

II B.Sc (MB)	SOLID WASTE MANAGEMENT	AZMB402
SEMESTER - III		HRS/WK - 6
ALLIED		CREDIT - 6

(For II Year B.Sc., Micro-Biology)

Unit I : Introduction

(20 Hrs)

Waste – classification, quantification, solid waste management and disposal, source and generation of solid wastes – characterization, composition and classification, physico-chemical properties.

Municipal solid wastes: Collection, storage and transportation – disposal methods – sanitary land fills, shredding and pulverizing, baling, incineration, composting, vermicomposting, recycling – energy recovery from wastes – municipal wastes management and handling rules (1999)

Unit II: Industrial wastes:

(20 Hrs)

Industrial solid wastes and description – health hazards – collection and storage – treatment and disposal - liquid wastes – primary, secondary and tertiary treatments – water pollution and their effects on animals and plants – water quality standards – gaseous pollution – types and sources – air pollution control.

Unit III: Bio-medical wastes:

(20 Hrs)

Generation – legal aspects and environmental concern – Bio-medical waste management and handling rules, 1998 – storage, handling and transportation of bio-medical wastes – disposal technologies.

Hazardous wastes: Definition – characteristics – sources and transportation – radio active wastes – half life, mode of decay, effect on plants, animals and man – treatment methods; physical, chemical and biological methods – site remediation – waste minimization – hazardous waste rules, 1989.

Unit IV : Earthworms:

(20 Hrs)

Characteristics, types – Indian species – suitable species for vermicomposting – digestion, decomposition and humification – role of microorganisms.

Earthworm culture: Steps involved in the culture of indigenous and exotic species of earthworms – physical, chemical and biological requirements – protection of worms from predators – enemies of earthworms.

Organic wastes: Definition – types and sources of various organic wastes – utilization of organic wastes in vermiculture and vermicomposting.

Unit V: Composting technology:

(20 Hrs)

Definition – types of vermicomposting – requirements – advantages – precautionary measures - nutrients enhancement of vermicompost – effect of vermicomposting in the soil fertility.

Economics of vermicomposting: Small scale and large scale applications of vermicomposting – loan facilities – marketing strategies.

Field Work:

(20 Hrs)

Methods of vermicomposting – preparation of vermi bed – monitoring – bio-manure production – application of compost for culture operations – minor project reports.

Text Books:

Study materials given

Reference Books:

1. K.C. Agarwal, 2001. Environmental pollution: Causes, Effects and Control, Nidhi Publisher (India), Bikaner.
2. Verma, P.S., and VK. Agarwal. 2003. Environmental Biology, S. Chand and Company. Ram Nagar, New Delhi.
3. Pradyot Patnik, 1977. Hand book of Environmental Analysis. Chemical Pollutants in Air, Water, Soil and Solid wastes, Lewis Publishers, CRC Press. U.S.A.
4. S.A. Abbasi, 1998. Water Quality, Sampling and Analysis. Discovery Publishing House, New Delhi.
5. P.K. Gupta, 2000. Methods in Environmental Analysis. Water Soil and Air, Agrobios (India) Jodhpur.
6. Bhatnager and R.K. Patra (1996); Earthworm, Vermiculture and Vermicompositing, Kalyani Publishers, New Delhi.
7. C.A. Edwards and B.J. Bohlen (1996); Biology and Ecology of Earthworms, Chapman and Hall, London.
8. S. Ismail (1997); Vermicology, Orient Long man Limited, Chennai.
9. K.E. Lee (1985) 'Earthworms; Their Ecology and Relationship with Soils and Land Use', Academic Press, Sydney.
10. J.E. Satchell (Ed) (1983) - Earthworm Ecology: From Darwin to vermi culture. Chapman and Hall, "London.

SOLID WASTE MANAGEMENT & VERMICOMPOSTING

Written paper: 75 Marks

Internal Assessment: 25 Marks

QUESTION PATTERN

Written paper Max Marks: 75 Marks

Time :3 Hours

A Question paper consists of three parts

Part-A

10 very short answer question without choice .Each question is to be answered in about 50 words . Each answer is to be valued out of 2 marks.

Part-B

5 questions are to be answered out of 8 given .Each question is to be answered in about 300 words . Each answer is to be valued out of 5 marks.

Part-C

Essay questions,containing internal choice to be answered in about 1200 words. Each answer is to be valued out of 15 marks.

Part-A

Very Short Answers(50 words) 10 questions each 2 marks.

Part-B

Short Answers(300 words) 5 questions each 5 marks.

Part-C

Essay questions (1200 words) 2 questions each 15 marks.