

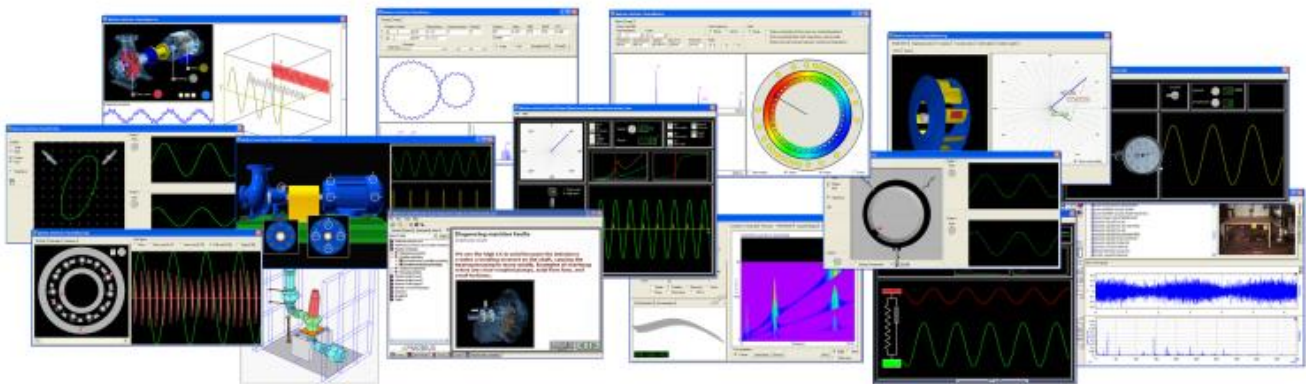
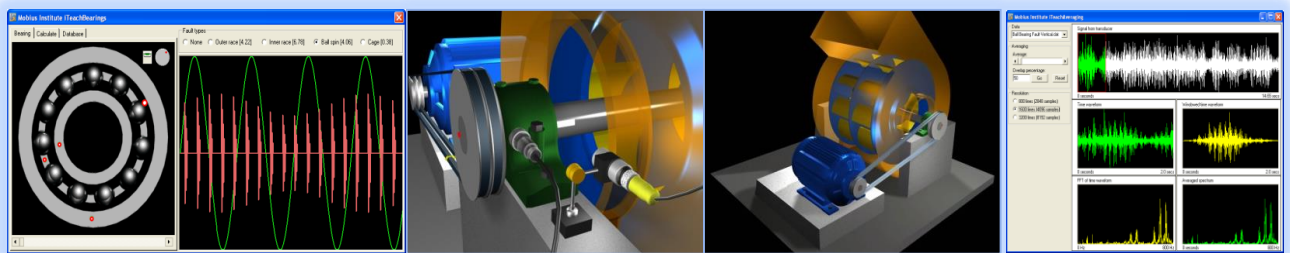
# 제 1회

## ISO 18436 MASTER VIBRATION ANALYST

### 교육 안내

## ISO 18436 Category IV

Master Vibration Analyst Training & Certification



[www.infaiTH.kr](http://www.infaiTH.kr)  
[www.Reliability.co.kr](http://www.Reliability.co.kr)

☐ 전 화 : 031-726-1672(대표)  
☐ 팩 스 : 031-726-1376  
☐ 주 소 : 16950 경기도 용인시 기흥구 흥덕중안로 120 유타워 1711호

플랜트 설비관리 솔루션 & 서비스 전문회사

고객의 성공을 기반으로正道를 걸어 가는 플랜트 설비관리 솔루션 서비스 회사 !

### Hybrid Online Learning & Public Classroom Training

Learn vibration analysis from the world's leading provider of training & certification.

Our Crystal Clear™ training methodology is unique, using hundreds of 3D animations and software simulations that make complex concepts easier to understand.

Mobius Institute is ISO/IEC 17024 and ISO 18436-1 accredited, meaning that you are assured that your certification meets the highest global standards, and our training teaches you everything you need to know according to the ISO 18436 standard for vibration analyst training.

### Category IV - Candidate Profile

- You have at least five years of vibration analysis experience
  - You want to be the chief diagnostic analyst or consultant
  - You want to understand all of the advanced measurement and analysis options
  - You want to understand fluid-film bearings, flexible rotors, their modeling, their testing and their potential fault conditions
  - You want to be able to diagnose and correct a wide range of conditions
  - You want to be able to balance rigid and flexible rotors using a range of techniques
- You are seeking to become certified to international standards (ISO-18436) by an accredited certification body

### CAT IV Course Contents (42 hours) : On-Line Learning Part I (동영상 교육 : 영어)

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Advanced signal processing including cross-channel measurements (phase, coherence, transfer functions, etc)</li> <li>• Structural dynamics (resonance, mass/stiffness/damping)</li> <li>• Resonance correction and isolation</li> <li>• Operating deflection shape analysis</li> <li>• Modal analysis</li> <li>• Balancing rigid and flexible rotors</li> <li>• Fluid film bearings</li> </ul> | <ul style="list-style-type: none"> <li>• Proximity probe and key phasor measurements</li> <li>• Orbits and centerline diagrams</li> <li>• Polar, Bode, and Full spectrum plots</li> <li>• Rotor dynamics and modeling</li> <li>• Fault conditions: unbalance, preload, misalignment, oil whip and whirl, rubs and looseness</li> <li>• Standards (ISO, IEC, API)</li> </ul> |
|---|---|

### CAT IV Course Contents (42 hours) : Public Learning Part II (교육장 교육 : 영어)

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Advanced signal processing including cross-channel measurements (phase, coherence, transfer functions, etc)</li> <li>• Structural dynamics (resonance, mass/stiffness/damping)</li> <li>• Resonance correction and isolation</li> <li>• Operating deflection shape analysis</li> <li>• Modal analysis</li> <li>• Balancing rigid and flexible rotors</li> <li>• Fluid film bearings</li> </ul> | <ul style="list-style-type: none"> <li>• Proximity probe and key phasor measurements</li> <li>• Orbits and centerline diagrams</li> <li>• Polar, Bode, and Full spectrum plots</li> <li>• Rotor dynamics and modeling</li> <li>• Fault conditions: unbalance, preload, misalignment, oil whip and whirl, rubs and looseness</li> <li>• Standards (ISO, IEC, API)</li> </ul> |
|---|---|

교육 참가 비용 : ₩7,920,000 (부가세 포함)

< 온라인(3,630,000) + 교육장 교육(3,630,000) + 시험 응시(660,000) >

## Online Learning & Public Classroom Course

The Master Vibration Analyst course is intended for personnel who have at least five years vibration analysis experience and Category III certification by a recognized certification body. The course provides an in-depth study of advanced signal processing, cross channel measurements, dynamics (mass/stiffness/damping, natural frequencies, modes), resonance testing (run-up/coast down tests, impact tests, ODS, modal analysis), corrective action (flow control, resonance correction, isolation and damping), proximity probe and casing measurements, orbit and centerline plot analysis, rotor dynamics (natural frequencies, modeling), journal bearings (design, fluid film instabilities), torsional vibration and flexible rotor balancing.

This course will take a practical approach to these subjects. Animations and software simulations will be used to make these topics easier to understand. Mathematics and theoretical derivations will be kept to an absolute minimum. Utilizing advanced 3D animations and software simulations, topics that were possibly beyond the reach of many vibration analysts will be far easier to understand. The aim is to provide the level of knowledge that enables the vibration analyst to understand these topics to a high degree, with the expectation that if advanced analysis, design modification or modeling is required, a specialist in those areas will be called-in.

## Detailed topic list:

### Principles of vibration

- Vectors, modulation
- Phase
- Natural frequency, resonance, critical speeds
- Force, response, damping, stiffness

### Data acquisition

- Test planning
- Test procedures

### Reporting and documentation

- Vibration diagnostics reports

### Signal processing

- RMS / peak detection
- Analog/digital conversion
- Analog sampling, digital sampling
- FFT computation
- Filters: low pass, high pass, band pass, tracking
- Anti-aliasing
- Bandwidth, resolution
- Noise reduction
- Averaging: linear, synchronous time, exponential
- Dynamic range
- Signal-to-noise ratio
- Spectral maps

### Fault analysis

- Spectrum analysis, harmonics, sidebands
- Time waveform analysis

- Phase analysis
- Transient analysis
- Enveloping
- Electric motor defects
- Flow induced vibration, aerodynamics and liquids
- General fault recognition

### Corrective action

- Flow control
- Isolation and damping
- Resonance control

### Equipment testing and diagnostics

- Impact testing
- Forced response testing
- Transient analysis
- Transfer functions
- Damping evaluation
- Cross channel phase, coherence
- Operating deflection shapes
- Modal analysis

### Reference standards

- ISO
- IEC
- Relevant national standards

### Fault severity determination

- Spectrum analysis
- Time waveform analysis, orbit analysis
- Severity charts, graphs and formula

## Principles of vibration

- Natural frequency, resonance, critical speeds
- Force, response, damping, stiffness
- Instabilities, non-linear systems
- Torsional vibration
- Instrumentation
- Proximity probe operation, conventions, glitch removal
- Shaft and casing measurements

## Fault analysis

- Orbit analysis
- Shaft centerline analysis
- Transient analysis
- Unbalance, bent shaft, cracked shaft, eccentricity

- Rubs, instabilities
- Resonance and critical speeds
- Turbomachinery

## Corrective action

- Low and high speed shop balancing
- Field balancing (single plane, two plane, static/couple, flexible rotor)

## Rotor/bearing dynamics

- Rotor/bearing dynamics
- Rotor characteristics
- Rotor modeling (rotor, wheels, bearings, aerodynamic effects)
- Bearing characteristics (fluid film bearings, housing and supports, seals, couplings)

# Course Review & Certification Exam Preparation

A key component of the Mobius Institute ISO Category IV hybrid course is the public classroom course component. The aim of the five-day classroom session is to combine education, review and exam preparation. Attendees will learn, and attendees will be tested. The sessions will be very interactive with ample opportunity to ask questions. As we review the topics covered in the Online Learning portion of the course, we will also challenge you with exam standard practical questions.

On the final day of the review course, you will take the ISO 18436 Category IV certification examination. The exam takes five hours to complete.

## 교육 참가 신청서

신청 교육 과정	<input type="checkbox"/> MASTER VIBRATION ANALYST CAT IV
시험 응시 여부	<input type="checkbox"/> 시험 응시 <input type="checkbox"/> 시험 미 응시
신청 교육 기간	2019년 10 월 07 일 ~ 2019년 10 월 14 일 ( 5 일간)
회사명	한글 :  영문 :
주소	(                      )
부서명 / 직책	
성함 (한글)	
성함 (여권 영문)	
직장 연락처	
휴대폰	
이메일	
결제 방법	현금 송금 (                      ) 신용카드 결제 (                      )
차량 이용(주차)	차량 이용 주차권 요청 (                      )
기타 요청사항	

상기와 같이 교육 참가 신청을 합니다.

2019년    월    일

신청자 :                      (서명)

## 교육장 찾아 오시는 길 및 숙소 안내

### SRT로 오시는 길

동탄역에서 택시 탑승 (약25분 소요) : 흥덕중학교 앞 하차

### 수원역에서 오시는 길

수원역에서 분당선 승차 청명역 3번 출구로 나와서  
34번 버스 승차 흥덕중학교앞 정류장에서 하차 (40분 소요)

### 자동차로 오시는 방법

경부고속도로 수원/신갈 IC에서 나와 10뿐 거리에 위치  
〈내비게이션 검색〉  
“흥덕 유타워”  
경기도 용인시 기흥구 흥덕중앙로120  
〈 주차비는 1일 ₩8,000 주차권을 구입하셔야 합니다 〉

### 고속버스로 오시는 길

수원 종합 터미널 또는 용인 신갈 정류장에서 하차 택시 탑승

숙소는 회사 근처 모텔 또는 호텔을 안내하여 드리오니  
예약은 본인이 직접 하시면 됩니다.

