

**Aquitaine –Karnataka collaboration
Scientific Project for Pre-PhD student exchange
Scientific Proposal**

Project Title	BIODEGRADABLE POLYMER NANO COMPOSITES FOR PACKAGING APPLICATIONS	
Scientific domain	Biodegradable polymer nano-composites, Mechanical Engineering	
Summary (ca. 10 lines)	<p>The use of plastics plays an important role in our daily life, But, its non-biodegradability and environmental consciousness limits its uses and to look for alternate materials. This development has for the best part led to focusing on alternative packaging films derived from natural biopolymers which are replenishable and completely biodegradable under a variety of ecological systems.</p> <p>Chitin is a naturally occurring and abundantly available polysaccharide obtained from crustacean wastes. Therefore, it was felt desirable that a study be initiated to evaluate the properties of chitosan films prepared and to modify the films by reinforcing the various natural fibres and additives and to look for their application to packaging purpose.</p> <p>In this proposed work, the mixture of Chitosan and Nano-clay, which is in the form of a resin, will be used as a Matrix material and various natural fibers like Sisal Fibers , jute mat, areca fibers, coconut coir, cotton fabric and others were used as reinforcements and Composite Chitosan films with natural fibers as reinforcements will be prepared. The effect of Aluminum Tri hydroxide (ATH) and Magnesium tri hydroxide on the composite films will also be studied. The composite films obtained will be tested for mechanical properties, fire retardation, degradability and moisture absorption properties. These composite films may be used to prepare hand bags which can be used for packaging applications.</p>	
Student profile wished	Mechanical Engineering, Composite Materials, Chemistry.	
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Timing & duration for project (give approximate ranges)	From 3 to 6 month, any time of the year	
Selected References	<ol style="list-style-type: none"> 1. Jong-Whan Rhim, Seok-In Hong,Hwan-Man Park, And Perry K. W. Ng “Preparation and Characterization of Chitosan-Based Nanocomposite Films with Antimicrobial Activity”, <i>Journal of Agricultural and Food Chemistry</i>, Vol. 54, No. 16, 2006, 5814-5822. 2. Khaoula Khwaldiaa, Altaf H. Bastab, Hajer Alouia, Houssni El-Saiedb, “Chitosan–Caseinate bilayer coatings for paper packaging materials”, <i>Carbohydrate Polymers</i>, Volume:99, 2014,508– 516. 	

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