Indian Institute of Technology Delhi

School of Interdisciplinary Research (SIRe)

SIRe Project Number

2022-01-16

(will be assigned by SIRe)

PhD Project

Project Details	
Project Title	Design and development of an advanced 3D woven honeycomb composite structure shell with high energy absorbent liner for air crew helmet
Project Summary	This proposal envisages design and development of a novel architecture of aircrew helmet energy absorbing liner . The proposed liner consists of a dual energy absorbing components such as 3D woven honeycomb composite core and 3D woven spacer/solid structure based composite skin. 3D woven composites , solid or hollow, are known for their impact energy absorption behavior. However, specific impact energy in case of an aircrew helmet remains a challenge as optimization of fibre volume fraction involves technological paradoxy between honeycomb shell geometry, X-Y-Z components of 3D solid and total mass of the liner. Structure property relationship, stress distribution aspects to delaminate multiple layers of FRP to effectively dissipate energy also needs to be systematically studied.Composite processing to achieve desired mechanical performance with minimum resin will also play an important role.

PhD Supervisors

Role	**Faculty**	**Academic Unit in IITD**	**Email ID**
Supervisor 1	Prof. B K Behera	Textile and Fibre Engineering	behera@textile.iitd.ac.in
Supervisor 2	Prof. S P Singh	Mechanical Engineering	singhsp@mech.iitd.ac.in
Supervisor 3	Prof. Javed Sheikh	Textile and Fibre Engineering	jsheikh@textile.iitd.ac.in

Project requirements (Student qualications, experience required, etc)

- M Tech in Textile/Mechanical/Materials Engineering

Source of funding (IRD/FITT Project details, if any)

IRD project : RP04187

Role of Faculty Members involved:
Supervisor