ABET Course Syllabi for IND E 321: Statistical Quality Control

1. Course number and name: IND E 321: Statistical Quality Control

2. Credits and contact hours: 4 credit hours, 5 hours per week

3. Instructor’s name: Linda Ng Boyle, Christina Mastrangelo

4. Text book, title, author, and year

4a. Other supplemental materials: NA

5. Specific course information
   5a. Brief description of the content of the course (catalog description):
   5b. Prerequisites or co-requisites: IND E 315
   5c. Required, elective, or selected elective (as per Table 5-1) course in the program:
       Elective for b (Statistics).

6. Specific goals for the course
   This class provides students an overview of techniques that an engineer or researcher needs to assist companies and organizations generate a quality product. It provides students insights into quality engineering and how processes are controlled and monitored to ensure high quality products. The course is conducted in lecture format and begins with a review of descriptive statistics (means, histograms, frequency distributions) and introduces many statistical quality control techniques used in the real world (application and interpretation of control charts, and, process capability concepts).

6a. Specific outcomes of instruction
   • Students will have a broad knowledge of various modern industrial engineering methods and tools associated with designing systems in manufacturing, health care, transportation, and other related fields.
   • Students will have the ability to apply engineering design methods to represent, integrate and solve problems, including the ability to recognize problem context and integrate knowledge and skills appropriate sources.
   • Students will have the ability to communicate effectively.
   • Students should possess the following professional characteristics: leadership, ethics, the ability to work with others, and an appreciation for other disciplines.
• Students will have an understanding of the integrated, broad nature of the IE discipline with an appreciation of the depth of the field and an ability to find information, when needed.

6b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
   a) An ability to apply knowledge of mathematics, science and engineering appropriate to the discipline
   b) An ability to design and conduct experiments, analyze and interpret data
   c) An ability to design a system, component, or process to meet desired needs
   e) An ability to identify, formulate, and solve engineering problems
   h) The broad education necessary to understand the impact of engineering solutions in a societal context
   i) A recognition of the need for, and an ability to engage in life-long learning
   j) A knowledge of contemporary issues
   k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

7. Brief list of topics to be covered
   • Descriptive Statistics
   • Discrete/Continuous Distributions
   • Statistical Inferences
   • Methods and Philosophy of Statistical Process Control
   • Variable Control Charts
   • Attribute Control Charts
   • Process Capability Analysis
   • Gauge R&R
   • CUSUM/EWMA
   • Short Production Runs
   • Modified and Acceptance Control Charts