

Aksum University-Shire Campus  
School of Water Technology  
Department of Water Resources and Irrigation  
Engineering

<b>Engineering</b>				
<b>Course Title</b>	<b>Introductory Hydrology &amp; Hydrometry</b>			
<b>Course Number</b>	WRIE2093			
<b>Program</b>	<b>B.Sc in Water Resources and Irrigation Engineering</b>			
<b>Module Name</b>	<b>Engineering Hydrology</b>			
<b>Course Coordinator</b>	Name: Michale Gebrekiros Office location . . . . . Mobile: +251-09318089; e-mail: mgk169@ gmail.com website: http://Mgebrekiros.github.io			
<b>Instructor Name</b>	Name: Michale Gebrekiros Office location . . . . . Mobile: . . . . . .; e-mail: . . . . . Consultation Hours: _____			
<b>Course Information</b>	Academic Year Year : Semester: Meeting Day: Meeting Time: Meeting Location:			
<b>ECTS</b>	<b>5</b>			
<b>Students' work load in hrs</b>	<b>Lecture</b>	<b>Tutorial</b>	<b>Lab</b>	<b>Home study</b>
	2	2	1	3
<b>Course objectives &amp; Competences to be Acquired</b>	<p>After successful studying of the course, trainers will be able to:</p> <ul style="list-style-type: none"> <li>➤ get an insightful knowledge on hydrological cycle</li> <li>➤ understand the climatic variables and its effect on the hydrologic cycle</li> <li>➤ know the different methods of precipitation data analysis and interpretation</li> <li>➤ identify the methods used for evapotranspiration</li> <li>➤ provide critical sought on the overland and sub surface flow process</li> <li>➤ appreciate the practical significance of the course in engineering practices</li> </ul>			
<b>Course Description</b>	<p>The hydrologic cycle, Precipitation: types of precipitation; measurement of rainfall; analysis and interpretation of precipitation data. Evaporation and transpiration; factors controlling evaporation and transpiration process; measurement of evaporation; estimation of potential evapotranspiration. Infiltration: factors affecting infiltration, measurement of infiltration; infiltration indices .runoff: factors affecting runoff. Stream f low measurement. hydrometry: the need for data, water level determination,(direct stage read of gauges and recording limn meters).water depth and bottom level: mechanical and electronic devices, practical depth and stage measurement, flow velocity measurement: surface velocity, velocity in a single point: propeller type current meter, pitot tube, electromagnetic current meter, mean velocity: salt screen and floats.</p>			

<b>Pre-requisite</b>	<b>Probability and statics</b>	
<b>Status of Course</b>	<b>Compulsory</b>	
<b>Schedule/syllabus</b>		
<b>Week</b>	<b>Topics</b>	<b>Required Text</b>
	<b>1. Introduction to hydrology (Lec=3hrs, tut=2hrs)</b> 1.1 Intoduction 1.2 Application of Hydrology in Engineering 1.3 Hydrologic cycle 1.4 Water budget equation and world water balance	fundamental hydrology
	<b>2. Precipitation (Lec=7hrs, tut=10hrs)</b> 2.1 introductions 2.2 formation and types of precipitation 2.3 measurement of rain fall 2.4 Analysis and interpretation of precipitation data 2.4.1 estimation of missed data 2.4.2. checking data consistency 2.6 optimum rain gauge network designs 2.5 estimation od mean areal depth of precipitation 2.7 graphical representations of rainfall data 2.8 Rainfall frequency analysis	1. Ven Te Chow and Maidment (1988) Engineering Hydrology. McGraw-Hill. 2. fundamental hydrology 3. Engineering hydrology, subrmanya
	<b>3. Evaporation and Transpiration (Lec=2hrs, tut=10hrs)</b> 3.1 introductions 3.2 factors controllng evaporation and transpiration process 3.3 evaporation and transpiration process 3.3 measurement of evaporation 3.4 estimation of potential evaporation	1. Ven Te Chow and Maidment (1988). Engineering Hydrology. McGraw-Hill. 2. fundamental hydrology
	<b>4. Infiltration (Lec=5hrs, tut=8hrs)</b> 4.1 Introductions 4.2 Factor affecting infiltration 4.3 Measurement and estimation of infiltration process 4.4 Horton's infiltration concept 4.5 Infiltration indices	1. fundamental hydrology
	<b>5. Runoff (Lec=3hrs, tut=5hrs)</b> 5.1 Introductions 5.2 Factors affecting runoff 5.3 Runoff characteristics of stream 5.4 Runoff estimation 5.5 Flow duration curves	1. Engineering hydrology, subrmanya
	<b>6.0 Hydrometry</b> 1.1. Measurement of stage 1.2. Depth and velocity 1.3. Rating curve 1.4. Establishment and operation of hydrometer logical stations;	Hydrology and Water Resources Engineering by K.C. Patra

Teaching and Learning Method		
Assessment	➤ 10% Test	<b>chapters</b> Chapter 1,2&3
	➤ 20% Quizzes	All chapters
	➤ 30% assignments & project work	Chapter 4,5&6
	➤ 40% Final-exam	Chapter 2,3,4,5&6
Course Expectation	<p><b>Preparedness and participation:</b> 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.</p> <p><b>Material availability:</b> reference materials are expected to be available in the library nearest to respective faculties.</p>	
Policy	<p><b>Attendance:</b> students should attend at least 85%</p> <p><b>Assignments:</b> all students must do all the assignments given</p> <p><b>Tests/quizzes:</b> all students must sit/take all tests/quizzes given</p> <p><b>Cheating/plagiarism:</b> cheating/plagiarism is strictly forbidden. It will result in disqualification of the course.</p>	
Reference	<ul style="list-style-type: none"> <li>• Wilfried Brutsaert. (2005). Hydrology: An Introduction. Cambridge University Bridge.</li> <li>• Hydrology and Water Resources Engineering by K.C. Patra</li> <li>• Warren Viessman and Gary L. Lewis. (2002). Introduction to Hydrology. 5/e. Prentice Hall.</li> <li>• Ven Te Chow and Maidment (1988). Engineering Hydrology. McGraw-Hill.</li> <li>• Fundamental hydrology</li> <li>• Engineering hydrology, subrmanya</li> <li>• Bhattacharya (2003). Elements of Applied Hydrology, Delhi</li> <li>• Ward, R.,C (2000). Principles of Hydrology, London.</li> <li>• Robinson, M. (2000). Principles of Hydrology, London.</li> <li>• Wilson E. M (1990). Engineering Hydrology: 4th Edition, Britain</li> <li>• Subramany K (1994). Engineering Hydrology: 2nd Edition, New Delhi</li> </ul>	