



Online Course Objectives

The main objective of this course is to:

- Provide a systematic understanding of process design procedures for low-cost natural wastewater treatment systems which can be applicable to SWIM partner countries, including waste stabilization ponds, anaerobic systems, soil aquifer treatment and constructed wetlands.

Course Outcome: Upon the successful completion of the course, the participant understands the basic principles of natural treatment processes and systems, can identify the concepts and functions of the different compartments in the natural systems, knows about the performance, operation and maintenance, and understands the basic principles of the design.

Syllabus

The table below shows the content of the course that will be delivered to the participants.

Content of the Online Course Indicating the Start and End Dates

Course on Natural Treatment Systems	Start Date	End Date
Introduction		
Introduction to natural treatment systems		
Course objectives and set-up	06/05/2015	10/05/2015
Introduction to eCampus		
Course 1 - Wastewater Treatment		
Introduction to wastewater treatment		
Wastewater characterisation		
Preliminary and Primary Treatment		
Organic matter removal		
Nitrification	11/05/2015	31/05/2015

Denitrification				
Phosphorus removal				
Self-evaluation test				
Course 2 - Constructed Wetlands				
Introduction to course	01/06/2015	14/06/2015		
Introduction to constructed wetlands				
Basic principles				
Operation and maintenance				
Types of constructed wetlands				
Soil Aquifer Treatment				
Case Studies				
Self-evaluation test				
Course 3 - Ponds				
Introduction to course	15/06/2015	21/06/2015		
Overview of planning, design and operation and maintenance				
Case Studies				
Self-evaluation test				
Course 4 - Anaerobic Systems				
Introduction to anaerobic systems				
Anaerobic wastewater treatment systems				
Microbial aspects of anaerobic conversions				

Predicting methane production	22/06/2015	12/07/2015
Impacts of sulphate		
Anaerobic reactor technology		
The Upflow Anaerobic Sludge Blanket		
Start-up and sludge granulation		
Anaerobic Treatment and Domestic Sewage		
Case studies		
Self-evaluation test		
Course 5 - Application		
Introduction to course		
Comparative analysis		
Life cycle analysis		
Reuse of effluent for agriculture		
Selection tool for natural wastewater treatment systems (WAWTTAR)		
Final Assignment		
	03/08/2015	10/08/2015

Course Set up

The online course consists of video-recorded lectures, PowerPoint presentations with voice-over, lecture handouts for participant's self study and assignments. The Virtual Learning Environment, "eCampus", which will be used for the course delivery is based on the free open source course management system "Moodle".

A discussion forum set up by the course coordinator, enables participants to communicate online with each other and the course coordinator using text. Participants can receive posts by email, and/or log onto Moodle to view them. The course coordinator can also view the participation and

activity per participant which is recorded on Moodle, and can act upon it, if necessary in case of limited activity, by contacting the participant.

The course program will be taught over a period of 3 months (12 weeks). A participant will be expected to spend about 8 hours per week on average through reading, discussion and assignments. The discussions will take place on the forum, with fellow participants and/or teachers. The course is sub-divided into 5 chapters and one final assignment. The table above displays the contents of the online course including the estimated study load per subject. The total work load of the course is estimated at around 96 hours.