

## STUDIES ON STRUCTURAL ANALYSIS OF A GOAT BONE WITH ALTERNATIVE COMPOSITE MATERIALS

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### ABSTRACT

Nature acts as an inspiration form any designs & innovations. There is a lot to learn from nature, see how nature creates these much strong and light weight structures of bone. Unfortunately, there comes another phase, which leads to the breakage of bones in some conditions. In order to replace the bone, those bones should be of suitable material with the same properties as bones which includes strength, elasticity, etc. To satisfy all these properties, it is very important to analyze the bone in ANSYS with different materials like composite material, natural fibers, stainless steel, steel, etc. To find the suitable and the best one. This paper deals with the design of a goat leg with exact dimensions. In order to predict the strength of an original bone, the structural analysis has carried out to find out the mechanical properties. And also, the structural analysis has been carried out for the following composite materials: Glass/Epoxy, Carbon/Epoxy, Sisal/Epoxy, coir/Epoxy & Hybrid (Sisal/ Coir). The mechanical properties of each composite material are compared with the original bone material. But the usage of composite material should be a healthy one for the goat. This study had been carried out for Biomimicry the human bone for replacement during accidental failure. The material should not react with the blood, muscles and other factors while retrofitting. This study provides better understandings on selection of suitable material for bone.

**Keywords:** Bone, Composite material, Structural Analysis, Carbon, Goat

