

- All students are expected to practice and display a high level of personal and professional integrity. Any minor unprofessional behavior to instructor, teaching assistants, or course assistants will result in a 10% reduction of your final score per occurrence.
- Any major unprofessional behavior to instructor, teaching assistants, or course assistants will result in a failing grade ‘F’ and a hearing before the Watson School Academic Integrity Committee and could result in dismissal from the University. Each student is responsible for obtaining the information presented in lectures.
- Silence all electronic devices (phones, Palms, Pocket-PC’s, iPods, pagers, etc.) during classes. Use of earphones is not allowed during classes. Disturbance of class by electronic devices will result in a 5% reduction of your final score per occurrence.
- All laptops should be closed during lecture unless instructed otherwise. No smart phones allowed in class, and in quizzes and exams.


9. Disability Services

If you have a disability and may require some type of instructional and/or examination accommodation, please inform me early in the semester so that we can coordinate the accommodations you may need. If you have not already done so, please contact the Student Disability Services office. The office is located at University Union, Room 119 and the telephone number is (607) 777-2686. The website is at: [http://www.binghamton.edu/ssd/](http://www.binghamton.edu/ssd/)

The instructor reserves the right to modify the syllabus.