THREE RIVERS COMMUNITY COLLEGE
COURSE OUTLINE

Course Number/Title: MFG K236 Non-Destructive Testing I

Lecture 3 hrs Laboratory 0 hrs Credit 3 hrs Contact 3 hrs

Course Description: This is an introduction to the non-destructive testing technologies commonly used in industry. These include liquid penetrate, magnetic particle, eddy current, ultrasonics, radiography and others. Requirements for personnel certification will also be addressed.

Method: Lecture, demonstration, films, videos

Text: Handbook of Nondestructive Evaluation, Charles J. Heller McGraw-Hill

Prerequisites: None Co-Requisites: MFG K237

COURSE TOPICS/CONTENT

	HOURS
1. Introduction to Quality Control / Assurance and Nondestructive Testing, Types and Applications Personnel training and certification, ASNT-SNT-TC-1A, and ISO 9000.	7
2. Engineering design for inspectionability, reasons products fail. Internal and external factors, stresses and loads. Impact of new materials and designs have on quality. Types of indications and discontinuities, Visual inspection, Equipment used to enhance visual inspection process, Equipment application and specification requirements.	9
3. Electromagnetic Testing / NDT, eddy current and magnetic particle testing, material consideration, crack detection, conductivity measurements data display and indication interpretation magnetic particle testing applications, direct and indirect magnetization.	9
4. Liquid Penetrate testing applications, different testing systems, sensitivity differences and application procedure. Ultrasonic Testing applications, sensitivity of testing techniques, pulse echo, through transmission, transducer construction and characteristics.	11
5. Radiography File interpretation. Radiography testing, and generation of x-rays and gamma rays. Safety considerations, film, quality measurements, geometric considerations and calculations. Radiography film interpretations, discontinuities, classifications of indications.	4
6. Acoustic Emission applications, Basic principles of operation, Computerized nondestructive testing applications, Trends of Nondestructive testing applications.	5
TOTAL HOURS	45

Date: February 13, 2008

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Program Coordinator: *Robert Lantz*

Department Chairperson: *Tony Benoit*

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Measurable Objectives

The student will demonstrate the understanding of the fundamentals of Nondestructive Testing by completing class assignments and passing tests on NDT principles and operating applications which include:

1. Describe the advantages and limitation of nondestructive testing
2. Explaining the operating principles of a nondestructive testing inspection, visual, liquid penetrate, magnetic particle, ultrasonic, radiography, eddy current and acoustic emission.
3. Specify the selection process of a given nondestructive test for a particular inspection requirement.
4. Describe the importance of NDT inspection specifications and codes.
5. Explain how nondestructive testing is affected by international standards (ISO 9000).
6. Describe the components of a NDT personnel certification and testing program.
7. Explain the relationship and influence of internal and external forces upon a material that cause potential product failure.