

# ADVANCED BITUMEN TECHNOLOGY

## GOALS OF THIS COURSE

This course focuses on the binder of asphalt mixes, namely the bitumen. The composition, testing, specifications (global and local), behaviour, performance and certification of binders will be covered. The link between flexible asphalt pavements and bitumen will form an integral part of the course in order to place the technology in context in terms of application. In particular, the course will cover:

- Fundamentals of bitumen technology;
- International trends in binder specification (including modification), with a link to performance; and
- Certification of binders (warranties etc), which should be of special interest to road authorities.

## LEARNING PROCESS

The delegates will have the opportunity to immerse themselves in the subject matter, through a series of lectures that will be augmented by workshops, tutorials and case studies. The immersion course concept has been very successful and it has been the format of all recent courses.

## ACADEMIC CREDIT

This course forms part of the University of Stellenbosch postgraduate programme. It carries eight (8) SAQA credits for academic purposes and/or continuing education based upon an extensive exercise and written/oral examination. In addition, certificates will be awarded to all delegates participating satisfactorily in the course.

## LANGUAGE & REGISTRATION

This course will be conducted in English.

*Enrolment will be limited. Registration, will be accepted on a first received basis and only confirmed by payment of the course fees.*

## ADMISSION REQUIREMENTS

The course is aimed at engineers and technologists who wish to augment and update their knowledge of bitumen technology, especially those who work in the field of bitumen and asphalt (regardless of the sector). A degree or diploma in Civil Engineering plus several years experience in pavement engineering is recommended.

## COURSE OUTLINE

### MODULE 1 BITUMEN ORIGIN AND MANUFACTURE

- Crude sources (global) & characteristics
- Crude sources for SA
- Bitumen types and composition

### MODULE 2 BITUMEN CLASSIFICATION

- Classification of bitumen grades
- Application of different binder grades
- Trends in bitumen specifications (USA)
- Trends in bitumen specifications (Europe)
- *Workshop on binder classification & application*

### MODULE 3 BINDER RHEOLOGY

- What is rheology? What is its function?
- Basic models for describing bitumen behaviour
- Black diagrams and master curves
- More advanced models and “state of the art”
- *Workshop on Rheology*

**MODULE 4**  
**PERFORMANCE TESTING & SPECS**

- Engineering properties of bitumen
- Specialist binders (polymer modified, cold mix etc)
- Performance testing – USA perspective, including damage resistance characterisation
- Performance testing – European perspective
- Life Cycle Costing linked to binder performance
- Workability and compaction issues
- *Workshop on Binder Performance & Specifications*

**MODULE 5**  
**QUALITY CONTROL & WARRANTIES**

- Quality control and monitoring (USA)
- Quality control and monitoring (Europe)
- Warranty systems (USA and Europe)
- Case studies of PPGS in SA
- Health, Safety and the Environment