Water Supply and Sanitation Engineering Module				
Course Title	Water Quality & Treatment			
Course Number	WRIE3121			
Program	B.Sc. in Water Resources and Irrigation Engineering			
Module name	**Water Supply and sanitation Engineering**			
Instructor Name	Name: .Bezawit Tesfaye e-mail: bezawittesfaye.bt@gmail.com			
Course Information	Academic Year : 2012 Year : **III** Semester: **II**			
ECTS	**3 ECTS**			
Students' work load	**Lecture**	**Tutorial**	**Lab**	**Home study**
	1	0	2	2
Course Objectives and Competences Acquired	The aim of this course is to introduce students with the concepts of water quality, organic and in-organic compounds that can pollute water. Students can analyze the physical, chemical and biological components of water, understand the standards of drinking and Irrigation water standards based on the physical, chemical and biological components of water at the end of this course. Students are also capable to suggest suitability of given water for different purposes such as irrigation, domestic supply or industrial requirement. Students will also be familiar with different water treatment methods.			
Course Description	Water quality pollution and analysis: types and sources of pollution, water quality Changes, impurities of water. Organic and in-organic components of surface water and groundwater, Laboratory test procedures: Physical, chemical and biological examination of water. Drinking and Irrigation water standards. Water quality and health; Water quality and Agriculture; Water treatment; treatment methods; Basic water treatment: sedimentation, coagulation, slow sand filter, roughening filter, rapid sand filter, disinfections. Treatment methods for rural water supply, treatment of saline/sodic water, treatment of waste water, treatment methods for rural water supply.			
Pre-requisite	Nil			

	1. Water quality pollution and analysis 1.1 Introduction 1.2 types and source of pollution 1.3 water quality changes 1.4 impurity of water schemes	Bride, G.S. (1989) Water supply and Sanitary Engineering. Dhanpat Rai&Sons, Delhi.

	2. organic and inorganic components of surface water and ground water 2.1 Introduction 2.2 laboratory test procedures 2.2.1 physical, chemical and biological examination of water **3. Drinking and irrigation water standards** 3.1 introductions 3.2 water quality and health 3.3 water quality and agriculture	Bride, G.S. (1989) Water supply and Sanitary Engineering. Dhanpat Rai & Sons,Delhi.
	4. water treatment 4.1 Introduction 4.2 Treatment methods 4.3 Basic water treatment 4.3.1 Sedimentation 4.3.2 Coagulation 4.3.3 Slow sand filter 4.3.4 Roughening filter 4.3.5 Rapid sand filter 4.3.6 Disinfections **5. Treatment methods for rural water supply** 5.1 Introduction 5.2 Treatment of saline/solid water 5.3 Treatment of waste water	Bride, G.S. (1989) Water supply and Sanitary Engineering. Dhanpat Rai & Sons, Delhi.

Assessment arrangements	Test 1	15%
	Quizzes	15%
	Assignments	15%
	Test 2	15%
	Final-exam	40%

Policy	**Attendance**: A student required to attend at least 85 % of the classes lecture and 100% lab **Practical Assignments**: all students must do all the assignments given **Tests/quizzes**: all students must sit/take all tests/quizzes given **Cheating/plagiarism**: cheating/plagiarism is strictly forbidden. It will result in disqualification of the course.
Reference	• Thomas D. Waite, 1994. Principles of Water Quality, Academic Press inc., New York. • T.H.Y. Tebbutt ,1998.Principle of water quality control ,Fifth Edition, Biddles ltd, Britai • Bride ,G.S (1989)Water supply and Sanitary Engineering. Dhanpat Rai & Sons, Delhi. • Tomar, M. (1999) Quality Assessment of Water and West water. Lewis Publishers,LondonTechnical Drawing, 12th edition, Prentice Hall.