SWCE 510 Dryland Water Management Technologies 2+0

Objectives:

To provide detail knowledge about analysis of severity of drought assessment and various dryland water management technologies suitable for conservation, harvesting and enhancing productivity of rainfed areas.

Unit-I

Drought severity assessment: Meteorological, hydrological and agricultural methods. Drought indices. GIS based drought information system, drought vulnerability assessment and mapping using GIS. DPAP programme, IWDP, State Water Conservation programmes (PMKY, Jalyukt Shivar etc.), drought monitoring constraints, limiting crop production in dry land areas. Types of drought, characterization of environment for water availability, crop planning for erratic and aberrant weather conditions.

Unit-II

Drought management strategies. Preparation of appropriate crop plans for dry land areas. Mid contingent plan for aberrant weather conditions.

Unit-III

Land shaping and land development for soil moisture conservation. Improvement of tillage and soil management by implements and engineering practices. Soil and moisture conservation for rainfed lands through improved implements and engineering practices. Gel technology. Ex-situ measures: Water harvesting-micro catchments. Design of small water harvesting structures: Farm Ponds, percolation tanks their types and design, recycling of runoff water for crop productivity.

Unit-IV

Crops and cropping practices related to soil and moisture conservation. Fertility management in dryland farming. Planning and development of watersheds from engineering view point. Case studies.

Unit-V

Application of RS in surveys and planning of watersheds for rainfed agriculture.
Watershed Evaluation & Monitoring: Use of indices

Course Outcome:

The students will be able to under stand drought severity assessment techniques along with new and appropriate methods of rainwater conservation and harvesting technologies for rainfed areas.

Teaching Schedule

S.No.	Topic	No. of Lectures
1	Drought severity assessment: Meteorological, hydrological and Agricultural methods	2
2	Drought indices	1
3	GIS based drought information system, drought vulnerability assessment and mapping using GIS	2
4	DPAP programme, IWDP and State programme drought monitoring constraints,limiting crop production in dry land areas	3
5	Types of drought: characterization of environment for water availability	1
6	Types of drought: crop planning for erratic and aberrant weather	1

	conditions	
7	Drought management strategies	1
8	Preparation of appropriate crop plans for dry land areas	2
9	Mid-contingent plan for aberrant weather conditions	1
10	Land shaping and land development for soil moisture conservation	1
11	Improvementoftillageandsoilmanagementbyimplementsandengineeringpractices	2
12	Soil and moisture conservation for rainfed lands through improved Implements and engineering practices	2
13	Introduction of Gel technology for conservation measures	1
14	Ex-situ measures: Water harvesting-micro catchments	1
15	Design of small water harvesting structures: Farm Ponds	1
16	Design of small water harvesting structures: percolation tanks their types and design	2
17	Recycling of runoff water for crop productivity	1
18	Crops and cropping practices related to soil and moisture conservation	1
19	Fertility management in dryland farming	1
20	Planning and development of watersheds from engineering view point	2
21	Planning and development of watersheds- Case studies	1
22	Application of RS in surveys and planning of watersheds for rainfed agriculture	1
23	Use of Remote Sensing in soil moisture estimation	1
	Total	**32**

Suggested Readings

1. Singh RV 2003. *Watershed Planning and Management*. Second Edition. Yash Publishing House, Bikaner.
2. Das NR 2007. *Tillage and Crop Production*. Scientific Publishers.
3. Dhopte, AM 2002. *Agro Technology for Dryland Farming*. Scientific Publ.
4. Gupta, US 1995. *Production and Improvements of Crops for Drylands* .Oxford & IBH
5. Singh, RP 1988. *Improved Agronomic Practices for Dryland Crops*. CRIDA.
6. Singh, RP2005. *Sustainable Development of Dryland Agriculture in India*. Scientific Publ.
7. Singh, SD1998. *Arid Land Irrigation and Ecological Management*. Scientfic Publisher
8. Hand book of Applied Hydrology-G Mail Book
9. Soil Conservation and Land Management-S.K. Datta
10. Map Projection –A Working Manual, G mail Book
11. Soil and Water Conservation Engineering –Prof. R. Suresh
12. Hydrology -H. M. Raghunath