Lean Graduate Certificate Course Descriptions w/ credit hours

MFS 503 Lean Manufacturing Principles and Practices (3)
Offered Spring Semester
This course will introduce students to the fundamental concepts of production improvement utilizing lean manufacturing principles and practices. In addition to the lectures, web-based simulations/experiments/games will be used to help learn the application of the tools supported by industry case studies. A Capstone Simulation will be used to demonstrate the collective application of all the tools and techniques (details included below). An application project is also included where students will work in teams to study a real-life manufacturing or service environment to assess the current state, identify improvement opportunities and develop countermeasures for implementation.

MFS 509 Leadership for a Lean Enterprise (not on regular schedule) (3)
Offered on case-by-case basis
This is an on-campus and/or distance learning course designed to provide an introduction to important leadership thinking and activities required to create and sustain a lean culture within an organization as practiced by Toyota. The primary content for this course comes from two books entitled *The Toyota Way to Lean Leadership* and *Seeds of Collaboration: Seeking the Essence of the Toyota Production System* as well as the internationally recognized University of Kentucky Lean System Program's public *Lean Executive Leadership Institute* and *Lean Certification* courses. In addition to reviewing written material and video presentations by experienced Toyota executives and others, there will be weekly written assignments and activities/discussions designed to explore each topic in more depth. Topics will include; Toyota's response to adversity, the thinking behind the TPS, understanding the True Lean destination and core thinking, management led problem solving and Toyota leadership competencies and business practice. Other important topics discussed include the pillars of a lean business philosophy, the people side of lean, lean system operations, management structure and measurement systems that support and sustain an ongoing lean transformation.

MFS 526 Lean Operations Management I (3)
Offered Fall Semester
This course will cover topics in basic lean system operations as well as the management system to support the attainment of highest customer satisfaction with respect to Safety, Quality, Cost, Productivity, Delivery and Human Resource Development. Working in teams, students apply fundamental lean tools and concepts to develop a lean operations environment capable of driving continuous improvement in a simulated factory. As the operational environment evolves, key management principles and tools are explored using the teachings of Taiichi Ohno and others considered to be the pillars of the Toyota Production System. All students must have a webcam and microphone or headset to participate in on-line team and class meetings.

MFS 529 Lean Operations Management II (3)
Offered Spring Semester
This course will revolve around the development of a Multi-Product (also called Multi-Purpose) production system. It covers advanced operations & management practices applied to multi-purpose

production systems based on Toyota's current True Lean/TPS thinking to support the attainment of highest customer satisfaction by focusing on Safety, Quality, Cost, Productivity, Delivery and Human Resource Development. Working in teams, students will create multi-purpose production lines & explore a variety of changeover strategies while developing a management system to and drive continuous improvement in a simulated factory. As the operational environment evolves, key management principles based on teachings of Taiichi Ohno and others considered to be the pillars of the Toyota Production System are applied along with current multi-purpose production practices used by Toyota.

MFS 581 Quality Control (3)

Offered Spring Semester

The is an online self-study course where students work at their own pace with periodic check-ins.

The course is designed to provide students with an overview of Toyota's Quality Assurance program and teach fundamental quality tools, which are an important skill set required to achieve operational excellence through effective systematic problem solving. This course follows Kaoru Ishikawa's *Guide to Quality Control* to teach the basic quality tools including histograms, graphs, check sheets, Pareto graphs, scatter diagrams, cause and effect, frequency diagrams, and control charts. Students will develop a basic understanding and competency to apply each tool.

MFS 780 Student Lean Certificate + Project (3)

Offered on a case-by-case basis

This course consists of completion of the Lean Student Certificate class plus an independent lean project.

The Student Lean Certificate (0)

This is a non-credited 1-week (40hr) class that employs a mixture of presentations, activities and selected outside assignments to teach and demonstrate the application of basic lean tools and the development of a lean system as taught by the University of Kentucky Lean Systems Program using Toyota as the benchmark. Working in teams, students will produce their own products and develop a lean operations environment within a simulated factory environment through a series of activities designed to follow the levels of development required to ultimately create a sustainable Just-in-Time lean system. Common lean concepts applied include; 5S, Visual management, Waste identification and elimination, Material and Information flowcharts and kanban systems, etc. Students will also create standardized work and conduct 8-Step problem solving on the production system they create. Students successfully completing this course will also be awarded a University of Kentucky Student Lean Certification certificate.

NOTE: This class is usually the entry course of the program. The course costs $295 but does not require UK tuition.