

# MAR AUGUSTHINOSE COLLEGE RAMAPURAM



DEPARTMENT OF BIOTECHNOLOGY

Scheme and Syllabus of  
Value Added Course  
2020 (Revised)

**MAVAC003 SOLID WASTE MANAGEMENT**

## **BOARD OF STUDIES (BoS)**

**Chairman- Dr. Sajeshkumar N.K.** (Head of Department of Biotechnology)

**Members- Mr. Jiby John Mathew** (Asst. Prof. Department of Biotechnology)

**Ms. Manesh Mathew** (Asst. Prof. Department of Biotechnology)

**Ms. Anju George.** (Asst. Prof. Department of Biotechnology)

### **INTRODUCTION**

The Value-Added Courses aims to provide additional learner centric graded skill oriented technical training, with the primary objective of improving the employability skills of students

### **AIM OF THE PROGRAMME**

Understanding various aspects of the subject and acquiring methodological knowledge of them. Application of this knowledge in a suitable manner in required fields.

### **ELIGIBILITY FOR ADMISSIONS**

All UG and PG students from various departments of the college. The number of intakes to the course is limited. The course can be offered only if there are at least 5 students opting for it.

**MEDIUM OF INSTRUCTION:** English.

### **DURATION OF THE COURSE**

The duration of value-added course is 30 hours (including the hours of final examination) of which 15hrs theory and 15hrs for laboratory/demonstration/experimental activities and the course can have a maximum of three hours a day.

The value-added courses will be offered beyond the usual class hours and days of the college.

The value-added course will be a blend of theory classes / experimental learning / project-based learning / assignments / activity-based learning.

### **COURSE OBJECTIVES**

1. To sensitize students on the relevance of solid waste management.
2. To develop practical skills for the management of solid waste.
3. To equip the students with the methods to convert solid waste in to value added substances.
4. To create an awareness in students to develop and adopt technologies and methods leading to the reduction of solid waste generation

### **COURSE OUTCOMES (COs)**

- CO<sub>1</sub>. Imparting basic knowledge in the interdisciplinary field of biotechnology.

- CO<sub>2</sub>. To equip the candidates to meet the demands of the society in the management of solid waste to get sustainable products and processes through biotechnology.
- CO<sub>3</sub>. To be aware of the personal and environmental effects of solid waste and the need of its proper management.
- CO<sub>4</sub>. Promoting the application of solid waste management strategies and familiarizing the methods of compost production methods using solid waste through implementation of experiments and demonstrations.

## EVALUATION

1. The value-added courses shall be evaluated through an examination at the end of the course.
2. The duration of examination is two hours.
3. The total marks of the examination shall be 100

Components of Evaluation	Marks
Attendance	10
Assignment / Seminar	10
Project & Viva	30 (20+10)
External Examination	50
Total	100

## Pattern of questions Paper

Sl. No.	Pattern	Marks	Choice of questions	Total marks
1	Short Answer/problem type	2	5/7	10
2	Short essay/problem	5	4/6	20
3	Essay/problem	10	2/4	20
Total				50

4. A committee consisting of the Head of the Department, the course coordinator and a senior faculty member nominated by the Head of the department shall monitor the evaluation process.
5. The list of students along with the marks and the grades earned may be forwarded to the Principal/Chief Superintendent of Examinations.

6. The Dept. course coordinator is responsible for maintaining and processing the record with regard to the course, assessment marks and results.
7. Certificates will be issued to those students with 75% attendance, timely submission of assignment and project and a minimum of 40% marks in the qualifying examination.

### **Grading Pattern**

Grades are given **on a 7-point scale** based on the total percentage of marks secured in internal and external assessment, as given below: -

<b>Percentage of Marks</b>	<b>Grade</b>
95 and above	<b>S</b> Outstanding
85 to below 95	<b>A<sup>+</sup></b> Excellent
75 to below 85	<b>A</b> Very Good
65 to below 75	<b>B<sup>+</sup></b> Good
55 to below 65	<b>B</b> Above Average
45 to below 55	<b>C</b> Satisfactory
35 to below 45	<b>D</b> Pass
below 35	<b>F</b> Failure
Absent	<b>Ab</b>

**SYLLABUS**  
**MAVAC003 Solid Waste Management**  
**Total hours of instruction: 30 Hours**

**Module 1: 6 Hrs**

Introduction Waste Management: waste quantity and quality, Sources and types of solid waste- composition and its determinants of Solid waste-factors influencing generation-quantity assessment of solid wastes-methods of sampling and characterization. Waste Collection & Transport: collection of mixed waste or of source separated waste, collection logistics- collection system, sorting, equipments – time and frequency of collection – labour requirement – factors affecting collection – analysis of collection system, Transport operation & maintenance.

**Module 2: 6 Hrs**

Treatment/disposal Technologies: dumping, sanitary landfills, mechanical-biological treatment, incineration, anaerobic digestion, recycling of plastics, batteries, e-waste. Composting process and techniques, Methods, Regulations and permits, Qualities of the finished compost, Quality standard, Vermi-composting.

**Module 3: 3 Hrs**

Financial, Social and Institutional aspects: costs of collection, separation, management; equipment costs; social costs, stake holders, scavengers, public health issues, policy and legislation.

**DEMONSTRATIONS/PRACTICALS (15 Hrs)**

1. Determination of pH of solid waste.
2. Determination of Total Solids, fixed solids and volatile solids.
3. Determination of nutrient value (NPK).
4. Lab scale study on vermicomposting.
5. Lab scale study of aerobic and anaerobic digesting of solid wastes.
6. Practical knowledge and working of incinerators
7. Visit to the waste collection and disposal site.
8. Ecology baseline and impact of waste – disposal on vegetation.
9. Design of waste handling, treatment and disposal systems.
10. Preparation of Project report based on wastes collection, handling, treatment, and disposal.

**Assignment and Project**

**REFERENCES**

1. Text Book of Biotechnology - R.C. Dubey; S. Chand & Company Ltd., New Delhi
2. Essentials of Biotechnology - R.C. Sobi and Suparna S. Pachauri. Ane Books.
3. Prospects and Perspectives of Solid Waste Management – B.B.Hosetti ; New Age International Publisher.