TEACHING PLAN: PROBLEMATIC SOIL AND THEIR MANAGEMENT

SCHOOL: SOAS		ACADEMIC SESSION: 2023 – 2024	FOR STUDENT'S BATCH: 4th SEM
1	**Course Code**	**ASS-202**	
2	**Course Title**	**PROBLEMATIC SOIL AND THEIR MANAGEMENT**	
3	**Credits**	**2 (2+0)**	
4	**Learning Hours**	**Contact Hours: 48** **Assessment: 20** **Guided Study: 32** **Total hours: 100**	
5	**Course Objective**	1. The main objective of this course to provides an understanding and solves the problems of soils and their management. 2. To provide knowledge and understanding about soil quality and health. 3. To study and understand waste land and problematic soils in India. 4. The course also provides reclamation and management, irrigation water, remote sensing and GIS in diagnosis and management of problem soils and bioremediation.	
6	**Course Outcomes**	1. Students will be able to understand about waste land and problematic soils in India and management of the soils. 2. Students will be able to know the different reclamation and management practices for the development of the soils. 3. Students will be able to understand different factors responsible for saline , sodic and acidic soils and their properties. 4. Students will be able to use the fundamentals of soil science disciplines for the reclamation of degraded soils. 5. Students will also be able to demonstrate fundamental knowledge to identify problematic soils and associated problems and identify processes resulting in deterioration of soil physical and chemical properties.	
7	**Outline Syllabus:**		

7.01	**Paper Code**	**Unit**		**Reference Number**	**Teaching Methods**
7.02	**ASS-202**	UNIT-I CONCEPT OF SOIL QUALITY AND HEALTH	a) Soil quality and health b) Distribution of Waste land and problem soils in India c) Categorization of soil based on properties	Patil and Mali, Fundamentals of Soil Science pp. 57-80	Lecture , PPT

		UNIT-II RECLAMATION AND MANAGEMENT OF PROBLEMATIC SOIL	a) Reclamation and management of Saline and sodic soils, acid soil, eroded and compact soil, flooded soil and polluted soil b) Remote sensing and GIS in diagnosis and management of problem soils c) Utilization of saline water in agriculture	Patil and Mali, Fundamentals of Soil Science pp. 162-184	Lecture and PPT
		UNIT-III IRRIGATION WATER QUALITY	a) Irrigation water – quality and standards b) Utilization of saline water in agriculture	Patil and Mali, Fundamentals of Soil Science pp. 185-190 Rani, R. Problematic soil and their management pp.204-224	Lecture and PPT
7.03		UNIT-IV: CONCEPT OF BIOREMEDIATIO	a) Multipurpose tree species b) Bio remediation through MPTs of soils c) Land capability and classification d) Problematic soils under different Agro-ecosystems	Chakrabarthy and Chand, Public Administration in Globalizing World pp 40-450	Lecture and PPT ,Assignment

8	**Course Evaluation**	
8.1	**COURSE ASSESEMENT: 50%**	
8.1.1	**Attendance**	**5 %**
8.1.2	**Homework**	**5 %**
8.1.3	**ClassTest**	**5 %**
8.1.5	**Presentation**	**5%**
8.1.6	**Any other**	**10%**
8.2	**MTE**	**20%**
8.3	**End-term examination: 50%**	
9	**Text Books & References**	
9.1	**Text book**	1. Fundamentals of Soil (2000) by V.N. Sahai, Kalyani Publishers, New Delhi 2. Problematic Soil and their management (2019) by Dr. Rajni Rani, Rama Publishers, Meerut 3. Problematic Soil and water logging problems (2019) by Dr. Rajni Rani, Rama Publishers, Meerut

		4. Patil and Mali, Fundamentals of Soil Science
9.2	**Reference**	1. Bear F.E., 1964. Chemistry of the Soil. Oxford & IBH. 2. Jurinak J.J., 1978. Salt-affected Soils. Department of Soil Science & Biometeorology. Utah State Univ. 3. USDA.1954. Diagnosis and Improvement of Saline and Alkali Soils. Oxford & IBH. 4. ISSS, 2009. Fundamentals of Soil Science. Divison of Soil Science, IARI, New Delhi 5. Cirsan Paul, J., 1985. Principles of remote sensing. Longman, New York. 6. Richards, L.A., 1954. Diagnosis and improvement of saline and alkali soils. USDA Hand book No. 60, Washington, DC USA. 1.
9.3	**Video References**	1. https://www.youtube.com/watch?v=sN8sVZno1CY&list=PLvSukZ-l0KuNiOpk1xd1DM71SvKoyE4dM 2. https://www.youtube.com/watch?v=ExW9C_lCFKg 3. https://www.youtube.com/watch?v=jtM3nYfVRZ8 4. https://www.youtube.com/watch?v=fm-SRMsiBy4 5. https://www.youtube.com/watch?v=Pf9XTGCaQLo 6. https://www.youtube.com/watch?v=80tXm4Y03tA 7. https://www.youtube.com/watch?v=ZoeYIW7PpvA

Mapping of Outcomes v. Topics

Outcome no. → Syllabus topic↓	1	2	3	4	5
Paper Code.Unit I (a)					✓
Paper Code. Unit I (b)	✓				
Paper Code. Unit I (c)					✓
Paper Code.Unit II (a)		✓	✓	✓	
Paper Code. Unit II(b)		✓	✓	✓	
Paper Code. Unit II(c)		✓	✓	✓	
Paper Code.Unit III (a)	✓				
Paper Code. Unit III(b)					✓
Paper Code.Unit IV (a)					✓
Paper Code. Unit IV(b)	✓				✓
Paper Code. Unit IV(c)					✓
Paper Code. Unit IV(d)					✓

QUESTION BANK

1. Write about the different types of soil found in India?
2. Write about the soil quality?

3. Define soil health?
4. Define soil quality?
5. Describe the soil quality indicators?
6. Write the constraints of soil and their management?
7. Write about the methods to improve the soil quality and explain them also?
8. What is soil pollution?
9. Write the solution for soil erosions?
10. Write a short note on types of soil erosion?
11. Write the beneficial effect of lime?
12. What are types of liming material?
13. What are the problems in soil acidity?
14. Write the kinds of soil acidity?
15. What is wind erosion?
16. Write the stages of water erosion?
17. What is compact soil?
18. What is saline soil, describe the reclamation and management?
19. What is alkaline soil?
20. What are the qualities of irrigating water?
21. What are the risks involve in using saline soil for irrigation?
22. What is eutrophication? Write the steps of it in the environment?

PROJECTS (To be given to group of students)

1. Attend webinar and seminar.
2. Field Visit
3. MOOC Courses
4. Identify different types of soil