

UNIVERSITY OF SARGODHA
DEPARTMENT OF SOIL & ENVIRONMENTAL SCIENCES, COLLEGE OF AGRICULTURE

COURSE OUTLINE

Fall 2020

Course Title: **Municipal and Agro Waste Management**

Course Code: **SES-407**

Credit Hours: **3(3-0)**

Instructor: **Mr. Muhammad Zeeshan Manzoor**

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DESCRIPTION AND OBJECTIVES

The relationship of plants with soil and water is complex, and each depends on other for growth and conservation of soil and water. Imbalance in these structured ecosystem can result in the reorganization of plant and animal community to the extent that entire ecosystem may change. Anticipated increase in global temperature and air pollution are predicted to have significant effect on soil composition and water availability which, in turn, can affect the survival and growth of natural and agricultural plant community. This course is concerned with the movement of water in the soil-plant-atmosphere continuum and the impact of soil water stress on plant growth. The overall aim of the course is to provide the student with a solid background in the basic concepts of water properties and water dynamics within soil and plant. The specific objectives of the course are:

- ❖ Skill development in students to solve applied problems in Plant-Soil-Water Relations.
- ❖ Enhance student learning in main water properties and flow processes within the soil-plant-atmosphere continuum.

INTENDED LEARNING OUTCOMES

- ❖ Understanding the different instruments for measuring soil water availability and water potential components.
- ❖ Methods to measure water availability and water potential components.
- ❖ Adoption of scientific approach for understanding plant-soil-water relations.
- ❖ Ability to write scientific reports for some assignments and to work in team to solve scientific problems.

COURSE CONTENTS

Theory

1. Introduction
2. Municipal waste: Sources, types and composition
3. Nature and management of sewerage and industrial waste water
4. Solid waste management and role of community
5. Methods and technologies in solid waste management
6. Utilization of municipal waste as organic fertilizer and soil conditioner
7. Production of energy from municipal waste
8. Ethical issues of municipal waste management
9. International waste management strategies

READINGS

1. Pichtel, J. 2005. Waste Management Practices: Municipal, Hazardous and Industrial. CRC Press, Taylor and Francis Group, Boca Raton, FL, USA.
2. Pepper, I.L., C.P. Gerba and M.L. Brusseau (eds.). 2006. Environmental and Pollution Science. 2nd Ed. Elsevier / Academic Press, San Diego, CA, USA.
3. Dhamija, U. 2006. Sustainable Solid Waste Management: Issues, Policies, and Structures. Academic Foundation, New Delhi, India.
4. Cheremisiouff, N.P. 2002 Handbook of Solid Waste Management and Waste Minimization Technologies. Elsevier Science, Burlington, MA, USA.
5. Tchobanoglous, G., H. Theisen and S. Vigil. 1993. Integrated Solid Waste Management. Irwin McGraw Hill. USA.

COURSE SCHEDULE

Week	Topics and Readings	Books with Page No.
1	Introduction and scope	Handbook of Solid Waste Management and Waste Minimization Technologies.
2	Municipal waste: Sources, types and composition	Handbook of Solid Waste Management and Waste Minimization Technologies.
3	Urbanization pattern, growth in waste generation, solid waste management scenario, institutional legal and management aspects, solid waste management policy	Handbook of Solid Waste Management and Waste Minimization Technologies.
4	Solid waste management and role of community	Handbook of Solid Waste Management and Waste Minimization Technologies.
5	Methods and technologies in solid waste management Avoidance/waste minimization, repair and reuse, recycle & new product feedstock	Handbook of Solid Waste Management and Waste Minimization Technologies.
6	Methods and technologies in solid waste management Manufacturer take-back, mulch and compost, waste to energy	Handbook of Solid Waste Management and Waste Minimization Technologies.
7	Methods and technologies in solid waste management	Handbook of Solid Waste Management and Waste Minimization Technologies.
8	Landfill, incineration, plasma gasification, <i>gasification and pyrolysis, open burning</i>	Handbook of Solid Waste Management and Waste Minimization Technologies.
9	Utilization of municipal waste as organic fertilizer and soil conditioner	Handbook of Solid Waste Management and Waste Minimization Technologies.
10	Need for using MSW compost	Handbook of Solid Waste Management and Waste Minimization Technologies.
11	Benefits of MSW compost	Handbook of Solid Waste Management and Waste Minimization Technologies.
12	Environmental implications of MSW compost application	Handbook of Solid Waste Management and Waste Minimization Technologies.
13	Integrated use of MSW compost with chemical fertilizers	Handbook of Solid Waste Management and Waste Minimization Technologies.
14	Production of energy from municipal waste	Handbook of Solid Waste Management and Waste Minimization Technologies.

15	Ethical issues of municipal waste management	Handbook of Solid Waste Management and Waste Minimization Technologies.
16	International waste management strategies	Handbook of Solid Waste Management and Waste Minimization Technologies.

RESEARCH PROJECT/PRACTICAL/LABS/ASSIGNMENTS

Short research projects and laboratory assignments will be assigned to the students during the semester.

ASSESSMENT CRITERIA

Sessional:	20 % of the total theory marks (Project, Presentation, Participation and Assignment)
Project:	-
Presentation:	-
Participation:	-
Mid Exam:	30 % of the total theory marks
Final Exam:	50 % of the total theory marks
Practical Exam:	100 % of the total practical marks