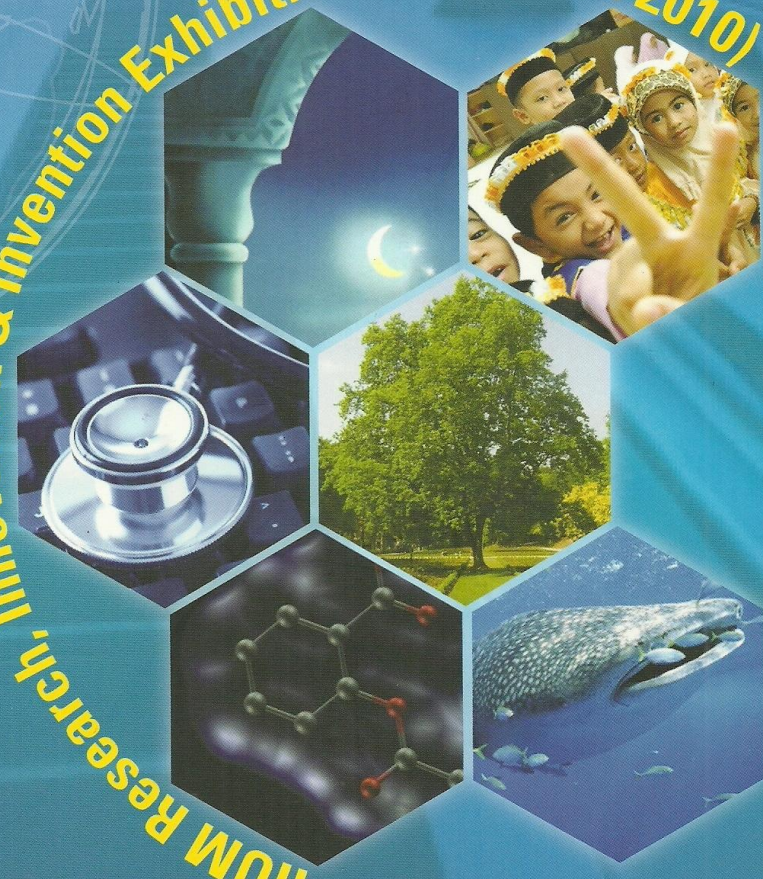
الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يونيۏرسيتي اسلام انتارابڠسا مليسيا

IRIIE 2010

IIUM Research, Innovation & Invention Exhibition 2010 (IRIIE 2010)



ENHANCING QUALITY RESEARCH &

INNOVATION for SOCIETAL DEVELOPMENT

P-137 Edge-cracked bimaterial systems under thermal heating

*Abd El-Fattah A. Rizk, **Meftah Hrairi***
Mechanical Engineering, Kulliyyah of Engineering
International Islamic University Malaysia

The problem of thermoelastic edge-cracking in two-layered bimaterial systems subjected to convective heating is considered. The medium is assumed to be insulated on one surface and exposed to sudden convective heating on another surface containing the edge crack. It is known that, when a bimaterial systemâ€™s surface is heated, compressive stresses arise near the heating surface, forcing the crack surfaces together over a certain cusp-shaped contact length. It is also known that, for a cooled bimaterial systems surface, tensile stresses take place close to the cooling surface and tend to open the crack. So, the edge cracked heating surface problem is treated as an embedded crack with a smooth closure condition of the crack surfaces, with the crack contact length being an additional unknown variable. Superposition and uncoupled quasi-static thermoelasticity principles are adopted to formulate the problem. By using a Fourier integral transform technique, the mixed boundary value problem is reduced to a Cauchy type singular integral equation with an unknown function as the derivative of the crack surface displacement. The numerical results of the stress intensity factors for an edge crack and a crack terminating at the interface, are calculated and presented as a function of time, crack length, heat transfer coefficient, and thickness ratio for two different bimaterial systems, namely a stainless steel layer welded on ferritic steel and a ceramic layer coating on ferritic steel

P-140 Design, Build and Test IIUM Remote Controlled Glider

***Ashraf A. Omar**, Mohd Hafizuddin Bin Abd Rihem, Abdul Rahman Bin Mohamad Hashim,*
Hani Maisara Saiful Bahri, Marissa Mohamed Noor, Ahmad Najmuddin Ahsanah,
Nurul Farahana Bt Mahmud Zuhudi,Iqbal Bin Joari, Ahmad Shahir Bin Yazid
Mechanical, Kulliyyah of Engineering
International Islamic University Malaysia

The main objective of this subject is to design and build a sailplane that meets certain performance requirement. Simple mission profile was used which is include warm up, taxi, takeoff, climb, cruise and landing. The cruising altitude, range and sailplanes requirements and specification has been decided base on certain criteria. The take off weight of the sailplane has been successfully estimated as 1.225 kg. NACA 4412 airfoil was used for the wing sectiion. The fuselage diensions were estimated. The length of the fuselage from nose to tail is 0.8 meter, and the fuselage cross section will be rectangular in shape. The power available was estimated as 0.2 hp. The static stability analysis shows good results since all three components which are wing fuselage and tail gives desirable stability results. After 13 weeks of hard work, the team had managed to complete the fabrication of sailplane and also had managed to have it flown by a hired RC pilot. The aircraft flew without any difficulty and the objectives was reached, which is to perform an unpowered gliding.

P-142 Lightweight Biodegradable Cotton/Albumen Board (CAB) for Sustainable Environment

*Yusliza Yusof, **Zuraida Ahmad**, IIs Sopyan*
Manufacturing and Materials Engineering, Kulliyyah of Engineering
International Islamic University Malaysia

The depletion of petroleum resources coupled with environmental awareness have spurred effort to produce biodegradable materials from natural resources, which is stable during storage and can be safely disposed after their intended time of use. These materials also can form the basis for sustainable and eco-efficient products that often results in lightweight structures having high stiffness and tailored properties for specific applications. Thereby, main objective of this work is to develop biodegradable board materials from cotton fiber reinforced egg albumen composites. The investigation is about the effect of fibre content on the mechanical properties, and thermal stability of the CAB. The composites having 0%,