

R.V. COLLEGE OF ENGINEERING, BANGALORE-560059  
(Autonomous Institution Affiliated to VTU, Belgaum)



**Generation of Bio-electricity From Waste Water and Cellulose Based Wastes  
Using a Microbial Fuel Cell**

**PROJECT REPORT**

*Submitted by*

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## ABSTRACT

In the present day scenario, the need of the hour is a new, clean source of energy that is non-polluting and available in abundance while at the same time generating a good amount of energy. The Microbial Fuel Cell is one such device which has the potential to generate electricity from waste water. By converting biodegradable materials into electricity, Microbial Fuel Cells (MFCs) present a promising technology for renewable energy production for specific applications. MFC systems with wastewater as the anolyte were studied for optimizing various parameters such as anode materials, electrode surface area, substrate enhancement with treated cellulose based wastes, catholyte and dissolved oxygen. A Semi-continuous trial with wastewater yielded a peak power density of 60.84 mW/m<sup>2</sup> after refill with fresh waste water at 155 hours of operation and the final trial with all optimized parameters produced an output of 87.13 mW/m<sup>2</sup>. Microbes responsible for bioelectricity were isolated from wastewater and studied in the MFC. A 43% COD removal was achieved in the system, indicating dual advantages of MFC systems for wastewater treatment and bioelectricity generation, which holds a strong future and scope for extensive applications in a world looking for an alternate and eco-friendly source of power. Currently, the prime bottlenecks that face the technology are the high cost of the materials involved, particularly the membrane. However, these issues are being addressed and the MFC has already found commercial applications in marine experiments to power small electronic circuits.