

Module Name Wetlands for Water Quality		Module Code LIWM 721 Wetlands for Water Quality	Credit Points/ECTS 3.0/6.0
Target Group BSc. graduates in biology, Environmental Sc & other related areas		Prerequisites Programme prerequisites	
Overall objective Students learn the structure and functions of wetlands and their applications in waste water treatment.			
Learning Objectives After successful completion of this module participants will be able to: <ul style="list-style-type: none"> • Identify types of wetlands and explain processes in natural wetlands • Explain wastewater treatment and sanitation options. • Explain the water quality function and the process of wastewater purification by natural and constructed wetlands • Design and operate constructed wetland for wastewater treatment 			
Module Subjects/Module syllabus Introduction to natural wetlands: Definition and characteristics of wetlands, classification, wetland biota, vegetation zonation and dynamics, wetlands and climate. Wastewater sources & characteristics, challenges and options for wastewater management-conventional wastewater treatment and Eco-sanitation. Use of natural wetlands for wastewater treatment: basic principles, the role of the different wetland components (biota, soil and water), contaminant removal mechanisms, Natural wetlands for water treatment-Case studies Constructed wetlands for wastewater treatment: Why constructed wetlands? Types of constructed wetlands, factors influencing performance, design, construction and set up (features, criteria, wetland sizing, planting), operation and maintenance, case studies-industrial and domestic constructed wetlands for wastewater treatment and modelling. Economics of constructed wetlands and re-use of treated wastewater.			
Didactics The contact hours in the module include lectures, fieldwork, laboratory work, structured exercises, assignment, group and individual presentations and discussions. Field work will include natural and constructed wetlands. The ability to make a proper design for the treatment of wastewater by a constructed wetland will be tested by group and or individual assignment.		Assessment Part 1 (60%): written examination Part 2 (10%): assignment Part 3 (20%): group work and individual presentation Part 4 (10%): participation in laboratory and field work	
Lecturing Materials Lecture notes, Laboratory manuals, case studies, reference materials (books, scientific publications).			
Resource Persons: Module coordinator: Prof. Nzula Kitaka Module overview Prof. Julius Kipkemboi Introduction to natural wetlands Prof. J. Kipkemboi/Mr. Harrison Ngirigacha Wastewater characteristics, challenges and solutions Prof. J. Kipkemboi/Margaret. Abira Use of natural wetlands for wastewater treatment Prof. Frank Kansiiime Constructed wetlands for wastewater treatment, Dr. Margaret Abira/ Dr. Richard Kimwaga Technical Staff: Mr. Lewis Mungai			