21AENG151 SOIL AND WATER CONSERVATIONENGINEERING

Hours Per Week :

L	T	P	C
2	-	2	2

Total Hours :

L	T	P
15	-	30

Source :

https://www.indiamart.com/seven-days-fashion-mumbai/services.html#soil-and-water-conservation-engineering00

Course Description and Objectives:

This course offers knowledge on the different types of erosion and degradation of soil and the physical and vegetative control measures to conserve and use soil

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes
1	Understand various erosion control measures and the concept of sedimentation and vegetated grassed
2	Apply the knowledge, to identify different types of erosion and quantify the annual soil loss
3	Evaluate mechanics of wind erosion, control measures and land use capability classification

SKILLS:

- ✓ *Design prototype models of drop spillway, drop inlet spillway and chute spillway with procedures*
- ✓ *Prepare an estimation of various costs and benefits of different structures*
- ✓ *Analyze various soil and water conservation structures designs using softwares*

ACTIVITIES:

- *Calculation of erosion index – Estimation of soil loss*
- *Preparation of contour maps*
- *Design of grassed water ways, contour bunds, graded bunds and bench terracing system*
- *Design of farm ponds - Lining of ponds*
- *Demonstration of different irrigation pumps and structural differences*

UNIT - 1

Soil Erosion: Introduction to soil and water conservation - Causes of soil erosion – Definition and agents of soil erosion - Water erosion - Forms of water erosion - Gully classification and control measures

UNIT - 2

Soil loss estimation: Soil loss estimation by Universal Soil Loss Equation - Soil lossmeasurement techniques - Principles of erosion control - Introduction to contouring - Strip cropping - Contour bund - Graded bund and bench terracing - Grassed water ways and their design - Water harvesting and its techniques

UNIT - 3

Wind erosion: Mechanics of wind erosion - Types of soil movement - Principles of wind erosion control and its control measures

UNIT - 4

Introduction to irrigation: Irrigation project classification - Methods of micro irrigation -Importance of irrigation water measurements – Volumetric area velocity - Discharge methods - Weirs – Orifice – Flumes - Types of wells - Water lifting devices - Classification of pumps – capacity – Power - Discharge calculations - Open channel hydraulics - Discharge calculations - Underground pipeline systems

UNIT - 5

Micro irrigation systems: Functional components of micro irrigation systems and its design like drip - Sprinkler etc. – Water harvesting - Lining of ponds – Tanks - Canals

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS

1. Practicing survey - Principles and educating to use pacing technique for measurement
2 & 3. Area calculations through chain survey - GPS demo for tracking and area measurement
4. Estimation of soil loss and calculation of erosion index
5. Leveling concepts and practical utility in agriculture
6. Preparation of contour maps
7. Concept of vegetative water ways and design of grassed water ways
8. Construction of contour and graded bunds
9. Wind erosion and estimation process
10 & 11. Water discharge measurements lab exercises for computing discharge
12 & 13. Different irrigation pumps and their constructional differences
14. Farm pond construction and its design aspects
15. Farm pond and canal lining and its procedures; visit to nearby farm pond

REFERENCES:

1. Ghanshyam Das., 2012. *Hydrology and Soil Conservation Engineering, including Watershed Management.* Second edition, PHI Learning Private Limited, New Delhi – 110001
2. Murthy, V.V.N., 2004. *Land and Water Management Engineering.* Kalayani Publishers, New Delhi
3. Michael A.M., 2007. *Irrigation Theory and Practice*. Second edition. Vikas Publishing House Pvt. Ltd.
4. Mal, B. C. 1995. *Introduction to Soil and Water Conservation Engineering*. Kalayani Publishers, Rajinder Nagar, Ludhiana
5. Kanetakar, T. P. 1993. *Surveying and Leveling*. Pune Vidyarthi Griha, Prakashan, Pune
6. Suresh, R. 2008. *Land and Water Management.* Standard Publishers Distributors, Delhi.