

Programme	B.Sc. (Hons) Agriculture (Major: Soil Science)	Course Code	SS-308	Credit Hours	2(2-0)
Course Title	SOIL AND WATER CONSERVATION				
Course Introduction					
In this course, students will learn various ways and means of soil and water losses and how these losses can be decreased with various strategies of their conservation.					
Learning Outcomes					
<ol style="list-style-type: none"> 1. Students will be able to describe the different types of soil erosion (water, wind, gravity) and their impacts on the environment. 2. They will understand the processes and consequences of soil erosion on agricultural productivity, water quality, and ecosystem health. 3. They will assess the risks associated with landslides and the measures to mitigate them. 4. Students will learn to use the modified Universal Soil Loss Equation (USLE) and wind erosion equations to predict soil loss. 5. They will discuss the challenges and opportunities in implementing conservation practices, considering the socio-economic context of different regions. 					
Course Content (Theory)				Assignments/Readings	
Week 1	Unit 1 1.1. Soil erosion: description, types and impact on environment 1.1.1. Concept of Soil Erosion 1.1.2. Types of Soil Erosion 1.1.3. Environmental Impact of Soil Erosion			What is the impact of soil erosion on crop growth and development?	
Week 2	Unit 2 2.1. Water and wind erosion: forms, causes and damages 2.1.1. Forms of Water Erosion (e.g., sheet, rill, gully) 2.1.2. Causes of Water Erosion 2.1.3. Damages Caused by Water Erosion				

Week 3	<p>2.1.4. Forms of Wind Erosion (e.g., saltation, suspension, surface creep)</p> <p>2.1.5. Causes of Wind Erosion</p> <p>2.1.6. Damages Caused by Wind Erosion</p>	
Week 4	<p>Unit 3</p> <p>3.1. Gravity erosion and landslides</p> <p>3.1.1. Description of Gravity Erosion</p> <p>3.1.2. Types of Landslides</p> <p>3.1.3. Causes and Effects of Landslides</p>	<p>Prepare a report (1000-1500 words) analyzing a specific case of water or wind erosion in a particular region. Discuss the factors leading to erosion and the resultant damages to the environment and agriculture.</p>
Week 5	<p>Unit 4</p> <p>4.1. Erosion prediction: modified Universal Soil Loss Equation; wind erosion equations</p> <p>4.1.1. Introduction to MUSLE</p> <p>4.1.2. Factors Affecting MUSLE</p> <p>4.1.3. Application of MUSLE</p>	
Week 6	<p>4.1.4. Introduction to Wind Erosion Prediction Models</p> <p>4.1.5. Factors Affecting Wind Erosion</p> <p>4.1.6. Application of Wind Erosion Equations</p>	<p>Create a case study (1000-1500 words) of a notable landslide event. Include an analysis of the causes, the immediate and long-term impacts, and the measures taken to mitigate future occurrences.</p>
Week 7	<p>Unit 5</p> <p>5.1. Erosion control and management: agronomic, engineering and bioengineering practices</p> <p>5.1.1. Cover Crops</p>	

	5.1.2. Crop Rotation 5.1.3. Conservation Tillage	
Week 8	5.1.4. Terracing 5.1.5. Contour Plowing 5.1.6. Check Dams 5.1.7. Vegetative Barriers 5.1.8. Riparian Buffers 5.1.9. Bioengineering Techniques	
Week 9	Unit 6 6.1. Hydrological cycle and its components 6.1.1. Overview of the Hydrological Cycle	
Week 10	6.1.2. Components: Precipitation, Infiltration, Runoff, Evapotranspiration 6.1.3. Impact on Soil and Water Conservation	
Week 11	Unit 7 7.1. Water conservation and management practices, and water harvesting techniques 7.1.1. Efficient Water Use 7.1.2. Irrigation Techniques 7.1.3. Water-Saving Technologies	
Week 12	7.1.4. Rainwater Harvesting 7.1.5. Watershed Management 7.1.6. Groundwater Recharge	
Week 13	Unit 8 8.1. Strategies for soil, water and environment conservation	

	8.1.1. Integrated Soil and Water Management	
Week 14	8.1.2. Sustainable Land Use Practices 8.1.3. Environmental Impact Assessment	
Week 15	Unit 9 9.1. Socio-economic issues of soil and water conservation 9.1.1. Economic Impact of Soil Erosion 9.1.2. Social Aspects of Conservation Practices 9.1.3. Policies and Legislation	
Week 16	Unit 10 10.1. Visit to an agro-meteorological/weather station 10.1.1. Practical observation and data collection	
Textbooks and Reading Material		
6.	Bhushan, L.S., I.P. Abrol, and M.S.R.M. Rao. 1998. Soil and Water Conservation: Challenges and Opportunities. Vol. 1 & 2 A. A. Balkema, Rotterdam, The Netherlands.	
7.	Ehlers, W. and G. Michael. 2003. Water Dynamics in Plant Production. CAB Publishing, Cambridge, UK.	
8.	Fangmeier, D.D., W.J. Elliot and S.R. Workman. 2006. Soil and Water Conservation Engineering. 5th Ed. Thomson Delmar Learning, NY, USA.	
9.	Morgan, R.P.C. 2005. Soil Erosion and Conservation. 3rd Ed. Longman Group Ltd., Essex, UK.	
10.	Unger, P.W. 2006. Soil and Water Conservation Handbook: Policies, Practices, Conditions and Terms. Haworth Food and Agriculture Products Press, NY, USA.	
Teaching Learning Strategies		
11.	Multimedia	
12.	White Board	
13.	Group discussion	
14.	Quiz/Assignments	
15.	Demonstration/Activity	
Assignments: Types and Number with Calendar		

16. What is the impact of soil erosion on crop growth and development?
17. Prepare a report (1000-1500 words) analyzing a specific case of water or wind erosion in a particular region. Discuss the factors leading to erosion and the resultant damages to the environment and agriculture.
18. Create a case study (1000-1500 words) of a notable landslide event. Include an analysis of the causes, the immediate and long-term impacts, and the measures taken to mitigate future occurrences.
19. Develop a proposal (1500-2000 words) for an erosion control and management plan for a specific area. Include agronomic, engineering, and bioengineering practices and justify your choices based on the area's characteristics.

Assessment

Sr. No.	Elements	Weightage	Details
	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.