



2022

# Fracture of Metals

Nigel Brewitt & Dr Andrew Spowage

The course will be a discussion of the various modes of metallic fracture and the features that identify them. Lectures will be given to discuss the possible mechanisms of the fracture modes including the effects of the environment. Fracture mechanics will be outlined in a basic manner sufficient to provide a good understanding of fracture processes. Physical examples of fracture will accompany the classroom lectures. Practical techniques for mapping fracture surfaces will be shown. Fractures in steel, aluminium, copper and titanium will be given.

## OBJECTIVES

Failures involving metallic fracture are occurring in industry every day. The understanding and investigation of such failures is becoming essential particularly with the continued introduction of novel materials. This course aims to give students a working knowledge of the identification of fracture modes in metals to assist in the investigation of metallic failures.

## LEARNING OUTCOME

The students will gain knowledge of preparing fracture samples and the techniques involved in identifying the various fracture modes, mechanisms and fracture origin.

## COURSE CONTENTS

- Preparation of fracture surfaces for analysis. Making preliminary observations and gathering data prior to optical examination.
- Discussion of the various fracture modes e.g. dimple rupture, cleavage, decohesion and fatigue.
- Discussion on the effects of environment.

## TARGET AUDIENCE

Engineers involved in failure investigations, Materials Engineers and materials department /asset integrity managers who wish to gain an appreciation of materials fracture, Laboratory Technicians with experience in optical/electron optical microscopy from the oil and gas, power generation, railways, aerospace and any other industry understanding the importance of in-depth failure investigation.



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### PRE-REQUISITES:

1. Experience in optical and electron optical microscopy
2. Professional/Technician qualifications in engineering.

**DURATION:** 1 Day

**CERTIFICATE:** Certificate of Attendance

**FEE:** RM1299 per person

**VENUE:** TBA

**LANGUAGE:** English

**DATES:** 12 Jan, 8 Feb, 8 Mar, 5 Apr, 8 Jun, 5 Jul, 2 Aug, 6 Sep, 4 Oct 2022

SWEC Code 18111500S - Safety, Survival & Specialised Skills Training & Consultancy

### JOTAC Academy Sdn Bhd,



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**Eur. Ing. Nigel Brewitt  
MMet, CEng, FIMMM,  
FIMM**

Nigel graduated from The University of Sheffield with a Masters Degree in advanced physical metallurgy and from Derby University with a post-

graduate diploma in corrosion science and technology. He worked in the welding and fabrication industry for 10 years before joining Rolls-Royce where he spent 20 years in the nuclear submarine division and a further 3 years in the aero-engine division as a metallurgist/ failure investigator. This also included working offshore on titanium heat exchangers in the North Sea for six years. Since retirement from RR, he has worked on a broad range of projects for Intertek Services Ltd in the UK as a failure investigator mainly on aerospace and railway track components. He is a director of MTIS Sdn. Bhd and a materials consultant for Norimax Sdn. Bhd where he has worked mainly on offshore component failures. Nigel is also a part-time lecturer at Nottingham University Malaysia Campus giving advice on industrial design and manufacturing.

He is a European Engineer, a Chartered Engineer, a Fellow of the Institute of Materials Minerals and Mining, a Fellow of the Institute of Materials Malaysia and was made honorary Associate Professor at the University of Nottingham Malaysia Campus. He is also on the industrial advisory panels for UTAR, TARUC and Nottingham Universities.



**Dr Andrew Spowage CEng, CSci,  
FIMMM, FIMM, PGCHE, CSSBB**

Dr Andrew holds the position of Senior Lecturer (Associate Prof) within the School of Engineering and Materials Science at Queen Mary University of

London. His areas of expertise range from the performance of materials, materials selection, corrosion and failure of materials. Before joining QMUL Andrew held the post of APAC Engineering Manager Wood PLC where he ran the materials, corrosion and integrity management teams. Andrew has also held the post of Head of Department of Mechanical Materials and Manufacturing Engineering at The University of Nottingham's Malaysia Campus and has been a materials specialist consultant for MTIS Sdn. Bhd. Since 2009. Dr Andrew holds a Post Graduate Certificate in Higher Education (PGCHE), is a Chartered Engineer, (CEng) a Chartered Scientist (CEng) and is a fellow of IOM3, IMM and HEA.

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## REGISTRATION FORM

Please send the completed form to [admin@jotac.com.my](mailto:admin@jotac.com.my) or WhatsApp no.: (011) 6356.0336. Thank you.

Name of Course: \_\_\_\_\_ Date of Course: \_\_\_\_\_

Name/s of Participant: 1. \_\_\_\_\_ 2. \_\_\_\_\_

3. \_\_\_\_\_ 4. \_\_\_\_\_

Name of Company: \_\_\_\_\_ Location: \_\_\_\_\_

Email Address: \_\_\_\_\_ Mobile No: \_\_\_\_\_

### PAYMENT DETAILS

Please make payment to **JOTAC ACADEMY SDN BHD**

Bank: Maybank

Account No.: 5127-1811-6603