IlliNois vAlLeY CoMMuNItY CoLLeGe

COURSE OUTLINE

Division: Workforce Development

COURSE: CAD 2204 Geometric Tolerancing and Dimensioning

Date: August 28, 2018

Credit Hours: 3

Prerequisite(s): DFT1200

Delivery Method:
- [x] Lecture 2 Contact Hours (1 contact = 1 credit hour)
- [ ] Seminar 0 Contact Hours (1 contact = 1 credit hour)
- [x] Lab 2 Contact Hours (2-3 contact = 1 credit hour)
- [ ] Clinical 0 Contact Hours (3 contact = 1 credit hour)
- [ ] Online
- [ ] Blended

Offered: [ ] Fall  [x] Spring  [ ] Summer

IAI Equivalent – Only for Transfer Courses - go to http://www.itransfer.org:

CATALOG DESCRIPTION:
This is a course in Geometric Tolerance and Dimensions including tolerances of form and position or location control. The student will learn methods of indicating geometric tolerances by means of geometric characteristic symbols, as recommended by ANSI, rather than by traditional notes.
GENERAL EDUCATION GOALS ADDRESSED

Upon completion of the course, the student will be able:

- To apply analytical and problem solving skills to personal, social, and professional issues and situations.
- To communicate successfully, both orally and in writing, to a variety of audiences.
- To construct a critical awareness of and appreciate diversity.
- To understand and use technology effectively and to understand its impact on the individual and society.
- To develop interpersonal capacity.
- To recognize what it means to act ethically and responsibly as an individual and as a member of society.
- To recognize what it means to develop and maintain a healthy lifestyle in terms of mind, body, and spirit.
- To connect learning to life.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

Upon completion of the course, the student will be able to:

1. Student will be able to examine parts in terms of its function and its relationship to mating parts to determine the tolerance limits, not just for the size of the object, but for all of the various critical characteristics of a part.
   a. Student will learn the fundamentals required to interpret engineering drawings.
   b. Student will learn various building blocks which make up the system as well as how to properly apply them.
   c. Student will learn the concepts of datums in order to effectively apply geometric tolerancing.
   d. Students will apply concepts according to the latest ANSI Y14.5 standards.
   e. Students will apply principles of quality control and continuous quality improvement.

MAPPING LEARNING OUTCOMES TO GENERAL EDUCATION GOALS

<table>
<thead>
<tr>
<th>Goals</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>First Goal</td>
<td>To apply analytical and problem solving skills to personal, social, and professional issues and situations.</td>
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<td>Student will learn various building blocks which make up the system as well as how to properly apply them.</td>
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<td>Second Goal</td>
<td>To understand and use technology effectively and to understand its impact on the individual and society.</td>
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<td>Students will apply concepts according to the latest ANSI Y14.5 standards.</td>
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<td>Students will apply principles of quality control and continuous quality improvement.</td>
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COURSE TOPICS AND CONTENT REQUIREMENTS:

1. Engineering Drawings and Tolerancing
   a. Dimensioning standards
   b. Coordinate tolerance system
   c. Dimensioning rules
   d. Geometric dimensioning and tolerance system

2. Introduction to Geometric Tolerancing symbols and terms
   a. Definitions
   b. Material conditions
   c. Modifiers
   d. Introduction to geometric tolerances

3. Rules and concepts of GD&T
   a. Introduction to basic dimensions
   b. Introduction to virtual condition, inner and outer boundary
   c. Introduction to bonus tolerance

4. Form controls
   a. Flatness control
   b. Straightness as a surface element control
   c. Straightness as an axis of centerline control
   d. Circularity control
   e. Cylindrically control

5. Datums
   a. Implied datums
   b. Planar datums
   c. FOS Datum features and applications

6. Orientation controls
   a. Perpendicularity
   b. Angularity
   c. Parallelism

7. Tolerance of position
   a. TOP theories
   b. TOP applications
   c. Inspection TOP
   d. TOP Calculations

8. Concentricity and symmetry controls

9. Runout controls
   a. Circular runout
   b. Total runout

10. Profile controls
    a. Profile of surface
    b. Profile of a line

INSTRUCTIONAL METHODS:

- Lecture
- Lab
- Group projects

INSTRUCTIONAL MATERIALS:

Fundamentals of Geometric Dimensioning and Tolerancing, Krulikowski
Workbook, Krulikowski
STUDENT REQUIREMENTS AND METHODS OF EVALUATION:
1. Completion of assigned problems, required reading of text.
2. Periodic tests
3. Group projects
4. Problem Based learning

A= 90-100
B= 80-89
C= 70-79
D= 60-69
F= 0-59

OTHER REFERENCES
### Course Competency/Assessment Methods Matrix

**Assessment of Student Learning**

For each competency/outcome place an “X” below the method of assessment to be used.

<table>
<thead>
<tr>
<th>Assessment Measures – Direct/Indirect</th>
<th>Assessment Options</th>
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**Assessment Measures**

- Direct
- Indirect

**Student will examine parts in terms of its function and its relationship to mating parts to determine the tolerance limits, not just for the size of the object, but for all of the various critical characteristics of a part.**

  a. **Student will learn the fundamentals required to interpret engineering drawings.**

    - X
    - X
    - X
    - X
    - X

  b. **Student will learn various building blocks which make up the system as well as how to properly apply them.**

    - X
    - X
    - X
    - X
    - X

- X
c. Student will learn the concepts of datums in order to effectively apply geometric tolerancing.  

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d. Students will apply concepts according to the latest ANSI Y14.5 standards.  

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e. Students will apply principles of quality control and continuous quality improvement.  

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