DAY 1
Session Duration: 8 hours
→ Review of maintenance practices
→ Review of condition monitoring technologies
→ Principles of vibration
• Complete review of basics
• Waveform, spectrum (FFT), phase and orbits
• Understanding signals: modulation, beating, sum/difference
→ Data acquisition
• Transducer types: Non-contact displacement

DAY 2
Session Duration: 8 hours
→ Proximity probes, velocity sensors, and accelerometers
• Transducer selection
• Transducer mounting and natural frequency
• Measurement point selection
• Following routes, and test planning
• Common measurement errors
→ Signal processing
• Filters: Low pass, band pass, high pass, band stop
• Sampling, aliasing, dynamic range
• Resolution, Fmax, data collection time
• Averaging: linear, overlap, peak hold, time synchronous
• Windowing and leakage

DAY 3
Session Duration: 8 hours
→ Vibration analysis
• Spectrum analysis
• Time waveform analysis (introduction)
• Orbit analysis (introduction)
• Phase analysis: bubble diagrams and ODS
• Enveloping (demodulation), shock pulse, spike energy, PeakVue

DAY 4
Session Duration: 8 hours
→ Fault analysis
• Natural frequencies and resonances
• Imbalance, eccentricity and bent shaft
• Misalignment, cocked bearing and soft foot
• Mechanical looseness
• Rolling element bearing analysis
• Analysis of induction motors
• Analysis of gears

• Analysis of belt-driven machines
• Analysis of pumps, compressors, and fans

DAY 5
Session Duration: 6 hours
→ Equipment testing and diagnostics
• Impact testing and bump tests
• Phase analysis
→ Corrective action
• General maintenance repair activities
• Review of the balancing process
• Review of shaft alignment procedures
→ Running a successful condition monitoring program
• Setting baselines
• Setting alarms: band, envelope/mask, statistical
• Setting goals and expectations (avoiding common problems)
• Report generation
• Reporting success stories
→ Acceptance testing
→ Review of ISO standards