

## TIME & FREQUENCY MEASUREMENT

### Aim of Course

To provide an introduction to time & frequency measurements in general as well as the specific requirements needed to ensure traceability in accredited calibration laboratories.

The course covers a thorough overview, both theoretical as well as practical, and ensures that attendees are given the skills needed to calibrate equipment that requires time and frequency measurement and / or traceability.

### Pre-Requisites for attending this course

- Measurement System (Part 1 & 2)
- Uncertainty of Measurement – Physical Measurements

### Course Overview

Overview of T&F measurements

Terminology, Traceability and Time scales

Time & frequency standards - History of time keeping

History of frequency standards & Time scales

Operational principles- Accuracy / performance comparison- Time transfer accuracy requirements

Practical demonstration of different standards

Applications & Calibration requirements

Frequency conversion and scaling

Measurement techniques: Frequency and period

- Counters
- Oscilloscopes
- Phase comparators
- Introduction to Oscilloscope calibration: EA G30

Measurement techniques: Time interval and Phase angle

Time transfer

- Introduction
- Internet time protocols
- TTCU
- Satellite time transfer - GPS
- VLF / LF / HF
- Portable clock

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**Who should attend**

T&F Technicians and Metrologists

**Course Duration**

5 Days

**Evaluation**

Daily tests and the passing of a final examination are required in order to successfully complete this course