



# Course Brochure

## Water Engineering Courses 2012

Course 1: Flood hydrology and climate change impacts – 31 January to 3 February 2012

Course 2: Modeling of free surface flow and dam break analysis – 7 to 10 February 2012

Course 3: Pipeline design and conduit hydropower – 2 to 6 July 2012

Course 4: Transient analysis (pipelines and hydro penstocks) – 10 to 13 July 2012

### **Course 1:**

#### **Flood hydrology and climate change impacts**

4 days – 31 January to 3 February 2011



### **Description**

A practical course on flood calculation methods and flood routing will be presented. The theory will be reviewed and practical exercises will be undertaken. Deterministic, empirical and statistical analysis procedures will be applied in the exercises. The widely used freeware software program, EPASWMM will be reviewed and introduced as a tool for the modeling of urban drainage system. The EPA Storm Water Management Model (EPASWMM) is a dynamic rainfall-runoff simulation model used for single event or long-term (continuous) simulation of runoff quantity and quality from primarily urban areas. The objective is that after this course, you will be in a position to perform the required design flood calculations and be able to conduct simulation modeling of storm water systems.

Prof Will Alexander's latest book: *Analytical methods for water resource development and management* will be launched during this course.

A discussion session on the COP17 resolutions will be held.

### **Who should attend?**

Planners, designers, modelers and managers of flood and storm water systems.

### **Course 2:**

#### **Modeling of free surface flow and dam break analysis**

4 days – 7 to 10 February 2012



### **Description**

The course will focus on the basic theory and analyses of practical free surface flow problems. The basic theory of free surface flow, mass; energy and momentum conservation, will be reviewed and the application to determine flood lines, culvert sizing and bridge flow hydraulics will be covered.

The widely used HEC-RAS software package will be reviewed and demonstrated by performing one-dimensional hydraulic calculations for steady and unsteady flow conditions as well as dam break analysis.

A number of practical problems will be discussed and solved utilizing the software programs. This will acquaint participants with background and confidence to conduct varied flow simulations.

### **Who should attend?**

Planners, designers, modelers and managers of flood and storm water systems

### **Course 3:**

#### **Pipeline design and conduit hydropower**

4/5 days – 2 to 6 July 2012



### **Description**

The focus in this course will be on the practical aspects of pipeline design. The theory of pipeline engineering, the optimization process and the design of pipelines will be covered through worked examples.

The effect of energy escalation in pump systems will be reviewed and participants will become confident with the design of pipeline systems. Other aspects which will be discussed include: pipeline hydraulics, surge analysis, pipeline component design, pipeline installation, life cycle costing, testing and operation of pipelines.

The potential of developing conduit hydropower as a renewable energy source in existing water distribution systems in South Africa will be reviewed and time will be devoted to possible implementation of renewable energy in the design of water transfer systems. Friday, 6 July 2012, is scheduled as an optional day to visit pipe- and valve manufacturers to obtain information on the latest products and also to review the performance of the cross-flow renewable energy project of Tshwane Metropolitan Council.

### **Who should attend?**

Planners, designers and managers of pipelines and water infrastructure, will benefit from the course.



**Course 4:****Transient analysis (pipelines and hydro penstocks)**

3/4 days – 10 to 13 July 2012

**Description**

The course will focus on the analysis of transients in pipe systems and hydro power penstocks. This is a crucial part of the pipe's pressure class selection ensuring a sustainable conveyance system.

Dynamics resulting from foreseen and unforeseen operational circumstances will be covered.

Aspects which will be discussed covers the basic theory of transient flows, calculation procedures, selection of surge protection devices and the use of the widely used SURGE2010 software ([www.kypipe.com](http://www.kypipe.com)). Workshop sessions covering transient flow analysis problems and evaluating of surge protection options will be held. On Friday, 13 July 2012, an optional day is scheduled where pipe and surge protection device manufacturers will be visited to obtain details of the latest manufacturing products and surge alleviating options.

**Who should attend?**

Planners, designers and managers of pipelines and water infrastructure, will benefit from the course.

**Cost per course**

In the table below different fee structures are offered. Firstly, there is a discount for persons who attend two courses. Secondly, there is a discount for organisations that send more than 3 persons to the courses. Delegates should bring their own notebooks.

Fee structure	Course 1	Course 2	Course 3	Course 4
	Flood hydrology and climate change impacts	Modeling of free surface flow and dam break analysis	Pipeline design and conduit hydropower <sup>#</sup>	Transient analysis (pipelines and hydro penstocks) <sup>#</sup>
Normal fee	R 7 800	R 7 900	R 8 000	R 6 200
Attending two courses	R 7 200	R 7 300	R 7 400	R 5 600
Organizations sending more than 3 participants per course	R 6 800	R 6 900	R 7 000	R 5 200
Organizations sending more than 3 participants to 2 courses	R 6 400	R 6 500	R 6 600	R 4 800

\*Notebooks can be rented from The Notebook Company ([www.notebook.co.za](http://www.notebook.co.za))

<sup>#</sup>The cost for the additional 5<sup>th</sup> day (Friday 6 July or 13 July 2012) is R500/person

**Continuous Professional Development**

All the courses will be accredited for CPD points. Registered students for will also attend some of the courses as part of their requirements to obtain a BEng (Hons) or BSc Hons (Applied Science) degree (depending on previous qualifications).

Current registered students can register for the specific subject on 21 January 2012. Prospective students need to apply for admission for the offered degrees ([www.up.ac.za](http://www.up.ac.za)). **You need the CPD points and we suggest that you do that by registering for a postgraduate qualification.** For more details please download the postgraduate brochure from: [www.up.ac.za/academic/civil/](http://www.up.ac.za/academic/civil/)

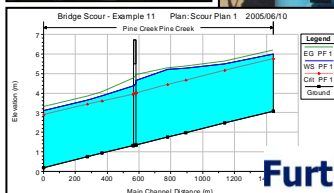
**Presenters**

A number of practitioners and academics will share their knowledge and experiences during the course.

Main presenters		Organizer
Prof Fanie (S J) van Vuuren Department of Civil Engineering, University of Pretoria Phone: +27 (012) 420 2438 E-mail: <a href="mailto:fanie.vanvuuren@up.ac.za">fanie.vanvuuren@up.ac.za</a>	Mr Marco van Dijk Department of Civil Engineering, University of Pretoria Phone: + 27 (012) 420 3176 E-mail: <a href="mailto:marco.vandijk@up.ac.za">marco.vandijk@up.ac.za</a>	Ms Anja Vosloo (Continuing Education) Phone: + 27 (012) 420 3842 Fax: + 27 (012) 634 9253 Cell: + 27 083 704 4418 E-mail: <a href="mailto:anja.ce@up.ac.za">anja.ce@up.ac.za</a>

**Important notes:**

- You will need your computer/notebook (relevant software will be provided for use during the course).
- You will need you calculator.
- You will learn something at each of these courses.
- You will enjoy the lunches and refreshments provided.
- You will have great networking opportunities.



**Further Your Future With Us**