National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Conference Return Seminar: COMPARATIVE EVALUATION OF RHIZOFILTRATION USING HYDROPONIC PLANT AND NATURAL ADSORBENTS FOR HEAVY METAL REMOVAL FROM SYNTHETIC WASTEWATER
Speaker	: Ravutla Varsha
Supervisor	: Dr. M. Gattu
Venue	: CE Seminar Hall
Date and Time	: 11 Mar 2025 (400pm)
Abstract	: The discharge of heavy metals such as cadmium (Cd), copper (Cu), nickel (Ni), zinc (Zn), and chromium (Cr) into water bodies poses significant environmental and health challenges. This study explores the sustainable treatment of synthetic wastewater with a metal concentration using natural adsorbents and hydroponic phytoremediation techniques. The adsorbents include cotton, gravel, coarse sand, fine sand, and red mud, chosen for their natural abundance and adsorption capabilities. Hydroponic systems utilizing Limnophila indica (Indian marshweed) was employed to evaluate the effectiveness of rhizofiltration. The research aims to compare the performance of natural adsorbents and hydroponic plants in removing heavy metals from wastewater. Parameters such as removal efficiency, adsorption capacity, and the synergistic effects of plant and substrate interactions were analyzed. The study also investigates the mechanisms of heavy metal uptake in hydroponic plants and the potential of adsorbents to serve as cost-effective alternatives in wastewater treatment. The findings are expected to provide critical insights into sustainable and eco-friendly solutions for heavy metal mitigation, contributing to the development of integrated wastewater treatment strategies. This research holds promise for scalable applications in environmental management, particularly in regions facing water pollution challenges due to heavy metal contamination