

Educational Services

Maximize Your Investment with Well-Trained Personnel



Basic Rotor Dynamic Analysis for Vibration Analysts (Category IV, Part One)

Course# 2034 (CEUs: 4.0)

This course is part one of the two courses required for the Category IV examination.

This 5-day class is designed to allow the students to better understand rotor dynamics and their options when facing a problem piece of equipment that is running at or close to its critical speed. This course will provide vibration analysts a road map to develop a plan to perform basic calculations to estimate the critical speeds of different types of machinery. Lab calculations will be performed by the students throughout the course to reinforce topics learned in the class. These techniques can be applied to all types of rotating machinery using either journal bearings or rolling element bearings.

The students will be able to calculate stiffness for rolling element bearings and journal bearings using the provided equations. Tables for viscosities, journal bearing damping and stiffness will be supplied, along with other materials required for a critical speed model. An extensive list of required equations for calculation of natural frequencies will also be provided. The single degree of freedom modeling will also be taught.

Upon completion of the course, students will have the skills to perform a hand calculation to accurately estimate the critical speed of a shaft. Additionally, the students will be able to develop the necessary parameters for the development of a computer rotor dynamic model.

Topics to be covered:

- Introduction to Basic Rotor Dynamics
- Natural Frequencies
- Free versus Forced Vibrations
- Stiffness
- Damping
- Natural Frequency Equations
- Forced Vibrations
- Amplification (Q) Factor calculation Methods
- Types of Journal Bearings
- Center Hung Rotors versus Overhung Rotors
- Rigid Rotors versus Flexible Rotors
- Subharmonic Resonance
- Shaft Instabilities
- Cracked Shafts
- Required Information for Critical Speed Analysis
- Field Testing for Modeling Requirements
- Rotor Modeling
- Shaft Hand Calculations
- Computer Modeling

Course Information:

- Date: September 9 to 13, 2019
- Time: 8:00 AM to 5:00 PM daily
- Price: \$2,800
- Location: Emerson Training Center
835 Innovation Drive, Knoxville, TN 37932
- Registration: To register, complete this **Registration Request**, or for more information, contact Emerson Educational Services at +1 800 338 8158.

Educational Services

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Training Courses

Emerson Educational Services is accredited by the International Association for Continuing Education and Training (IACET) and is accredited to issue the IACET CEU.

