The stress tensor of a ferrofluid exposed to an external magnetic field is subject to an additional magnetic terms. For a linearly magnetizable medium, such terms results in an interfacial magnetic force acting on the ferrofluid boundaries. This force changes the characteristics of many free-surface ferrofluid phenomena. The aim of this work is to implement this force into Navier-Stokes equations and propose a numerical method to solve them. The interface of ferrofluid is tracked with the use of level-set method and additional reinitialization step assures conservation of its volume. Incompressible Navier-Stokes equations are formulated for divergence free velocity fields while discrete interfacial forces are treated with continuous surface force model. Velocity-pressure coupling is given by projection method. To predict the magnetic force effect quantitatively, Maxwell's equations for magnetostatics are solved in each time step. Finite element method is utilized for the spatial discretization. At the end of the work, equilibrium droplet shape and dripping phenomenon are qualitatively compared to known experimental results.