Αρχιμήδης ΙΙΙ – Ενίσχυση ερευνητικών ομάδων στο ΤΕΙ Αθήνας

Πρόσκληση σε Διαλέξεις

του Καθηγητή **J. N. Reddy**

Advanced Computational Mechanics Laboratory
Department of Mechanical Engineering
Texas A & M University, College Station, TX 77843-3123
jnreddy@tamu.edu

Ο διακεκριμένος καθηγητής J.N. Reddy του Τμήματος Μηχανολόγων Μηχανικών του Πανεπιστημίου Texas A&M θα δώσει την Πέμπτη 25 και την Παρασκευή 26 Ιουνίου 2015 δύο διαλέξεις στο Τεχνολογικό Εκπαιδευτικό Ίδρυμα (Τ.Ε.Ι.) της Αθήνας σχετικά με θέματα της πρόσφατης έρευνάς του.

Η παρουσία του στην Αθήνα είναι στα πλαίσια της συμμετοχής του στην κύρια ερευνητική ομάδα του προγράμματος με τίτλο *«Υδροελαστική απόκριση μεγάλων πλωτών κατασκευών και σωμάτων γενικού σχήματος σε περιβάλλον μεταβαλλόμενης 3D βαθυμετρίας»* του «ΑΡΧΙΜΗΔΗΣ ΙΙΙ» (Υποέργο 29, HydELFS) και σε συνεργασία με το *Εργαστήριο Εφαρμοσμένης Μηχανικής* του ΤΕΙ της Αθήνας.

Η πρώτη διάλεξη θα δοθεί την **Πέμπτη 25 Ιουνίου 2015**, ώρα 12:00 με 14:00, στην Αίθουσα Τηλεδιάσκεψης του ΤΕΙ της Αθήνας (Αίθουσα Κ10.044 στο κτίριο Κ10) με τίτλο:

A LOCKING-FREE SHELL ELEMENT WITH THICKNESS STRETCH FOR LARGE DEFORMATION ANALYSIS OF COMPOSITE AND FUNCTIONALLY GRADED SHELLS

Η δεύτερη διάλεξη θα δοθεί την **Παρασκευή 26 Ιουνίου 2015**, ώρα 12:00 με 14:00, στην Αίθουσα Τηλεδιάσκεψης του ΤΕΙ της Αθήνας (Αίθουσα Κ10.044 στο κτίριο Κ10) με τίτλο:

ON NONLOCAL AND STRAIN GRADIENT EFFECTS IN STRUCTURAL THEORIES

Σύντομη περιγραφή του περιεχομένου κάθε διάλεξης του Καθηγητή J. N. Reddy καθώς και οδηγίες πρόσβασης στο ΤΕΙ της Αθήνας και το χώρο των διαλέξεων επισυνάπτονται στην παρούσα πρόσκληση.

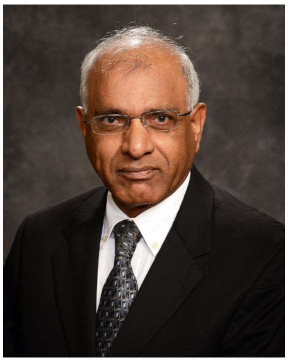
Για περισσότερες πληροφορίες μπορείτε να επικοινωνήσετε με τον Φίλη Κόκκινο, Τμήμα Πολιτικών Μηχανικών και Μηχανικών Τοπογραφίας & Γεωπληροφορικής του ΤΕΙ Αθήνας, τηλ. 6977285710, *fkokkinos@teiath.gr*

Η παρούσα δράση έχει συγχρηματοδοτηθεί από την Ευρωπαϊκή Ένωση (Ευρωπαϊκό Κοινωνικό Ταμείο, ΕΚΤ) και από εθνικούς πόρους μέσω του Επιχειρησιακού Προγράμματος «Εκπαίδευση και Δια Βίου Μάθηση» του Εθνικού Στρατηγικού Πλαισίου Αναφοράς (ΕΣΠΑ) – Ερευνητικό Χρηματοδοτούμενο Έργο: ***ΑΡΧΙΜΗΔΗΣ ΙΙΙ****. Επένδυση στην κοινωνία της γνώσης μέσω του Ευρωπαϊκού Κοινωνικού Ταμείου.*

Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης

Αρχιμήδης ΙΙΙ – Ενίσχυση ερευνητικών ομάδων στο ΤΕΙ Αθήνας

Vitae of Prof. J. N. REDDY



Dr. Reddy is a Distinguished Professor, Regents' Professor, and inaugural holder of the Oscar S. Wyatt Endowed Chair in Mechanical Engineering at Texas A&M University, College Station, Texas. Dr. Reddy earned a Ph.D. in Engineering Mechanics in 1974 from University of Alabama in Huntsville (under the guidance of J.T. Oden). He worked as a Post-Doctoral Fellow in Texas Institute for Computational Mechanics at the University of Texas at Austin, Research Scientist for Lockheed Missiles and Space Company, Huntsville, during l974-75, and taught at the University of Oklahoma from 1975 to 1980, Virginia Tech from 1980 to 1992, and Texas A&M University from 1992 till now.

Dr. Reddy is the author of numerous journal papers and several well-received textbooks in the area of composite materials and structures, variational methods, plates and shells, and linear and nonlinear finite elements (no one person in engineering, since S. P. Timoshenko has written so many well-received textbooks as Dr. Reddy that have made lasting contribution to engineering education and research). He has delivered over 139 plenary, keynote, or general invited lectures at international conferences and institutions; taught over 90 short courses on finite elements, composite materials, and nonlocal structural theories. Professor Reddy advised 33 postdoctoral fellows and research visitors and over 107 graduate theses.

Dr. Reddy's research is concerned with the development of higher-order theories of plates and shells and extensions and applications of the finite element method to a broad range encompassing composite structures, numerical heat transfer, computational fluid dynamics, and more recently to biology and medicine. His shear deformation plate and shell theories and their finite element models and penalty finite element models of fluid flows have been implemented into commercial finite element computer programs like ABAQUS, NISA, and HyperForm. Dr. Reddy is one of the original top 100 *ISI Highly Cited Researchers* in Engineering around world with over 17,300 citations (average citations of over 35 per paper) with *h-index* (*h*-index is the largest number *h* such that *h* publications have at least *h* citations) of over 63 as per *Web of Science*; as per *Google Scholar* the number of citations of nearly 40,000 with *h-index* of 83 and *i10-index* of 369 (i.e., 369 papers are cited at least 10 times). A more complete resume with links to journal papers can be found at

http://isihighlycited.com/ and http://www.tamu.edu/acml.

A Locking-free Shell Element with Thickness Stretch for Large Deformation Analysis of Composite and Functionally Graded Shells

J. N. Reddy

Advanced Computational Mechanics Laboratory
Department of Mechanical Engineering
Texas A & M University, College Station, TX 77843-3123
jnreddy@tamu.edu

ABSTRACT

In this lecture a high-order spectral/hp continuum shell finite element for the numerical simulation of the fully finite deformation mechanical response of isotropic, laminated composite, and functionally graded elastic shell structures will be discussed [1, 2]. The shell element is based on a modified first-order shell theory using a 7-parameter expansion of the displacement field. The seventh parameter is included to allow for the thickness stretch and the use of fully three-dimensional constitutive equations in the numerical implementation. The finite element coefficient matrices and force vectors are evaluated numerically using appropriate high-order Gauss-Legendre quadrature rules at the appropriate quadrature points of the element mid-surface. The virtual work statement is further integrated numerically through the shell thickness at each quadrature point of the mid-surface; hence no thin-shell approximations are imposed in the numerical implementation. For laminated composite shells, we introduce a user prescribed vector field (defined at the nodes) tangent to the shell mid-surface. This discrete tangent vector allows for simple construction of the local bases associated with the principal orthotropic material directions of each lamina. As a result, we were free to employ skewed and/or arbitrarily curved elements in actual finite element simulations. Through the numerical simulation of carefully chosen benchmark problems, it is shown that the developed shell element is insensitive to all forms of numerical locking and severe geometric distortions.

Acknowledgements: The research findings reported herein was supported by Air Force Office of Scientific Research (Award No. FA-9550-09-1-0686).

References

1. J. N. Reddy, *An Introduction to Nonlinear Finite Element Analysis*, 2nd ed., Oxford University Press, Oxford, UK, 2015.
2. G. S. Payette and J.N. Reddy, "A seven-parameter spectral/hp finite element formulation for isotropic, laminated composite and functionally graded shell structures," *Computer Methods in Applied Mechanics and Engineering*, **278**, 664-704, 2014.

On Nonlocal and Strain Gradient Effects in Structural Theories

J. N. Reddy

Advanced Computational Mechanics Laboratory
Department of Mechanical Engineering
Texas A & M University, College Station, TX 77843-3123
jnreddy@tamu.edu

ABSTRACT

In this lecture, an overview of the author's recent research on nonlocal elasticity, couple stress theories in formulating the governing equations of functionally graded material beams and plates. In addition to Eringen's nonlocal elasticity (1972), two different nonlinear gradient elasticity theories that account for (a) geometric nonlinearity and (b) microstructure-dependent size effects are revisited to establish the connection between them. The first theory is based on modified couple stress theory of Mindlin (1963) and Yang et al. (2000) and the second one is based on Srinivasa-Reddy gradient elasticity theory (2013). The modified couple stress theory includes a material length scale parameter that can capture the size effect in a material. The Srinivasa-Reddy (2013) theory contains, as a special case, the first one. These two theories are used to derive the governing equations of beams and plates. In addition, the nonlocal model of Eringen (1972) and a discrete peridynamics idea (Reddy et al. 2013) as an alternative to the conventional peridynamics are also discussed briefly.

References

1. A. C. Eringen (1972): *International Journal of Engineering Science*, **10**, p. 1.
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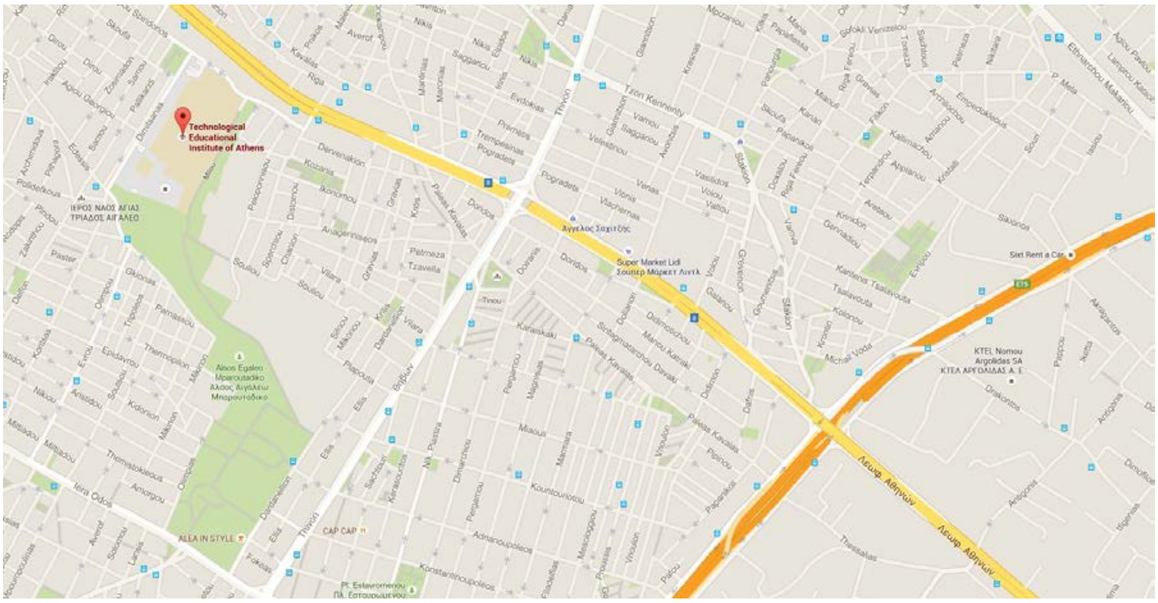
Πρόσβαση στο Τεχνολογικό Εκπαιδευτικό Ίδρυμα Αθήνας



[ΤΕΙ Αθήνας (Google Maps)]

Πύλες εισόδου και Αίθουσα Τηλεδιάσκεψης