

## **Course content overview**

### ***Construction Risk Management (10851-812)***

Principles of risk management is covered, including identification of risks and compilation of risk registers, risk probability and impact, risk prioritization matrices, assignment, monitoring and mitigation. The course considers construction risk management as experienced by all parties involved in construction projects, including the client (owner), consultant and contractor. The risks created by the different parties are identified. Advanced risk management methods such as Monte Carlo analyses are presented. The course includes a presentation from two software suppliers (@Risk from Palisade and Primavera from Oracle). A client and a contractor are invited to present the application of risk management on projects.

### ***Construction Contract Law (10824-842)***

The course deals with construction contracts in general from a legal and project-management perspective. It covers the most important general principles of the law of contract with the emphasis on the law of procurement and building contracts. It provides an overview of the different standard form contracts commonly encountered in South Africa (GCC, NEC, FIDIC and JBCC), and their role and effect on the common-law principles relating to building contracts and project management. An analysis is given of central terms of these contracts (breach, claims, changes, disputes). The GCC is the point of departure but is critically considered in relation to other standard-form contracts. The course furthermore addresses contract administration, guarantees and insurance.

### ***PPP and procurement (13003-811)***

The first part of the course covers the Public Private Partnership (PPP) procurement model. The course provides the basic concepts and characteristics of this procurement model and the South African regulatory environment. Case studies provide examples of the applications, advantages and pitfalls of PPP. Project finance is addressed which is an essential part of PPP but also for other forms of contract.

The second part of the course addresses the CIDB tender procedures and contract documentation. Writing skills are developed for compilation of tender documents including writing of a clear scope of works. Compilation of other reports is addressed including tender evaluation reports and project proposals. Alternative procurement options are addressed including design-build, framework agreements and construction management projects.

### ***Construction Management (10821-812)***

The course addresses a variety of topics in construction site management which are not covered in the other courses. It includes aspects of labour employment agreements, project controls (planning and scheduling the project, developing the cost estimate, monitoring project progress and costs, forecasting final costs and schedule results), and the Constructions Regulations.

Aspects of prefabrication are presented to allow a choice between in-situ and pre-cast construction methods. Students are expected to compare different project options for prefabricated and in-situ elements by considering a detailed breakdown of time, cost, material and labour for the different options.

The course addresses cooperation and coordination between designer and contractor in formulating a conceptual design. Building Information Models play an important part in this interaction and collaboration between parties.

Schemes and philosophies of organizing a construction site are analyzed and discussed. The course includes an introduction on temporary works and an overview of the important parameters to be considered.

### ***Infrastructure Asset Management (13002-811)***

The purpose of this course in Infrastructure Asset Management is to address the management practices required for the implementation and maintenance of municipal infrastructure. The course commences with a background to infrastructure asset management, including the position thereof in the national context. Legislation is addressed as well as available and current strategies for infrastructure asset planning and management. The course includes the methodology for setting up an asset register, and a field exercise is undertaken where participants are exposed to the compilation of an actual asset register.

The course addresses ISO55000 and best practice Infrastructure Asset Management implications in practice. The lectures comprise of modules on asset planning and implementation on institutional level. It addresses the basics of project management as required by managers in local authorities.

Representatives from organizations present the application of asset management on municipal services and on road pavements.

### ***Project Management (Department of Industrial Engineering)***

The basic objective of this short course is to introduce the participants to the principles of project management and to plan and control projects with the application of time-based planning techniques using computer-aided project management software. The course is focused on practical application, enabling participants to apply techniques immediately.

After covering the theory, the participants are given hands-on experience in the use of Microsoft® Project 2007/2010/2013 during a computer tutorial using real life examples. Throughout the whole short course, ample time is allowed for discussions and participation using practical exercises.

It is expected that the short course participants will be able to use computer software like Microsoft® Windows and Office with reasonable ease.

***Project leadership and the environment (2017+)***

The course will be presented from 2017 onwards. It will provide an overview of the nature and extent of the current regulatory environment in the South African Construction Industry. It will identify the parties responsible for regulations in the construction industry, purpose of legislation/regulations and will elaborate on basic performance standards required by legislation/regulations. The implications of the regulatory environment for the construction industry will be addressed.

The course will also address aspects of human resource management, team management and leadership. Motivation of teams and team composition will be addressed.