Penetrant Course Outline (16hrs)

1. **Introduction**
   a. Brief history of nondestructive testing and liquid penetrant testing
   b. Purpose of liquid penetrant testing
   c. Basic principles of liquid penetrant testing
   d. Types of liquid penetrants commercially available

2. **Liquid Penetrant** Processing
   a. Preparation of parts
   b. Adequate lighting
   c. Application of penetrant to parts
   d. Removal of surface penetrant
   e. Developer application and drying
   f. Inspection and evaluation
   g. Postcleaning

3. Various Penetrant Testing Methods
   a. Characteristics of each method
   b. General applications of each method

4. Liquid Penetrant Testing Equipment
   a. Liquid penetrant testing units
   b. Lighting for liquid penetrant inspection
   c. Materials for liquid penetrant testing
   d. Precautions in liquid penetrant inspection

Penetrant Level II Course Outline (16hrs)

RECOMMENDED TRAINING FOR LEVEL II LIQUID PENETRANT TESTING

1. **Review**
   a. Basic principles
   b. Process of various methods
   c. Equipment

2. Selection of the Appropriate Penetrant Testing Method
   a. Advantages of various methods
   b. Disadvantages of various methods

3. Inspection and Evaluation of Indications
   a. General
      (1) Discontinuities inherent in various materials
      (2) Reason for indications
      (3) Appearance of indications
      (4) Time for indications to appear
      (5) Persistence of indications
   b. Factors affecting indications
      (1) Penetrant used
      (2) Prior processing
      (3) Technique used
   c. Indications from cracks
      (1) Cracks occurring during solidification
      (2) Cracks occurring during processing
      (3) Cracks occurring during service
   d. Indications from porosity
   e. Indications from specific material forms
      (1) Forgings
      (2) Castings
      (3) Plate
      (4) Welds
      (5) Extrusions
   f. Evaluation of indications
      (1) True indications
      (2) False indications
      (3) Relevant indications
      (4) Nonrelevant indications

4. Inspection Procedures and Standards
   a. Inspection procedures
   b. Standards/codes