# IV Year II Semester Code: 17CE832

#### L T P C 3 1 0 0

#### WATERSHED MANAGEMENT

#### (Dept.Elective-III)

#### **Course Learning Objectives**

The objectives of this course are:

- 1. Introduce the concept of watershed management
- 2. Understand the watershed characteristics
- 3. Learn the principles of soil erosion and measures to control erosion
- 4. Appreciate various water harvesting techniques.
- 5. Learn land management practices for various land use/land cover.
- 6. Introduce concepts of watershed modelling.

#### **Course outcomes**

At the end of the course the student will be able to

- 1. Calculate watershed parameters and analyze watershed characteristics to take appropriate management action.
- 2. Quantify soil erosion and design control measures.
- 3. Apply land grading techniques for proper land management .
- 4. Suggest suitable harvesting techniques for better watershed management.
- 5. Apply appropriate models for watershed management.

## SYLLABUS

## UNIT-I

**Introduction:** Concept of watershed development, objectives of watershed development, need for watershed development, Integrated and multidisciplinary approach for watershed management.

#### UNIT-II

**Characteristics of Watersheds:** Size, shape, physiographic, slope, climate, drainage, land use, vegetation, geology and soils, hydrology and hydrogeology, socio-economic characteristics, basic data on watersheds.

## UNIT-III

**Principles of Erosion:** Types and causes of erosion, factors affecting erosion, estimation of soil loss due to erosion- Universal soil loss equation.

**Measures to Control Erosion:** Contour techniques, ploughing, furrowing, trenching, bunding, terracing, gully control, check dams, rock-fill dams, brushwood dam, Gabion.

**UNIT-IV: Water Harvesting:** Techniques of rain water harvesting- rain water harvesting from roof top, surface flow harvesting, subsurface flow harvesting, stop dams, farm ponds and dugout ponds, percolation tanks.

# UNIT-V

**Land Management:** Land use and Land capability classification, management of forest, agricultural, grassland and wild land, land grading operation, Reclamation of saline and alkaline soils.

# UNIT-VI

**Watershed Modeling:** Data of watershed for modeling, application and comparison of watershed models, model calibration and validation, advances of watershed models.

## **TEXT BOOKS:**

- 1. 'Watershed Management' by Das MM and M.D Saikia, PHI Learning Pvt. Ltd, 2013.
- 2. 'Land and Water Management' by Murthy.VVN, Kalyani Publications, 2007.
- 3. 'Watershed Management' by Murthy J V S, New Age International Publishers, 2006.

## **REFERENCES:**

- 1. 'Water Resource Engineering' by Wurbs R A and James R A, Prentice Hall Publishers, 2002.
- 2. 'Watershed Hydrology' by Black P E, Prentice Hall, 1996.