

# Watershed Management - Video course

## COURSE OUTLINE

Watershed is the basic scientific unit for planning and management of water resources.

Watershed Management is an integration of technologies within the natural boundaries of drainage area for optimum development of land, water and plant resources to meet the basic needs of the people in a sustained manner.

In watershed concept, development is not confined to agricultural lands alone but covers the entire watershed area, starting from the highest point (most remote point) or ridge line to outlet or nalla or natural stream.

The main objective of any watershed development and management program is "proper use of all available resources of a watershed for optimum production with minimum hazards to natural resources".

The main aim of this course "Watershed Management" is to discuss various aspects of water resources development and management on watershed basis.

The various sections in the course will focus on the technical aspects of watershed management; perspectives on water management; skills of analyzing the complex issues in water management and on specific knowledge on issues of watershed management.

Each topic will be developed in logical progression with possible case studies and advancements in various areas.

Some of the important topics covered in this course include: basics of watershed developments and management, watershed modeling, Integrated Watershed Management, sustainable watershed approach, water quality management, storm water and flood management, drought management, use of modern techniques in watershed management such as remote sensing, Geographical Information System and numerical modeling.

This course will be very useful to undergraduate students, post-graduate students, teachers, NGO's and practitioners. A number of field problems will be discussed to illustrate the concepts clearly.

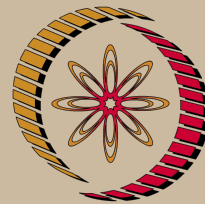
### Contents:

Introduction and basic concepts; Watershed management practices in various regions; Sustainable watershed approach; Integrated watershed management; Watershed modeling; Use of modern techniques in watershed management;

Social aspects of watershed management; Management of water quality; Storm water and flood management; Drought management; Water conservation and recycling.

## COURSE DETAIL

Sl.No.	Topic	No. of Hours
1.	<p><b>Introduction and Basic Concepts:</b></p> <p>Concept of watershed, introduction to watershed management, different stakeholders and their relative importance, watershed management policies and decision making.</p>	03



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**Civil Engineering**

### Additional Reading:

1. Literature on Hydrology, Water Resources Development and Management.

### Coordinators:

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2.	<p><b>Sustainable Watershed Approach &amp; Watershed Management Practices:</b></p> <p>Sustainable integrated watershed management, natural resources management, agricultural practices, integrated farming, Soil erosion and conservation;</p> <p>Watershed Management Practices in Arid and Semiarid Regions, Case studies, short term and long term strategic planning.</p>	04
3.	<p><b>Integrated Watershed Management:</b></p> <p>Introduction to integrated approach, Integrated water resources management, conjunctive use of water resources, rainwater harvesting; roof catchment system.</p>	04
4.	<p><b>Watershed Modeling:</b></p> <p>Standard modeling approaches and classifications, system concept for watershed modeling, overall description of different hydrologic processes, modeling of rainfall-runoff process, subsurface flows and groundwater flow.</p>	07
5.	<p><b>Social Aspects of Watershed Management:</b></p> <p>Community participation, Private sector participation, Institutional issues, Socio-economy, Integrated development, Water legislation and implementations, Case studies.</p>	03
6.	<p><b>Use of modern techniques in watershed management:</b></p> <p>Applications of Geographical Information System and Remote Sensing in Watershed Management, Role of Decision Support System in Watershed Management.</p>	05
7.	<p><b>Management of Water Quality:</b></p> <p>Water quality and pollution, types and Sources of pollution, water quality modeling, environmental guidelines for water quality.</p>	04
8.	<p><b>Storm Water and Flood Management:</b></p> <p>Storm water management, design of drainage system, flood routing through channels and reservoir, flood control and reservoir operation, case studies on flood damage.</p>	04
9.	<p><b>Drought Management:</b></p> <p>Drought assessment and classification, drought analysis techniques, drought mitigation planning.</p>	03

10.	<b>Water Conservation and Recycling:</b> Perspective on recycle and reuse, Waste water reclamation.	03
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**References:**

1. Allam, Gamal Ibrahim Y., Decision Support System for Integrated Watershed Management, Colorado State University, 1994.
2. American Socy. of Civil Engr., Watershed Management, American Soc. of Civil Engineers, New York, 1975.
3. Black Peter E., Watershed Hydrology, Prentice Hall, London, 1991.
4. Michael A.M., Irrigation Engineering, Vikas Publishing House, 1992.
5. Murty, J.V.S. "Watershed Management", New Age Intl., New Delhi 1998.
6. Murthy, J.V.S., Watershed Management in India, Wiley Eastern, New Delhi, 1994 .
7. Purandare, A.P., Jaiswal A.K., Waterhed Development in India, NIRD, Hyderabad, 1995.
8. Vir Singh, Raj , Watershed Planning and Management, Yash Publishing House, Bikaner, 2000.