Abstract

The main goal of this thesis is to perform an analysis of MHD Maxwell fluid free convective flow on a porous vertical plate. The fluid flow phenomenon is used to describe the oscillatory movement of a vertical plate submerged in a magnetic medium in which the magnetic field is either stagnant or moving along the plate. Asymmetric temperature is set to provide heat on both sides of the plate. The phenomena of heat transfer is investigated with the constant concentration, 1st order chemical reaction, and thermal conductivity being the function of time. The movement of the plate in specific instances, as well as variations in concentration and temperature, are studied in detail. The motion of the fluid is described mathematically by a coupled system of partial differential equations. To make the model free from geometry, regime dimensionless variables are introduced. Caputo fractional derivative is used for the fractionalized model analogue. The integral Laplace transform as well as numerical algorithms are used to solve the problem. By using graphical analysis, the impact of physical parameter's on the fluid flow is discussed. The result for the integer-order derivative and viscous fluid are derived as limiting sense and useful conclusions are recorded.