Water Resources Economics, Planning and Management

Code	Credit Hours
CE- 886	3-0

Course Description

The overall objective of this course is to introduce the students to water resource system planning, design & operation and application of economic principles and operational research methods to various surface and groundwater allocation problems.

Reference Books:

1. P. Cassimatis, A Concise Introduction to Engineering Economics. E & FN Spon, London, 1988.
2. D. A. Hay, and D. J. Morris, Industrial Economics and Organisation, 2nd edition, Oxford University Press, 1991.
3. L. D. James, and R. R. Lee, Economics of Water Resources Planning. McGraw-Hill, New York, 1971.
4. Alvin S. Goodman, Principles of Water Resources Planning, Prentice-Hall, 1984.
5. Maasset. al. Design of Water Resources Systems, MacMillan, 1968.
6. M. C. Chaturvedi, Water Resources Systems Planning and Management, Tata McGraw Hill Inc., New Delhi, 1997.
7. R. K. Linsley, J. B. Franzini, D. L. Freyberg, and G. Tchobanoglous, Water Resources Engineering, 4th edition. McGraw-Hill, New York, 1992.
8. D. P. Loucks, J. R. Stedinger and D. A. Haith, Water Resource Systems Planning and Analysis, Prentice-Hall Inc, Englewood Cliffs, N J, 1981

Prerequisites

Nil

ASSESSMENT SYSTEM FOR THEORY

Quizzes	10%
Assignments	10%
Mid Term	30%
ESE	50%

Teaching Plan

Week No	Topics	Learning Outcomes

1-2	Overview of the issues associated with water resources development, planning and management. Types of models used to assist in the planning and management of water resources	Introduction to water resources planning & management, Overview of water resources planning & management both at global and national level, Importance of models, types and uses
3-5	The Economics of Water. Production possibility curve; Total, average, marginal, fixed and variable costs. Supply, demand and the concept of market equilibrium. Producer and consumer surplus. Pricing and Regulation.	Water resources economics, Water supply & demand in various sectors, Concept of market equilibrium, Concept of producer & consumer surplus, Mechanism of pricing & regulation
6	**MID TERM IN WEEK 9**	
7-8	Economic principles underpinning the pricing of water services; Social and political implications of pricing policies; Economic regulatory mechanisms.	Economic principles used for determining the pricing of water services, Social & political impact of pricing policies on the society and national economy, Mechanism of economic regulation
9	**MID TERM EXAM**	
10-12	Principles of Engineering Economics. Time value of money and interest rates. Time value equivalence of cash flows; Economic comparison of alternatives. Evaluation of Water Resources Projects using Economic Criteria. Methodologies to evaluate the economic feasibility of water resources project including identification of costs and benefits of projects, and determination of standard economic criteria for their evaluation.	Introduction to engineering economics, Understanding the concept of time value of money, Calculation of Time Value of Money, Interest rates, Comparison of alternatives for Water Resources Projects, Economic feasibility of water resources projects
13-14	Integrated River Basin Management. Approaches and issues associated with the integrated management	Concept of Integrated River Basin Management, Water allocation for various sectors, Role of sustainable development concepts, Alternatives to classical economics theories; Multiple criteria decision-making models.

	of water catchments, allowing for economically, socially, and politically balanced allocations of water resources amongst water users. Role of sustainable development concepts. Alternatives to classical economics theories; Multiple criteria decision-making models.	
15-17	Optimization Models for Planning and Operation. Optimization approaches to decision making. Decision making criteria used in planning and management; Linear programming and its application to water resources development. Dynamic programming and its application to water resources development	Optimization and Simulation, Optimization models, Linear programming & Dynamic programming, Optimization software
18	**End Semester Exam**	