In this dissertation we describe a shooting method of solving two point boundary value problems and apply it to produce the computational solution of a physical problem in fluid dynamics concerning the flow of viscous incompressible axisymmetric stagnation flow on a cylinder in the presence of a porous medium. We devote the first section to the relevance of computational fluid dynamics. In the second section a two point boundary value problem has been posed with $n$ first order ordinary differential equations with $n$ boundary conditions. Only $r$ boundary conditions are specified at the initial point and remaining $(n-r)$ boundary conditions are specified at the terminal point. We assume suitable arbitrary values for the $(n-r)$ missing initial conditions and integrate the equations to the terminal point by Runge Kutta Gill method. The differences between the computed terminal values and specified terminal values are used to find or adjust the missing initial conditions through a numerical process called shooting method which is described in detail. In the third section we start with the description of classical stagnation point flows and enter into the formulation of an axisymmetric stagnation flow on a cylinder through a
porous medium. The governing equations and the boundary conditions form a two point boundary value problem which has been solved numerically using the shooting method. In section 4 we describe various computational aspects of this physical problem. The last section is devoted to the discussion of the results based on physical parameters. An important property that there are additional boundary layers formed at the fluid porous medium interface characterises the flow. This altogether alters the behaviour of the profiles in comparison with the corresponding case of free fluid.