Spring 1-1-2020

MNET 420-102: Quality Systems

Edwin May

New Jersey Institute of Technology
Department of Engineering Technology
MNET 420 Quality Systems

COURSE NUMBER MNET 420

COURSE DESCRIPTION Quality Systems

COURSE STRUCTURE (2-2-3) (lecture hr/wk - lab hr/wk – course credits)

COURSE COORDINATOR/ INSTRUCTOR Dr. S. Lieber/ E. May

COURSE DESCRIPTION This course introduces students to the basic concepts, definitions, methodologies, calculations, and metrics that are used to manage for quality and performance excellence. The course highlights Quality Management Systems, Methodologies and Awards such as ISO 9000, Lean Thinking, Six Sigma Quality, the Malcolm Baldrige National Quality Award and the Deming Prize. Guest Speakers bring their real world experience to the classroom. Students are divided into project teams, which study important topics within the world of Quality, and present their findings to the rest of the class.

PREREQUISITE(S) MNET 315 Industrial Statistics or equivalent

COREQUISITE(S) None

REQUIRED MATERIALS

1. Evans and Lindsay, Managing for Quality and Performance Excellence, South-Western Cenage Learning, 10th Edition. ISBN 9781305662544
2. Statistical Calculator
3. MOODLE http://moodle.njit.edu

COMPUTER USAGE Excel, MiniTab

COURSE LEARNING OUTCOMES

By the end of the course students should be able to:

1. Describe the history and ongoing evolution of Quality and provide a myriad of definitions for Quality.
2. Employ basic Quality principles, practices and techniques and describe how Quality is applied to manufacturing operations, services, health care, education, small business, not-for profit organizations, the public sector.
3. Explain the contributions of Quality luminaries such as Deming, Juran, Crosby, Feigenbaum, Ishikawa and Taguchi to the field.
4. Differentiate between the MBNQA and other international Quality Award programs such as the Deming Prize, and the Quality Award programs in Europe, Canada, and Australia.
5. Explain the structure, factors leading to, implementation process, registration process, and benefits of ISO 9000.
6. Understand Strategic Focus for Performance Excellence, Focusing on Customers, High Performance Workforce Management, Process Management, Performance Measurement

and Information Management, Leading, Building and Sustaining Performance Excellence.
7. Use the seven Quality Control tools, the seven Management and Quality Tools, Customer Satisfaction Surveys, Lean tools, Kaizen, Poka Yoke, Balanced Scorecard, Quality Costs, Six Sigma tools, etc.
8. Use statistical thinking and applications such as descriptive statistics, statistical analysis, statistical inference, enumerative and analytic studies, Design of Experiments, ANOVA, Regression and Correlation.
9. Understand the statistical basis for Six Sigma, the DMAIC methodology, and how to manage a Six Sigma project.
10. Understand and use Design for Six Sigma including Quality Function Deployment, Design for X, Reliability Testing, Gage R & R studies, and calculations of capability.
11. Understand Statistical Process Control methodology and implementation.
12. Construct and interpret control charts for variable data (Average & Range, Average & Sigma, etc.) and for attribute data (p, np, c, u).
13. Research, as a team, a Quality topic and present findings via PowerPoint to the rest of the class.

CLASS TOPICS

Introduction to Quality, Total Quality in Organizations, Philosophies and Frameworks, Strategic Focus for Performance Excellence, Focusing on Customers. High Performance Workforce Management, Process Management, Performance Measurement and Information Management, Leading, Building and Sustaining Performance Excellence, Statistical Thinking and Applications, Six Sigma and Process Improvement, Design for Quality and Product Excellence, Statistical Process Control.

STUDENT OUTCOMES

The Course Learning Outcomes support the achievement of the following MET Student Outcomes and TAC of ABET Criterion 9 requirements:

Student Outcome a - an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
Related CLO – 1-13

Student Outcome b - an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
Related CLO – 7 thru 13

Student Outcome e - an ability to function effectively as a member or leader on a technical team;

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Related CLO – 13
Student Outcome f - an ability to identify, analyze, and soplve broadly-defined engineering technology problems;
Related CLO – 2, 13

Student Outcome g - an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature.
Related CLO – 13

Student Outcome j - a knowledge of the impact of engineering technology solutions in a societal and global context.
Related CLO – 1 thru 3

GRADING POLICY

Class Participation	10%
Homework	10%
Team Project	10%
Quizzes	10%
Tests (a total of 4 tests)	60%

ACADEMIC INTEGRITY

NJIT has a zero-tolerance policy regarding cheating of any kind. Student behavior that is disruptive to the learning environment will not be tolerated. Incidents will be reported to the Dean of Students. Honor Code violations may result in failure in the course, disciplinary probation, and/or expulsion from NJIT. Refer to http://www.njit.edu/academics/honorcode.php.

STUDENT BEHAVIOR

- Students expected to arrive on time & stay for the entire class.
- Electronic communication devices turned off.
- Laptop computers used during class, for academic purposes, are OK.
- Class time should be participative.
- You should try to be part of the discussion

MODIFICATION TO COURSE

The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be consulted if any changes occur. .

PREPARED BY
Ed May
COURSE COORDINATED BY
Dr. S. Lieber

CLASS HOURS

Thursday 5:45 PM to 9:50 PM GITC 1400

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OFFICE HOURS

Before Class After Class or By Appointment:
Cell Phone 201-274-6257 Email emay@njit.edu

GRADING LEGEND

GRADE	NUMERIC RANGE
A	90 to 100
B+	85 to 89
B	80 to 84
C+	75 to 79
C	70 to 74
D	60 to 69
F	0 to 59

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COURSE OUTLINE

Before semester starts: get Welcome Email from Instructor, Read Syllabus & Schedule, Buy Text, Read Ch 1 & 2. During the Semester a total of 5 speakers are planned: ISO, Lean, Six Sigma, Baldrige Award, Deming Prize

Week	Topics & Assignments
1 1/23	Course Handout - Class Session One PowerPoint - Discuss Teams – Teach Ch 1 - Introduction to Quality and Ch 2 - Foundations of Quality.
2 1/30	Quiz Zero due - Questionnaire due - Self Intros - Pick Teams – Ch 3 Customer Focus, Ch 4 Workplace Focus
3 2/6	Ch 5 Process Focus Ch 1 to 5 Homework & Quizzes due
4 2/13	**TEST #1** on Chapter 1 through 5; Extra Credit due Ch 6 Statistical Methods in Quality Management
5 2/20	Ch 7 Design for Quality & Product Excellence Review Chapter 6 & 7
6 2/27	Ch 6 & 7 Homework & Quizzes due **TEST #2** on Chapters 6 & 7; Extra Credit Due
7 3/5	Ch 8 Measuring & Controlling Quality Ch 9 Process Improvement & Six Sigma
8 3/12	Review Chapter 8 & 9 Ch 8 & 9 Homework & Quizzes due
SPRING BREAK 3/15-3/22	
9 3/26	**TEST #3** on Ch 8 & 9; Extra Credit due Ch 10 Baldrige Framework for Performance Excellence
10 4/2	Ch 11 Strategy & Performance Excellence Ch 12 Measurement & Knowledge Measurement
11 4/9	Ch 13 Leadership for Performance Excellence Ch 14 Building & Sustaining Quality & Performance Excellence
12 4/16	Work Shop on Team Presentations Ch 10 to 14 Homework & Quizzes Due
13 4/23	ISO 9001 and Lean Team Presentations Six Sigma and Baldrige Award Team Presentations
14 4/30	Deming Prize Team Presentation
TBD	**TEST #4 FINAL EXAM** on Chapters 10 thru 14 Team Reports - Team Self Evaluations - Extra Credit due