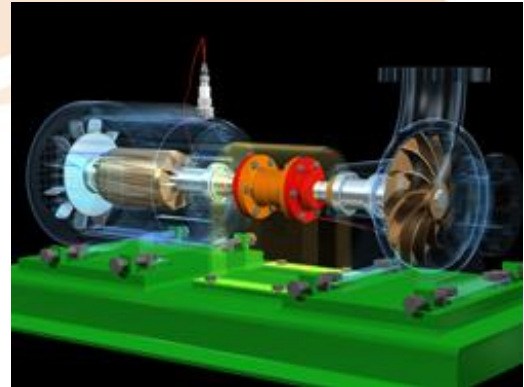


## Introductory Vibration Analysis

Mobius Institute's Introductory Vibration Analysis course is offered in public venues and by special arrangement at customer facilities throughout North America. This course is also offered by certified Training Partners in over 30 other countries around the world.

Our courses are uniquely understandable through the extensive use of 3D CAD animations of typical machinery found in plants and facilities of all types. These animations convey a better understanding of the machinery components and how faults affect the vibration that is transmitted through the machine.

Animated simulators allow the students to adjust the speed, severity of faults, measurement locations and so on to see how these differences manifest themselves in the vibration signal.



Registered students are given access to the online version of the course via the Mobius Institute Learning Zone before the class and for 6 months after course completion to assist them with converting the course information into practice. Our focus is on practical knowledge and understanding of machine knowledge, faults and how to recognize problems in time to plan for an outage and act before catastrophic failure or collateral damage occurs.

## ISO Category I and ASNT Level I Vibration Analysis

Public or on-site course conducted by an experienced, certified Mobius Institute instructor. The course follows ISO 1836-2:2003 and ASNT SNT-TC-1A Recommended Practice for training and certification of Category I or Level I vibration analysts.



This course includes a Course Manual, Quick Reference Guide, Mobius mouse pad with fault diagnostic reminders and pen. Examinations for certification are offered as an option at the end of the course.

All Mobius certified analysts receive personalized logos with their certification number and name for their own professional use. Mobius Institute also maintains a listing of all certified analysts on [mobiusinstitute.com](http://mobiusinstitute.com) and provides each analyst with a personal webpage.

## Course Description

Duration: 3-days Cat I / Level I, Optional Review & Certification Examination: 1-Day, 75% Passing Grade

The Introductory Vibration Analysis course is intended for personnel who are new to vibration monitoring and analysis, and for personnel who have limited vibration analysis experience. The course focuses on periodic, single channel data collection and analysis for condition based maintenance programs. A foundation is established for in-depth understanding of spectrum and waveform relationships. This is the ideal starting place for new vibration analysts, people collecting vibration data, and those who want a better understanding of vibration analysis and condition monitoring.

You will come away from this course with a very good understanding of the fundamentals; you will understand how to take good measurements (and understand the importance of repeatability); and you will be ready to begin analyzing vibration spectra. Topics covered include:

### Maintenance practices

- Breakdown, preventive, predictive and RCM

### Condition monitoring

- Review of condition monitoring technologies: Vibration, oil, wear particle, infrared, acoustic emission, electric motor testing

### Principles of vibration

- Motion, r.m.s./peak/peak-peak, frequency/period
- Displacement, velocity and acceleration
- Units and unit conversion
- Waveform and spectrum (FFT)
- Natural frequencies and generated frequencies
- Basic forcing frequency calculations

### Data acquisition

- Instrumentation
- Transducers and transducer mounting
- Measurement point naming conventions
- Routes/surveys: Loading and unloading the route
- Data collection

- o Following a route
- o Repeatable data collection
- o Test procedures
- o Observations: best utilizing your time in the field
- o Recognizing bad data

### **Equipment knowledge**

- o Rotating equipment types and applications
- o Rolling element bearings and journal bearings
- o Review of failure modes and appropriate use of condition monitoring technologies

### **Basic vibration analysis**

- o Overall level measurements
- o Spectrum analysis
  - o Harmonics, sidebands and the analysis process
  - o Alarm limits, trending and exception reports
- o Introduction to fault diagnosis:
  - o Imbalance, misalignment, looseness, eccentricity, resonance
  - o Defects associated with bearings, gears, belts, electric motors
- o Case studies will be presented to illustrate the analysis and fault diagnosis process. Attendees will perform analysis.

### **Review of ISO standards**