Dr. J.N. Reddy, Distinguished Professor and Oscar S. Wyatt Endowed Chair
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Computational mechanics is an integral and major component in many fields of engineering, design and manufacturing. Major established industries such as the automobile, aerospace, atmospheric sciences, chemical, pharmaceutical, petroleum, electronics and communications, as well as emerging industries such as biotechnology, and information technology rely on computational mechanics-based capabilities to model and simulate complex systems for the analysis, design, and manufacturing of high-technology products. In this lecture, mathematical models and computational methodologies for numerical simulations of complex shell structures, least-squares based finite element models of fluid flows, and biological cells are discussed. In particular, the speaker’s recent research in the development of a robust shell element for the analysis of structures with finite deformation, least-squares finite element models of flows of viscous incompressible fluids, and numerical simulations of the mechanical behavior of biological cells will be discussed.

Dr. Reddy is a Distinguished 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. He worked as a Post-Doctoral Fellow at the University of Texas at Austin, Research Scientist for Lockheed Missiles and Space Company during 1974-75, and taught at the University of Oklahoma from 1975 to 1980, Virginia Polytechnic Institute & State University from 1980 to 1992, and Texas A&M University from 1992 till now. Dr. Reddy is the author of over 300 journal papers and 14 text books on theoretical formulations and finite-element analysis of problems in solid and structural mechanics (plates and shells), composite materials, computational fluid dynamics, numerical heat transfer, and applied mathematics. He delivered over 50 general and keynote lectures at national and international conferences. 1997 Melvin R. Lohmann Medal from Oklahoma State University's College of Engineering, Architecture and Technology, the 1997 Archie Higdon Distinguished Educator Award from the Mechanics Division of the American Society of Engineering Education, the 1998 Nathan M. Newmark Medal from the American Society of Civil Engineers, the 2000 Excellence in the Field of Composites from the American Society of Composite Materials, the 2000 Faculty Distinguished Achievement Award for Research from Texas A&M University, the 2003 Texas A&M Bush Excellence Award for Faculty in International Research award., and the 2003 Computational Solid Mechanics award from USACM are among several awards he has received throughout his career. Professor Reddy is a fellow of the American Academy of Mechanics (AAM), the American Society of Civil Engineers (ASCE), the American Society of Mechanical Engineers (ASME), the American Society of Composites (ASC), International Association of Computational Mechanics (IACM), U.S. Association of Computational Mechanics (USACM), the Aeronautical Society of India (ASI), and the American Society of Composite Materials. He serves on the editorial boards of dozen journals, including International Journal for Numerical Methods in Engineering, Computer Methods in Applied Mechanics and Engineering, Journal of Engineering Mechanics (Associate Editor), and International Journal of Non-Linear Mechanics. He is currently the Editor-in-Chief of Mechanics of Advanced Materials and Structures, International Journal of Computational Methods in Engineering Science and Mechanics, and International Journal of Structural Stability and Dynamics (served as the Editor of Applied Mechanics Reviews till 2012).

Monday, March 3 2014
Petroleum Engineering 121 | 2:00 – 3:00 pm
Coordinator: Dr. Burak Aksak (burak.aksak@ttu.edu)