**Outcome:** Students will identify and resolve issues related to equipment and/or procedures within their Process Operations Professional II capstone project or other selected case studies. Analysis techniques include but are not limited to:

1. Root Cause Failure and Analysis (RCFA’s)
2. Failure Modes and Effects Analysis (FMEA’s)

**Lecture:** Lecture to review and group discussion:

1. Failure Modes and Effects Analysis
   1. Types
   2. Steps
   3. Completing a FMEA Form
   4. Application
2. Root Cause Failure Analysis
   1. Categories
   2. When to perform
   3. Benefits and challenges
   4. Tools and methodologies
   5. Application
3. Lean
   1. Methodologies
   2. Benefits and challenges
   3. Application
4. Six Sigma
   1. Six Sigma status
   2. DMAIC Methodology
   3. Benefits and challenges
   4. Application

**Homework:**

1. FMEA Homework – Application to capstone project
2. Root Cause Failure Analysis – Research and presentation
3. RCFA – Techniques and methodologies
4. Value Added Worksheet – Identifies value-added versus non-value-added tasks
5. Lean and Six Sigma Homework

**Documentation:**

1. FMEA.ppt
2. FMEA Homework.doc
3. Root Cause Failure Analysis Homework.doc
4. RCFA – Techneques.doc
5. Increasing Efficiency and Quality.ppt
6. Value Added Worksheet.Excel
7. Six Sigma.ppt
8. Lean and Six Sigma Homework.doc

**Assessment:**

1. Homework
2. Application in Capstone Project – Improvement Report
3. Final Exam - Verbal