

PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

X Transfer Course X A.A. Degree applicable course
(check all that apply)

COURSE NUMBER AND TITLE: QAT 115 Inspection Techniques and Applications

UNIT VALUE: 3

MINIMUM NUMBER OF SEMESTER HOURS: 48

BASIC SKILLS REQUIREMENTS: Appropriate language and computational skills.

ENTRANCE REQUIREMENTS

PREREQUISITE: None.

COREQUISITE: None.

RECOMMENDED PREPARATION: None.

SCOPE OF COURSE:

Basic inspection concepts as applied to the fabrication and assembly of mechanical and electrical components; fundamental tools and techniques of measurement as applied to inspection and quality control. Fundamental blueprint reading reviewed, including geometric positioning.

SPECIFIC COURSE OBJECTIVES:

The successful student will be able to:

1. Apply concepts of Quality Assurance Technology to the fundamentals of dimensional metrology.
2. Identify and compare inspection tools and inspection methods currently in use.
3. Upon presentation of a spectrum of inspection requirements, compute the required tolerances, analyze the inherent precision, analyze the accuracy and resolution of available instruments, and select the optimum instruments to meet the inspection criteria.
4. Define the maximum possible error of any dimensional measurement.
5. Apply the skills necessary to function as an entry-level dimensional inspector.
6. Define the principle role of calibration, classification of measurement errors and basic calibration procedures. Understand calibration requirements for an ISO Certified Quality System.

CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:

- I. Introduction to Quality, Quality Systems, Quality Communication
- II. TQM Concepts and Tools
- III. Quality Cost Categories/Concepts
- IV. The Audit Process
- V. Inspection Planning/Quality Plans
- VI. Reading Drawings, Geometric Tolerancing
- VII. Geometric Dimensioning and Tolerancing
- VIII. Graphical Inspection Analysis
- IX. Measuring Tools
- X. Accuracy, Measurement Error
- XI. Calipers, Indicators
- XII. Vernier Instruments
- XIII. Pneumatic Measurement
- XIV. Calibration
- XV. Measurement with Optical Flats
- XVI. Reference Planes, Surface Plate Inspection Methods
- XVII. Angle Measurement I and II
- XVIII. Role of Metrology
- XIX. Optical Comparators
- XX. Surface Metrology
- XXI. Coordinate Measuring Machines
- XXII. Optical Metrology
- XXIII. Basic Shop Mathematics, the Metric System
- XXIV. Acceptance Sampling Plans
- XXV. Basic Statistics, Statistical Process Control

REQUIRED READING:

Griffith, Gary K. The Quality Technician's Handbook. 4th edition. New Jersey: Prentice Hall, 2000.

SUGGESTED READING:

Busch, T. Fundamentals of Dimensional Metrology. 3rd edition. New York: DelMar Publishers Inc., 1989.

Farago, F.T. Handbook of Dimensional Measurement. 2nd edition. New York: Industrial Press Inc., 1991.

Kennedy, C.W. and E.G. Hoffman. Inspection and Gaging. 6th edition. New York: Industrial Press Inc., 1990.

Wortman, Bill, Glen Gee, and Wesley Richardson. CMI Primer. 2nd edition. Indiana: Quality Council of Indiana, 1995.

Catalogs, generally available for the asking from vendors, and usually available in house.

Current industrial brochures.

Quality (monthly publication)

Quality Digest (monthly publication)

Quality Progress. (ASQC monthly magazine)

REQUIRED WRITING:

Multiple choice questions and answers at the end of text chapters. Three exams are multiple choice exams.

OUTSIDE ASSIGNMENTS:

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

Read and study the text to achieve a comprehensive understanding of the subject. Additional reading and study of supplementary material is periodically assigned. Students are encouraged to bring measuring tools into class for hands-on demonstration of technique and application. Students are required to give a five minute oral presentation on the application of a measuring/inspection tool in the work place.

INSTRUCTIONAL METHODOLOGY:

Check all that apply:

- lecture
- laboratory
- lecture-laboratory combination
- directed study

DISTANCE LEARNING:

This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.

Yes No

If yes, check all that apply:

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
- Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
- Two-Way Video Conferencing (Two-way interactive video and audio)
- One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
- Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

GRADING POLICY AND STANDARDS (include methods of determining whether the stated objectives have been met by students):

The course grading policy will be determined by individual instructors and may include the following:

- Exams
 - Quizzes
 - Research projects
 - Writing assignments
 - Classroom presentations
 - Research papers
 - Lab assignments
 - Journal writing
 - Classroom participation & discussion
 - Homework
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IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?

Yes ____ No X Number of times course may be taken for credit: 1

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

CONTACT PERSON: Director, Vocational Programs, Ext. 2286

SIGNATURES ON FILE