###### COURSE SYLLABUS

###### Semester: Year: 2013

**Mission Statement:**

Richard J. Daley College provides high-quality education which leads to academic success, career development, and personal enrichment that fulfill diverse community needs.

###### Course (Discipline): Manufacturing Technology Number: 139 Section:       IAI#:

**Course Title:** Print Requirements and Quality Assurance **Length of Course (Weeks):** 16

**Credit Hours:** 3 **Lecture Hours:** 3 **Lab Hours:** 0 **Contact Hours:** 3

**Meeting Day(s):**       **Times:**       **Building:**       **Classroom #:**

**Syllabus can be found on Blackboard website at** [**https://ccc.blackboard.com/webapps/login/**](https://ccc.blackboard.com/webapps/login/)**.**

###### Dean, College to Careers in Advanced Manufacturing \_\_Ray Prendergast\_\_\_\_\_\_\_

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#### Office hours:

**Course Description**:

This course focuses on the fundamentals of print reading and the measuring skills needed to verify print requirements. Visualization of 3D objects from orthographic views and the use of micrometers and dial calipers are stressed. The concepts of Geometric Dimensioning and Tolerancing, and quality tools (such as Pareto diagrams and fishbone charts) are introduced. Writing assignments, as appropriate to the discipline, are part of the course.

**Course Prerequisites**:

Eligibility for Math 98 and Reading 99, or Consent of Department Chairperson

**Students Course is Expected to Serve:**

Students in the manufacturing program and engineering students interested in applied mechanics. This course is required for the AAS in Manufacturing Technology.

**Course Objectives**:

* Illustrate the principles of orthographic projection and the interpretation of engineering drawings.
* Demonstrate the ability to use prints for the layout and manufacture of machined parts.
* Explain notes, revisions, titleblock information, and basic GD&T callouts.
* Demonstrate proficiency in math competencies used in print reading: fraction to decimal conversion, conversion of inch units to and from metric units, arithmetic of common fractions, geometry of angles and angular relationships.
* Demonstrate proficiency in precision measuring with micrometers and calipers.
* Explain Quality Assurance concepts and standards used to control machining processes.

**Student Learning Outcomes:**

Upon completion of this the student will be able to:

* Identify part features, linetypes, symbols, and terms used in mechanical drawings.
* Visualize three dimensional objects from orthographic projections.
* Calculate upper and lower limits of print dimensions.
* Measure machined parts to .001” with micrometers and to within .005” with dial calipers.
* Convert inches to millimeters and millimeters to inches.
* Identify unspecified angles from specified angles and principles of geometry.
* Apply acceptance sampling to sample parts correctly.
* Identify and segregate non-conforming materials.
* Complete a Corrective Action Report.

**Recommended Texts and Course Materials:**

***Text:***

Hammer, W. (2001). *Blueprint Reading Basics: Manufacturing Print Reading*. New York: Industrial Press. ISBN: 978-0831131258.

Quality Council of Indiana. (2011). *Certified Quality Inspector (CQI) Primer, Sixth Edition*. Indianopolis, IN: Author. ISBN: none.

RECOMMENDED REFERENCE BOOKS

Walker, H. F., Elshennawy, A. K., Gupta, B. C., Vaughn, M. M. (2009). *Certified Quality Inspector Handbook.* Milwaukee, WI: ASQ Press. ISBN 978-0-87389-731-0

Quality Council of Indiana. (2012). *Certified Quality Improvement Associate (CQIA) Primer, Third Edition*. Indianapolis, IN: Author. ISBN: none.

Quality Council of Indiana. (2011). *Certified Quality Technician (CQT) Primer, Seventh Edition*. Indianapolis, IN: Author. ISBN: none.

***Materials:***

0-1” micrometers

0-6” dial calipers

surface plates and layout tools

digital micrometers and calipers with metric readouts

**Additional Course Requirements:**

N/A

**Recommended Methods of Instruction:**

The methods of instruction will include lecture, small group work, and project-based learning.

**Recommended Methods of Evaluation:**

Midterm and final course grades will be based on the following assessments:

Chapter tests

Projects

Final examination

Attendance

Grading Scale:

90-100% = A

80-89 = B

70-79 = C

60-69 = D

Below 60 = F

See the Policy on grade designations and grade appeals at:

<http://www.ccc.edu/colleges/daley/departments/Pages/Grade-Appeal-Policy-and-Procedure.aspx>

**NOTE:** Type or copy and paste the link above into a web browser to view its content.

### Topical Outline / Course Calendar:

1. Engineering drawings in manufacturing: sketches and prints
2. Orthographic projections, alphabet of lines
3. Orthographic views and three-view drawings
4. Dimensions and tolerances: traditional and geometric
5. Machine terms and holes
6. Surface textures
7. Threads and Fasteners
8. Gears
9. Global Manufacturing: Third Angle vs. First Angle projections
10. Precision measuring with dial calipers, micrometers, and height gages
11. Global Manufacturing II: metric measurement
12. Quality Concepts and Teams
13. Quality Standards: ISO 9000, AS-9000, TS-16949
14. Quality Tools: problem solving steps, Cause and Effect Diagrams, Histograms, Pareto Diagrams, Scatter Diagrams.
15. Preventive and Corrective Action
16. Final Exam/Final Project: first article inspection of a part to print requirements

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