THE UNIVERSITY OF ARIZONA
COLLEGE OF ENGINEERING
Systems & Industrial Engineering

SIE 506 QUALITY ENGINEERING

COURSE DESCRIPTION

This course will introduce the concepts, principles & tools to conduct statistical quality control for manufacturing & service processes. The course is composed of a systematic introduction of the fundamental topics of statistical quality engineering, including:

- Probability Theory & Statistical Inference
- Statistical Process Control Charting
- Risk & Process Capability Assessment
- Acceptance Sampling

The emphasis is placed on understanding when and how to apply specific tolls, interpreting results correctly, and supporting future design and decision-making.

EXPECTED LEARNING OUTCOMES

- Characterize, model, and make inference from quality data.
- Apply statistical control charts for different types of quality data collected from different manufacturing and service processes.
- Assess the risks of statistical control charts and process capability.
- Understand the theoretical basis for statistical process control.
- Development of statistical quality control tools for given engineering problems.

COURSE FORMAT

- Highly interactive delivery | 16-**week** semester
- Tailored to your **professional needs**
- **3-credit** hour | You may apply it towards SIE MS and PhD programs
- Usually offered in the **Fall**

PROGRAM DIRECTOR
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ENROLLMENT
Graduate Coordinator
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COURSE SCHEDULE

LECTURE 1
- Course Overview & Introduction- Ch. 1

LECTURE 2
- Modeling Process Quality-Ch. 2

LECTURE 3
- MPQ + Inferences About Quality- Ch. 2/3

LECTURE 4, 5, 6
- Inferences About Quality- Ch. 3

LECTURE 7, 8
- Methods and Philosophies- Ch. 4

LECTURE 9
- Quality Control Philosophies & Applications- Ch. 4

LECTURE 10, 11, 12
- Charting Variables- Ch. 5

LECTURE 13
- Implementing Charts + Charting Attribute- Ch. 5/6

LECTURE 14
- Group project discussion

LECTURE 15
- CUSUM- Ch. 8

LECTURE 16
- Review Session for Exam I

LECTURE 17
- Exam I (in class)

LECTURE 18
- CUSUM + EWMA + MA- Ch. 8

LECTURE 19
- Short Production Runs- Ch. 9-1

LECTURE 20
- SPC with Autocorrelated Data- Ch. 9-4

LECTURE 21
- Process Capability- Ch. 7

LECTURE 22
- Project Prep

LECTURE 23
- Gage R&R- Ch. 7

LECTURE 24
- Specification/Tolerances- Ch. 7

LECTURE 25
- Acceptance Sampling + Project Prep- Ch. 14

LECTURE 26
- Review Session for Exam II
  Exam II

Real-World Application

Flexible/Interactive Learning

Bridge Theory & Practice

Innovative Curriculum

Distinguished Faculty

FROM EFFICIENCY TO INNOVATION–LEAD THE FUTURE OF INDUSTRIAL ENGINEERING.