**NDSE 423: Quality Engineering (3 credit)**

This course provides an overview of the principles of quality control systems, process control concepts, specification and tolerances, process capability studies, control charts, acceptance sampling plans, cost aspects of quality decisions, quality improvement programs, and quality information systems: *Prerequisite****:*** MATH 260***)***

**Course Learning Outcomes:**

By the end of the course, students will be able to:

A1. Demonstrate the overall Quality Engineering Domain through identification of its main concepts, and its tools and techniques.

A2. Acquire the different implementation methods and applications of quality engineering at workplace.

B1. Demonstrate effective use of tools and techniques in the Quality engineering

B2. Analyze and take appropriate action to solve quality engineering problems through quality improvement project.

B3. Performing a Presentation demonstrating the quality engineering methodology for a quality improvement project.

B4. Writing a productivity improvement project report outline its main elements.

C1. Deploy employability skills to tackle a quality problem during the project period and site visits.

**Course Learning Materials:**

* Quality Improvement: Pearson New International Edition, 9th Edition, by Dale H. Besterfield, College of Engineering, Southern University at Carbondale, Besterfield and Associates.
* Six Sigma and the Quality Toolbox by John Bicheno and Philip Catherwood
* The Lean Toolbox, 5th edition. A handbook for lean transformation, by John Bicheno and Matthias Holweg
* The Goal: A Process of Ongoing Improvement, by Eliyahu M. Goldratt and Jeff Cox

**Course Content:**

1. Understand the main theories, concepts, and application of Quality Engineering.
2. Explain basic and essential tools, techniques, and software, related to Quality Engineering, and practices some of the tools through group exercise and discussion.
3. Definitions, concepts, and applications of Strategic Planning Concept and Applications
4. Description of ISO 9001:2015 Concept and Applications
5. Six Sigma and Cost Optimization Concept and Applications
6. Process Control Concepts and Specification and Tolerances
7. Control Charts
8. Acceptance Sampling Plans
9. Excellence Model Concept and Applications
10. Quality Improvement Programs and Quality Information Systems
11. Identification of main Tools, Software, and related Professional Certificates.