COURSE SYLLABUS
MFG 210-01
QUALITY CONTROLS & STATISTICAL MEASUREMENT
Fall 2016

Faculty: Mrs. Sheila Kintz
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Telephone: 302-236-9598 (C)
E-mail: skintz@worwic.edu or reliance95@comcast.net
Office Hours: Call or email instructor to set up an appointment
Class Time: Lecture: Online – Accessible through Blackboard
Lab: Tuesday – 5:00 – 7:00 p.m. MTC 304

COURSE DESCRIPTION:

This course covers the concepts of quality control and quality improvement for both manufacturing and service businesses. These concepts are demonstrated within the framework of quality systems and methodologies such as ISO 9000 quality standards, Six Sigma, Lean Manufacturing and the Baldridge National Quality Award. Included are both statistical and non-statistical techniques used for quality improvement such as process definition, process flow diagrams, data collection techniques, measurement techniques, causes of process variation, Pareto diagrams, histograms, cause and effect diagrams, control charts and process capability analysis. Techniques to effectively work in teams are also addressed. This course is usually offered in the fall.


Software: Excel will be used by the instructor and the students for data acquisition and to prepare data for further analysis. Students do not purchase any software for this course.

Blackboard is being used as a supplementary site in this course. To use course content in Blackboard you need to have access to a computer with an Internet connection, (other requirements may apply). Computers that meet these requirements are available for your use on campus (see information under Computer: section).

Please follow these directions to access course syllabi and any other materials posted for this course:

Login Information
1. From Wor-Wic home page, point to "Quick Links" (top-right) and click the “Blackboard Login” link.
2. Enter your Wor-Wic user ID and password (same as your Wor-Wic email user ID and password).

Example: if your Wor-Wic email is jdoe0001@live.worwic.edu, your Blackboard user name will be jdoe0001 and your password is the same password you use to access your Wor-Wic email.

Don't know your user ID or password? Contact Student Services.

Once logged in, you can pick the course you want to work in and start navigating through the course.

All students logging into Blackboard affirm that they understand and agree to follow Wor-Wic Community College policies regarding academic integrity and the use of College resources as described in the college catalog.

Computer: A Pentium-based processor with a printer. Computer must have Microsoft Office Word, Microsoft PowerPoint, Microsoft Excel, Internet access through an Internet Service Provider (ISP), and Microsoft Internet Explorer or Firefox to access Blackboard and the information within Blackboard. Also students can download a free Word, Excel or PowerPoint viewers and will be able to access (read only) files without having to purchase the software. Please visit the Downloads and Plug-Ins page at

http://www.worwic.edu/Academics/DistanceEducation/DownloadsAndPlugins.aspx

In addition, computers that meet these requirements are available in MTC 200, AAB 217, HH 100, GH 204, ADH 108, and WDC 305.

If students do not have a computer with these requirements available at home, they will need to gain access to them through the college or other means.

REQUIRED ORIENTATION

Blackboard Student Tutorial:

If you have not previously used Blackboard, you will be required to complete the Blackboard orientation online. You can either log into Blackboard, access the Blackboard Student Tutorial, or access the Blackboard Student Tutorial website directly at:

http://www.worwic.edu/Academics/DistanceEducation/StudentTutorial/
COURSE OBJECTIVES, ASSESSMENT GOALS AND ASSESSMENT STRATEGIES

1. Explain the role of quality in any organization
   - List and explain key elements of quality that make an organization effective
   - Explain the role of quality compared to benefits in an effective organization
Assessment Strategy: Exam questions, quizzes and homework. *

2. Discuss Quality Systems
   - Discuss and analyze industry standard quality systems on which effective organizations can build a quality management foundation.
   - Discuss and analyze criteria on which effective organizations can build a quality management foundation and discuss each in the framework of three quality management systems.
Assessment Strategy: Exam questions, quizzes and homework. *

3. Collect data and use various data collection methods.
   - Use flowcharts in class to collect data
   - Use control charts to collect data
Assessment Strategy: Exam questions, quizzes and homework. *

4. Use the concepts and techniques of mechanical, electrical, and physical measurements; measurement system calibration; and measurement uncertainty.
   - Demonstrate and explain calibration techniques customary to modern production
   - Analyze acceptable methods to control measurement uncertainty
Assessment Strategy: Exam questions, quizzes and homework. *

5. Contrast and compare the difference and consequences of normal and special-cause variation.
   - Explain and use variable control chart interpretation
   - In a class exercise, put variation together with time
Assessment Strategy: Exam questions, quizzes and homework. *

6. Apply basic descriptive statistics to processes, products, and services.
   - Use descriptive statistics to perform a class or lab experiment
   - Determine what to measure and what types of data to use to apply basic descriptive statistics to processes, products, and services
Assessment Strategy: Exam questions, quizzes and homework. *

7. Use sample methods and the limits of sampling.
   - Use random numbers in sampling class and lab exercises
   - Use surveys that include sample methods and the limits of sampling in solving class and lab exercises/problems
Assessment Strategy: Exam questions, quizzes and homework. *

8. Apply the Six Sigma Define-Measure-Analyze-Improve-Control methodology to solve quality problems.
   - Use Six Sigma methods to define, measure, analyze and improve confidence level in solving class/lab exercises
   - Use Six Sigma methods to define, measure and analyze margin of error in solving class/lab exercises
Assessment Strategy: Exam questions, quizzes and homework. *

*Note: Assessment Strategy There is a required Graded internet assignment

*Note: MFG 210 includes GEOs 1,2,3,4,7
Major Topics:
I. Quality Basics
   A. Definitions of Quality (Products and Services)
   B. Quality Roles and Responsibilities in Organizations
   C. Quality Systems
      a) ISO9000
      b) Baldrige National Quality Award
      c) Six Sigma – Define/Measure/Analyze/Improve/Control
      d) LEAN Enterprise
      e) Others
II. History of Quality
    A. Deming
    B. Juran
    C. Taguchi
    D. Crosby
    E. Others
III. Quality Organizations
    A. American
    B. International
    C. Internet search – exercise
IV. Solving Quality Problems – Getting Ready
    A. Types of Data
       a) Attribute Data
       b) Variable Data
    B. Concepts and Techniques of Measurement
       a) Mechanical
       b) Electrical
       c) Physical
       d) Calibration
       e) Measurement uncertainty – Gage R&R
    C. Use of Statistics
       a) Concept of Variation – Normal versus Abnormal
       b) Types of Statistical Distributions
       c) Mean, Mode, Median and Standard Deviation
       d) Populations versus Sampling
    D. Team Problem Solving Dynamics
       a) Selecting the Team
       b) Team Charter
       c) Code of Conduct
V. Solving Quality Problems – Getting Started
   A. Define
      a) Process Flow Diagrams
      b) Value Stream Mapping
   B. Measure
      a) Data Collection Planning
         i. Historical Data
         ii. Current Data
         iii. New Data
      b) Baseline Data Collection
i. Tally sheets
ii. Run Charts
C. Analyze
   a) Pareto Principal
   b) Histograms
   c) Concentration diagrams
   d) Scatter diagrams
   e) Variable Control Charts
   f) Attribute Control Charts
D. Improve
   a) Value Added versus Non-valued added steps
   b) Corrective and Preventative Action
   c) LEAN techniques
   d) Brainstorming
   e) Cause and Effect Diagram
   f) Benchmarking
   g) Process Capability – Variation versus Specification
E. Control
   a) Error Proofing
   b) Reversible and Irreversible Change
   c) Monitoring the Process
      i. Process Audits
      ii. Product Audits
      iii. Service Audits
      iv. Control charting
VI. Advanced Techniques
   A. Quality Function Deployment
   B. Failure Modes Effects Analysis
   C. Design of Experiments
VII. Quality Problem Solving Project

**COURSE REQUIREMENTS**

**Grading:**

Grading will be determined on the basis of tests, homework assignments, quizzes, Electronic Library project, and a comprehensive final exam. A lab grade will be entered each scheduled lab for participation and progress toward course objective. The course grade will be determined as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Discussion Topics</td>
<td>10%</td>
</tr>
<tr>
<td>Homework &amp; Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>2 Exams</td>
<td>15%</td>
</tr>
<tr>
<td>Lab</td>
<td>20%</td>
</tr>
<tr>
<td>Electronic Library Assignment</td>
<td>5%</td>
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<tr>
<td>Quality Project</td>
<td>15%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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</tbody>
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Conversion of numeric average to final (letter) grade:

- 90 – 100 = A
- 80 – 89 = B
- 70 – 79 = C
- 60 – 69 = D
- 0 – 59 = F

**TENTATIVE CLASS SCHEDULE** (Please see Blackboard for specific information concerning each week)

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapters</th>
<th>All assignments, quizzes, and labs for week due no later than:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>09/20/2016</td>
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<tr>
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<tr>
<td>12</td>
<td>12</td>
<td>12/06/2016</td>
</tr>
<tr>
<td>13</td>
<td>Review</td>
<td>12/13/2016</td>
</tr>
</tbody>
</table>

*Subject to change

**Attendance Policy**

Absence / Lateness is strongly discouraged. School is like a job. It is a commitment and absence or lateness will not be tolerated as it would not be tolerated in the workplace. If you miss or are late for classes, you miss important material and you will fall behind. This will affect other students in class if you are not prepared. It is YOUR RESPONSIBILITY to make up any missed class work.

**Please note that if you miss more than 3 class periods, whether face-to-face or online, you will not pass this course.**

**Electronic Lab Assignment**

An electronic library assignment will be due during the semester. The assignment will consist of directions that will require you to perform online research and answer questions concerning what you found. Please refer to the Electronic Library Assignment directions.
under Course Content in Blackboard for further requirements. **You must provide an electronic address; first page of each used must be turned in after presentation.**

**Discussion Topics**

Discussion questions for students will be posted each week throughout the semester in the discussion section of Blackboard. Students will answer discussion question (10 points) and respond to one other student’s posting (10 points). There will be a total of 13 discussion assignments worth 20 points each.

**Initial responses to a discussion question should be posted by 11:59 p.m. on the Saturday prior to weekly class time.** Late responses will not be graded. Responses to classmates’ postings can occur anytime up to the next weekly class start time. After that time, discussion topic will be closed, and you will no longer be allowed to post. Postings will be given points according to the quality of thought behind the posting. A response to a posting that only says that “I agree with you” or “that’s a good comment” will not receive any points.

**Late Assignment Policy**

All homework, laboratories, and reading assignments should be submitted on time. **Any LATE work must be made up within 7 days of the due date. If you do not do your homework, labs and reading in a timely manner, you will not be able to keep up with the class.** Class information will be provided on Blackboard. It is your responsibility to look at it.

**Quizzes and Exams**

If you miss a quiz or an Exam, you will receive ZERO (0) points for that quiz or exam. If you miss any quizzes or Exams, it will be at the discretion of the Instructor whether it can be taken, and if so, it must be made up within 7 days of the original exam date. **The Quizzes and Exams will be based on the text, lecture material, lab exercises, and handouts.**

**Course Evaluation**

“This course is participating in a college-wide pilot project to investigate converting the end-of-course evaluation from a paper to an online process. The College has selected SmartEvals as the vendor with whom to conduct the pilot. SmartEvals maintains the highest level of security with the evaluation information and the information resides only on SmartEvals’ computer servers. Faculty are unable to identify individual evaluations and any data which has the potential to reveal the identity of a student (i.e. the only male in a class) is blocked from viewing. Please disable your pop-up blockers on your internet browser in order to access the evaluation. Your cooperation in completing the online evaluation at the designated time is greatly appreciated. The results from the course evaluation provide valuable feedback to your instructor in order to make changes as needed with curriculum and teaching. Please direct any questions about the online course evaluation system to Hope Ellis at hellis@worwic.edu. **Please complete the course evaluation, print out the SmartEvals confirmation page, and turn in to me for credit.**
Credit will be 10 points to add to your final test score. See Blackboard calendar for dates towards the end of the semester to complete this evaluation.

ACADEMIC HONESTY POLICY

Students are required to maintain a high level of academic performance. Cheating and plagiarism are defined in Wor-Wic's Student Conduct Policy found in the College Catalog. Infractions of this policy will result in the assignment or test. (*Satisfies GEO Objective 8*)

SERVICES FOR STUDENTS WITH DISABILITIES

Wor-Wic provides reasonable accommodations for students with disabilities, in compliance with the Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973. If you are in need of accommodations, please contact the counseling office at (410) 334-2899. For more information, see Wor-Wic's Services for Students with Disabilities web page.

EMERGENCY INFORMATION STATEMENT

In the event of a flu epidemic or other emergency that results in the suspension of classes, faculty will be communicating with students about their courses and course requirements, such as assignments, quiz and exam dates, and class and grading policies, via faculty websites or Blackboard. Students will be responsible for completing all these assignments in accordance with class policies. Information about the resumption of classes will be communicated via the College's website and email system.