Ambo University Woliso Campus
School of technology and informatics
Department of CoTM
Hydraulics

Program	BSc. in CoTM
Course title	Hydraulics
Course code	Heng2121
Credit hour	3
ECTS credits	5
Class Year	II
Semester	II
Pre request	
Instructor	Nigusie K.

Course objective

- Understand the fundamental concepts of fluid mechanics.
- Understand the basic laws of physical science (conservation of mass, energy and momentum) which govern the mechanics of fluid flow.
- Apply these laws to the flow of water through pipes.
- Understand the factors influencing the performance of centrifugal pumps

Course content

Chapter 1 :-Introduction
- 1.1 What is hydraulics
- 1.2 Application of hydraulics

Chapter 2:- Fluids and their properties
- 2.1 Fluids
- 2.2 Fluid properties

Chapter 3:- Fluid statics
- 3.1 Fluid pressure
- 3.2 Pressure measurement
- 3.3 Hydrostatic pressure on plane and curved surfaces
- 3.4 Buoyancy and flotation

Chapter 4:-Fluid kinematics
- 4.1 Dimension of flow
- 4.2 Describing the pattern of flow
- 4.3 Types of fluid flow
- 4.4 Continuity equation

Chapter 5:-Fluid dynamics
- 5.1 Introduction
- 5.2 Equations of motion
- 5.3 Bernoulli's equation
- 5.4 Impulse momentum equation

Chapter 6:-Flow in open channel
- 6.1 Types of flow
- 6.2 Hydraulically efficient channel cross-section
- 6.3 Specific energy
- 6.4 Hydraulic jump

Chapter 7:-Flow through pipes
- 7.1 Major Losses (Head loss in conduits of constant cross-section)
- 7.2 Minor losses in the pipes
- 7.3 Pipeline system
  - Pipe in serious and parallel
- 7.4 Branching pipes

Chapter 8:-Introduction to Hydraulic Machines
- 8.1 Introduction
- 8.2 Pump Types

Mode of assessment	60% continues assessment and 40% final exam
Attendance requirement	90% minimum class attendance
Reference	1. Crowe, C.T., Elger, D.F. & Roberson, J.A. (2004), Engineering Fluid Mechanics, 8th edition, John Wiley & Sons. 2. Streeter, V.L., Wylie, B.E. and Bedford, K.W. (1997), Fluid Mechanics, 9th edition, McGraw Hill. 3. Douglas, J.F., Gasoriek, J.M., Swaffield, J. and Jack, L. (2006), Fluid Mechanics, 5th edition, Prentice Hall.