

## Fatigue & Fracture with MTS TestSuite Software

4 day course

### COURSE OUTLINE

- I. Testing fundamentals
  - A. Load, deformation, stress and strain
  - B. Stress-strain relations, material properties
  - C. Elastic-plastic deformation
  - D. Material strength: yield vs. fracture
- II. TestSuite fundamentals
  - A. Introduction/overview
  - B. Windows/menus
  - C. Projects, tests and test runs
  - D. Specimens
  - E. Procedure creation, modification and editing
  - F. Command processes
  - G. Data acquisition processes and management
  - H. Other processes
  - I. Runtime displays
  - J. Executing tests
  - K. Reports
- III. Standard tests
  - A. Tension
  - B. HCF/LCF
  - C. KIC fracture toughness
  - D. Fatigue crack growth
- IV. Fatigue and fracture fundamentals
  - A. Stress-life, strain-life, and linear elastic fracture mechanics
  - B. Cracks and crack propagation
  - C. Plane stress and plane strain
  - D. Stress intensity and fracture toughness
  - E. Crack length measurement: compliance
  - F. Fracture crack growth and damage tolerance design

This course provides you with the fundamentals of material testing and the use of MTS TestSuite Multipurpose Software for fatigue and fracture testing applications. Students will learn how to adjust and operate the software to run a material test as well as analyze data. The instructor will review the history and fundamentals of material testing. Class days are divided into classroom training and laboratory training.

### Who should attend

This course is targeted at material test system operators, test engineers, and laboratory managers who are using Fatigue and Fracture applications.

### Learning Outcome

At the completion of the course the students will have both a theoretical and practical knowledge of a wide range of material tests. Students will use MTS TestSuite software to create custom tests, and also use the templates to run standard ASTM tests. These tests include tension, compression, fatigue, fracture toughness and fatigue crack growth. In addition, students will be able to process test data and generate reports.

### Prerequisites

Students should have some experience prior to attending this course in servohydraulic testing and a working knowledge of the current Microsoft operating system. For assistance in determining which class would be appropriate for you, please contact the MTS Training department.