

Την Παρασκευή 21 Μαρτίου 2008, ώρα 12:00, θα διεξαχθεί το παρακάτω Σεμινάριο Μηχανικής στην Αίθουσα Βιβλιοθήκης, στο Ισόγειο του Κτηρίου Αντοχής Υλικών (Θεοχάρη).

#### Idle Gear Rattle in Manual Automotive Transmissions

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Transmission rattle has become a major Noise, Vibration and Harshness (NVH) concern in automobile industry and manifests itself in a variety of ways according to engine operating conditions; load and speed. One of its most annoying modes of response is under engine idling condition, where vibro-impact phenomenon of unselected gear pairs, emanated as transmission noise of a repetitive nature, is most noticeable with low engine noise. These impacts are repeated at intervals determined by engine order torsional vibration. Contacts of gear teeth in manual transmissions are lubricated conjunctions, operating under hydrodynamic regime of lubrication at light impact loads under engine idling condition. These also contribute to spectral contents as natural frequencies of the hydrodynamic conjunctions, where the contact compliance of the impacting solids is actually governed by the stiffness of the lubricant film. The system dynamic response is, therefore, highly non-linear due to the presence of gear backlash and the lubricant. This presentation investigates the role of hydrodynamic film under entraining motion and squeeze film effect resulting from combined rolling and approach/separation of the impacting gear teeth pairs, using lumped parameter numerical models of gear pairs. Validation of the models against experimental measurements is also presented.

Professor Theodossiades got his Dipl-Ing (1995) and PhD (2000) degrees from the Aristotle University of Thessaloniki, Mechanical Engineering Department. He also got an Executive MBA from Loughborough University, Business School (2005). He joined Loughborough University in 2002 as Research Associate and then as Research Fellow in the Dynamics Research Group, Wolfson School of Mechanical and Manufacturing Engineering. He was appointed as lecturer in Engineering Dynamics (Wolfson School, 2003), and Senior Lecturer (Associate Professor) since 2007. His research interests include Noise, Vibration and Harshness (NVH) phenomena in Automotive Powertrain Systems, dynamic analysis of medical devices and virtual prototype development.