ABET Course Syllabus for IND E 430: Manufacturing, Scheduling, and Inventory

1. **Course number and name:** IND E 430: Manufacturing, Scheduling, and Inventory

2. **Credits and contact hours:** 4 credit hours, 4 hours per week.

3. **Instructor’s name:** Benita Beamon

4. **Textbook, title, author, and year:**

   4a. **Other supplemental materials:**
       - Online lecture notes, technical handouts

5. **Specific course information:**
   5a. **Brief description of the content of the course (catalog description):** In this course, students will learn the basics of manufacturing system design, including forecasting, inventory management, scheduling, and manufacturing systems control.

   5b. **Pre-requisites or co-requisites:** IND E 411 and IND E 337.

   5c. **Required, elective, or selected elective (as per Table 5-1) course in the program:** Elective.

6. **Specific goals for the course:** This course is an introductory course in manufacturing system design. Therefore, the objectives of this course are for students to understand the underlying mechanisms for how to design, measure, analyze, and compare manufacturing systems. Students also learn the basics of manufacturing scheduling and sequencing, and quantitative inventory modeling.

   6a. **Specific outcomes of instruction:**
       - Students will be able to effectively design and analyze high-performance manufacturing systems.
       - Students will be able to apply and evaluate appropriate inventory models to inventory-based systems.
       - Students will be able to schedule/sequence jobs on machines, using optimal algorithms and heuristics, given specific performance objectives.

7. **Brief list of topics covered:**
   - Inventory Control: From EOQ to ROP
   - The MRP/ERP Crusade
   - The JIT Revolution
   - What Went Wrong (with MRP and JIT)
   - A Science of Manufacturing
   - Basic Factory Dynamics
   - Variability Basics
The Corrupting Influence of Variability
Push and Pull Production Systems
Types of Production Systems
Environmentally-Conscious Manufacturing
Energy and Manufacturing
The Human Element in Operations Management
A Pull Planning Framework
Production Scheduling and Forecasting
Supply Chain Management
Synthesis-Pulling It All Together