

# AFGROW Standard Training

AFGROW Standard Training classes are offered in the Dayton, OH area each year (usually in the spring and fall). Training notices are posted and announced to AFGROW Users a few months in advance.

The next class date:

**September 26 – September 29, 2022**

## Cost

**Class:** \$930.00/person until August 30, \$990.00/person thereafter

## Description

The standard class will familiarize students with the design and operation of the AFGROW crack growth life analysis framework. This includes a practical review of Linear Elastic Fracture Mechanics (LEFM) concepts, example problems, and the following new AFGROW capabilities: K-solutions for corner crack(s) at a C/S hole, advanced solution for through crack(s) at pin loaded holes, user-defined solution capability for two, interdependent cracks, and our spectrum management tool. The class will also provide an introduction to the use of advanced features unique to AFGROW (COM automation, Advanced Multiple Crack Solutions, and Plug-In K-Solutions).

We are also including a section on tips and tricks to help users model some practical complex geometries (i.e.: continuing damage scenarios).

## For more information visit:

<http://www.afgrow.net/support/training.aspx>

A certificate of completion will be issued to participants upon completion of the training.

AFGROW Standard Training is also available at your location on request. We offer the standard class for a maximum of 16 participants.

## Syllabus

### Day 1

- Introduction
  - Fundamentals of Linear Elastic
  - Fracture Mechanics
- AFGROW Layout and Flow
- Basic Features
- Main Modules
  - Spectrum
  - Spectrum Filters
  - Stress Intensity/Beta Factors
    - Classic Cases
    - User-Defined Solutions
    - Beta Correction
    - Beta Modification
    - K-Solution Filters
- Growth Rate Models
  - Example Using Tabular Rate Data (Class Participation)

### Day 2

- Main Modules, Continued
  - Stress State and Failure Criteria
  - Retardation Models
  - Residual Stresses
- Preferences
- Units
- I/O Files
- Examples (Class Participation)
- Additional Capabilities
  - Advanced Models
  - Crack Initiation
  - Environmental Data

### Day 3

- AFGROW Tips and Tricks
  - Using Superposition & Compounding
  - Getting more out of Advanced Models
  - Generating Reports
  - Continuing Damage
- COM Automation (Class Participation)
- Creating Plug-In K-Solutions
- Class Discussion/Feedback

# AFGROW Advanced Training

## Syllabus

### Day 1: Creating crack growth rate models using the fracture mechanics database (table lookup and another model)

- Using AFMAT (Air Force fracture mechanics Material database)
- How to utilize data for similar materials
- Acquiring/Organizing data
- Fitting, verifying, and formatting data
- Importing and using data with AFGROW

### Day 2: Using load interaction models to predict crack growth rate data available in the fracture mechanics database and/or DTDH

- AFGROW load interaction models in depth
- Validating tabular crack growth rate data using constant amplitude test data
- Fitting AFGROW load interaction model parameters to match test results for typical fighter and transport spectra
- Retardation model tips and tricks

### Day 3: Practical life prediction examples

Discussion of life prediction issues

- Wing Attachment Fitting
- Multiple Load Path Structure
- Fail Safe/Multiple Load Path Structure
- One example proposed by users

### Day 4: Practical life prediction examples

- AFGROW Application Interface, Methods, Properties and Events
- Use COM to control AFGROW and perform repetitive tasks
- AFGROW Com interfaces, modifying AFGROW model, materials, prediction parameters, beta correction using COM API
- How to create different stress intensity factor solutions/continued damage models using COM API
- Hands-on examples (finding initial equivalent flaw size, residual strength plot generation, creating customized GUI

We offer advanced training classes for students who have completed the standard AFGROW basic training class. Students who have not attended the training class, but have practical experience using AFGROW will be able to benefit from this training. The classes are not offered on a regularly scheduled basis, but can be arranged by contacting us: [info@lextechcentral.com](mailto:info@lextechcentral.com)

There are currently four classes (one day per class), and a description of each class is available so that one or more can be scheduled as needed:

<http://www.afgrow.net/support/documents/AFGROW-Advanced-Training-Class-Course-Description.pdf>

A minimum of four (4) students are required for a class in the Dayton, OH area, and eight (8) students are required for classes held in other areas. Because of the amount of individual attention required, the maximum number of students for any advanced training class is twelve (12).

### Cost

\$350.00 per day per person

### Description

This class will familiarize students with our Fracture Mechanics Database and will provide more advanced training on how these data can be used with AFGROW. This will include customized data searches, advanced curve fitting, formatting, and validation with test data. The load interaction models in AFGROW will be explored in detail, and instruction on the use of interaction model parameters to fit test data will be provided. Practical life prediction examples will include wing attach fittings, multiple load path, and multiple crack problems.

Advanced COM automation training will be provided to assist students in complex and repetitive life prediction tasks.

A certificate of completion will be issued to participants upon completion of the training.

### Custom Training

Do you have other training you are looking for? If the offered training solutions do not meet your requirements, we can develop course that is tailored to your specific needs. This course might be a combination of topics from our standard and advanced classes or we can create a specialized material.