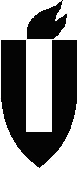
***ILLINOIS VALLEY COMMUNITY COLLEGE***



## COURSE OUTLINE

**DIVISION:**

**COURSE: GNT 1225; Quality & Measurement**

Date: Spring 2013

Instructor: Jennifer Scheri

Phone: 815-224-0390

Email: Jennifer\_Scheri@ivcc.edu

Credit Hours:  2

Prerequisite(s): None

Delivery Method:  **Lecture** **1 Contact Hours (1 contact = 1 credit hour)**

**Seminar Contact Hours (1 contact = 1 credit hour)**

**Lab 2 Contact Hours (2 contact = 1 credit hour)**

**Clinical Contact Hours (3 contact = 1 credit hour)**

**Online**

**Blended**

Offered:  **Fall**  **Spring**  **Summer**

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

**CATALOG DESCRIPTION:**

This course provides an introduction to controlling and improving quality in a manufacturing setting. Explores ways that manufacturers use data and analysis to improve quality. Students will have the opportunity to earn the Quality and Measurement Certification through the Manufacturing Skill Standards Council (MSSC).

**GENERAL EDUCATION GOALS ADDRESSED**

*[See the last page of this form for more information.]*

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

### [Choose those goals that apply to this course.]

To apply analytical and problem solving skills to personal, social and

professional issues and situations.

To communicate orally and in writing, socially and interpersonally.

To develop an awareness of the contributions made to civilization by

the diverse cultures of the world.

To understand and use contemporary technology effectively and to

understand its impact on the individual and society.

To work and study effectively both individually and in collaboration with

others.

To understand what it means to act ethically and responsibly as an

individual in one’s career and as a member of society.

To develop and maintain a healthy lifestyle physically, mentally, and

spiritually.

To appreciate the ongoing values of learning, self-improvement, and

career planning.

**EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:**

### *[Outcomes related to course specific goals.]*

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

1. Read multi-view drawings to visualize part shapes, identify features, and identify dimensions

2. Read drawings to determine part hole sizes and locations, scales, title blocks, part section features, and fastener sizes

3. Interpret part dimension tolerances, geometric dimensioning and tolerancing (GD&T) symbols and frames, and datums

4. Interpret English and S.I. measurements; perform system conversion; use tape measures and rules; accuracy and repeatability

5. Demonstrate making precision measurements using dial calipers, digital calipers, and micrometers

6. Demonstrate gauging parts using dial indicators, digital indicators, and data acquisition software; calibration of instruments; part mastering

7. Identify quality system elements, define quality, identify ISO 9000 standard, list types of quality management systems, explain the PDCA cycle, describe continuous improvement concepts, audits, and inspections

8. Explain methods of process improvement, the importance of data collection and analysis, and identify types of statistical tools

9. Explain the concepts of statistical process control, calculate mean, range, construct and analyze histograms, determine and interpret Cpk

10. Identify types and applications of control charts; construct and analyze an X bar and R chart

11. Identify applications of root cause failure analysis; construct and analyze Pareto charts; use brainstorming and fishbone diagrams to solve production problems, apply corrective and preventive action

12. Describe the role of managers and production workers in quality and quality teams

13. Describe the methods of quality inspection at different stages of manufacturing document and communicate inspection results

14. Identify types of quality audits, quality audit procedures, and document quality audit results; develop an action plan and recommendation from a quality audit

15. Identify types of nonconformities and methods of detection; perform a root cause failure analysis; decide when / how to take preventative and corrective action

16. Perform an effectiveness check; document and report preventative and corrective actions

**COURSE TOPICS AND CONTENT REQUIREMENTS~~:~~**

1. Blueprint Reading 1 (Multi-view Drawings)
2. Blueprint Reading 2 (Assembly Drawings and Fasteners)
3. Blueprint Reading 3 ( GD&T)
4. Basic Measurement
5. Precision Measurement Tools
6. Dimensional Gauging
7. Quality Systems
8. Quality Improvement
9. Introduction to SPC
10. Control Charts
11. Continuous Improvement-1
12. Continuous Improvement-2
13. Quality Inspections
14. Quality Audits
15. Preventative and Corrective Actions
16. Verification and Documentation

**INSTRUCTIONAL METHODS:**

1. Lecture

2. Demonstration

3. Problem solving and discussion

4. MSSC online e-Learning modules

**INSTRUCTIONAL MATERIALS:**

Warren Hammer, *Blueprint Reading Basics*, 3rd ed., Industrial Press, 2001. ISBN: 978-0831-131258.

Manufacturing Skill Standards Council, *High-Performance Manufacturing*, Woodland Hills, CA, 2006

**STUDENT REQUIREMENTS AND METHODS OF EVALUATION:**

1. Tests and quizzes

2. Student presentations

**OTHER REFERENCES**

“This workforce solution was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timelines, usefulness, adequacy, continued availability, or ownership. This solution is copyrighted by the institution that created it. Internal use, by an organization and/or personal use by an individual for non-commercial purposes, is permissible. All other uses require the prior authorization of the copyright holder.”

Course Competency/Assessment Methods Matrix

| **GNT 1225; Quality & Measurement** | **Assessment Options** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| For each competency/outcome place an “X” below the method of assessment to be used. | **Assessment of Student Learning** | Article Review | Case Studies | Group Projects | Lab Work | Oral Presentations | Pre-Post Tests | Quizzes | Written Exams | Artifact Self Reflection of Growth | Capstone Projects | Comprehensive Written Exit Exam | Course Embedded Questions | Multi-Media Projects | Observation | Writing Samples | Portfolio Evaluation | Real World Projects | Reflective Journals | Applied Application (skills) Test | Oral Exit Interviews | Accreditation Reviews/Reports | Advisory Council Feedback | Employer Surveys | Graduate Surveys | Internship/Practicum /Site  Supervisor Evaluation | Licensing Exam | In Class Feedback | Simulation | Interview | Written Report | Assignment |
| Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below. | **Direct/**  **Indirect** | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | I | I | I | I | D | D |  |  |  |  |  |  |
| 1. Read multi-view drawings to visualize part shapes, identify features, and identify dimensions |  |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 2. Read drawings to determine part hole sizes and locations, scales, title blocks, part section features, and fastener sizes |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 3. Interpret part dimension tolerances, geometric dimensioning and tolerancing (GD&T) symbols and frames, and datums |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 4. Interpret English and S.I. measurements; perform system conversion; use tape measures and rules; accuracy and repeatability |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 5. Demonstrate making precision measurements using dial calipers, digital calipers, and micrometers |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 6. Demonstrate gauging parts using dial indicators, digital indicators, and data acquisition software; calibration of instruments; part mastering |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 7. Identify quality system elements, define quality, identify ISO 9000 standard, list types of quality management systems, explain the PDCA cycle, describe continuous improvement concepts, audits, and inspections |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 8. Explain methods of process improvement, the importance of data collection and analysis, and identify types of statistical tools |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 9. Explain the concepts of statistical process control, calculate mean, range, construct and analyze histograms, determine and interpret Cpk |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 10. Identify types and applications of control charts; construct and analyze an X bar and R chart |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 11. Identify applications of root cause failure analysis; construct and analyze Pareto charts; use brainstorming and fishbone diagrams to solve production problems, apply corrective and preventive action |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 12. Describe the role of managers and production workers in quality and quality teams |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 13. Describe the methods of quality inspection at different stages of manufacturing document and communicate inspection results |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 14. Identify types of quality audits, quality audit procedures, and document quality audit results; develop an action plan and recommendation from a quality audit |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 15. Identify types of nonconformities and methods of detection; perform a root cause failure analysis; decide when / how to take preventative and corrective action |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |
| 16. Perform an effectiveness check; document and report preventative and corrective actions |  |  |  | X |  | X | X | X |  |  |  | X |  | X |  |  |  |  |  |  | X | X | X | X |  | X | X |  |  |  |  |