

# UCAT-I ISO Category I

ULTRASOUND ANALYSIS TRAINING  
& CERTIFICATION



[www.mobiusinstitute.com](http://www.mobiusinstitute.com)

# LEARN THE MOBIUS WAY

## WHY LEARN WITH MOBIUS INSTITUTE™?

**There are three major reasons why over 5,000 students choose Mobius Institute every year, and why you should, therefore, choose Mobius Institute for your ultrasound training and certification.**

- We make complex topics simple with amazing 3D animations and simulations that make you say, *"Ah, now I get it!"*
- We give you access to the entire course before the class begins so you are better prepared, and for six months after the course, just in case you still have questions.
- We use anonymous, stress-free polling throughout the course, so you know if you truly understand each topic, and the instructor knows not to move on to the next topic - *no student is left behind.*



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## WITH MOBIUS INSTITUTE™, YOU CAN *LEARN YOUR WAY*.

We offer the ultimate flexibility. See the course details for more information.



### CLASSROOM INSTRUCTOR-LED COURSES

We have training partners in 60 countries, offering 23 languages.



### VIRTUAL INSTRUCTOR-LED COURSES

Attend a virtual course - just like a live course, but you learn via GoToMeeting.



### PRIVATE ON-SITE INSTRUCTOR-LED COURSES

Have the instructor come to your site to save your precious time and money (and health).



### ONLINE VIDEO COURSES

Traditional eLearning courses and iLearnReliability Learning Management System (LMS) courses

## WHY BECOME CERTIFIED BY THE MOBIUS INSTITUTE BOARD OF CERTIFICATION™?

### There are so many benefits to becoming certified:

- You should be recognized for your achievements; not everyone is up to the challenge of understanding ultrasound analysis, let alone successfully collecting data and utilizing it
- Being certified by an accredited certification organization is a major step up from simply passing a test. Yes, the process is a little more complicated and stricter, but that is for very good reasons
- The educational process is extremely valuable, but being certified tells an employer (or a consulting client) that you are capable of doing an important job

Almost 40,000 students around the world, just like you, chose Mobius Institute for a good reason.

You will receive a digitally encrypted certificate, an ID card, and a personalized logo that you should use in email signatures and elsewhere that you want people to know about your achievements.

# UCAT-I Ultrasound Analysis

## ISO 18436-8 Category I

Learn to be a confident and effective ultrasound technician - capable of diagnosing faults, detecting costly steam and air leaks, and precision lubricating bearings - with advanced 3D animations and interactive simulations that make everything easy to understand.

Congratulations on the decision to become an ultrasound specialist. Ultrasound is incredibly powerful and versatile, so there is a lot to learn. The good news is you are in the right place. Our UCAT-I ISO Category I course will set you up for success.

We will help you understand why ultrasound analysis is important. You will gain a solid understanding of the fundamentals of ultrasound, lubrication, and leak detection. You will learn how to take quality, dependable measurements, and you will begin the process of understanding how to diagnose common faults.

Once you complete the training, you can take the exam with confidence, and become certified to ISO 18436-8 Category I via the internationally respected Mobius Institute Board of Certification [MIBoC]. The MIBoC certification is accredited to ISO/IEC 17024.

### UCAT-I CANDIDATE PROFILE

**This course is intended for the ultrasound analyst and technician analyst who will:**

- Collect ultrasound data to detect fault conditions in rotating machinery, electrical equipment, and a host of other equipment including valves, hydraulics, steam traps, and more
- Detect leaks in compressed air and steam systems
- Grease lubricate bearings with precision
- Use the training and certification as the start of a new and rewarding career as an ultrasound technician



# UCAT-I Ultrasound Analysis ISO 18436-8 Category I

## WHAT WILL YOU GAIN FROM TAKING THIS COURSE?

There are so many benefits to taking this course. You will learn...

- About condition monitoring, including a summary of the most common technologies
- About reliability improvement
- How ultrasound testing and ultrasound-assisted lubrication plays a key role in reliability improvement
- About the fundamentals of sound: frequency, amplitude, wavelength, pitch, and period
- How it is measured and quantified: dB, RMS, peak, kurtosis, and crest factor
- How sound behaves: speed of sound, reflection, refraction, and transmission
- How ultrasound is detected in industrial settings
- How to take dependable, repeatable, high-quality readings
- About listening to ultrasound, and capturing and interpreting waveforms and spectra
- About how to set up software systems, including the naming of assets
- About impacts, friction, turbulence, cavitation, arcing, tracking, corona, and partial discharge
- How it can be used to detect faults in bearings, electrical systems, steam traps, valves, hydraulic equipment, pumps, compressors, and other equipment
- About how hydraulics, electrical systems, steam systems, compressors, bearings, pumps, valves, steam traps, and other components work – all with vivid, realistic 3D animations
- How to correctly lubricate bearings: not too much, not too little
- How to collect data and perform tests safely
- How to generate reports that will provide people with the information they really need

## UCAT I FAST FACTS

### Duration:

32 hours, typically over four days

### Format:

- Live public course
- On-site course
- Virtual online course
- Video distance learning online course

### Compliance:

- Training and certification: ISO 18436-8
- Certification: ISO 18436-1, ISO/IEC 17024
- Training: ISO 18436-3

### Exam:

- Two hours
- 60 multiple-choice questions
- 70% passing grade
- Can be taken online or in-person at the course

### Certification requirements:

- Training course completed
- 6-months of work experience, verified by an independent person
- Pass a hearing test
- Valid for 5 years

### Pre-study:

- Access to the “Learning Zone” upon registration and payment
- Complete set of videos covering every topic
- An excellent way to be prepared and get the most from the course

### Post-study:

- Continue to access the Learning Zone for 6-months after the course
- Continue learning, without charge, on MOBIUS CONNECT® via [mobiusconnect.com](http://mobiusconnect.com)





*Mobius Institute Board of Certification is an accredited certification body per ISO/IEC 17024 and ISO 18436-1 authorized to provide certification in accordance with ISO 18436-1 and 18436-2.*

*Mobius Institute Board of Certification (MIBoC) is an impartial and independent entity that is directed by scheme and technical committees to ensure that its certification meets or exceeds the requirements defined by the applicable International Organization for Standardization, ISO 18436 standards.*



*MOBIUS INSTITUTE is a worldwide provider of Reliability Improvement, Condition Monitoring and Precision Maintenance education to industrial plant managers, reliability engineers, and condition monitoring technicians, allowing plants to be successful in implementing Reliability Improvement programs through delivery of more easily understandable and comprehensive training of Reliability and Vibration Analysis via public, in-plant and online education programs.*

For more information about additional training courses, software tools, industry terminology and definitions, accredited certification, and specific course details, visit the Mobius Institute website.

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**The maintenance and  
reliability industry's  
professional network.**



- Maintenance practices
  - Reactive, preventive, condition-based, proactive
  - How to decide between them
- Condition monitoring
  - Why it works
  - Vibration, infrared, oil analysis, wear particle analysis, and electric motor testing
  - Detecting faults, root causes, and quality control
  - Acceptance testing
- Principles of sound
  - What is sound, sound waves, and sine waves
  - Frequency, pitch, period, wavelength
  - Acoustic impedance, reflection, and transmission with different media (materials)
  - The inverse distance rule
- The application of ultrasound
  - Friction, turbulence, impacting, arcing, tracking, corona
- Ultrasound measurement
  - Heterodyning
  - The decibel dB scale
  - Metrics: RMS, Peak, crest factor, and Kurtosis
  - Listening versus measuring
  - Severity determination
- Collecting test data
  - Safety precautions
  - Sensor types: contact vs non-contact, magnets, horns, parabolic dishes
  - Collecting good data
  - Sensitivity validation
  - Repeatability
  - Sensor positioning
  - Shielding and competing ultrasound sources
  - Waveforms and spectra
- Data storage and management
  - Setting up a good database
  - ISO 14224 as a guide
- Leak detection
  - Steam systems
  - Compressed air systems and gas
  - Pressurized systems and systems under vacuum
  - Leak detection
  - Tightness testing
- Electrical testing
  - Safety precautions
  - Corona, arcing, tracking
  - Partial discharge
- Lubrication
  - Concerns with traditional methods
  - On-condition lubrication
  - Avoiding over-greasing or under-greasing



- Testing different assets types
  - Valves, steam traps, bearings (low speed and high speed), compressors, pumps, hydraulic systems
  - A detailed explanation of all the above equipment and their failure modes
- Report generation
  - Providing actionable information
- Case studies - Many case studies are presented throughout the course





### > CAN I SKIP THE CATEGORY I COURSE AND CERTIFICATION?

No, it is a requirement to be UCAT-I trained and certified before you move to UCAT-II.

### > WILL I RECEIVE PRE-COURSE STUDY MATERIALS?

Every registered student will receive an instructional email to finalize their course registration. They will also receive a link to their personal Learning Zone account. The account provides a digital version of the coursebook and also a series of folders containing movies. These movies are actual course videos, recorded in a studio, and contain the same content taught in the Instructor-led course the student is registered in. The Learning Zone account may be used for pre-course study materials, review during the course week, reference after the course, or used to re-take the course and re-sit your certification exam. The account is activated at the time the student registers for the course and expires 6 months after the close date of the course they will be attending.

### > CAN I BUY THE LEARNING ZONE ACCOUNT AND USE IT TO STUDY FOR THE CERTIFICATION EXAM?

No, but we do offer Category I Distance Learning (DL) courses which are the online equivalent to our Public courses. The training material content is fully ISO 18436 compliant and you will be qualified to take the certification exam once you have completed the DL course.

You will find the distance learning courses on our shopping cart.

### > DO YOU OFFER ON-SITE INSTRUCTOR LED COURSES?

Yes, we offer a range of courses that can be conducted onsite, including our Category I ultrasound courses, Asset Reliability Practitioner® ARP, vibration analysis, balancing, alignment, and others. If you are in North America, please email [learn@mobiusinstitute.com](mailto:learn@mobiusinstitute.com) for a quotation. Outside North America, contact your local training partner.

### > MAY I TAKE ONE OF YOUR COURSES IF I AM NOT INTERESTED IN BECOMING CERTIFIED OR IF I HAVE INSUFFICIENT EXPERIENCE FOR CERTIFICATION?

Yes, our courses are open to the public, regardless of experience. If you are involved in ultrasound measurement and analysis in any capacity, such as sales, marketing, engineering, design, or reliability, you will come away with a far better understanding of how machines are monitored, how faults develop, and what can be done to determine what faults actually exist in a machine. All attendees receive certificates of completion. Candidates without sufficient experience will still receive a certificate if they pass the exam, but it will note that their experience was insufficient for ISO certification at the time.

### > AFTER I ATTEND YOUR COURSE AND TAKE THE EXAM, WHEN WILL I RECEIVE NOTIFICATIONS AS TO WHETHER I PASSED, AND WHEN WILL I RECEIVE MY CERTIFICATE?

You will receive notification of your results 5-10 days after the exam has been received at our Australian office. If you have passed the exam and met all certification requirements, you will receive your Digital Certificate 10-15 days after your exam results notification email.





### > HOW LONG IS THE CERTIFICATION VALID?

Certification is valid for five (5) years.

### > HOW DO I RENEW MY CERTIFICATION?

We will endeavor to contact you before your certification expires, therefore it is important that you keep your TMS records up to date (TMS is the training management system you will use to register for the course and for certification). If you change roles, it is essential that you update your records. We also invite you to set a reminder in your calendar for five years hence to contact us.

### > HOW DO I QUALIFY FOR RENEWAL?

As per the standard, we do not require you to attend our conferences or take our courses, however, we hope you will take advantage of [www.mobiusconnect.com](http://www.mobiusconnect.com) and the sites linked to Mobius CONNECT® so that your knowledge remains current. These sites are free of charge. When it is time to renew your certification, we will ask you to nominate an independent person who can provide evidence of continued work experience in the field of ultrasound condition monitoring for the previous five years without significant interruption. You will also be required to submit evidence of passing a hearing test at the time of renewal. There will be a small fee to renew your digital certificate and to renew your certification status with the accreditation body.

### > WHAT ARE THE EXPERIENCE REQUIREMENTS FOR UCAT I?

You must have six months of experience generally associated with maintenance, reliability, and ultrasound testing. You will be asked to nominate an independent person who can verify that you have that experience.

### > WHAT IS THE HEARING TEST?

As per the requirements of ISO 18436-8, candidates should be given hearing examinations to ensure natural or corrected hearing acuity exists in at least one ear. A record of the results should be retained and presented to MIBoC upon request. The individual should be capable of hearing a standard pure tone in an audiometry exam with results of an average of 25 dB hearing level or lower. This examination should be administered upon initial certification and upon renewal, be administered by a licensed professional, and a record of the test made available to MIBoC upon request.

Candidates who do not provide a record of passing the hearing test will receive conditional certification under which it becomes the responsibility of their employer to assess the candidate's hearing acuity and their suitability to perform ultrasound data collection and/or analysis. This condition of certification will be noted on the candidate's certificate.

