

## COURSE SYLLABUS E M 570

---

**Course Name:** SYSTEMS IMPROVEMENT: INTEGRATING TOC, LEAN, AND SIX SIGMA

**Course Number:** E M 570

**Semester Credits:** 3

**Instructor/Contact Information:** David Paulus, PhD, PE, CPEM, CQE, CHFEP

**Email:** [david.paulus@wsu.edu](mailto:david.paulus@wsu.edu)

**Office Hours:** TBD

**Meeting Time:** Wednesday 6:15 – 8:45 pm Pacific    **Prerequisites:** None

**Textbook:** "Lean Six Sigma" by Donna Summers, ISBN-10: 0135125103

"The Goal: A Process of Ongoing Improvement" by Eliyahu M. Goldratt (Author), Jeff Cox (Author) ISBN-10: 9780884271956

"Sustaining Workforce Engagement" by Lonnie Wilson, ISBN-10: 1138316032

**Course Description and Objectives:** The Theory of Constraints (TOC) is used for identifying a system's limiting factor and focusing efforts to eliminate that constraint in order to improve throughput, reduce inventory, or lower operating expenses. Next, Six Sigma is a problem solving methodology that uses the structured approach of Define, Measure, Analyze, Improve, and Control to reduce variability. Finally, Lean is a management approach that focuses on continuous improvement and respect for people in order to improve the performance of a system by eliminating waste. TOC, Six Sigma, and Lean work synergistically by applying TOC to identifying what to improve, using the Six Sigma structured problems solving approach, and applying Lean tools for managing continuous improvement.

**Learning Outcomes:** You will develop a management approach that integrates TOC, Six Sigma, and Lean that promotes workforce engagement, and you will learn how to apply Deming's principles of creating cultural change by insisting on "driving out fear" so workers know they are will be needed in other areas for continuous improvement in order to promote "pride of workmanship" without fear of working themselves out of a job. The course topics are as follows:

- Lean Six Sigma Origins
- The Theory of Constraints
- Leadership For Process Improvement
- Process Improvement Teams
- Problem Solving using DMAIC
- Value-Added Process Mapping
- Design of Experiments
- Failure Modes and Effects Analysis
- Lean Tools
- Variables Control Charts
- Process Capability
- Workforce Engagement
- Integrating TOC, Six Sigma, and Lean