

IN ASSOCIATION WITH

SCIENCE CITY RESEARCH ALLIANCE

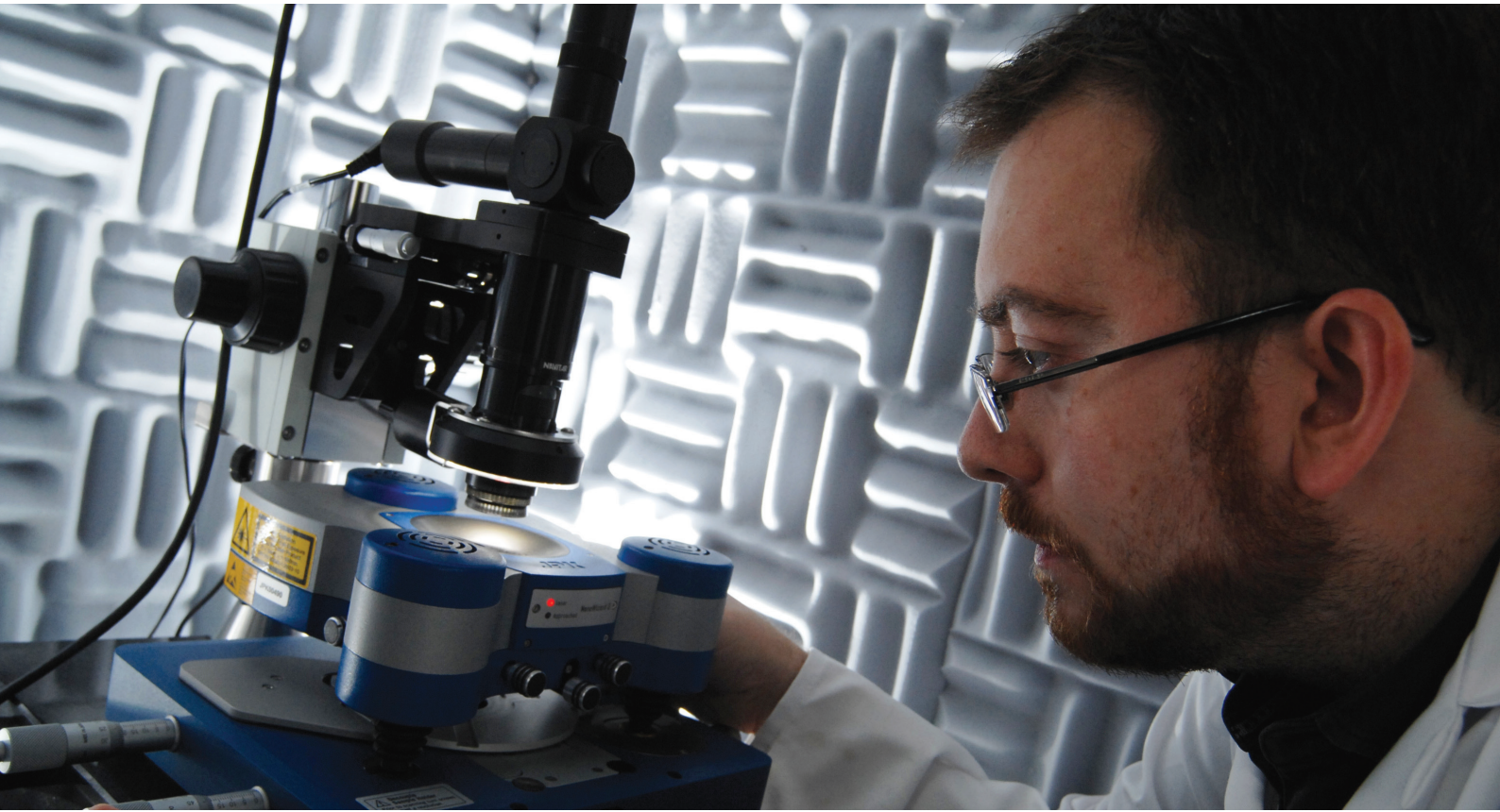
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SURFACE CHARACTERISATION OF MATERIALS - TRAINING COURSE FOR INDUSTRY

Venue: University of Birmingham, School of Chemical Engineering, Birmingham B15 2TT
Dates: 18th and 19th April 2012

OVERVIEW

This 2 day programme couples lecture-style training with demonstrations and hands-on experience in a laboratory setting together with informal discussion periods and workshop sessions. It will cover aspects of several surface characterisation techniques and respective instrumentation together with a balanced view of both the relative advantages and limitations. The course will be delivered by trainers experienced in the field of materials surface characterisation and analysis.

BACKGROUND

The Science City Research Alliance is a strategic union between two of the leading research universities in the Midlands, the University of Birmingham and the University of Warwick. The Alliance was formed under the Birmingham Science City initiative and has benefited from a multi-million pound investment by Advantage West Midlands (AWM) and the European Regional Development Fund (ERDF) in the technology areas of Advanced Materials, Energy Futures and Translational Medicine.

The trainers have many years experience of dealing with material physical property characterisation across a wide array of techniques. They are well versed in teaching practise and have performed significant work for industry in a variety of applications for market sectors including automotive, aerospace, paint application, food, health and hygiene, motorsport, pharmaceutical and electronics.

KEY TOPICS

3D non-contact profiling will be described as a technique to measure surface topography and wear volume through three-dimensional surface profiling.

The basics of tribological measurements of friction, lubrication and wear will be included and the use of equipment including a nanotribometer. This technique can be applied to contact mechanics of polymers, mammalian skin, particles, powders, coatings and fibres etc.

Nanoindentation will be covered, which is used to measure mechanical properties and scratch characteristics including fatigue and wear. Hardness and modulus may be assessed on the nanoscale using diamond-coated indenters. Applications include measuring mechanical properties of coatings, particles, granules and compacts etc.

The atomic force microscope will be described, which is capable of imaging in air and fluids as well as making electrical measurements. This technique can be applied to samples such as nanoparticles, electrode surfaces, thin films and biological samples. Applications include 3D surface topography and adhesion force mapping.

The course will focus on the following aspects of each characterisation technique:

- Applications in the real world
- How the techniques work – basic theory
- Advantages and limitations
- Instrumentation and systems
- Sample preparation
- Technique selection
- Analysis conditions and method optimisation
- Software, data and interpretation

WHO SHOULD ATTEND?

This course is designed for those that have recently moved into the field and wish to improve their background knowledge and understanding. It is suitable for analysts, quality control engineers, technicians, technical and product managers, or researchers who have an interest in surface characterisation. The course focuses on providing and improving overall skills set.

HOW YOU WILL BENEFIT FROM THE COURSE

- Provides a comprehensive and cost effective overview of this important area
- Introduces the theory and practise in an industrial context
- Combines lectures and informal discussion periods with practice in problem solving
- Gives valuable, informal access to leading experts
- Enables networking with professionals from other sectors to share ideas and practise
- Provides a comprehensive volume of course notes for all participants

COURSE DELIVERY

With skills derived from a dedication to excellence in product design, research and teaching, the trainers have a great deal of relevant experience to give you the best two days can offer.

Professor Mike Adams (University of Birmingham)

PhD, CEng, FICHEM, CChem, FRSC, CPhys, FinstP, FEng.
Unilever Professor of Product Engineering and Manufacture.

The University of Birmingham is a member of the prestigious Russell Group of research universities, is the largest university in the West Midlands region, and the 11th largest in the UK.

Professor Mike Adams joined the School of Engineering at the University of Birmingham in 2004. He was previously a Senior Scientist with Unilever R&D. His research interests include product engineering, particle technology, soft solids properties and processing, materials science, complex fluids, interfacial engineering, tribology and adhesion, and fibre science.

He has published over 180 scientific papers and published 2 edited books on tribology. In 1999, he was awarded the Donald Julius Groen Prize by the IMechE for outstanding achievements in the tribology of complex materials.



Ben Beake (Micro Materials Ltd)

Micro Materials Ltd have over 23 years experience in the nanomechanical testing industry. Micro Materials has continually been at the forefront of innovation, with a pioneering approach leading to world firsts including the first commercial nanoscale impact tester, for erosive wear, toughness and contact fatigue and the first commercial high temperature nanoindentation stage.

Robert Field and Alex Winkel (JPK Instruments Ltd)

JPK are a leading manufacturer of nano-analytical instruments - particularly based on atomic force microscope (AFM) and optical tweezers systems. JPK was founded in 1999. In 2006, NanoWizard® II product line came to market and the company was awarded with Deloitte's Fast 50 as Germany's fastest growing nanotechnology company. This year JPK launched the NanoWizard® 3 NanoScience AFM with maximum application versatility.

Russell Evans at (Omniscan Ltd)

Omniscan are a supplier of leading edge surface analysis instrumentation and metrology solutions to industry and academia. They provide instrumentation and consulting for measurement of surface roughness, waviness and shape; layer thickness and optical properties ranging from the sub-nanometer to the cm scales along with surface modification and laser lithography.

For further information and bookings please contact:

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