

# 22SWCE301 WATERSHED PLANNING AND MANAGEMENT

Hours Per Week :

L	T	P	C
1	0	2	2

**PREREQUISITE KNOWLEDGE:** Basics of water shed hydrology.

## COURSE DESCRIPTION AND OBJECTIVES:

This course deals with the watershed characteristics, development and its management. It also helps students to impart knowledge in watershed planning, watershed budgeting, management measures in watershed, integrated watershed management. It also helps student to plan and formulate project proposal for watershed management programme including cost – benefits analysis.

## MODULE-1

### UNIT-1

4L+0T+8P=12 Hours

**WATERSHED :** Watershed - introduction and characteristics. Watershed development - problems and prospects, investigation, topographical survey, soil characteristics, vegetative cover, present land use practices and socio- economic factors. Watershed management - concept, objectives, factors affecting, watershed planning based on land capability classes, hydrologic data for watershed planning, watershed codification, delineation and prioritization of watersheds – sediment yield index.

### UNIT-2

04L+0T+08P=12 Hours

**WATERSHED MANAGEMENT:** Water budgeting in a watershed. Management measures - rainwater conservation technologies -in-situ and ex-situ storage, water harvesting and recycling. Dry farming techniques-inter-terrace and inter-bund land management.

### PRACTICES:

- Exercises on delineation of watersheds using topo sheets.
- Surveying and preparation of watershed map.
- Quantitative analysis of watershed characteristics and parameters.
- Watershed investigations for planning and development.
- Analysis of hydrologic data for planning watershed management.
- Water budgeting of watersheds.

## MODULE-2

### UNIT-1

4L+0T+8P=12 Hours

#### INTEGRATED WATERSHED MANAGEMENT:

Integrated watershed management - concept, components, arable lands - agriculture and horticulture, non-arable lands - forestry, fishery and animal husbandry. Effect of cropping systems, land management and cultural practices on watershed hydrology.

### UNIT-2

4L+0T+08P=12 Hours

#### WATERSHED PROGRAMME PLANNING:

Watershed programme - execution, follow-up practices, maintenance, monitoring and evaluation. Participatory watershed management- role of watershed associations, user groups and self-help groups. Planning and formulation of project proposal for watershed management programme including cost- benefit analysis.



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**SKILLS:**

- ✓ *Surveying and preparation of watershed map.*
- ✓ *Watershed investigations for planning and development.*

**PRACTICES:**

- Prioritization of watersheds based on sediment yield index.
- Study of functional requirement of watershed development structures.
- Study of watershed management technologies.
- Practice on software for analysis of hydrologic parameters of watershed.
- Study of role of various functionaries in watershed development programmes. Techno-economic viability analysis of watershed projects.
- Visit to watershed development project areas.

**COURSE OUTCOMES:**

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply the knowledge of LCC and hydrologic data for planning of watershed management.	Apply	1	1, 2, 4, 7
2	Evaluate watershed budget.	Evaluate	1	1, 2, 4, 5, 7
3	Manifest the scientific aptitude and attitude of watershed management programmes at individual capacity and also with a team work approach.	Analyze	2	1, 2, 3, 4, 5, 6, 7
4	Create and develop innovative and results specific watershed development programmes with an integrated approach keeping in view of overall development of the stake holders.	Create	2	1, 2, 3, 4, 5, 6, 7, 12
5	Take up the various projects on the present research gaps in watershed development programmes and activities in connection to science, technology and socio economic parameters taken into account.	Create	2	1, 2, 3, 4, 5, 6, 7, 12

**TEXT BOOKS:**

1. Mahnot, S.C. "Soil and Water Conservation and Watershed Management" International Books and Periodicals Supply Service. New Delhi, 2014.

**REFERENCE BOOKS:**

1. Katyal, J.C., R.P. Singh, Shrinivas Sharma, S.K. Das, M.V. Padmanabhan and P.K. Mishra. 1995. Field Manual on Watershed Management. CRIDA, Hyderabad.
2. Ghanshyam Das. "Hydrology and Soil Conservation Engineering" Including Watershed Management. 2nd Edition, Prentice-Hall of India Learning Pvt. Ltd., New Delhi, 2008.