COURSE OUTLINE
Introduction to Metrology

Course Description
IT 263. Introduction to Metrology. 3 hours credit. This course will enable the student to apply basic measurement skills, system calibration skills, measurement system analysis, and build specialized inspection equipment.

Required Materials

*For complete material(s) information, refer to https://bookstore.butlercc.edu

Butler-assessed Outcomes
The intention is for the student to be able to
1. Demonstrate the ability to use common measurement appliances.
2. Demonstrate the ability to choose correct measurement tools.

Learning PACT Skills that will be developed and documented in this course
Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Analytical Thinking
- Critical thinking - Through the use of metrology theory, the student will develop critical thinking in using measurement systems.

Major Summative Assessment Task(s)
These Butler-assessed outcome(s) and the Learning PACT skill(s) will be demonstrated by
1. Competing two practical exercises in measurement which demonstrate metrological techniques and strategies.

Skills or Competencies
These actions are essential to achieve the course outcomes:
Demonstrate ability to function in a group continuous improvement project
1. Demonstrate the ability to put into practice current thinking in metrology
2. Design and implement a simple measurement system

Learning Units
I. Measurement and meteorology
   A. Language and systems of measurement
   B. Measurement and tolerances
II. Statistics and metrology
   A. Graduated scales
   B. Scaled instruments
   C. Vernier instruments
   D. Micrometer instruments
   E. Gage blocks
   F. Calibration

III. Measurement by comparison
   A. Reference planes
   B. Angle measurement
   C. Surface measurement
   D. High amplification comparators
   E. Pneumatic measurement
   F. Coordinate measuring machines

IV. Optical
   A. Flats
   B. metrology

**Learning Activities**
Learning activities will be assigned to assist the student to achieve the intended learning outcome(s) through lecture, instructor-led class discussion, guest speakers, group activities, drills/skill practice, and other activities at the discretion of the instructor. These activities may be either face-to-face or online.

**Grade Determination**
The student will be graded on learning activities and assessment tasks. Grade determinants may include the following: daily work, quizzes, chapter or unit tests, comprehensive examinations, projects, presentations, class participation, and other methods of evaluation at the discretion of the instructor.