

Seminar Title	: Development of Non-Enzymatic Electrochemical Sensor Materials for Detection of Biomarkers
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Venue	: New seminar hall, Department of Chemical Engineering
Date and Time	: 19 Sep 2024 (11:00 A.M.)
Abstract	: Biomarkers are crucial in healthcare for diagnosing diseases, monitoring treatment, and forecasting clinical outcomes. This work emphasizes the significance of biomarkers in various physiological processes, focusing on development of non-enzymatic electrochemical sensor materials for detection of biomarkers such as glucose, uric acid, nicotine, alcohol and dopamine. A comprehensive review of electrode materials, sensitivity, and detection limits for these biomarkers is presented, highlighting the need for advanced sensor materials. The report proposes objectives like synthesizing new materials, calibrating and detecting individual biomarkers, and developing a method to detect multiple biomarkers simultaneously. The methodology includes electrode development with Nickel Nanoparticles for glucose detection, material characterization, and the determination of calibration curves for respective biomarkers. Using chronoamperometry, glucose oxidation at 0.55 V was observed with increasing catalytic current, while differential pulse voltammetry (DPV) was employed for calibration. Applied potentials between 1200 and 1450 mV successfully detected glucose, with increasing peak current values confirming accurate calibration across concentrations ranging from 0 $\mu$ M to 500 $\mu$ M.