Foundation Degree (Fd) in Metrology

Summary

The world’s first and only Foundation Degree in Metrology is a vocational qualification that has been developed in collaboration with employers to ensure that the learning and skills acquired are those that employers need.

The programme is designed to introduce you to the principles and practices of metrology in the workplace. The course aims to develop your understanding of different measurement systems across national and international standards, and to develop your working knowledge of measurement methods and applied uncertainty for measurement and calibration.

Benefits of the Foundation Degree in Metrology

For businesses:

- Improved company performance, productivity and innovation
- Developing, up-skilling staff and improving retention
- Helping develop staff in line with an organisation’s strategic direction
- An enhanced contribution by employees to company performance, productivity and innovation developing transferable skills, enhancing contributions from employees
- Process capability improvement

For individuals:

- Flexible entry requirements - students do not necessarily need traditional academic qualifications to gain entry onto a Foundation level programme
- Studied on a part time basis which can integrate with work commitments
- Achieve the National Physical Laboratory’s Dimensional Measurement Training award at Levels 1 and 2
- Provides a recognised professional qualification
- Contributes to your continuing professional development

Programme content

To successfully complete the course you will need to complete 12 modules over 2 years. Year 1 involves 19 days of tuition, Year 2 involves 12 days of tuition. Nominally you will attend two lectures/practical sessions per module, supported with independent work related study and coursework. Integration of your work activity will be encouraged to enhance your learning.

Short module descriptors can be found on the following pages.
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Level One Modules

F100EC - Study Skills
This module aims to introduce students to a range of key concepts and techniques that will enable them to study effectively at Foundation Degree level and to identify how these skills can assist in becoming more effective at work.
It is targeted at students who are entering Higher Education for the first time or who are returning after a significant gap. Overall it seeks to help students become confident and competent in their studying and to apply similar skills in the work place.
The module covers study skills and academic practice for Higher Education, along with concepts of self-management, reflection and personal development planning.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 20 hrs, Independent study 110hrs, Assessment activities-work based 70hrs)

F101EC - Introduction to Metrology
This module is an introduction to inspection and metrology principles and practice. Students will examine the application of analysis of capabilities, understanding of limitations and risks. Students will be able to complete an analysis of their own organisational capabilities and present this to the group with a critique of Metrology within industry and their own organisational approach. The presentation will also have informed conclusions and recommendations.
Within this module students will complete National Physical Laboratory level 1 metrology training.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)

F102EC - Mathematics for Metrology
This module introduces students to Mathematics in Metrology, exploring disciplines such as torque, mass, temperature and vibration, (to cover the main disciplines within chemical, mechanical and nuclear industries). The students will be able to identify and evaluate mathematical methods in Metrology - algebra, transformation of formulae, trigonometry, statistical mathematics, application of mathematics for the collection of accurate and precise data, analysis tools and application. The module will also introduce Mathematics for Uncertainty Budgeting and investigate the application of Least Squares Fit. The students will evaluate their organisation and make informed conclusions and recommendations for further learning.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)
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F103EC- Engineering Science for Metrology
The aim of this module is to develop the student’s understanding of the science of metrology. The module will analyse the use of measurement units and national/international standards across the sciences. Students will study the application of standards for good measurement.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)

F104EC- Standards & Traceability in Metrology
This module aims to develop the student’s understanding of calibration and traceability in measurement to national and international standards. It evaluates the chain of traceability including the role of the National Physical Laboratory (NPL) and the United Kingdom Accreditation Service (UKAS). Students will examine the process of gaining and maintaining accreditation via United Kingdom Accreditation Services. The module will review the systems and process involved in accreditation including maintenance of records and systems, in line with the appropriate national and international standards. Students will develop the ability to define a plan for accreditation for their own organisation via United Kingdom Accreditation Services.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)

F105EC- Measurement Methods for Metrology
This module aims to develop the students understanding of the importance of accurate traceable measurement. Students will explore questions such as “why do we measure”, “how accurate do we want to be” “how accurate can we be" and “why”. This module enables the students to explore further their organisational capabilities of measurement by applying the knowledge gained to date. To identify the different disciplines being applied (Time, Frequency, and Resistance for example).
Within this module students will be required to complete and pass the National Physical Laboratory level 2 certificated metrology training.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)
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Level Two Modules

F200EC- Uncertainty in Measurement
This module aims to introduce the student to applied uncertainty for measurement and calibration. Students will gain an understanding of the terms used in measurement uncertainty including random and systematic errors, uncertainty estimates and combined uncertainties. Students will gain a clear understanding of the research and publications concerning uncertainty of measurement including the Guide to the Expression of Uncertainty in Measurement standard (GUM). The module will develop student’s working knowledge of applied uncertainty for complete measurement and will enable informed discussion on uncertainty as a dispersion of values.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)

F201EC- Measurement Systems
This module aims to develop the student’s understanding of different measurement systems testing and their selection regarding “fit for purpose”. Students will study the characteristics of different measurement systems, looking at the various measurement units and disciplines. They will gain an understanding of comparative measurement and evaluate against direct measurement systems. Students will evaluate correct selection testing and verification of systems for measurement.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)

F202EC- Professional Practice in Metrology 1
This is the first of two “specialist” modules that allow Level 2 students to develop their understanding of metrology focussed on a specific area. These areas of specialisation will be in line with organisational requirements. The module aims to develop the student’s ability to identify and complete a review of company documentation, procedures and processes involving the equipment. Students should be able to apply this as a controlled process in the work place with clear aims and objectives for the analysis and improvement of performance.

CATS points: 20
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)
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**F203EC- Professional Practice in Metrology 2**

This is the second of two “specialist” modules developing the students understanding of a more focussed area of metrology. Students will develop the skills to perform an analysis of the capability of measurement systems. Students should be able to apply this as a controlled process in the work place with clear aims and objectives for the analysis and improvement of performance. The module aims to develop the student’s ability to identify and complete a full review of company documentation, procedures and processes involving the equipment. Further to the first specialist module the students will develop their ability to identify improvements in terms of both the equipment and the process selected for measurement.

CATS points: 20  
Total student study hours: 200 hours (Lectures/Tutorials 40 hrs, Independent study 90hrs, Assessment activities-work based 70hrs)

**F204EC- Metrology Project- Double Module**

This module aims to develop the student’s ability to identify a suitable work based problem that requires improvement with the application of metrology principles. Students will study the process of completing a full review of a situation, performing a detailed analysis and making improvements where appropriate.

CATS points: 40  
Total student study hours: 400 hours (Lectures/Tutorials 40 hrs, Independent study 220hrs, Assessment activities-work based 140hrs)

**Entry Requirements**

The normal entry requirement is passes in four subjects, which must include:

- GCSEs (normally at grade C or above) to include English Language and Mathematics (or equivalent); and
- At least 40 points on the national tariff in one subject at GCE or VCE A-level (or a VCE double award) or equivalent; or
- At least 60 points on the national tariff in at least one subject at GCE or VCE Advanced Supplementary (‘AS’) level where the student has attempted and has been fully assessed in, but failed to achieve, and A-level

Or

Those without formal qualifications, but with significant relevant work experience and in appropriate employment. The University, at its discretion, may also admit to the programme students who do not fully meet the aforementioned categories.
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Tuition Fees

Tuition fees for this two year part time course are currently £6,200 for year one and £4,500 for year two. Please note if you already possess NPL level 1 and 2 the cost for year one will be reduced to £4,500.

How to apply

Those wishing to study this course can apply online at [www.coventry.ac.uk](http://www.coventry.ac.uk) or via a postal application. A part time application form can be requested on the details before or found on our website. Please contact us on the details below if you require any further information.

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