**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**
**BELGAUM - 590 014, KARNATAKA.**

# A PROJECT REPORT ON

# "DESIGNING MULTIFUNCTIONAL MATERIALS FOR DRUG DELIVERY,CONTRAST AGENT FOR FLUROSCENCE IMAGING AND INVITRO STUDIES"

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**BACHELOR OF ENGINEERING**
**IN**
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# ABSTRACT

In the current study we have demonstrated the possible applications of graphene oxide and ferrite nanoparticle composite as contrast agent for magnetic resonance imaging. The graphene oxide was synthesized by well-studied Hummers method and subsequently ferrite and graphene oxide composite was synthesized by chemical co precipitaion using NaOH. The nano composite prepared by co-precipitation was characterized by X-ray diffraction (XRD), Transmission electron Microscopy (TEM) and Vibrating Sample Magnetometer (VSM). The nano composite forms a stable dispersion in water and stable for significant time which enables it to use as in biomedical applications. Different concentrations were prepared and NMR values were recorded using 9 tesla Nuclear Magnetic Resonance Machine. The relaxivity values of water protons in the presence of Graphene oxide and ferrite nanoparticles composite were plotted against concentration of nanoparticles. The slope of the graph gives relaxivity value as 40.5 $mMS^{-1}$. TNF was attached to the composition of CdS nanoparticles which acts as fluorescence agent which emit the light when drug delivered to the target which was observed under fluorescence microscope. Even though the value is low it is a good demonstration of possible application of nano composite in biomedical imaging and in drug delivery.