ETM 596 SPECIAL TOPICS IN ETM
TOTAL QUALITY ENGINEERING AND MANAGEMENT
Spring 2019

Instructor : **Ali R. Kaylan (**kaylan@boun.edu.tr)
Engineering Building, Room: M4032

Course Web Site: **moodle.ie.boun.edu.tr** **Enrollment Key: excellence**

Lecture Hours: Thursday 19:00-22:00

Course Description: Quality leadership is recognized as the key to business success. Strong customer focus on all products and services, teamwork throughout all areas of the organization is essential for company competitiveness. This course aims at covering the fundamental issues of total quality management and engineering. Cost aspects, quality improvement tools, process management, online and offline quality control, innovation management and learning organizations are discussed. Actual case studies from industry will supplement the lectures.

Emerging technologies are shifting business models from products and services more towards customer experience. Virtual and Augmented Reality, Artificial Intelligence powered chatbots introduce new modes of customer interaction. The proliferation of available customer data helps to anticipate needs and expectations of customers more effectively.

Prosumerism and *hyper-collaboration* are among the new trends. Creative and Systems Thinking, Innovation, Learning Organizations are becoming more critical for the company survival besides the process improvement methodologies such as Kaizen, Lean, Six Sigma. The course reconsiders quality management viewpoints taking into account digital perspective and disruptive technologies.

Prerequisites: None.

Textbook: James R. Evans, William M. Lindsay, The Management and Control of Quality, Thomson South-Western, 6th Edition, 2005.

References:

1. Besterfield, Dale H. , *Total Quality Management*, Prentice Hall, 3rd Edition, 2003

2. Rao, Carr, Dambolena, Kopp, Martin, Rafii, Schlesinger, *Total Quality Management: A Cross-Functional Perspective*, John Wiley & Sons, Inc., 1996

3. Feigenbaum, A. V., *Total Quality Control*, McGraw-Hill Inc., 1991.

Topics:	**Chapters**	**Weeks**
1. Fundamentals of TQM and TQM Evolution	1-4	1 (Feb7)
2. Excellence Models, Quality Awards	3	2 (Feb14)
3. Leadership, Strategic Planning	5,8	3 (Feb21)
4. Process Management	7,13	4 (Feb28)
5. Lean Production and Six Sigma	10	5 (Mar7)
6. Statistical Process Control	14	6 (Mar14)
Midterm Exam March 21, 2019		
7. Design Quality - Quality Function Deployment	12	7 (Mar28)
8. Reliability Engg. FMEA	12	8 (Apr4)
9. Innovation Management and TQM	10	9 (Apr11)
10. TRIZ Methodology		10 (Apr18)
11. Learning Organization	9	12 (May2)
12. Project Presentations		13 (May9)
Final Exam		

Grading:
30% (Project) + 20% (In-Class Exercises and Participation) +
25% (Midterm) + 25% (Final Exam) = 100%
Midterm Exam: March 21, 2019 (90 Minutes – Coverage: Topics 1-6)
Final Exam: 90 minutes – Coverage: Topics 7-11.
Computer Usage:
Students use general statistical package and spreadsheet programs for topics 5, 6 and 8.

In-Class Exercises and Discussions (20%):
Discussion 1. (Topic 1. February 14, 2019) The first assignment is to compare and briefly discuss the views of quality gurus W. Edward Deming, Joseph Juran, and Philip Crosby. Some guideline questions and reference articles will be provided.
Exercises 2. (**Topic 5, March 14, 2019**) Selected problems on Lean Production and Six Sigma Methodology.
Exercises 3. (**Topic 6, March 21, 2019**) Selected problems on Statistical Process Control.
Exercises 4. (**Topic 8, April 11, 2019**) Selected problems on Reliability Engineering.

In Class Demonstrations, Simulations and Case Studies:
1. Red Beads Factory – Deming's Principles
2. Why inspection is the last resort in TQEM?
3. Time Management Exercise – How to become Q2 Person?
4. 5S Numbers Game – How to improve your work place?
5. Quincunx Bernoulli Experiments to illustrate statistical thinking
6. Funnel Experiment – Process Tampering
7. SPC Case Study
8. QFD Case Study
9. FMEA Case Study

Teamwork (30%, Team Size 2 Students, Due-Date: May 9, 2019)
You are expected to read a book related to **Innovation Management (Topic 9),** discuss it among the team members and prepare a review report highlighting the key concepts presented. The suggested book list is shared below. You may also propose a relevant book beyond this list. We will finalize the selected books on **February 21, 2019**. You are also expected to present this book in class on **May 9, 2019**.
Your written report and in-class presentation should give clear answers to the following questions. In your report, the first paragraph should reflect the details of your preparation process for this assignment.

1. What are the major concepts, notions, tools and techniques presented in the book?
2. State a quotation from the book which you have liked the most. Give your comments why.
3. What are the key lessons you have learned from the book?
4. Make an assessment of the book from the Total Quality Management Perspective. Would you recommend it for the other students? Why?
5. In the references at the end of your report, make sure that you give a complete list of the material (Book reviews by other people, Related presentations, TED talks, Interviews, etc.) you have reviewed in preparing your report.

Suggested Books for the Teamwork:

Erik Brynjolfsson, Andrew McAfee, *Machine, Platform, Crowd: Harnessing Our Digital Future*, W.W. Norton & Company, 2017.

Clayton M. Christensen (1997*), The Innovator's Dilemma: when new technologies cause great firms to fail,* Harvard Business School Press, 1997.

Clayton M. Christensen, Michael E. Raynor*, The Innovator's Solution: creating and sustaining successful growth,* Harvard Business School Press, 2003.

Jeff Dyer, Hal Gregersen, Clayton M. Christensen, *The Innovator's DNA, Mastering the Five Skills of Disruptive Innovators*, Harvard Business School Press, 2011.

Daniel Goleman, *Focus: The Hidden Driver of Excellence*, Harper Collins Publishers, 2013.

Daniel Goleman, Richard Boyatzis and Annie McKee, *Primal Leadership: Unleashing the Power of Emotional Intelligence*, Harvard Business Review Press, 2001.

Daniel Goleman, *Emotional Intelligence: Why It Can Matter More Than IQ* , Bantam Books, 1995.

Daniel Goleman, *Focus: The Hidden Driver of Excellence*, Harper Collins Publishers, 2013.

Daniel Goleman, Richard Boyatzis and Annie McKee, *Primal Leadership: Unleashing the Power of Emotional Intelligence*, Harvard Business Review Press, 2001.

Daniel Goleman, *Emotional Intelligence: Why It Can Matter More Than IQ* , Bantam Books, 1995.

Yuval Noah Harari, *21 Lessons for the 21st Century*, Spiegel & Grau, September 4, 2018.

Steven Johnson, *Where Good Ideas Come From: The Natural History of Innovation,* Riverhead Books, 2010.

Daniel Kahneman, *Thinking, Fast and Slow*, Farrar, Straus and Giroux, 2011.

Tom Kelley & David Kelley, *Creative Confidence: Unleashing the Creative Potential Within Us All*, Crown Business, 2013.

W. Chan Kim, Renée Mauborgne, *Blue Ocean Strategy: How To Create Uncontested Market Space And Make The Competition Irrelevant, Harvard Business Review Press*, December 16, 2004.

W. Chan Kim, Renée Mauborgne, *Blue Ocean Shift: Beyond Competing - Proven Steps to Inspire Confidence and Seize New Growth*, Hachette Books, September 26, 2017.

Judea Pearl, D. Mackenzie, *The Book of Why: The New Science of Cause and Effect* , 2018.

Daniel H. Pink, *Drive: The Surprising Truth About What Motivates Us*, Riverhead, 2009.

Eric Ries, *The Lean Startup*, Crown Publishing Group, 2011.

George Westerman, Didier Bonnet, Andrew McAfee, *Leading Digital: Turning Technology into Business Transformation*, Harvard Business Review Press, 2014.