

Measurement Uncertainty Applications - Module Definition Form

Module definition	
Module code	MUAP
MDF Version	1.0
MDF Date	September 2020
Course details	
Module Title	Measurement Uncertainty Applications
Learning Pathway	Measurement Uncertainty
Module Lead	Stephen MacDonald
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Course Delivery	
Learning type	<ul style="list-style-type: none"> • Live presentations • Online presentations • Virtual tutorials
Student requirements	
Requirements	<ul style="list-style-type: none"> • Internet connection • Access to Zoom or Microsoft Teams (Individual cohort requirements specified upon registration) • Access to spreadsheet software (Excel, Google Sheets)
Pre requisites	Measurement Uncertainty Fundamentals (MUF), Measurement Uncertainty Advanced (MUA)
Study commitment	
Expected study time	2-3 hours per week
Course duration	8 weeks
Module synopsis	
<p>This module focuses on applying the learning from the first two modules (MUF and MUA) to demonstrate how, and why MU is so much more than measuring our CV and in what situations it can be extremely beneficial to a laboratory to use it.</p>	

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We will cover IQC, EQA, result interpretation, method comparisons, calibration frequency and many other, otherwise unconsidered sources of laboratory performance that MU is essential for.

Content outline

This module focuses on Applications of MU in laboratory processes:

- Internal Quality control, rule setting, performance expectations, IQC limits
- Calibration - acceptability, frequency, interpretation
- Result interpretation - individual results, longitudinal results, results in panels of tests, cross disciplinary interpretation
- EQA - acceptable performance, interpretation of results

Key resources

Online

pathologymu.com
pathologyuncertainty.com

Learning Outcomes

All modules provided at pathologymu.com follow the same framework of 6 steps as a pathway to achieve the module learning outcomes. For MU Advanced they are:

Type	Standard to achieve
Knowledge and Understanding	Upon successful completion of this module, delegates will have developed an appreciation of how MU can be applied in the laboratory. So much more than usually thought to be this is where the possibilities of the application of MU come to the fore
Comprehension	By the end of the module the delegates shall be confident in applying their gained skills and knowledge and understand why they are using those skills Delegates will be able to explain, and justify, what approaches have been taken in their local approach and why specific processes particularly lend themselves to incorporating MU
Application	From the outset of the module delegates shall learn how best to choose the most suitable method, even if it is a more complex

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	approach. As mentioned above many different aspects of the quality process will incorporate these techniques
Analysis	Being able to review processes and apply more complex techniques, and to explain why they are the most appropriate. Why sometimes the simple approach is not only incorrect but potentially dangerous
Synthesis	Application of the skills learnt during the course project will encourage every delegate to have the confidence to work autonomously, including having the skill set to develop new systems in their own repertoire
Evaluation	Upon completion of this first module delegates will have all the skills required to develop and implement a holistic approach to continual evaluation and improvement in performance. This allows an engagement between departments, and sections within departments in a common system.
Learning structure	
Live Presentations	Hours: 2 Details: Project progress updates and reviews of material covered in the online learning.
Online presentations	Hours: 20+ hours of online instructional content. Learning outcomes: All learning outcomes Details: Each topic is presented in a sequential pathway, each topic building on the previous. Topics are opened weekly.
Virtual tutorials	Hours: 4 Learning outcomes: Details: These sessions are specifically designed to supplement the online learning throughout the course. The facilitator will review all content and extend the topics whilst at the same time approaching any content that needs clarification. Each session represents a checkpoint in the pathway. Successful completion of the online content and tutorial session is dependent on the learning objectives being achieved.
Assessments	
Formative	Method: Online quizzes and short exercises to support learning and

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Assessments	<p>develop the skills being taught in the online and tutorial sessions. A scientifically proven methodology for guaranteeing information retention and understanding is used. Constant feedback is provided to ensure understanding at all stages</p> <p>Learning Outcomes: All learning outcomes</p> <p>Weighting: 0%, but required to be completed to progress to the next topic</p>
Summative Assessments:	<p>Method: Submission of small reports demonstrating understanding and application of the taught course content. Each major topic within the module will be assessed separately and aggregated results being applied to the final achievement</p> <p>Learning Outcomes: All learning outcomes</p> <p>Weighting: 20 %, (2 submissions of 10%)</p>
Course Project	<p>Method: Delivery of a group project demonstrating critical evaluation of the course content and appropriate application to a methodology of the cohorts choosing. This will culminate in a submission to a peer reviewed publication.</p> <p>Learning Outcomes: All learning outcomes</p> <p>Weighting: 80%</p>
Course completion	<p>Attendees will receive a pass/fail for the module. Successful completion of this module completes the Measurement Uncertainty Pathway</p>