Course No. : SWCE – 244 **Title: Soil and Water Conservation Engineering**

Sem : IV **Credit: 3 (2+1)**

Theory:

Introduction; soil erosion - causes, types and agents of soil erosion; water erosion - forms of water erosion, mechanics of erosion; gullies and their classification, stages of gully development; soil loss estimation - universal soil loss equation and modified soil loss equation, determination of their various parameters; erosion control measures – agronomical measures - contour cropping, strip cropping, mulching; mechanical measures - terraces – level and graded broad base terraces and their design, bench terraces & their design, layout procedure, terrace planning, bunds - contour bunds, graded bunds and their design; gully and ravine reclamation - principles of gully control - vegetative and temporary structures; wind erosion - factors affecting wind erosion, mechanics of wind erosion, soil loss estimation, wind erosion control measures - vegetative, mechanical measures, wind breaks & shelter belts,

sedimentation - sedimentation in reservoirs and streams, estimation and measurement, sediment delivery ratio, trap efficiency; characteristics of contours and preparation of contour maps; land use capability classification; grassed water ways and their design; introduction to water harvesting techniques; introduction to stream water quality and pollution.

Practical:

Study of soil loss measurement techniques; Study of details of Coshocton wheel and multi-slot runoff samplers; Determination of sediment concentration through oven dry method; Problems on Universal Soil Loss Equation; Preparation of contour map of an area and its analysis; Design of vegetative waterways; Design of contour bunding system; Design of graded bunding system; Design of bench terracing systems; Determination of rate of sedimentation and storage loss in reservoir; Study of Shelter belts and wind breaks.

DEPARTMENT OF SOIL AND WATER CONSERVATION ENGINEERING

Lesson Plan for the B.Tech. [Agril.Engg.] from 2007-08

Course No. SWCE-244 Title: Soil & Water Conservation Engineering

Credit 3(2+1) Semester No.: IV

Lesson Plan

Lecture No.	Topic	Book No.	Article Nos..
1	Soil erosion, Problems caused by erosion	4	1.2
2	Soil erosion types: geological and accelerated	2	2.1, 2.1.1 to 2.1.3

	erosion, agents of erosion		
3	Water erosion, factors affecting water erosion, classification of water erosion	1	5.1 to 5.4 and 5.6
4	Gully erosion, causes and their classification, stages of gully development.	1,2	5.5; 12.2
5	USLE, its application and limitation	3,4	7.3; 19, 19.1, 19.2
6 & 7	Determination of various parameters of USLE, Problems on USLE	3	7.3, 7.4
8	Modified USLE	4	19.2
9	Land capability classification	4	20.4, 20.5,20.7
10	Erosion control measures- biological measures : contouring, strip cropping and tillage practices, mulching	1,5	5.8,5.9;12.4
11	Mechanical measures contour bunding, functions and design	3	3.1
12 & 13	Design of contour bunds and problems	4,5	12.1,12.2; 12.11; Ex.12.4
14	Graded bund functions and design	3	3.3
15	Design problems on graded bunding	3,5	3.3; 12.9
16 & 17	Terraces- broad base terrace design and problems	3,1	3.4; 8.6 to 8.9
18	Bench terrace- types, design of bench terrace	3,5	3.5; 12.10
19	Design problems on bench terraces	3,5	3.5; Ex.12.3
20	Grassed waterways and their design	4	13.1, 13.3 to 13.6
21 & 22	Problems on grassed waterways	4	13.2
23 & 24	Principles of gully control, vegetative and temporary gully control measures	2,6	12.3, 12.4, 12.5.1; 22.3 to 22.6
25	Wind erosion, factors affecting wind erosion	4	7.1, 7.2
26	Mechanics of wind erosion, soil loss estimation	4	7.3,7.4 (262-285)
27	Wind erosion control measures	4	7.7(292-309)
28	Introduction to measurement of sediment in streams and reservoirs	4	21.1,21.2 , 21.4, 21.8, 22.1
29	Estimation of sediment, sediment delivery ratio, trap	4,7	21.7; 15.4, 15.6

	efficiency (formulae)		
30	Introduction of water harvesting techniques importance and principles	4	14.1, 14.2
31	Introduction to water harvesting structures	4	14.3
32	Introduction to stream water quality and pollution		

List of Practicals

1. To conduct the land survey for contouring
2. To prepare a contour map of an area and its analysis
3. Study of soil loss measuring instruments and techniques (Runoff plots, H – flume, stage level recorder).
4. Study of details of Coshocton wheel and multi slot runoff sampler.
5. Determination of sediment concentration through oven dry method.
6. Determination of rainfall erosion index.
7. Determination of soil erodibility factor.
8. Estimation of soil loss by USLE.
9. Design of grassed waterways.
10. Design of contour bunding system.
11. Design of graded bunding system
12. Design of bench terracing systems
13. Determination of rate of sedimentation and storage loss in reservoirs

Text Books:

1. Soil and Water Conservation Engineering, by. G.O. Schwab, R.K. Frevert, T. W. Edminster and K. K. Barnes, John Willey and Sons, New York (1981)
2. Soil Conservation by N. Hudson, B. T. Bats Ford Ltd, London (1979).
3. Manual of Soil and Water Conservation Practices by G.Singh, C. Venkatramanan, G.Shastry and B.P.Joshi, Oxford and IBH Pub. Co. Pvt. Ltd, New Delhi (1990).
4. Soil and Water Conservation Engineering, by R. Suresh, Standard Publisher Distributors, Delhi (1997).
5. Agricultural Engineering Vol-II by A. M. Michael and T. P. Ojha, Jain Brothers, New Delhi (1981).

6. Land and Water Management by. V. V. N. Murty, Kalyani Publishers, New Delhi (1985).
7. Applied Hydrology by K. N. Mutreja, Tata Mc Graw Hill Publishing Co, Ltd, New Delhi (1986).