הטכניון – מכון טכנולוגי לישראל
הפקולטה להנדסת מכונות

TECHNION – Israel Institute of Technology
Faculty of Mechanical Engineering

SEMINAR - סמינר

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום א' 24.12.06 (ג' בטבת, תשס"ז), בשעה 14:30, בחדר 430 בבניין ליידי-דייויס.

<u>ירצה</u>:

Dr Giora Shatil
MBN Technology, University of the West of England

<u>על הנושא</u>:

Improvements in fatigue and fracture design of light weight structures

<u>להלן תקציר ההרצאה</u>:

This presentation brings together several current projects aimed at designing against fatigue and fracture failure of structures, in particular for commercial passenger aircraft and vehicle design.

1. Multiaxial Fatigue: Fatigue lives obtained from complex different components often involve discrepancy in results due to geometrical variation. Recently, models have been developed to improve correlation using a critical 'process zone' that surrounds the damaged material. A review of such an approach is presented. In several design cases investigated, a subsurface approach appears to improve life predictions.

2. Ductile fracture: The local approach to ductile fracture design of service components is an alternative to LEFM analysis. Cracking in structural steel was predicted using ductile fracture simulation and constitutive material damage models. Two ductile damage constitutive material models coupled to elastic-plastic finite element analysis were used to predict the fracture and possible failure of a light vehicle energy storage flywheel.

3. Thermoelastic cracks detection: The detection and prevention of early fatigue cracks is a critical part of modern design. Improvement of the detection of local cyclic stresses and damage by tiny thermal changes during fatigue loads has been investigated. This includes detection of fatigue crack initiation in airframe joints, evaluation of principal cyclic stress field by using a combined TSA and photoelasticity approach, and the detection of cyclic damage in composite calibrated using finite element analysis.

בברכה,

ד"ר אולג וגדלמן
מרכז הסמינרים

<u>המארח</u>: פרופ' אלי אלטוס