MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

GOVERNMENT POLYTECHNIC, KARAD

ACADEMIC YEAR 2023-2024

SEMESTER – 5th OF COMPUTER ENGINEERING

FOR MICRO-PROJECT

"Studies on solid waste management"

COURSE:

Environmental Studies (22447)

SUBMITTED BY-

Roll.No.	Name of the Team Members	Enrollment No.
2229	Saishwari Mukesh Korade	2100100027
2230	Siddhi Mahendra Pawar	2100100028
2247	Kshitija Santosh Vedpathak	2100100048

Under the guidance of:

Prof. K. K. Gaikwad

Academic Year 2023-2024

DEPARTMENT OF COMPUTER ENGINEERING

CERTIFICATE

This is to certify roll no. 2229,2230 and 2247 of fifth semester of Diploma in computer engineering of institute Government Polytechnic, karad has successfully completed microproject under the subject of **Environmental Studies (22447)** for academic year 2022-23 as prescribed in the curriculum.

Enrollment No.	Name of student
2100100027	Saisahwri Mukesh korade
2100100028	Siddhi Mahendra pawar
2100100048	kshitija Santosh vedpathak

We have completed the project report titled as **studies on solid waste management.**

Subject- Environmental Studies (22447)

Guide	Head of Department	Head of Institute
Prof. K. K. Gaikwad	Mrs. S. B. Patil	Dr. R. K. Patil

Seal of Institute

Submitted it to Government Polytechnic Karad.

ACKNOWLEGMENT

We take this opportunity to thank all those who have directly and indirectly inspired, directed and assisted us towards successful completion of this project report.

We express our sincere thanks to Prof. R. K. Patil principal of Government Polytechnic Karad and the Head of Department Prof. Patil S.B., for having us allowed to submit this report as a part of our academic learning. We express our sincere thanks to Prof.K.K.Gaikwad, Lecturer in Envoirnmental Studies(22447))".Department of Computer Engineering, Govt. Polytechnic, Karad for encouragement throughout the project report and guideline in designing and working out this project. We are also grateful to team of Envoirnmental Studies(22447).

Place: Government Polytechnic, Karad.

Your sincerely,

2229-saishwari Mukesh korade

2230-siddhi Mahendra pawar

2247-kshitija santosh vedpathak

RATIONALE:

Environmental studies is a systematically studies human interaction with the environment. Environmental studies connects principles from the physical sciences, commerce/economics, the humanities, and social sciences to address complex contemporary environmental issues.

Waste management is an important element of environmental protection. Its purpose is to provide hygienic, efficient and economic solid waste storage, collection, transportation and treatment or disposal of waste without polluting the atmosphere, soil or water system.

AIM AND BENEFITS:

- To create awareness for waste management.
- To improve knowledge about waste management.
- To identify how the waste is recycle. .
- To contribute to informed decision-making for waste management.
- To foster appreciation for the beauty and complexity of nature's variety.

COURSE OUTCOMES:

Co-a. Develop public awareness about environment.
Co-c. Conserve Ecosystem and Biodiversity.
C0-d.Apply techniques to reduce environmental pollution.
Co-e. Manage social issues and environmental ethics as lifelong learning

LITERATURE REVIEW:

waste management encompasses various facets, from environmental considerations to regulatory compliance and cost-efficiency. Environmental impact assessments reveal that improper waste management can have adverse consequences, making it imperative to adopt sustainable practices. Regulations and standards play a pivotal role in shaping waste management strategies within projects, necessitating adherence to codes and guidelines. To minimize waste, construction projects often employ lean principles and technology-driven solutions, such as Building Information Modeling (BIM). Waste segregation and recycling efforts further contribute to sustainability goals, although challenges in recycling construction and demolition waste persist. Real-world case studies illuminate successful waste management practices, offering valuable insights and best practices. The economic aspect cannot be ignored, as efficient waste management can lead to cost savings, whereas inadequate practices can result in unforeseen expenses. As the field evolves, future trends like circular economy principles and sustainable materials sourcing are likely to shape the landscape of project waste management..

➢ The Scenario :

Waste management is a pressing issue in India today, with the country grappling with a colossal waste problem. The exponential growth in population and urbanization has led to a dramatic increase in waste generation, overwhelming the existing waste management infrastructure. In many Indian cities, inadequate collection and disposal systems have resulted in piles of garbage accumulating in streets and public spaces, posing serious health and environmental hazards. Additionally, a significant portion of this waste consists of non-biodegradable materials like plastic, which further exacerbates the problem, as these materials persist in the environment for years.

One of the major challenges in addressing India's waste crisis is the lack of awareness and education regarding proper waste disposal among the general public. This has resulted in improper disposal practices, such as littering and burning of waste, contributing to air and soil pollution. Moreover, recycling and resource recovery are underutilized in India, with only a fraction of waste being recycled. To tackle this issue comprehensively, there is a growing need for improved waste management policies, investment in modern waste treatment facilities, and extensive public awareness campaigns. In essence, wastemanagement in India necessitates a multi-faceted approach that encompasses infrastructure development, policy reforms, and a shift in public behavior to foster a cleaner and more sustainable future.

➢ Need of waste management:

Waste management is imperative due to its pivotal role in safeguarding the environment, human health, and overall well-being. As societies continue to produce increasing amounts of waste, proper management becomes essential. Without it, waste can contaminate air, water, and soil, leading to pollution that harms ecosystems and poses health risks to communities. Moreover, waste often contains valuable resources, such as metals and plastics, which can be recovered and recycled, reducing the strain on finite natural resources. Inadequate waste management can also create breeding grounds for disease vectors like rodents and insects, contributing to the spread of diseases. Compliance with legal and regulatory frameworks is crucial to prevent environmental degradation. By embracing responsible waste management practices, we can mitigate these challenges, minimize our environmental footprint, conserve resources, protect public health, and work towards a sustainable future for generations to come.

➢ Actual Work:

We recently had the opportunity to visit a waste recycling company, where we were impressed by their dedication to environmental sustainability. Witnessing the meticulous sorting and processing of various materials, from plastics to paper, was eye-opening. It was reassuring to see how such companies play a crucial role in reducing waste and minimizing the impact on our planet. Our visit reaffirmed the importance of recycling and inspired us to be more mindful of our own waste management practices

NirmalJyot facilities pvt.ltd

➢ Introduction:

Nirmal Jyot Facilities Pvt.Ltd was established in 2009 in Karad, West Maharashtra, India. Understanding the need of essential labour for domestic and industrial purposes, we aspire to provide you the best trained individuals with trusted work ethics. A little seed was planted with an urge of employing genuine people to their best suited jobs, have now built a team of more than 600 service professionals.

The company operates across three diverse and dynamic regions in India: Maharashtra, Goa, and Karnataka. With a strategic presence in these states, the company is well-positioned to address the unique waste management challenges and opportunities that each area presents. In Maharashtra, it contributes to the state's urban sustainability goals by implementing innovative waste recycling solutions. In Goa, it plays a vital role in preserving the pristine beauty of this coastal paradise through responsible waste disposal practices. Meanwhile, in Karnataka, the company is actively engaged in fostering a culture of recycling and environmental consciousness. By serving these states, the company aims to make a meaningful impact on the environment and communities it operates in, promoting a greener and cleaner future for all.

- **Functions of the company:**

The primary function of our company encompasses a multifaceted approach to waste management and environmental sustainability. We specialize in providing efficient door-to-door garbage collection services, ensuring that waste is systematically removed from residential and commercial areas. Additionally, our company is deeply committed to manufacturing and importing state-of-the-art industrial cleaning machines and waste management equipment, designed to streamline the process of waste disposal and maintain cleanliness. Moreover, we prioritize proper recycling techniques, aiming to reduce the environmental footprint of waste by implementing cutting-edge recycling practices. Through these integrated efforts, we strive to contribute to a cleaner, greener future by promoting responsible waste management and recycling.

➢ The services provide by the company:

I. Biogas Plantation
II. Wet waste management
III. Dry waste management
IV. Bio medical waste management
V. Door to Door garbage collection using private vehicales.

➢ Biogas Plantation Or wet waste Management:

Biogas is a renewable energy source produced through the anaerobic digestion of organic materials such as agricultural waste, sewage, food scraps, and other organic matter. This process involves the breakdown of organic substances by microorganisms in the absence of oxygen, resulting in the release of methane gas (CH_4) and carbon dioxide (CO_2). Biogas can be used as a clean and sustainable fuel for heating, electricity generation, and as a vehicle fuel. It is considered environmentally friendly because it reduces greenhouse gas emissions and helps manage organic waste

- **Process of Biogas creation:**

The fixed dome type biogas consist of a closed underground digester tank made up of the bricks which has a dome shaped roof made roof of bricks .this dome-shaped roof of the digester tank functions as a gas holder and has an outlet pipe at the top to provides gas to home.

The slurry is formed by mixing water in cattle dung in equal proportion in mixing tank. The formed slurry is then sent into the digester tank with the heilp of the inlet chamber.it must be noted that slurry is fed into the digester tank up to the point where the dome of the roof starts inside the digester tank the complex carbon compaunds are the present in the cattle dung breaks into simpler materials by the action of anaerobic microorganisms in the presence of water. This anaerobic decomposition of complex carbon compaunds present in cattle dung produces biogas and gets finished in about 60 days .the produced biogas starts to collect in the dome-shaped roof of biogas plant and is supplied to homes through popes .the spent slurry is replaced with freash slurry in the time to time and continue the production if biogas.

- **Raw material used in biogas :**

1) Animal dung
2) Poultry waste
3) Kitchen waste
4) Plant waste
5) Agricultural waste
6) Human excreta.

- **Benefits of biogas plantation:**

1) Biogas is eco-friendly.
2) Biogas generation reduces soil and water pollution.
3) Biogas generation produces organic fertilizers.
4) Healthy cooking alternative.

➢ Dry Waste management:

Nirmaljyot Company is a leader in the field of dry waste management and recycling. With a commitment to environmental sustainability and a focus on reducing waste sent to landfills, we have developed innovative solutions to collect, sort, and process dry waste materials efficiently. Our state-of-the-art facilities employ advanced technology and skilled professionals to segregate and recycle various dry waste components, including paper, plastics, glass, metals, and electronic waste. By transforming these materials into valuable resources, we contribute to the conservation of natural resources, reduction of pollution, and the promotion of the circular economy. Nirmaljyot Company is dedicated to raising awareness about responsible waste disposal and recycling practices, making a positive impact on the environment and fostering a greener, more sustainable future

• Process on dry waste:

The process of managing and recycling dry waste typically involves several key steps:

Collection: Dry waste is collected from various sources, such as households, businesses, or industries. This collection can be done through separate bins or containers specifically designated for dry waste.

Segregation: Once collected, the dry waste is transported to a facility where it undergoes further sorting and segregation. Skilled workers or automated machinery are used to separate different types of dry waste, including paper, cardboard, plastics, glass, metals, and electronic waste**.**

Transportation: The sorted dry waste is then transported to recycling or processing centers. Efficient transportation methods are employed to minimize costs and environmental impact

- **Recycling process:**

Paper and Cardboard: These materials are typically pulped, cleaned, and processed to create new paper and cardboard products.

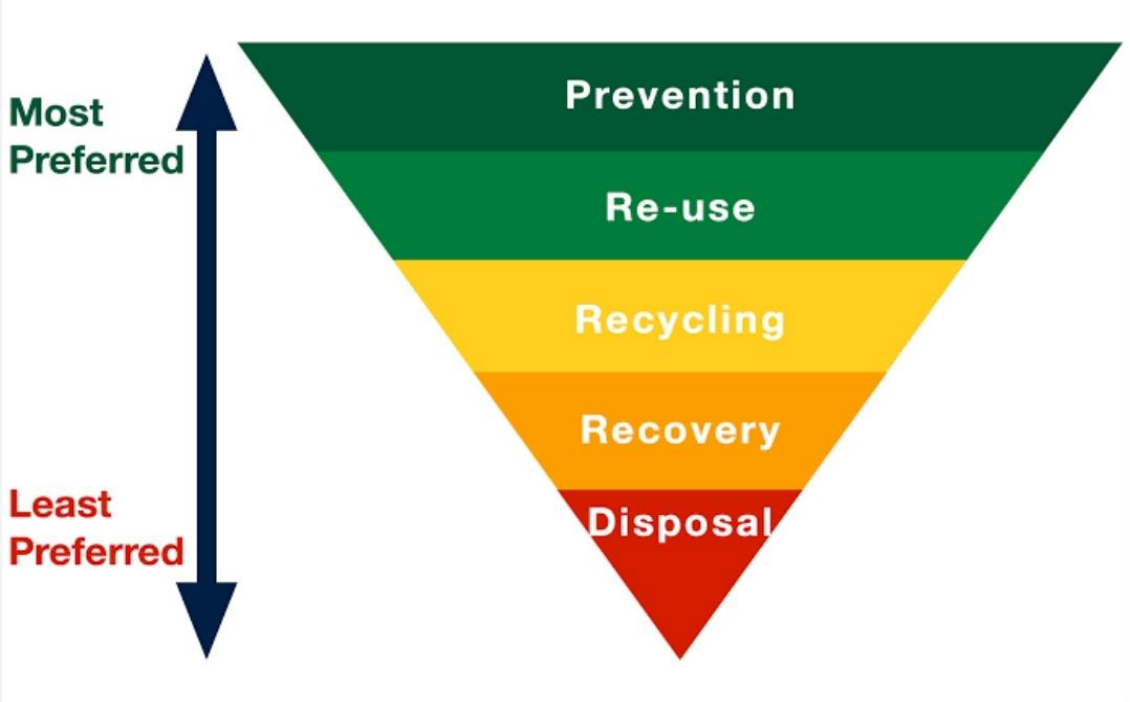
Plastics: Plastics are sorted by type and then melted down, reprocessed, and molded into new plastic items.

Glass: Glass is cleaned, melted, and used to manufacture new glass products.

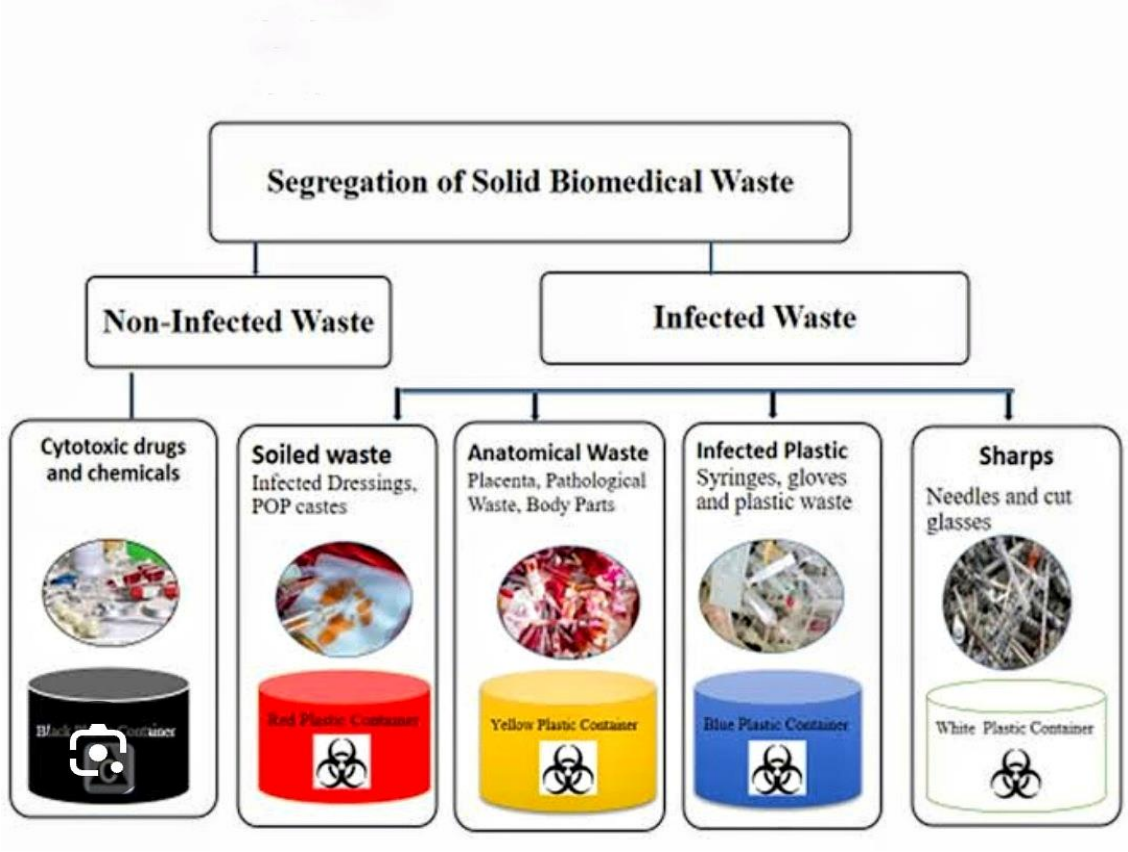
Metals: Metals like aluminum and steel are melted and remanufactured into various metal products**.**

Electronic Waste (E-waste): E-waste components are disassembled, and valuable materials like metals and electronic components are extracted and reused.

Disposal: Some dry waste materials that cannot be recycled, such as non-recyclable plastics and hazardous waste, may be disposed of in an environmentally responsible manner, often in landfills or through specialized treatment methods**.**



➢ Biomedical Waste Management:



- **biomedical waste management:**

Biomedical waste management is of prodigious impact because biomedical waste can harmfully affect health leading to serious implications to the people who get in touch with it. Segregation, storage and safe disposal of the waste is very crucial to the effective management of biomedical waste in a workplace.

- **Segregation of Biomedical Waste:**

Segregation of waste plays a chief role for enhanced biomedical waste management. It is imperative to decrease the volume of infectious waste or else the quantum of waste will go beyond the control of management. The waste is separated according to various colour coding system of waste containers which is given below:

Red bag: Recyclable contaminated waste such as bottles, intravenous tubes, catheters, urine bags, syringes and gloves.

Yellow bag: Human and animal anatomical waste, soiled waste including items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs, expired or discarded medicines, chemical waste (liquid), rejected linen, mattresses, beddings infected with blood or body fluid, microbiology, biotechnology and other medical laboratory waste.

Black bag: Incineration ash and chemical waste (solid).

White bag: Waste sharps including needles, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts.

Blue bag: Metallic body implants and glassware such as medicine vials, ampoules.

- ## Treatment on Biomedical waste :

Biomedical waste treatment refers to the procedures to eliminate the harmful effects of the waste. There are numerous treatment options which maximize safety during management and disposal of the waste. It also reduces environmental hazards. Incineration, Autoclaving, irradiation and chemical treatments are the most used methods for management and cleansing of biomedical waste.

- ## Incineration:

It is a treatment process used to transform pathological and pharmaceutical waste into ash, flue gases and heat. Functioning temperature for incineration should be in the range of 800-1400 degree Celsius. It reduces the bulk of waste by 90-95% and thus decreases harmful effects on the surroundings**.**

- ## Autoclaving:

It is a method of steam sterilization and is the most common substitute to incineration. Autoclaving necessitates a temperature of 121 degree Celsius and pressure of about 15 pounds per square inch (psi) for 20-30 minutes. This action is applied to inactivate the contagious agents and to sterilize the apparatus used in clinical services. It is less expensive and carries no recognized health impacts.

- ## Chemical treatment:

This treatment is frequently used to decontaminate liquid waste, so that it can be disposed-off nearby. It makes use of a number of techniques such as oxidation, reduction, precipitation and pH

neutralization to transform waste into less dangerous substances. Chlorine, sodium hydroxide or calcium oxide can be used agreeing to the nature of waste.

- **Irradiation:**

These methods are at present being used in waste treatment procedures which include gamma, electron-beam, ultraviolet and X-rays. Irradiation sterilizes waste in a sealed off chamber by uncovering it to a radioactive cobalt-60 which gives out gamma rays that are lethal to micro-organisms. It is very costly as associated to other methods and protections must be taken to guard workers from detrimental effects of radiations such as cancer, radiation sickness or even death

- **Disposal of Biomedical Waste:**

Land disposal is usually employed for remediation of waste which is decontaminated by appropriate treatment approaches. This technique is generally used in developing countries which includes the throwing away of waste into a landfill. Land-filling should be conducted at places where groundwater level is low and which are far from flooding sources. Radioactive wastes are commonly dumped in the oceans far away from human inhabitations. Every state and local government has its own rules and regulations for dumping of sanitized waste.

- **Advantage of Biomedical waste Management:**

Scheduling the waste management and reconditioning for all of the waste generated in the health care facilities is a fundamental task which plays an extremely significant role in the global cleanliness, public health, preservation of resources and sustainability of the ecosystem. Recycling medical waste curtails utilization of raw material and decreases the amount of the waste materials that must be disposed in a landfill. It decreases the dangers and risks to the communities which can be at risks due to hospitals. Decrease in the incidence of HIV/AIDS, sepsis, hepatitis, and other diseases spread by infectious medical equipment takes place by accurate waste management. Illegal trading of used syringes, injection needles and medical tools can also be stopped by proper management tactics. Attentiveness about biomedical waste and its appropriate disposal is compulsory for a nontoxic and vigorous future

➢ Door to Door Garbage Collection:

Our innovative company is dedicated to revolutionizing waste management through our door-to-door garbage collection service. With a commitment to sustainability and cleanliness, we've streamlined the process to make it as convenient as possible for our customers. Our highly-trained team follows a structured approach, starting with scheduled pick-up times to ensure reliability. Residents simply place their garbage bins outside their homes, and our eco-friendly vehicles equipped with advanced sorting technology collect and segregate the waste efficiently. We prioritize recycling and proper disposal methods, aiming to reduce environmental impact. Our goal is to create cleaner, healthier communities, one doorstep at a time.

This company is currently active in Maharashtra,goa and karnatka undre the contract of nirmaljyot facilities pvt.ltd .

- **How to create awareness in public :**

To create awareness in the public for waste management, it's crucial to employ a multi-faceted approach. First, organize community workshops and seminars on waste reduction, recycling, and proper disposal methods. Engage local schools and educational institutions to include waste management in their curriculum. Launch public awareness campaigns through social media, posters, and local newspapers to highlight the importance of waste management practices. Collaborate with local authorities and businesses to set up recycling centers and promote responsible waste disposal. Encourage community participation through clean-up drives and recycling initiatives. By combining education, outreach, and practical solutions, we can effectively raise awareness and foster a culture of responsible waste management in our communities.

ACTUAL METHODOLOGY FOLLOWED:

- After considering everyone's opinion, the team decided to work on the waste management in different location as a microproject.
- Conduct research to gather relevant information.
- Prepared and submitted a proposal outlining the project's scope, goals, timeline.
- The team collected the information of waste management by this company.
- Prepared a final report outlining the project's research, analysis, and conclusions, and present it to relevant faculty.

RESOURCES USED:

Sr. No.	Name of Resources	Specifications	Quantity
1.	Computer Systems	Systems with various specification	1
2.	Software tools	Microsoft Office Software (Word)	1
3.	Websites	https://nirmalacm.com	1

SKILL DEVLOPMENT:

- Teamwork: Collaboration with fellow researchers has improved our teamwork and collaborative skills.
- Environmental Awareness: Our project has cultivated a heightened environmental awareness, emphasizing the significance of waste management
- Teamwork: Collaboration with fellow researchers has improved our teamwork and collaborative skills.

APPLICATION OF THE PROJECT:

- Ecosystem Management: Understanding waste management in managing ecosystems for ecological balance, such as maintaining a environmental structure.
- Educational Purposes: Providing valuable information for educational institutions and researchers to study waste management.
- Resource Conservation: Your project can contribute to the efficient use of resources by promoting recycling, reducing the need for virgin materials, and conserving energy.
- Environmental Protection: Implementing effective waste recycling measures helps mitigate pollution, lowers greenhouse gas emissions, and safeguards ecosystems.
- Create awareness:implementing this project to create public awareness.

Thank You