

Hydraulic Structures & Hydropower Engineering Module				
Course Title	River Engineering			
Course Code	WRIE3151			
Program	B.Sc in Water Resources and Irrigation Engineering			
Module name	Hydraulic Structures & Hydropower Engineering			
Module Coordinator	Name: Office location Mobile:; e-mail: Consultation Hours: _____			
Instructor Name	Name: Office location Mobile:; e-mail: Consultation Hours: _____			
Course Information	Academic Year Year: III Semester : II Meeting Day: To be arranged at the beginning of the semester Meeting Time: To be arranged at the beginning of the semester Meeting Location: To be arranged at the beginning of the semester			
ECTS	5 ECTS			
Students' work load in hrs	Lecture	Tutorial	Lab	Home study
	2	2	0	4
Course objectives	To introduce students to the mechanisms of sediment transport and enable them design stable channels and river training works.			
Course Description	River characteristics. River Hydraulics. River morphology and regime. Sediment transport: Origin and properties of sediment, initiation of particle motion. Transportation mechanics, Bed load, suspended load, wash load and total load transport. Alluvial roughness. Calculation of sediment transport. Local scours near structures. River training and flood control. Erosion protection and discharge control. River flow forecasting. Hydraulics of bridges, culverts and aqueducts. Sediment transport: bed load sampler: trap sampling, bed form tracking; suspended load sampler: classification of samplers, instruments for concentration, point-integrating measurements (bottle and trap samplers, pump-samplers, optical and acoustical sampling methods), instruments for discharge, point integrating measurements, instruments for concentration, depth-integrating measurement.			
Pre-requisite	Open Channel Hydraulics			
Course status	Core			
Schedule/syllabus				
Week	Topics			Required Text
	1. Introduction (Lec=5hrs, Tut=5hrs) 1.1 River characteristics 1.2 River hydraulics 1.3 River morphology and regime			Lelaviasky, S., (1965). River and Canal Hydraulics, Vol. 4, Chapman and Hall ltd, London.

	2. Sediment transport(Lec=10hrs, Tut=15hrs) 2.1 Origin and properties of sediment 2.2 Limitations of particle motion 2.3 Transportation mechanisms 2.4 Bed load transport 2.5 Suspended load transport 2.6 Wash load transport 2.7 Total load transport	Lelaviasky, S., (1965). River and Canal Hydraulics, Vol. 4, Chapman and Hall ltd, London.	
	3. Sediment load sampler(Lec=3hrs, Tut=5hrs) 3.1 Introduction 3.2 Bed load sampler		
	4. Scouring (Lec=5hrs, Tut=10hrs) 4.1 Introduction 4.2 Local scour near structures		
	5. River training and flood control (Lec=7hrs, Tut=10hrs including 3-5 minutes groups discussion on each topic, 5-10 minutes reflection on discussions, and for summarizes and problems solutions by the instructor) 5.1 Erosion protection 5.2 Discharge control 5.3 River flow forecasting 5.4 Hydraulics of bridge, culverts and aqueducts	Przedwojski, B., (1984). River Training techniques: fundamentals design and applications.	
Summary of Teaching and Learning Method		Lecture, tutorials, discussion, individual work, problem solving, project work	
Assessment	15% Test		Chapter 1,2&3
	10% Quizzes		Chapter all
	10% assignments		Chapter 1,2&3
	15% project work		Instructor selection
	40% Final-exam		All Chapters
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. (1986).Flow in Open Channels, Tata McGraw-Hill, New Delhi ➤ Lelaviasky, S., (1965). River and Canal Hydraulics, Vol. 4, Chapman and Hall ltd, London. ➤ Przedwojski, B., (1984). River Training techniques: fundamentals design and applications.
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