

Write up for admission to PhD in *Polymer Composites*

## **DEVELOPMENT OF 3D PRINTABLE BIO-COMPOSITES**

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Three-dimensional (3D) printing is an innovative method that can produce a 3D component by adding materials layer by layer. Diverse materials such as metals, polymers, and ceramics are commonly used for 3D printing. In order to make sustainable components researchers are working towards utilizing biodegradable materials for 3D printing. Biodegradable polymeric materials are considered as potential 3D printing materials due to their abundant resources and useful properties. Further, due to their multi-functional characteristics they are also seen as probable contender to replace the petroleum based polymeric materials. However, some of their properties are inferior to the conventional synthetic polymeric materials. Hence, this research aims in developing bio-composite materials 3D printing applications. It is proposed to use bio-fillers as reinforcement materials for the polymer matrix and fabricate 3D printable filaments. The influence of addition of fillers and the various process parameters in the 3D printing technique on the functional properties of the ensuing bio-composites would be investigated. Based on the results suitable application would be suggested.