



MANUFACTURING AND PRODUCTION

Metallurgical Failure Analysis and Fractography

3 day course

Classroom, online or in-house

Course overview

A broken component carries the record of how it broke on its own fracture surface, and the most common way that record is destroyed is by somebody cleaning the part or fitting the pieces back together to see how they match. This course teaches reading it instead. Delegates work through evidence preservation and the sequence of examination that must happen before anything is cut or cleaned. Fracture surface interpretation follows: the beach marks and ratchet marks of fatigue, the dimples of ductile overload, the facets of brittle cleavage and the intergranular appearance of embrittlement and stress corrosion. Loading direction and origin location are established from the surface. Metallography follows, covering sectioning, mounting, polishing, etching and reading microstructure against what the material should be. Hardness traverses and chemical analysis are addressed. Corrosion and wear mechanisms are covered. Manufacturing defects as origins are addressed. The course closes on writing a failure report that distinguishes evidence from inference.

What you will learn

- Preserve evidence and examine in the correct sequence
- Recognise fatigue, ductile overload, cleavage and intergranular fracture
- Establish loading direction and origin from the fracture surface
- Section, mount, polish and etch specimens for metallography
- Read microstructure against the specified material condition
- Use hardness traverses and chemical analysis as supporting evidence
- Write a failure report that separates evidence from inference

Who should attend

- Metallurgists and materials engineers
- Laboratory staff conducting failure investigations
- Reliability and maintenance engineers
- Quality staff handling warranty failures
- Insurance and forensic investigators of equipment failure

Course outline

- 01 The record destroyed by cleaning the part
- 02 Evidence preservation and examination sequence
- 03 Fatigue beach marks and ratchet marks
- 04 Ductile dimples and brittle cleavage
- 05 Intergranular fracture and embrittlement
- 06 Origin location and loading direction
- 07 Sectioning, etching and microstructure
- 08 Hardness, chemistry, wear mechanisms and reporting

Upcoming dates



Dates	Venue	Format	Fee per delegate
12 to 14 October 2026	Cape Town, South Africa	Classroom	R14,950
19 to 21 October 2026	Lusaka, Zambia	Classroom	USD 995
9 to 11 December 2026	Maputo, Mozambique	Classroom	USD 995
24 to 26 February 2027	Durban, South Africa	Classroom	R14,950

Fees and how to register

This 3 day course is **R6,500** per delegate online, **R14,950** in the classroom in South Africa, Botswana, Namibia, Lesotho and Eswatini, and **USD 995** in the classroom elsewhere in Africa. In-house training is quotation on request. Book 2 or more delegates on this course and save 10%.

To register or request an in-house proposal, visit www.afrisciencegroup.com, email info@afriScience.co.za, or WhatsApp us on **+27 63 479 1136**.

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