SEMESTER S7

WATERSHED CONSERVATION AND MANGEMENT

Course Code	OECET723	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:3:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None	Course Type	Theory

Course Objectives:

1. To develop watershed management program, making proper use of all available resources.
2. To obtain optimum output from watershed with minimum hazards to natural resources.

SYLLABUS

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Module No.	Syllabus Description	Contact Hours
1	**Introduction to Watershed Management:** Definition and importance of watersheds - Watershed functions and processes -Watershed management objectives and principles- Integrated and multidisciplinary approach for watershed management. **Hydrological Cycle and Watershed Characteristics:** Components of the hydrological cycle - Watershed characteristics (size, shape, slope, drainage pattern -Hydrological processes in watersheds (precipitation, infiltration, runoff) **Importance of Watershed Properties:** Effect of Physical Properties, Effect of Geomorphologic Factors & Associated Processes	9
2	**Soil and Water Conservation Techniques**: Soil erosion- types, causes, and effects, Soil conservation methods (contour plowing, terracing, strip cropping), Water conservation techniques (rainwater harvesting, check dams, recharge pits)	9

	Role of Vegetation in Watershed Management: Importance of vegetation in soil and water conservation - Types of vegetation and their roles in watershed health - Afforestation and reforestation practices **Drought management**- Drought assessment, Drought analysis- Drought mitigation	
3	**Watershed Management Planning and Implementation:** Steps in watershed management planning - Community involvement in watershed management - Case studies of successful watershed management projects **Environmental and Socio-Economic Considerations:** Environmental impact assessment of watershed projects - Social and economic benefits of watershed management - Policy and legal frameworks for watershed management - Watershed management for conservation of resources and enhancing productivity in problem lands	**9**
4	**Watershed Modeling and Geographic Information Systems (GIS):** Introduction to watershed modelling- Use of GIS in watershed management - Applications of remote sensing in watershed analysis Delineation and Prioritization-Concept of Topographic or Contour Map, Boundary Delineation, GIS for Delineation, Accuracy in Delineation, Concept of Priority, Factors, Basics & Methods, Purpose & Benefits Land Management: Land use and Land capability classification, management of forest, agricultural, grassland and wild land. Reclamation of saline and alkaline soils Integrated watershed modelling – basic concepts	**9**

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Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

	Course Outcome	Bloom's Knowledge Level (KL)
CO1	To understand the concepts and importance of watershed management.	**K1**
CO2	To learn the techniques for soil and water conservation.	**K3**
CO3	To develop skills for designing and implementing watershed management plans.	**K3**
CO4	To assess the environmental, social, and economic impacts of watershed projects.	**K3**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3					2	2					1
CO2	3	2	1	1	1	2	1					1
CO3	2	2	1	1	2	2	2	1			2	1
CO4	3	2	1	1	1	2	3	3				1

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

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Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Watershed Management	JVS Murthy	New Age International	revised edition -1998
2	Land and Water Management	VVN Murthy	Kalyani Publication	2015
3	Irrigation and Water Management	D K Majumdar	Prentice Hall of India	revised edition -2001
4	Hydrology and Watershed Management	Vijay P. Singh and Ram Narayan Yadava	Allied Publishers	2003
5	Soil and Water Conservation Engineering	R. Suresh	Standard Publishers Distributors	2nd edition 2005

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Integrated Watershed Management: Principles and Practice	Isobel W. Heathcote	Wiley	2nd edition 2009
2	Water Resource Engineering	R. Awurbs and WP James	Prentice Hall	revised edition 2001

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Video Links (NPTEL, SWAYAM…)	
Sl. No.	**Link ID**
1	https://archive.nptel.ac.in/courses/105/101/105101010/