All components subjected to use will encounter stresses and strains that affect the performance and durability. Often, since stress and strain states cannot be exactly determined or predicted, some components may undergo failure to various degrees; these degrees range from degradation of performance through fracture of the component into one or more parts. Failure analysis is therefore a key engineering process that allows corrective actions to be taken so that, the probability of future failure can be significantly reduced.

A broken component will exhibit features on the fracture surface that allow physical root cause determination of the origin. In many cases, these features are of a magnitude where macroscopic visual examination will indicate root cause. Thus, being able to recognize and interpret macroscopic features will allow an engineer to more rapidly identify the source of the failure and begin redesign to minimize future reoccurrence.

This course is designed to give the essentials to understand these failures, and includes:

- How to properly perform a visual examination of a damaged assembly or component
- How to classify the failure mode (deformation, fracture, wear, corrosion, …)
- How to recognize brittle and ductile features at macro and micro scales
- Determination of the loading geometry (axial, bending, …) that allowed fracture to occur
- How to tell if the component was loaded in a manner not according to design
- How to recognize if unanticipated loads or environmental conditions contributed to the demise of the component

To register for the course, please contact Julie Nimer, ASM Detroit Chapter at asmdetroitchapter@gmail.com.

The class is limited to the first 30 participants to ensure a high level of interaction between the instructor and attendees.

The course is led by Deborah Aliya, a nationally-recognized expert in failure analysis and prevention. Since 1994, Aliya Analytical, Inc. has been providing failure prevention and materials characterization to create solutions to issues in multiple industries. A contributor of several sections in the ASM Handbook on Failure Analysis, Ms. Aliya has been active in the ASM International Affiliate Failure Analysis Society and its precursor, the FA Committee for over 25 years, and has presented failure analysis courses internationally. She is also a very active board member or the ASM West Michigan Chapter.