
Wollo University
Kombolcha Institute of Technology (KIOT)
Department of Water Resources & Irrigation Engineering (WRIE)

Course Outline

Course Title: Software Application in WRIE	Academic Year: 2020G.c
Course Code: WRIE5203	Semester: II
Prerequisite: Introduction to computers & Programming and Engineering Hydrology Module,	Section: A,B,C&D
Instructors: Tewodrose D. & Habtamu.	L-T-P-Hs-E: 1-0-3-1

Course Description: This course contains subjects in the Software Application in WRIE which will enable students understand

- ✓ Introduction to hydrodynamic models,
- ✓ General structure of different water resource models,
- ✓ Describing steady and unsteady flow using models based on 1D differential equation for water quality, quantity, response time and sediment transport problems.
- ✓ Modeling branching open channel networks with variable cross-sections and control structures like weir, culverts, siphons, flap gates and pumps.
- ✓ Modeling propagation of waves through canals, response time effect on operation, effect of maintenance on water levels and operation of off takes.
- ✓ Exercise based on the operation of an irrigation canal by an active modeling of a canal with control structures.
- ✓ To determine the irrigation water requirement using CROPWAT software

Objective of the course:

The objective of the course is introduce to the students different models, and their structures, at the end student be able to use those models in aliasing real time problem in water resources

1. Introduction to Water Resource model

- 1.1 Importance of Water Resource system modelling
- 1.2 Definition Water Resource system modelling Developing

2. Module one:- WaterCAD and Flowmaster Software

- 2.1 Steady state flow analysis using WaterCAD software
- 2.2 Unsteady state flow analysis WaterCAD software

- 2.3 Analysis of open channel, pipe flow and gate flow and also design of weir using flowmaster

3 Module Two:- Introduction some hydrological model

- 3.1 Determine run off sedimentation rate using some Hydrological model like ARC SWAT and HEC-HMS

4 Module Three:- Introduce some software which is used to design Hydro structure like HY-8 Software

**4 Module Four:- Determine the
Irrigation Requirement Using
CropWat software**

**5 Module Five:- Introduce some
software which is used to design**

layout of channel like Civil 3D Software

Method of Evaluation:

Tests & laboratory practice 50%

Projects 20%

Final examination 30%

References:

- Use the software Manual which is given by the Instructors.

Requirement:

For a better teaching learning process students are advised to:

- Attend lectures regularly
- Participate actively in the class
- Be punctual in submitting assignments and other duties
- Cheating is strictly forbidden. It will result in disqualification of the course