Accredited Africa Training Institute for Capacity Development
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COURSE BROCHURE

Measure Track Geometry In Order To Determine Track Condition Training

Physical Planning and Construction / Civil Engineering Construction

Unit Standard 119973 · NQF Level 3 · 15 Credits · 12 Days

COURSE OVERVIEW

This course equips learners with the skills to measure and interpret track geometry parameters such as gauge, cross-level, and alignment to assess the condition of railway tracks. Participants will learn to use specialized measuring equipment and apply industry standards to ensure safe and efficient rail operations.

Category	Physical Planning and Construction
Subfield	Civil Engineering Construction
Unit Standard	119973
Accreditation	SAQA Accredited · NQF Level 3 · 15 Credits
Duration	12 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS — verifiable online

LEARNING OUTCOMES

- Demonstrate the ability to set up and calibrate track geometry measuring equipment accurately.
- Apply measurement techniques to assess track gauge, cross-level, alignment, and twist.
- Analyze measurement data to identify deviations from standard tolerances.
- Evaluate track condition based on geometry measurements and recommend corrective actions.
- Interpret relevant standards and procedures for track geometry assessment.
- Document and report findings in accordance with organizational requirements.

WHO SHOULD ATTEND

- This course is designed for track maintenance personnel, supervisors, and inspectors in the railway industry who are responsible for monitoring and maintaining track geometry.

COURSE OUTLINE

Day 1: Introduction to Track Geometry and Safety

- Overview of railway track components.
- Track geometry parameters and their definitions.
- Importance of track geometry for safe train operations.
- Basic safety procedures for track measurement activities.
- Introduction to relevant standards (e.g., SANS, SAQA).

Day 2: Track Geometry Measurement Tools and Equipment

- Manual tools: track gauge, spirit level, straight edge, string line.
- Automated systems: track measurement trolleys, laser-based systems.
- Calibration and zeroing of instruments.
- Care and storage of equipment.
- Comparison of manual vs. automated methods.

Day 3: Measuring Track Gauge and Cross-Level

- Step-by-step gauge measurement procedure.
- Cross-level measurement: placement and reading.
- Understanding tolerance limits per standards.
- Recording data: forms and units (mm).
- Common errors and how to avoid them.

Day 4: Measuring Alignment and Twist

- Horizontal alignment measurement: string line method.
- Optical alignment: theodolite and total station basics.
- Twist measurement: chord and offset technique.
- Twist limits and calculation.
- Curve alignment considerations.

Day 5: Measuring Longitudinal Level and Topography

- Longitudinal level: equipment setup (level, staff).
- Running levels along the track.
- Determining gradient and vertical curve radii.
- Identifying defects: dips, crests, and sags.
- Data recording and plotting profiles.

Day 6: Track Geometry Tolerances and Standards

- Overview of SANS 3000 series and PRASA standards.
- Tolerance tables for gauge, cross-level, alignment, twist, longitudinal level.
- Speed-dependent tolerance limits.
- Classification of defects.
- Practical examples of tolerance checks.

Day 7: Data Collection and Recording Methods

- Paper-based recording forms.
- Field numbering systems (kilometer posts, reference points).
- Digital data loggers and mobile apps.
- Data validation and double-checking.

- Introduction to spreadsheet templates.

Day 8: **Identifying and Classifying Track Defects**

- Defect types: gauge widening, cross-level error, alignment kinks, twist, dips.
- Severity classification: immediate, planned, monitored.
- Root cause analysis: ballast, sleeper, rail issues.
- Defect reporting forms.
- Case studies of defect identification.

Day 9: **Track Geometry Analysis and Condition Assessment**

- Introduction to Track Quality Index (TQI).
- Statistical analysis of geometry data.
- Trend analysis over time.
- Condition rating scales (good, fair, poor).
- Report structure and findings.

Day 10: **Practical Field Measurement Exercise**

- Field safety briefing.
- Site selection and marking.
- Measurement of gauge, cross-level, alignment, twist, longitudinal level.
- Data recording in real time.
- Defect identification and classification.

Day 11: **Data Analysis and Reporting from Field Exercise**

- Data entry and validation.
- Calculation of deviations and TQI.
- Interpreting results against standards.
- Writing a professional report.
- Presentation of findings to group.

Day 12: **Integration, Review, and Assessment**

- Review of key concepts from Days 1–11.
- Complex scenario analysis: combined defects.
- Summative assessment: written test and practical demonstration.
- Feedback and evaluation.
- Certification and next steps.

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **15 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 41,000.00	**R 41,000.00**
1	In-House	R 53,300.00	**R 53,300.00**
1	On-Campus (Pretoria)	R 61,500.00	**R 61,500.00**

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	18 Aug 2026	On-Campus	Johannesburg, South Africa
04 Aug 2026	19 Aug 2026	On-Campus	Mauritius
05 Aug 2026	20 Aug 2026	On-Campus	Cape Town, South Africa
06 Aug 2026	21 Aug 2026	On-Campus	Dubai, UAE
07 Aug 2026	24 Aug 2026	On-Campus	Pretoria, South Africa
07 Aug 2026	24 Aug 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	25 Aug 2026	On-Campus	Durban, South Africa
10 Aug 2026	25 Aug 2026	On-Campus	Mauritius

Contact us if no suitable date is listed — on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit **www.aaticd.co.za**, open the page for this course (Unit Standard 119973) and click **Get A Quote / Apply**. Select your training method and number of delegates — your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to **apply@aaticd.co.za** — our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically — the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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