



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Laboratory Testing Procedures For Asphalt Materials Training

Physical Planning and Construction / Physical Planning, Design and Management

Unit Standard 110334 · NQF Level 4 · 30 Credits · 27 Days

COURSE OVERVIEW

This course equips learners with the practical skills and theoretical knowledge required to perform laboratory testing procedures for asphalt materials in accordance with South African standards. It focuses on ensuring quality control and compliance with industry specifications for road construction and maintenance.

Category	Physical Planning and Construction
Subfield	Physical Planning, Design and Management
Unit Standard	110334
Accreditation	SAQA Accredited · NQF Level 4 · 30 Credits
Duration	27 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply standard sampling and preparation methods for asphalt materials in accordance with SABS and TMH specifications.
- Demonstrate proficiency in performing key laboratory tests such as Marshall stability, flow, density, and binder content analysis.
- Analyze test results to evaluate asphalt mix compliance with design specifications and identify potential deviations.
- Implement quality control procedures to ensure accurate and reliable test outcomes.
- Maintain laboratory equipment and records in compliance with health and safety regulations and quality management systems.

WHO SHOULD ATTEND

- Laboratory technicians, quality controllers, and civil engineering professionals involved in asphalt testing and road construction projects.
- This course is also suitable for individuals seeking formal recognition of their skills in asphalt materials testing.

COURSE OUTLINE

Day 1: Introduction to Asphalt Materials and Laboratory Safety

- Overview of asphalt materials: bitumen, aggregates, additives
- Importance of asphalt testing for quality assurance
- Laboratory safety, PPE, and emergency procedures
- Introduction to SANS 3001 and related standards

Day 2: Sampling Techniques for Asphalt Materials

- Sampling methods for aggregates (SANS 3001-AG1)
- Sampling of bitumen (SANS 3001-BT1)
- Handling, labelling, and transport of samples
- Chain of custody and documentation

Day 3: Aggregate Properties – Particle Size Distribution

- Sieve analysis procedure (SANS 3001-AG2)
- Types of sieves and mechanical shakers
- Calculation of cumulative passing percentages
- Grading envelopes and specification compliance

Day 4: Aggregate Properties – Flakiness Index and Elongation

- Flakiness index test (SANS 3001-AG3)
- Elongation index test
- Significance of particle shape in asphalt
- Reporting results and tolerances

Day 5: Aggregate Properties – Sand Equivalent and Atterberg Limits

- Sand equivalent test (SANS 3001-AG4)
- Atterberg limits: liquid limit, plastic limit
- Plasticity index calculation
- Acceptance criteria for aggregates

Day 6: Bitumen Properties – Penetration and Softening Point

- Penetration test (SANS 3001-BT2)
- Softening point (ring and ball) test (SANS 3001-BT3)
- Temperature conditioning and equipment calibration
- Bitumen grading systems

Day 7: Bitumen Properties – Viscosity and Ductility

- Kinematic viscosity test (SANS 3001-BT4)
- Ductility test (SANS 3001-BT5)
- Factors affecting bitumen viscosity
- Specifications for different climates

Day 8: Bitumen Properties – Flash Point and Specific Gravity

- Flash point test (SANS 3001-BT6)
- Specific gravity test (SANS 3001-BT7)
- Safety precautions for heated bitumen
- Calculation and reporting

Day 9: Hot Mix Asphalt (HMA) – Mix Design Principles

- Overview of HMA mix design
- Aggregate blending for target gradation
- Marshall compaction procedure
- Bulk specific gravity of compacted mix

Day 10: Marshall Stability and Flow Test

- Marshall stability test (SANS 3001-AS1)
- Flow measurement
- Correction factors for specimen thickness
- Acceptance criteria for HMA

Day 11: Volumetric Analysis of Asphalt Mixes

- Theoretical maximum specific gravity (Rice test) (SANS 3001-AS2)
- Calculation of VMA, air voids, VFB
- Influence of compaction effort
- Volumetric requirements for HMA

Day 12: Asphalt Binder Content – Extraction and Recovery

- Solvent extraction (SANS 3001-AS3)
- Recovery of bitumen (SANS 3001-AS4)
- Ignition oven method (SANS 3001-AS5)
- Binder content specifications

Day 13: Moisture Susceptibility – Tensile Strength Ratio

- AASHTO T283 / modified Lottman test
- Specimen conditioning (freeze-thaw)
- Indirect tensile strength measurement
- TSR acceptance criteria

Day 14: Dynamic Modulus and Rutting Performance Tests

- Dynamic modulus (E^*) test (AASHTO TP62)
- Flow number test (AASHTO TP79)
- Asphalt performance testing overview
- Use in mechanistic-empirical design

Day 15: Fatigue Cracking – Flexural Beam and Semicircular Bend Tests

- Flexural beam fatigue test (AASHTO T321)
- SCB test (AASHTO TP124)
- Data analysis: fatigue curve and fracture parameters
- Cracking resistance specifications

Day 16: Reclaimed Asphalt Pavement (RAP) Testing

- RAP sampling and processing
- Binder extraction and recovery from RAP
- RAP aggregate gradation
- Blending charts for RAP mixes

Day 17: Polymer-Modified Bitumen (PMB) Testing

- PMB types: SBS, EVA, etc.
- Elastic recovery test (SANS 3001-BT8)
- Softening point after RTFOT aging

- Separation test for storage stability

Day 18: Quality Control and Statistical Process Control

- Basics of SPC for asphalt testing
- Control charts for individual measurements and moving range
- Process capability indices (Cp, Cpk)
- Corrective actions for non-conformance

Day 19: Laboratory Accreditation and Documentation

- ISO/IEC 17025 requirements
- Document control and record keeping
- Equipment calibration and maintenance logs
- Participation in inter-laboratory comparisons

Day 20: Integrated Practical Assessment and Course Review

- Practical assessment on sampling, bitumen, and aggregate tests
- Case studies on mix design and quality control
- Review of key concepts and standards
- Final Q&A; and feedback session

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 **30 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 79,400.00	R 79,400.00
1	In-House	R 103,200.00	R 103,200.00
1	On-Campus (Pretoria)	R 119,100.00	R 119,100.00

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	08 Sep 2026	On-Campus	Mauritius
04 Aug 2026	09 Sep 2026	On-Campus	Cape Town, South Africa
05 Aug 2026	10 Sep 2026	On-Campus	Dubai, UAE
06 Aug 2026	11 Sep 2026	On-Campus	Pretoria, South Africa
06 Aug 2026	11 Sep 2026	On-Campus	Lagos, Nigeria
07 Aug 2026	14 Sep 2026	On-Campus	Johannesburg, South Africa
10 Aug 2026	15 Sep 2026	On-Campus	Cape Town, South Africa
11 Aug 2026	16 Sep 2026	On-Campus	Dubai, UAE

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 110334) 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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