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Date of joining: 11.07.2023

Department: Mechanical Engineering

Education Details (UG & PG)

B.E. – Mechanical Engineering

M.E. – Engineering Design

Tentative title of the research work:

Development and Characterization of Protection Cap for Complex Scapula Bone Fracture

Brief Abstract:

In this research work, it is planned to develop a protective cap for scapula bone fracture by using the synthesised nanoapatite materials such as Hydroxyapatite (HAP), Fluoroapatite (FAP), and Chloroapatite (CAP) with surface modification, reinforced with Polylactic Acid (PLA) at different compositions through the extrusion process, and the specimens were subsequently prepared through FDM 3D printing. The combination of PLA with different compositions of HAP, FAP, and CAP were characterised for their crystallinity, surface morphology, biocompatibility, mechanical properties, and biodegradability to reduce the surgical difficulty of scabular bone fracture



**Good schematic /
image related to the
proposed work (if
available)**

Publications (if any)

- N. Jayakumar, H. Arumugam, and **A. D. Albert Selvaraj**, “Mechanical behaviour of the post processed 3D printed PLA parts using polar and non-polar solvents,” *Polym. Bull.*, no. 0123456789, 2023, doi: 10.1007/s00289-023-04900-8.
- J. Nagarjun, J. Kanchana, G. Rajeshkumar, and **A. Anto Dilip**, “Enhanced mechanical characteristics of polylactic acid/tamarind kernel filler green composite filament for 3D printing,” *Polym. Compos.*, no. February, pp. 1–16, 2023, doi: 10.1002/pc.27676.
- E. Natarajan, S. Ramesh, K. Markandan, N. Saravanakumar, **A. A. Dilip**, and A. R. S. Batcha, “Enhanced mechanical, tribological, and acoustical behavior of polyphenylene sulfide composites reinforced with zero-dimensional alumina,” *J. Appl. Polym. Sci.*, no. December 2022, pp. 1–12, 2023, doi: 10.1002/app.53748.
- A. Dhandapani et al., “Investigation of Wear Behavior in Self-Lubricating ABS Polymer Composites Reinforced with Glass Fiber/ABS and Glass Fiber/Carbon Fiber/ABS Hybrid,” *Lubricants*, vol. 11, no. 3, p. 131, 2023, doi: 10.3390/lubricants11030131.
- H. Arumugam, B. Krishnasamy, G. Perumal, **A. D. A**, M. I. Abdul Aleem, and A. Muthukaruppan, “Bio-composites of rice husk and saw dust reinforced bio-benzoxazine/epoxy hybridized matrices: Thermal, mechanical, electrical resistance and acoustic absorption properties,” *Constr. Build. Mater.*, vol. 312, no. May, p. 125381, 2021, doi: 10.1016/j.conbuildmat.2021.125381.
- S. S, E. Natarajan, R. Shanmugam, V. K, S. N, and **A. A**, “Strategized friction stir welded AA6061-T6/SiC composite lap joint suitable for sheet metal applications,” *J. Mater. Res. Technol.*, vol. 21, pp. 30–39, 2022, doi: 10.1016/j.jmrt.2022.09.022.
- H. Srinivasan, H. Arumugam, **A. D. A**, and B. Krishnasamy, “Desert cotton and areca nut husk fibre reinforced hybridized bio-benzoxazine / epoxy bio-composites : Thermal , electrical and acoustic insulation applications,” *Constr. Build. Mater.*, vol. 363, no. September 2022, p. 129870, 2023, doi: 10.1016/j.conbuildmat.2022.129870.
- E. Natarajan et al., “Drilling-Induced Damages in Hybrid Carbon and Glass Fiber-Reinforced Composite Laminate and Optimized Drilling Parameters,” *J. Compos. Sci.*, vol. 6, no. 10, 2022, doi: 10.3390/6100210