INDUSTRIAL ENGINEERING DEPARTMENT

IE 423
QUALITY ENGINEERING
Fall 2014

Type: Required
Credits/ECTS: 3 Credits / 6 ECTS
Class/PS schedule: Wednesday 11:00-12:50 (M2200) – Regular Class
                     Friday 13:00-14:50 (M3100) – Problem Session
Instructor: Ali R. Kaylan (kaylan@boun.edu.tr)
           Office Hours: Tu 15:00–17:00, W 15:00-17:00 (M4032)
Teaching Assistant: Oylum Şeker (oylum.seker@boun.edu.tr), Tuğçe Karataş
Prerequisite(s): IE 256 (Statistics for Industrial Engineers), or equivalents.

Course Description:
This course covers the fundamental methods of quality engineering. The major emphasis is on the statistical tools of quality engineering systems. In addition, quality excellence models, cost models, quality audit programs, quality information systems will be discussed. Actual case studies from industry will supplement the lectures.

Course Website:
Lecture notes, class handouts, assignments, and other relevant course materials will be posted on the course web page (http://moodle.ie.boun.edu.tr/).

Textbook:

References: The following books and journals can be accessed from the University library.
6. a) Quality Engineering, b) Quality Progress

Course objectives (and program outcomes):
This course aims to equip students with the necessary statistical methods and problem solving techniques to improve product and service quality. By the completion of the course, the students will be able to:
• Understand the key notions of quality and the voice of the customer how to improve product and service quality continuously
• Use the statistical process control methodology, specifically Shewhart Control Charts and the other tools for monitoring and improving the production and service processes
• Carry out process capability and measurement system capability studies
• Conduct offline quality control studies, namely understand how to design and analyse engineering experiments
• Understand how to design and use acceptance sampling plans.

Considering these objectives, this course mainly addresses the following student outcomes of the industrial engineering undergraduate program;
(a) An ability to apply knowledge of mathematics, science, and engineering
(b) An ability to design and conduct experiments, as well as to analyze and interpret data
(c) Ability to identify, model, formulate and solve industrial engineering problems
(k) An ability to use the techniques, skills, and modern engineering tools necessary for industrial engineering practice.

Course Outline:

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<th>Course</th>
<th>Weeks</th>
<th>Chapters</th>
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<tr>
<td>1. Quality Notions, Total Quality Management</td>
<td>1 (Sep 24)</td>
<td>1-2</td>
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<td>2. Modelling Process Quality and Related Inferences</td>
<td>2 (Oct 1, 8)</td>
<td>3-4</td>
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<td>3. Statistical Process Control, Control Charts for Variables</td>
<td>3-4 (Oct 15, 22)</td>
<td>5-6</td>
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<td>4. Control Charts for Attributes</td>
<td>5-6 (Oct 31, Nov 5)</td>
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<td>5. Process Capability Studies</td>
<td>7 (Nov 14)</td>
<td>8</td>
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<td>7. Design of Experiments</td>
<td>9 (Nov 26)</td>
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<td>8. Factorial Experiments for Process Design</td>
<td>10 (Dec 3)</td>
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<td>9. Process Optimization</td>
<td>11 (Dec 10)</td>
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<td>10. Acceptance Sampling Plans</td>
<td>12 (Dec 17)</td>
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<td>11. Other Acceptance Sampling Procedures</td>
<td>13 (Dec 24)</td>
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Grading:

Midterm I: 20% Friday Nov. 7, 2014, 17:00-19:00
Midterm II: 20% Friday Dec. 12, 2014, 17:00-19:00
Final: 30%
Project: 15%
Assignments/Quizzes: 15%

Eligibility For The Final Exam:
You will have the right to take the final exam only if you have accumulated at least a score of 20 out of 55%.
(0.20xMidterm1 + 0.20xMidterm2 + 0.15xAssignments/Quizzes > 20 pts)

Updated by: Ali R. Kaylan
Date of update: September 2014