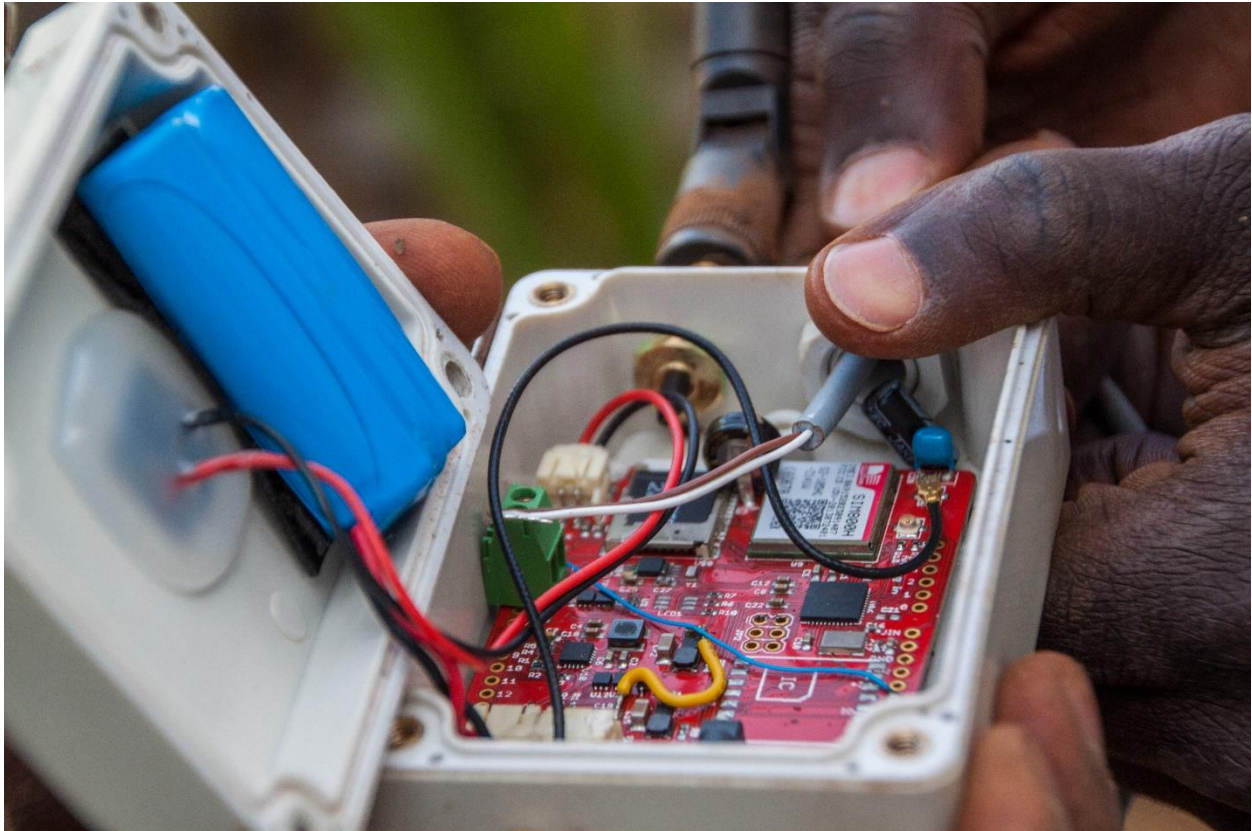


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# Course Outline



## «ICT for Water Utilities»

*An Interactive e-Learning course that explores emerging ICT trends, applications and experiences in WASH, and equips participants with a roadmap to design, develop and implement their own ICT-enabled solutions*

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# COURSE OUTLINE

## Background

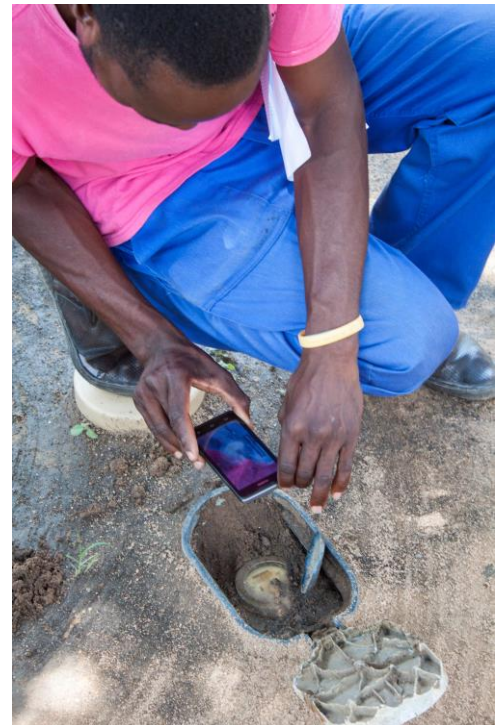
Margraf Publishers has been developing and running e-Learning and blended learning courses for water sector professionals for nearly 15 years. Along with e-Learning, Margraf has offered training-of-trainers, regional face-to-face (F2F) workshops and events, an international “Good Practices” conference, and has continuously served as a platform for digital networking and communication for stakeholders in the MENA and the East and Southern Africa regions.

Margraf has develops and delivers new training courses, while also improving upon existing ones based on participants' feedback and changing demands.

The Margraf network is still growing (refer to <http://www.dis-course.net/>) and its members are increasingly demanding new knowledge, partnerships and projects to tackle emerging water and sanitation challenges. It is to these ends we are creating new, relevant and dynamic e-Learning courses, and expanding the wider digital platform and community of practice.

The first milestone in this process will be to launch a pilot course, titled “ICT for Water Utilities”.

We envision this pilot course to be the catalyst for expanding the wider capacity building platform and network. Subsequent courses will include “Managing Non-Revenue Water (NRW)”, “GIS for Water Utilities”, “NUST: New Urban Sanitation Technologies”, and various topics related to Water Utility Management (General, Commercial and Technical), Water Resources Management, and Water and Wastewater Engineering.



## Target Users

Target users are senior and middle managers and professional staff in water and sanitation utilities, in particular Managing Directors and Technical, Commercial, and ICT Managers.

Also welcome are persons from national government entities, regulators, civil society and private sector organizations who seek to support utilities' adoption of appropriate technologies to provide reliable and sustainable water and sanitation services.

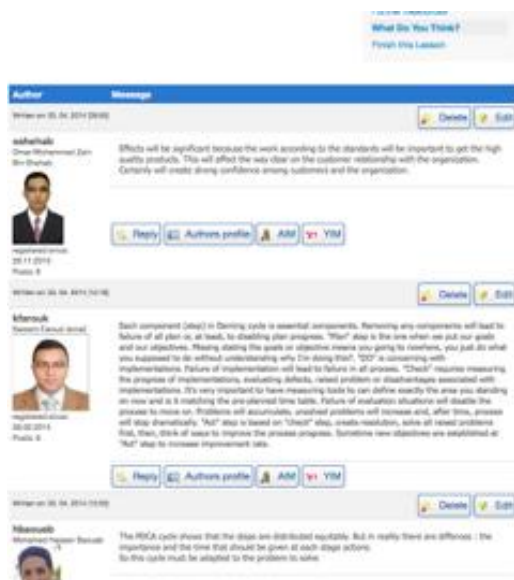
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## Objectives and Outcomes of the Course

There is already a great deal of knowledge and experience in the application of ICTs for Development (ICT4D), but most of this exists outside of the WASH sector. Water Service Providers (WSPs) in particular have limited exposure to key ICT applications and experiences, and when they do, the focus is on the novelty of the innovations, rather than how they can be adopted to develop and improve institutional structures and meet objectives.

This e-Learning course will build the practical capacity of both the participants and the institutions they serve. Participants will critically evaluate and discuss emerging ICT trends, applications and experiences in WASH and other development sectors. Through analyzing and engaging in discourse around key successes and failures of other WSPs, as well as directly interacting with various ICTs (for example testing Android-based mobile data collection apps, and web-based geospatial apps and databases), participants will **expand their own knowledge**, be better equipped to overcome their own obstacles, and **develop, implement and sustainably scale ICT solutions in their own utility**.

Participants will ultimately take their ICT roadmap back to their utility to **implement new initiatives that directly improve services provision, customer satisfaction, revenue collection, finances, and asset management**. This course showcases WSPs who have done just this - harnessing low-cost ICT-enabled solutions to bring to light and resolve the most pressing challenges (especially uncontrolled NRW), then using this new cost-recovery to increase access to and better leverage financing for further advancement of the utility and people they serve. Whether it's rectifying incorrect customer information, uncovering faulty meters, identifying errors in the billing system, exposing internal fraud, or digitally mapping network assets and customers, each utility will realize the benefits of joining this course.



## Cooperative Distance Learning Approach

Participants should be familiar with the basics of distance-learning and with the principles of the Cooperative Learning Approach – an educational approach which aims to organize learning activities into academic and social learning experiences. Students must work in groups to complete tasks collectively toward the goals of the course. Unlike individual learning, a cooperative learning process can capitalize on one another's resources and skills (asking one another for information, evaluating one another's ideas, monitoring one another's work, etc.). The e-tutors who are guiding the learning process are not supposed to give detailed information but to facilitate students' learning. Everyone succeeds when the group succeeds.

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## Structure of the Course

The e-Learning course is divided into two (2) modules. The first of these modules will discuss concepts and general applications of ICT in various development sectors, WASH sector and service provider challenges, and delve into concepts such as IoT, M2M, smart metering, and mobile payments in WASH.

The second module will focus on the practical design and implementation of ICT-enabled meter reading, fault/complaint reporting, job tracking, and customer and asset registration and mapping. GIS will be introduced, but only briefly, as a full 2-3 module e-Learning course and F2F workshop on the subject are currently being developed.

## Course Components & Timeframe

The e-Learning course is designed for a total learning time of 4 weeks. The course is supposed to be taken on an extra-occupational basis. Beside their daily work, participants should calculate one to two hours per day to browse through the reading material and to develop the description of a strategy.

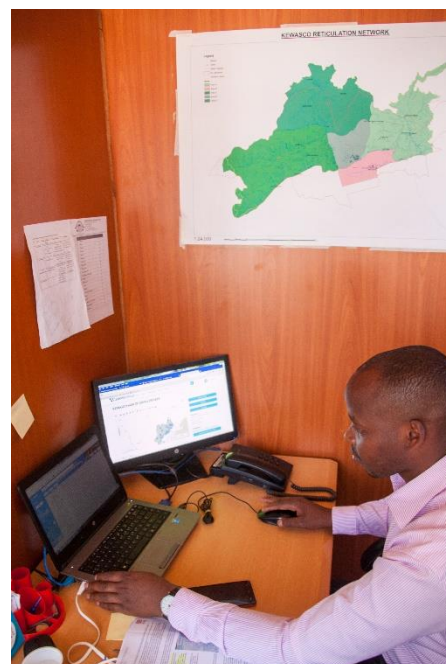
In addition to the interactive self-guided content, the course includes with live group Webinars, Multiple Choice Tests, online forum discussions, social media participation, and practical exercises with the use of various mobile and desktop applications.

## Participant Selection

Participant selection for this e-Course will be slightly different since this is in fact the 'pilot course'.

A select number of participants who have been successful and engaged participants in past Margraf courses will be invited to register. Their familiarity with the Margraf Learning methodology and existing relationships with other participants will help 'jumpstart' the course, and allow for ample feedback to be collected and assimilated.

At least 50% of the participants will be personally invited to apply due their proven interest in, or recent adoption of ICTs in their utility. The remaining 'seats' will be filled by Senior managers and staff from utilities in the East and Southern African region who are successfully chosen during the application process. Preference will be given to those who are yet to begin, or are in the early stages of, ICT-project planning or adoption.





## Pre-Requisites to Join the Course

- **Professional Background:** Senior managers and professional staff in water and sanitation utilities, in particular Managing Directors and Technical, Commercial, and ICT Managers. Representatives from national government entities, regulators, civil society and private sector organizations with a vested interest in supporting the work of utilities.
- **Workload:** Around 6 hours per week in order to complete the course successfully.
- **Technical Environment:** Up-to-date browser, and a stable internet connection to access the multimedia course content and collaborate with other participants in live group webinars and online



fora. Headphones are required for participation in the webinars.

- Participants should also have access to an android-based smartphone to partake in practical exercises which use various android applications.
- **Language:** This course is currently only offered in English, though in the future a French version might also be available.

## Certificates

Successful participants receive a certificate issued by the institutions which offer this course. To receive a certificate, participants must:

- Join at least two (of three) interactive webinars
- Successfully complete three Multiple Choice Tests (at least 60%), MCTs at the end of each module
- Develop an analysis of challenges in their WSP, and develop a roadmap for developing an ICT-related project
- Actively take part in the working groups

Your responsible tutor\*

Your e-mail address\*

(For the following Multiple Choice Questions, please notice the following important advice: some of the questions require MORE THAN ONE answer to be fully correct solved (Multiple Choice). Some questions with "Radiobuttons" (the round ones) are single choice questions - here, only one answer is possible.)

Q1: If an organization practices Cash Accounting, will it be able to know how much its customers owe? ☐ Yes ☐ No

Q2: Revenue is cash in the door ☐ True ☐ False

Q3: How is the management report that shows "Revenues and Expenses" called? ☐ Balance Sheet ☐ Sources and uses of funds ☐ Income Statement ☐ None of the above

Q4: Tariffs are considered affordable if the amount that people pay for water is which percentage of household income? ☐ 5% ☐ 10% ☐ 3% ☐ 8%

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# CONTENT COMPONENTS

## Module 1 «Introduction to ICT tools and trends»

The first part of the course consists of five (5) lessons to introduce participants to Information and Communication Technologies and how they are being used to further development and WASH objectives.

This module gives information on the following:

### Lesson 1: Introduction to Information and Communication Technologies in Development

Global, regional and local ICT trends, applications in different development sectors, barriers to adoption

### Lesson 2: Water, Sanitation and Hygiene Challenges

WASH challenges at global, regional and local scales; increasing challenges of Water Service Providers

### Lesson 3: ICT in WASH

Explores existing and cutting-edge ICT applications and experiences in the WASH Sector

### Lesson 4: IoT, M2M, and Smart Metering in WASH

The sensor revolution and its impacts on WASH; Overview of the Internet of Things, Machine-to-Machine communications, and smart water metering.

### Lesson 5: Mobile Money in WASH

Current and existing mobile payment platforms, emerging approaches to mobile billing



## Module 2: «Practical application of ICT in Water Utilities»

This module covers the practical design and implementation of initiatives which use ICTs to reach WSP objectives. Participants are given an overview of principles to take into consideration, and an in-depth look at three of the more popular and accessible ICT-related initiatives being undertaken by WSPs in the region.

This module gives information on the following:

### Lesson 1: Principles of design and development

Considerations for planning, designing and developing ICT-related projects, user/human-centered design principles, and selecting the right technologies

### Lesson 2: Principles of Implementation and Sustainability

Putting the plan into action, partnerships, and financial and system sustainability

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### Lesson 3: Mobile-enabled Meter Reading

Exploration in the use of mobile devices in reading residential and commercial meters. Mobile-enabled meter reading case study.



### Lesson 4: ICT-enabled Asset and Customer Registration and Mapping

Traditional vs. new methods of customer identification, asset registration, and the use of ICT in visualizing and managing this information.

### Lesson 5: ICT-enabled Fault and Complaint Reporting and Job Tracking

How can mobile devices and web-based software be harnessed to make a simple monitoring and feedback system to better respond to technical and commercial issues.

## COURSE COMPONENTS

### Learning Environment – Didactical Concept

Each of the 10 lessons use the same structure to introduce to the particular problem on 5 short pages. At the end of the lesson, participants are expected to download the complete chapter and use it as obligatory off-line reading for a full understanding of the discussion. Further resource material is provided to give even deeper insight to those who are especially interested in a certain topic.

Each module takes two weeks which are divided into three parts:

- ✓ «Acquire Knowledge» – Study-time of all lessons of this module (online overview, offline reading, resources)
  - ✓ «Reflect & Remix» – Interactive group working and individual transfer task phase: Webinar (online meeting using Audio/Video for the presentation and discussion on selected topics) and Forum (interactive asynchronous discussion tool)
  - ✓ «Proof of Knowledge» – The module is completed with an online test consisting of Multiple Choice and free text questions as well as an own short essay on selected topics
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## Cooperative Learning Environment

Cooperative learning is an educational approach which aims to organize learning activities into academic and social learning experiences. Students must work in groups to complete tasks collectively. Students take benefit from one another's resources and skills (asking one another for information, evaluating one another's ideas, monitoring one another's work, etc.).

All experiences show that the learning result in an e-Learning course is strongly influenced of the grade of collaboration between participants.

The tools used to bring participants into interaction with each other are:

- ✓ **Social Media (Facebook):** The course makes use of the fact that almost everybody has an account at Facebook which can easily be accessed at any time from everywhere with a Smartphone. Facebook offers the possibility to established closed groups which guarantee a certain level of privacy – only course participants have access to the group and to the communication. Social Media are used for general communication and for administrative purposes (announcement of test, webinars etc.)
  - ✓ **Webinars:** Regular components of the course are interactive experts input lectures. Up to 100 participants are connected together in a virtual conference room and follow the presentation of an expert, can post their questions and forward their comments. The webinar uses VoIP (Voice over IP) technique for audio and video communication which is especially optimized for low bandwidth.
  - ✓ **Working Groups (Forum):** The course room allows participants to get into content-related discussion with each other and up-/download own resources. The discussion forum is mainly used to establish working groups in which participants collaborate to achieve certain targets and to benefit from a mutual exchange of experiences.
  - ✓ **Multiple Choice Tests:** Interactive test forms give participants the opportunity to check whether they understood the content properly. Multiple Choice Tests help the tutors and the course administration to evaluate the students' performance and may as well give the basis to decide on whether certificates can be issued.
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