

# Advanced Geotechnics

## Limit States and Reliability-based design



**A block release course over 5 days 15 - 19 July 2019**



Presented by: Dr Peter Day, Adjunct Professor of Geotechnical Engineering and Consultant at Jones & Wagener

assisted by Prof. Johan Retief, Dr Nico de Koker and Dr. Richard Walls

### Prerequisites

Attendees are expected to have an understanding of bearing capacity and settlement calculations for foundations and piles, earth pressures on retaining structures and statistics at an undergraduate level.

### Course Objectives

The objective of this course is to provide an understanding of:

- ◆ Basic reliability concepts including an introduction to Monte Carlo simulation and First Order Reliability Methods
- ◆ Reliability basis of Limit States Design
- ◆ Limit state design of geotechnical structures using SANS 10160-5
- ◆ Application of STR limit state to design of foundations
- ◆ Application of First Order Reliability Methods (FORM) in geotechnical design

### Course Outcomes

At the end of the course, the participants should be able to:

- ◆ Appreciate the existence of geotechnical uncertainties necessitating the use of a semi-probabilistic limit state design or reliability-based design approaches
- ◆ Understand the basic reliability concepts
- ◆ Understand the general basis of limit state design as per SANS 10160-1
- ◆ Understand the basis of geotechnical design as per SANS 10160-5
- ◆ Apply the requirements of SANS 10160 to spread footings, piles and retaining structures
- ◆ Apply FORM to geotechnical design problems including the use of response surfaces.

**Course Fees: R 9000.00      CPD: 5**

***Applications close: 5 July 2019***

### Course Assessment

The participants taking the course as part of their post-graduate studies will be assessed by means of a practically-orientated design assignment.

The design assignment takes place after completion of the course. Participants attending the course for non-degree purposes are welcome to submit the assignment.

### Course Material

Reference material to be used to during the lectures and tutorials will be distributed in the form of printed notes. The presentations, other reference material and background reading will be distributed electronically to all participants to the extent permitted by copyright.

All attendees are expected to have access to a copy of SANS 10160-1 and SANS 10160-5.

**Attendees should bring their own laptops for tutorial sessions.**

**Enquiries   Janine Myburgh   Tel 021 808 2080   Email   [civilcourses@sun.ac.za](mailto:civilcourses@sun.ac.za)**