Engineering Hydrology Module	
Course Title	Surface Water Hydrology
Course Code	WRIE2094
Program	B.Sc in Water Resources and Irrigation Engineering
Module name	Engineering Hydrology
Course Coordinator	Name: Michale Gebrekiros Office location : Shire Campus Mobile: 0931808915; e-mail: mgk169@gmail.com Consultation Hours: _____
Instructor Name	Name: Michale Gebrekiros Website: http://Mgebrekiros.github.io :Mobile: 0931808915 e-mail: mgk169@gmail.com _____
Course Information	Academic Year 2008E.C Year II : Semester**: II** Meeting Time: Meeting Location:
ECTS	**5**

Students' work load in hrs	**Lecture**	**Tutorial**	**Lab**	**Home study**	
	2	3	0	3	

Course objectives & Competences to be Acquired	The course is designed to acquaint students with developing hydrographs, frequency analysis of, rainfall and stream flow data, flood routing, reservoir capacity determination and sedimentation, and statistical analysis of hydrological parameters and generation of random numbers
Course Description	• Flood Routing; Reservoir Routing; Channel Routing. • Frequency analysis: rainfall, low flow, floods and droughts. • Reservoirs: determination of reservoir capacity; reservoir sedimentation • Basic concepts of stochastic hydrology: parameter estimation, biased and unbiased statistics, time series analysis, consistency and homogeneity, hypothesis testing, trend and periodicity, histogram and frequency distributions: applications to flood frequency analysis, probable maximum precipitation and probable maximum floods.
Pre-requisite	**Introductory hydrology and Hydrometry practice**
Status of Course	**Compulsory**
	Syllabus/Schedule

Week	**Topics**	**Required Text**

	1. Introduction (Lec=2hrs)	
	2. Frequency Analysis (Lec=4hrs, Tut=7hrs) 2.1 Introduction 2.2 Flow Frequency 2.3 Flood Probability 2.4 Precipitation Probability 2.5 Low Flow Analysis 2.6 Risk, Reliability, and Safety Factor	Subramanya, K. (1994), Engineering Hydrology 2nd ed., Tata McGraw-Hill
	3. **Flood Routing & Reservoir (Lec=3hrs, Tut=5hrs)** 3.1.Introduction 3.2.Simple Non-Storage Routing 3.3.Storage Routing 3.4.Reservoir or level pool routing 3.5.Channel Routing 3.6.Hydrologic routing 3.7. Types & purposes of reservoirs 3.8.Reservoir capacity determination	
	4.0. Rainfall-runoff relationship 4.1 Introduction 4.2 Rational Method 4.3 SCS Curve method 4.4 Time Area Method 4.5 Hydrograph analysis 4.5.1 Factors affecting flood hydrographs 4.5.2 Effective rainfall 4.5.3 Separation of base flow hydrograph 4.5.4 Unit hydrographs 4.5.5 S-hydrographs 4.5.6 Synthetic unit hydrographs	
	5.0 Introduction to Urban Hydrology (Lec=3hrs, Tut=5hrs) 5.1 General 5.2 Climate modification 5.3 Catchment response modification 5.4 Urban development planning 5.5 Urban drainage design concepts	Subramanya, K. (1994), Engineering Hydrology 2nd ed., Tata McGraw-Hill
	4. **Basic Concepts of Stochastic Hydrology (Lec=4hrs, Tut=5hrs)** 4.1.Introduction 4.2.Time Series 4.3. Hydrological Time series analysis method 4.4. Time Series Analysis 4.5. Time Series Synthesis 4.6. Application of Time Series Analysis and Synthesis	Subramanya, K. (1994), Engineering Hydrology 2nd ed., Tata McGraw-Hill
Summary of Teaching and Learning Method	Lecture, discussion, individual work, problem solving, project work	
Assessment		**chapters**
	a. 10% Test	Chapter 2,3&4

	b. 10% Quiz	All chapters
	c. 15% assignments	
	d. 15% project work	Instructor selection
	e. 10% presentation	Project presentation
	f. 40% Final-exam	
Course Expectation	**Preparedness and participation**: both students and the teacher should be prepared since education is an interactive process. Students should be active participants in the teaching-learning process. They should be interested to the course and come to class with the necessary materials such as exercise books and pen. In addition, they should to take responsibility in their education. Teachers are also expected be prepared and interested to the course, which they are offering. They have to consult the essential materials ahead of time and try share their knowledge in an efficient and effective manner. **Material availability**: reference materials are expected to be available in the library nearest to respective faculties.	
Policy	**Attendance**: students should attend at least 85% **Assignments**: all students must do all the assignments given **Tests/quizzes**: all students must site/take all tests/quizzes given **Cheating/plagiarism**: cheating/plagiarism is strictly forbidden. It will result in disqualification of the course.	
Reference	- Subramanya, K. (1994), Engineering Hydrology 2nd ed., Tata McGraw-Hill - Shaw, E.M. (1994) Hydrology in Practice, 3rd ed., Chapman & Hall - Linsley, R.K (1982), Hydrology for Engineers, 3rd ed., McGraw-Hill - Chow, V.T. (1964), Hand book of Applied Hydrology, McGraw-Hill - Any journals and research papers on hydrology - Wilfried Brutsaert. (2005). Hydrology: An Introduction. Cambridge University Bridge. - Warren Viessman and Gary L. Lewis. (2002). Introduction to Hydrology. 5/e. Prentice Hall. - Ven Te Chow and Maidment (1988). Engineering Hydrology. McGraw-Hill. - Fundamental hydrology - Bhattacharya (2003). Elements of Applied Hydrology, Delhi - Ward, R.,C (2000). Principles of Hydrology, London. - Robinson, M. (2000). Principles of Hydrology, London. - Wilson E. M (1990). Engineering Hydrology: 4th Edition, Brtain	