

Online short course

Water Transport and Distribution 1

Runs once a year; next run 4 September 2006 See <http://www.unesco-ihe.org/education/illearning.htm>

Objectives of the course

safe water is one of the biggest challenges in urban areas of the 21st century

Despite large investments in the past decades, safe water supply is still a concern of many people in the world, specifically having in mind the growth of population in urban areas of developing countries. Water transport and distribution networks play essential role in providing sufficient quantity and maintaining adequate quality of drinking water and are the most expensive part of urban water cycle in terms of infrastructural investments, as well as looking at their operation and maintenance. Un-interrupted supply is already achieved goal in the developed world where the focus has been shifted from basic objectives towards the issues such as optimisation of the system reliability, management of assets, environmental protection, etc. In many less developed countries, satisfying the quantity and quality requirements is still a dream.

The main objectives of the online course in Water Transport and Distribution 1 are to introduce the basics of planning, hydraulic- and engineering design, construction, operation & maintenance of water transport and distribution systems. On conclusion of the course, the participant should be able to decide on the main planning elements of these systems, namely the design demands, pressures, velocities and gradients. Furthermore, he/she should fully understand the steady-state hydraulics, be able to choose adequate supplying scheme, suggest the network layout, main components and pipe materials, be able to distinguish between various operational modes and finally, be able to judge technical solutions dealing with the system maintenance, rehabilitation, and expansion.



Why take this online course?

- through innovative learning methodologies you will receive the latest knowledge in the field of Water Transport and Distribution
- you can follow the course from your home or workplace, with ample opportunities for communication with trainers and participants
- you will come in touch with (inter)national experts and become part of an international network with participants from different regions, sectors and disciplinary backgrounds
- you will get access to an expertise that you can share with your fellow-participants and your colleagues

Target group

water distribution professionals

Mid-career professionals dealing with technical aspects of drinking water transport & distribution, working for municipal assemblies, water supply companies or consulting bureau's. Those possess a BSc degree in Civil Engineering or similar technical background and have a basic PC-computer knowledge. Although not restricted to, the programme is specifically advised for the young professionals from the developing- and countries in transition.

Course content and time schedule

online learning, total study load 140 hours

Currently, the WTD1 online course is offered in full distance learning mode. Alternatively, the programme can be followed as an offline course with all materials and instructions posted on a CD. Participants complete the course in a period of approximately four months with a workload of 8 hours a week, on average.

Developed and implemented under the **PoWER** partnership with the following partners:

- Birzeit University (Palestine)
- Taiwan International Institute for Water Education (Taiwan of China)
- Kwame Nkrumah University of Science and Technology (Ghana)
- UNESCO-IHE (The Netherlands)

The course comprises the following subjects:

1. Introduction to water transport and distribution
2. Pumping stations
3. Unaccounted for water & leakage
4. Urban water demand management & planning
5. Water supply from the roof tanks

The first subject in the above list is compulsory and furthermore the participant has freedom to choose any three out of the remaining four subjects.

The subjects cover the following syllabus: *Introduction*: main objectives and components of water transport and distribution systems. *Water demand*: categories, patterns, calculation, forecasting. *Hydraulics of pressurised flows*: basic equations, single pipe calculation, branched and looped networks, system- and pump characteristics, pressure related demand; hydraulics of storage and pumps. *Main components of hydraulic design*: design parameters, choice of supply scheme, network layouts. *Engineering design*: choice of pipe materials, valves and other equipment. *Pumping stations*: review of various pumps and their applications, design of pumping stations, power requirements and energy consumption, auxiliary equipment. *Network construction*: pipe laying, testing and disinfect ion. *Operation & maintenance*: regular & irregular supply; unaccounted-for water definition, structure & survey; leak detection methods; network cleaning and rehabilitation procedures; water demand management measures. *Roof tanks*: applications in water scarce areas, hydraulic operation, design, construction and maintenance.

Innovative learning

the best of traditional and distance-learning combined

The core of the learning scenario is the PowerPoint slideshow with audio presentation of the teacher. These are accompanied by corresponding pdf-file of the lecture notes and variety of exercises. Excel-spreadsheet hydraulic lessons attached to the materials are used for solving the workshop problems on steady-state hydraulics while in interactive computer exercise a network operation can be analysed through numerous combinations of different layouts and demand scenarios. Both tools are designed exclusively for this module and are combined with major goal to help participants develop a 3D perception of the pressure distribution in the network. Next to this, they shall have to solve a number of multiple-choice tests and complete the design exercise on pumping stations. The web-based I-Learning Environment is used for downloading all materials and for communication. Questions can be posted on the 'Ask-Trainer' page or on the discussion forum eliciting responses from fellow participants.



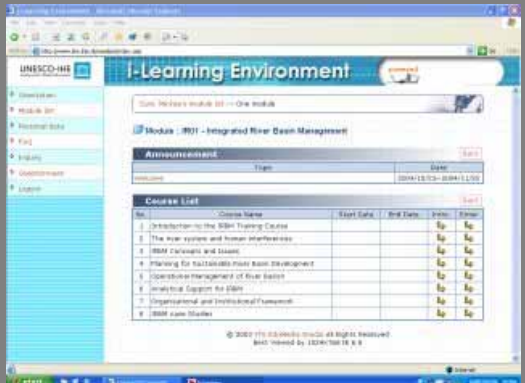
Innovative Learning

Fee

The online course fee is 550 Euro, which includes access to the I-Learning Environment, its training materials and full training support. Group discounts are possible.

Entry requirements

Participants are expected to have sufficient English language skills. For the internet-based component, participants must have access to a computer with 512 kilobits per second (kbps) downstream Internet connection or better.



See and feel the I-Learning Environment at www.lms.ihe.nl (login **demouser**, password: **demouser**)

More information and registration

For more information on the course, contact Nemanja Trifunovic (n.trifunovic@unesco-ihe.org) or see UNESCO-IHE's website (<http://www.unesco-ihe.org/education/learning.htm>) where you can also download registration forms and see information about the other online courses available.