

## **Course Syllabus:**

# **Designing and Operating High Performance Manufacturing Systems**

### **Course Objective:**

Through experiential learning, participants discover and apply guiding principles for creating high performance manufacturing systems.

### **Course Agenda:**

- 9:00**    **Introductions and Overview**
- 9:30**    **Five Guiding Principles of Modern Manufacturing**
- 10:00**   **Break**
- 10:15**   **Discovery through Game Play: The Cups Game**
- 11:15**   **Process Mapping**
- 11:30**   **Process Mapping Exercise**
- 12:00**   **Lunch Break**
- 1:00**    **Cups Game Competition**
- 2:15**    **Break**
- 2:30**    **Multi-Item Kanban Game**
- 4:00**    **Wrap-up**
- 4:15**    **End of Session**

### **Course Description:**

#### **1. Introductions and Overview**

In the beginning it is important to establish the expectations for the day and to set the participants at ease with one another. They will be working together closely for much of the day.

## **2. Principles of Modern Manufacturing**

In this interactive discussion we emphasize the fundamental transition that has occurred in manufacturing over the past twenty-five years from mass production to lean manufacturing. The discussion concludes with a statement of the Five Guiding Principles for a high performance manufacturing system. We will illustrate the Five Principles throughout the course of the day.

## **3. Discovery through Game Play: The Cups Game**

Most of the day will be spent in the discovery and application of the Five Guiding Principles through a game called the Cups Game. This Cups Game environment illustrates fabrication and assembly operations, bottleneck operations, quality issues, coordination, and the management philosophy underlying the use of capacity and inventory to achieve good customer service. The experience that the participants will have is divided into three parts. First, by viewing a video of the game, the participants study and observe the differences between mass production and its corresponding inventory policies and the use of a Kanban control policy. Second, the participants will prepare a process map of the environment as part of their diagnosis of the existing system. Third, the participants will re-design the system to optimize the manufacturing performance metrics. This last experience is conducted as a competition among teams of participants.

## **4. Discovery through Game Play: The Multi-item Kanban Game**

Kanban systems are typically associated with low product variety and high volume production. In this game, we simplify the production process of the Cups Game but dramatically increase the product variety and demand variability, and then limit production capacity. A traditional Kanban system would break down in this environment. Participants learn through game play new techniques that preserve all the benefits of a Kanban system but cope effectively with high product variety.

## **5. Wrap-up**

The course concludes with an interactive discussion to review the participants' experiences and how the Five Principles apply to the design and operation of high performance manufacturing systems.