

PROFESSIONAL HIGHLIGHTS OF J. N. REDDY

Background



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. Professor Reddy has been a prolific researcher and passionate teacher, and he served the profession admirably. Dr. Reddy, an ISI highly-cited researcher, is known for his significant contributions to the field of applied and computational mechanics through the authorship of nearly 700 journal papers and 21 textbooks.

Professor Reddy received his Bachelor of Engineering (B.E.) degree from Osmania University, Hyderabad, India in 1968, and Master of Science (M.S.) degree from Oklahoma State University, Stillwater, Oklahoma in 1970. He obtained his Ph.D. (1974) degree in Engineering Mechanics from University of Alabama in Huntsville. He worked for a short period for Lockheed Missiles and Space Company in Huntsville, Alabama, before joining the University of Oklahoma as an assistant professor in 1975. He was promoted to the rank of associate professor in 1978. In 1980 he was recruited as a full-professor in the Department of Engineering Science and Mechanics at Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, Virginia. In 1986, he was named the inaugural holder of the Clifton C. Garvin Professorship in Engineering Science and Mechanics Department. In 1992, he was recruited in a nationwide search as the inaugural holder of the Oscar S. Wyatt Jr. Endowed Chair in the Department of Mechanical Engineering at Texas A&M University, College Station, Texas. In 1998 he was appointed as the University Distinguished Professor (only top 2% of the university faculty hold this honor); he was named as the Regents' Professor in 2010. He held the Distinguished Nanyang Visiting Professorship at Nanyang Technological University (NTU) in Singapore (2002-2005). During 2005-2007, he served (on leave) as the first Head of the Engineering Science Programme at the National University of Singapore. He was the Satish Dhawan Visiting Professor at Indian Institute of Science (2012); Distinguished Visiting Fellow of the Royal Academy of Engineering (2013); Distinguished Visiting Professor, Beihang University, China and City University of Hong Kong (2014); Chair of Excellence at Universidad Carlos III de Madrid, Spain (2014-2015); Visiting Professor of the Science without Borders Program at University of Sao Paulo, Brazil (2014-2016); and Finland Distinguished Professor (FiDiPro), Aalto University and National Technology Agency of Finland (2014-2018). He also held the Simpson Distinguished Visiting Professorship at Northwestern University (2016) and the Arthur Newell Talbot Distinguished Lectureship at University of Illinois at Urbana-Champaign (2017).

His pioneering works on the development of shear deformation theories (that bear his name in the literature as *the Reddy third-order plate theory* and *the Reddy layerwise theory*) have had a major impact and have led to new research developments and applications. Another profound contribution of Professor Reddy has been in education and knowledge that impacted the educational and professional lives of scoreless young people around the world through his text books, short courses, and workshops.

The highlights of Professor Reddy's contributions that attest for his qualifications as an **author** of research articles that received world-wide recognition and as an engineering **educator** (teacher and text book writer), especially in applied and computational mechanics, are summarized here.

Research Impact in Academia and Industry

Dr. Reddy has a very broad research background that includes applied mathematics and theoretical mechanics, with contributions to mathematics of finite elements, variational methods and principles in theoretical mechanics, and computational methods with applications to heat transfer, fluid flow, and solid and structural mechanics (and coupled phenomena). As a researcher, Dr. Reddy cares about quality than quantity though the latter exceeds the norm in his field substantially; he has published steadily from the start of his career till now, often in the best journals of his field, spanning about 45 years. For him, writing is an integral part of doing research. He takes pride in seeing his work appear in print.

Dr. Reddy's research in early years (i.e., during his PhD and soon thereafter) was on the mathematical theory of finite elements and variational principles in theoretical mechanics. Since 1975 his work has been on the development of refined theories of laminated composite plates and shells and associated finite elements. The single most significant contribution of Dr. Reddy is the development of refined third-order and layer-wise plate and shell theories that bear his name in the literature. His plate and shell theories, which account for transverse shear deformation and interlaminar stresses in laminated composite materials are well-received by the composite materials and structures community all over the world and they are highly cited. The Defense Evaluation and Research Agency, DERA, Ministry of Defense of the United Kingdom contracted ABAQUS (HKS, Inc.) and Dr. Reddy as a consultant to incorporate his ideas on higher-order and layerwise theories into the Abaqus software, which is used by universities as well as most structural analysis companies around the world. Thus, his work in shear deformation theories has resulted in both scientific advancement as well as technological utility which have helped researchers and practicing engineers in the field of laminated composite structures to extend and apply to practical engineering problems.

Another topic that he worked on was a new paradigm in computational mechanics, namely, the least-squares finite elements. This paradigm shift from the conventional c^0 -finite elements based on weak-form Galerkin formulations of the Navier-Stokes equations has proven to be far superior to the weak-form Galerkin formulations that employ ad hoc approaches like upwinding, artificial viscosity, reduced integration, stabilization, and other techniques. The weak-form Galerkin finite element formulations are not well-suited for the solution of the Navier-Stokes equations because they do not represent any physical principle. He and his collaborators have shown that the least-squares formulations provide a much more robust computational framework for the solutions of flows of Newtonian and non-Newtonian fluids. His works have been implemented into commercial software NISA (Engineering Mechanics Corporation) and HyperXtrude (Altair). He also derived the Mindlin's plate theory from the classical plate theory using the penalty function method and identified the penalty parameters in terms of the shear moduli and shear correction coefficients.

In recent years, Dr. Reddy has been working on two major fronts: (1) development of 7-, 8- and 12-parameter shell theories and their finite elements and (2) nonlocal and non-classical continuum mechanics. The first one is a continuation of many years of his works on shear deformation theories of plates and shells for large deformation analysis of laminated composite and functionally graded structures. The second is a rejuvenation of ideas originated and advanced by Cosserat brothers, Green, Naghdi, Mindlin, Eringen, Hutchinson, and likes, and their implementation into structural theories. The nonlocal and non-classical continuum ideas can be used to study architected and meta materials and efficient modelling of large or mega structures, by bringing material as well as structural length scales into structural theories. One of the highlights of his research on nonlocal models is GraFEA, which is capable of studying fracture, without the user input in creating finite element meshes and, at the same time, eliminating mesh dependency.

Impact on Engineering Education

Professor Reddy is a well-known author in mechanics education. He has authored a wide variety of mechanics books, beginning with variational principles and methods, mathematical theory of finite elements, engineering analysis, linear and nonlinear finite elements, finite elements in heat transfer and fluid dynamics, mechanics of composite materials and structures, plates and shells, continuum mechanics, and mechanics of materials. Professor Reddy developed teaching tools in the form text books that are adopted worldwide. Over the past four decades he has consistently written highly substantive, upper-level undergraduate and graduate level textbooks. He is the author of 21 books (and many with solutions manuals), some of them in their third and fourth editions from well-known publishing houses of engineering books (e.g., Cambridge University Press, Oxford University Press, McGraw-Hill, John Wiley, Springer-Verlag, Elsevier, Taylor & Francis, and CRC Press), which amply demonstrates that they are well-received text books and that he is a superior engineering textbook author. In fact, no one person in engineering, since S. P. Timoshenko, has written so many well-received textbooks as J.N. Reddy that have lasting impact on engineering education.

A close look at the textbooks written by Dr. Reddy show that his teaching philosophy is based on: (1) motivate students to fully understand fundamental concepts and mathematical tools necessary to formulate the problems of engineering, and (2) develop creative and critical thinking in students so as to build solutions to real-life engineering problems. He reminds his students time and again that engineering is a "problem-solving discipline" that requires an understanding of the fundamental principles/axioms of nature and their role in formulating the underlying mathematical models. He does not compromise, as judged from his books, on mathematical rigor and physical understanding required to address the problem to be solved. This is the part that most students, even though initially a bit scared of the mathematical tools he uses to explain the physics, appreciate the most.

An especially strong point of Dr. Reddy's classroom teaching is the clarity and physical insight of explanations of even the most difficult topics through relevant engineering examples, but without compromising on the mathematical rigor. Dr. Reddy personally prepares his assignments and illustrations for all of his undergraduate and graduate courses. He maintains his own course web sites where his meticulously prepared illustrations and learning aids have helped countless students grasp fundamental and advanced principles of mechanics and computational methods for which he is internationally known. Phillip Kokel, a member of the Texas A&M class of 2003, writes, "...the most important thing I learned from this (Dr. Reddy's) class was the effectiveness of being thoughtful. Dr. Reddy has shown his ability as an exceptional teacher and has earned my utmost respect." Dr. Paul R. Heylinger, currently Professor of Civil engineering at Colorado State University, who has earned his Ph.D. under the guidance of Dr. Reddy writes, "He combines crystal clear diction with extremely well organized and precise lectures. He is a stellar teacher of teachers." Dr. Donald H. Robbins, another former Ph.D. student of Dr. Reddy writes, "...I was deeply impressed by his selfless efforts to make his own hard-earned expertise accessible to motivated students. He seemed to derive his personal reward, not from demonstrating to students that he is expert, but from being able to explain complex ideas to students in a way that they can comprehend and ultimately master these ideas." It is the considered opinion of many of his students that Dr. Reddy excels in both one-on-one research interactions and class room teaching. He has won the departmental *Outstanding Graduate Teaching award*, and College as well as University level *Association of Former Students' (AFS) awards for Distinguished Achievement in Teaching*. He also received the national level *Archie Higdon Distinguished Educator Award* from the American Society of Engineering Education.

An Introduction to the Finite Element Method, for example, had a large impact on four generations of engineering students. The reviewers acclaimed it as "an authoritative introduction to the finite element method." The book has received international recognition as one of the leading textbooks in undergraduate and graduate courses on the finite element method. The book is adopted as a textbook by many universities and used by hundreds of thousands of engineering students all over the world. *An Introduction to Nonlinear Finite Element Analysis* (2nd ed., 2015), another book of Professor Reddy, is acclaimed as "a unique text book that fills the gap in the literature by providing a clear and easy-to-understand account of the theoretical formulations, finite element models, and their computer implementation of nonlinear problems arising in heat transfer, fluid mechanics, and solid and structural mechanics." About his book on *Theory and Analysis of Plates and Shells* (2nd ed., Taylor and Francis), "This new book by J. N. Reddy digests more than two decades of research by him in plate theories (specially for thick plates and laminated composites), variational methods and finite elements into an excellent textbook which can be used very well by beginning or advanced graduate students, or by many engineers who deal with aerospace, automotive and civil engineering structures. That is, the material is presented carefully and reasonably thoroughly, in language that is easy to follow. This is the best textbook that this reviewer has seen for understanding the most important aspects of plate theory, and containing modern, important aspects of plate theory which Timoshenko hardly could touch upon at all (in some cases they were not yet recognized topics); especially thick plates, laminated composites, and finite elements. And yet Reddy's book accomplishes good, useful introductions to all these topics in a mere 540 pages. *Theory and Analysis of Elastic Plates and Shells* (2nd ed.) is a textbook that clarifies the important aspects of plate theory, emphasizing its most important modern ones. For this purpose, it is the best book available, in this reviewer's experience. As such it belongs on the bookshelves of every technical library, and every graduate student or engineer seriously interested in plates, and should become a widely used textbook in graduate level courses." The book, *Mechanics of Laminated Composite Plates and Shells* (2nd ed., CRC Press) is considered to be a classic, and there is no parallel to it in the literature (covers from anisotropic elasticity, development of classical and shear deformation theories, analytical solutions, and finite element analysis of laminated beams, plates, and shells). His book, *An Introduction to Continuum Mechanics* (Cambridge University Press) is already in its second edition, and translated into French.

The quality as well as the caliber of his research is strongly indicated by the placement of Dr. Reddy's doctoral recipients. Many of them hold faculty positions at U.S. universities (one is a department head, another endowed chair professor) as well as in institutions in other countries; others are research engineers in U.S. industries (US Air Force, General Electric, Lockheed, Ford, General Motors, etc.). Most of his postdoctoral fellows are faculty members in European and Asian universities. His impact on engineering education and research is truly extensive and, in good measure, fueled by the quality of his teaching and research.

Professional Service

One would think that someone who excels in research and teaching would not have much time to serve the institution and profession. Professor Reddy served his institution and profession admirably through Departmental, College, University, and national and international level technical committees, organizer of conferences and short courses, editor-in-chief of some major journals in his field. In particular, Dr. Reddy served as the president of US Association for Computational Mechanics, founding member of the General Council of international Association of Computational Mechanics, Secretary of Fellows of American Academy of Mechanics, member of the Board of Governors of the Society of Engineering Science, Chair of the Engineering Mechanics Executive Committee of the American Society of Civil Engineers, among others. He either served or currently serving on the editorial boards

of over three-dozen professional journals. In addition, he served as the Editor-in-Chief of the *Applied Mechanics Reviews*, and currently serving as the Editor of *Mechanics of Advanced Materials and Structures*, the *International Journal of Computational Methods in Engineering Science and Mechanics*, and the *International Journal of Structural Stability and Dynamics*. In addition, he organized/conducted numerous international conferences, advanced study institutes, workshops, and short courses.

Honors and Awards Received

Dr. Reddy is one of the original top 100 *ISI Highly Cited Researchers* in Engineering around world with over 30,600 citations and h-index of 81 as per Web of Science; the number of citations is over 73,000 with h-index of 107 as per Google Scholar. Dr. Reddy serves on the editorial boards of about two-dozen journals, including *Annals of Solid and Structural Mechanics*, *Composite Structures*, *International Journal for Numerical Methods in Engineering*, *International Journal for Numerical Methods in Biomedical Engineering*, and *International Journal of Non-Linear Mechanics*. He is the founding 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*.

Dr. Reddy also earned numerous national and international awards and they include:

- Ralph R. Teetor Education Award, Society of Automotive Engineers (1976)
- Walter L. Huber Civil Engineering Research Prize, American Society of Civil Engineers (1984)
- Worcester Reed Warner Medal, American Society of Mechanical Engineers (1992)
- Charles Russ Richards Memorial Award, American Society of Mechanical Engineers (1995)
- Archie Higdon Distinguished Educator Award, American Society of Engineering Education (1997)
- Nathan M. Newmark Medal, American Society of Civil Engineers (1998)
- Excellence in the Field of Composites, American Society for Composites (2000)
- Belytschko Medal, US Association for Computational Mechanics (2003)
- Distinguished Research Award, American Society for Composites (2004)
- Honorary Member, American Society of Mechanical Engineers (2011)
- Raymond D. Mindlin Medal, American Society of Civil Engineers (2014)
- O.C. Zienkiewicz Award, International Association of Computational Mechanics (2014)
- Member, US National Academy of Engineering (2015)
- Foreign Fellow, Indian National Academy of Engineering (2015)
- ASME Medal, American Society of Mechanical Engineers (2016)
- Prager Medal from the Society of Engineering Science (2016)
- Foreign Fellow, Canadian Academy of Engineering (2017)
- Foreign Fellow, Brazilian National Academy of Engineering (2017)
- John von Neumann Medal, US Association for Computational Mechanics (2017)
- JS Rao Medal in Vibration Engineering, Vibration Institute of India (2017)
- JN Reddy Medal in Mechanics of Advanced Materials and Structures (2018)
- Theodore von Karman Medal, American Society of Civil Engineers (2018)
- Eugenio Beltrami Senior Scientist Prize, the International Research Center for Mathematics & Mechanics of Complex Systems (M&MoCS), Università dell'Aquila, Italy (2019)
- Stephan P. Timoshenko Medal, American Society of Mechanical Engineers (2019)
- Foreign Member, The Chinese Academy of Engineering (2019)
- Corresponding Member, The Royal Academy of Engineering of Spain (2019)

CURRICULUM VITAE

EDUCATION

- B.E. (5yr Course), Mechanical Engineering, Osmania University, Hyderabad, Andhra Pradesh, India, 1968.
- M.S., Mechanical Engineering, Oklahoma State University, Stillwater, Oklahoma, 1970.
- Ph.D., Engineering Mechanics (*Advisor: Dr. J. T. Oden*), University of Alabama in Huntsville, Alabama, 1974.
- Post-Doctoral Fellow, Texas Institute for Computational Mechanics, University of Texas at Austin, 1973-1974.

PROFESSIONAL EXPERIENCE

- 1974: *Research Scientist*, Lockheed Missiles and Space Company, Huntsville, Alabama.
- 1975-1978: *Assistant Professor*, School of Aerospace, Mechanical, and Nuclear Engineering, University of Oklahoma, Norman.
- 1978-1980: *Associate Professor*, School of Aerospace, Mechanical, and Nuclear Engineering, University of Oklahoma, Norman.
- 1980-1985: *Professor*, Engineering Science and Mechanics Department, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- 1986-1992: *Clifton C. Garvin Professor* of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- 2006-2007: *Head of Engineering Science Programme*, National University of Singapore, Singapore (an honorary position to provide intellectual leadership, vision, and policy making).
- **1992-present**: Inaugural appointment to the *Oscar S. Wyatt, Jr. Chair* in Mechanical Engineering; **adjunct faculty appointments** in Department of Civil Engineering, Department of Aerospace Engineering, Department of Material Science and Engineering, and Department of Mathematics, Texas A&M University, College Station, Texas.
- **1998-present**: *Distinguished Professor*, Texas A&M University, College Station, Texas.
- **2010-present**: *Regents' Professor*, Texas A&M University, College Station, Texas.

RECENT KEY NOTE AND PLENARY LECTURES DELIVERED

(out of 171)

1. J.N. Reddy, A.R. Srinivasa, and P. Khodabakhshi, "On Recent Developments in Nonlocal and Strain Gradient Theories in Structural Mechanics," **Key Note Lecture**, East Asia-Pacific Conference on Structural Engineering and Construction (EASEC), 6-8 January, 2016, Ho Chi Minh City, Vietnam.
2. J.N. Reddy, "The Finite Element Method: Past, Present, and Future," Plenary Lecture, *International Workshop on Computational Methods with applications to Oil and Gas (IWCMOG)*, Texas A&M University at Qatar, 28-29 Feb 2016, Doha, Qatar.
3. J.N. Reddy, "On Non-Local and Non-Classical Continuum Mechanics Theories," *Simpson Distinguished Visiting Professor Lecture*, Northwestern University, April 2016.
4. J.N. Reddy, "Recent Developments In Nonlinear Analysis Of Composite and FGM Structures," **Keynote Lecture**, *Innovation and Development of Structures & Structural Modal Properties Measurement and Applications 2016 (IDS&STRUMO2016)*, Chongqing University, Chongqing, CHINA, 15-16 May 2016.
5. J.N. Reddy, "On Non-Local and Non-Classical Continuum Mechanics Theories and Applications," **Opening Key Note Lecture**, *11th HSTAM International Congress on Mechanics*, Athens, Greece, 27-30 May 2016.
6. J.N. Reddy, "On Nonlocal and Strain Gradient Models in Structural Mechanics," Opening Plenary Lecture presented at the *10th International Conference on Advanced Computational Engineering and Experimenting (ACE-X 2016)*, Split, Croatia, 3-6 July 2016.
7. J.N. Reddy, "On Non-Local and Strain Gradient Theories in Structural Mechanics: An Overview," *The Prager Medal Lecture*, Society of Engineering Science 53rd Annual Technical Meeting, 4-5 October 2016.
8. J.N. Reddy, "Computational Modeling and Simulations: Biological Cells, Composite Shells, and Fluid Flows," **Opening Plenary Lecture**, *International Conference on Advances in Materials and Manufacturing (ICAMM-2016)*, 8-10 December, 2016, College of Engineering, Osmania University, Hyderabad, India.
9. J.N. Reddy, "Invent, Create, and Make: My Personal Retrospective," **Invited talk** at (student organized event) *TECHNEX17*, 24-27 February 2017, Indian Institute of Technology-BHU, Varanasi, India.
10. J.N. Reddy, "Mathematical Models and Numerical Simulations of Problems in Mechanics," **Plenary Lecture**, *8th Mechanical and Mechatronics International Engineering Congress and the 4th Materials, Energy and Environment Congress - CIMM-2017*, Universidades Nacional de Colombia, Colombia, 25-28 March, 2017.
11. J.N. Reddy, "Numerical Simulations: The Third Pillar of Scientific Discovery and Investigation," **Opening Plenary Lecture**, *XI Colombian Congress of Numerical Methods 2017*, the Industrial University of Santander, Colombia, 16 - 18 August 2017.
12. J.N. Reddy, "Recent Developments in Shell Finite Elements and Non-Local Theories for Composite Structures," **Key Note Lecture** presented at *XXIII AIMETA (Association of Italian Mechanics, Theory and Applications)*, Salerno, Italy, 4-7 September 2017.
13. Miguel Gutierrez Rivera and J.N. Reddy, "Robust Shell Finite Elements Based on Seven- and Twelve-Parameter Shell Theories," **Key Note Lecture** presented at *EASEC15 Conference*, Xi'an, China, 12 October 2017.
14. J.N. Reddy, "On Non-Local and Non-Classical Continuum Mechanics Theories and Applications," **Opening Plenary Lecture**, *Annual Technical Meeting of the American Society of Composites*, Purdue University, W. Lafayette, October 23-25, 2017.
15. J.N. Reddy, "Computational Mechanics: the Third Pillar of Scientific Inquiry in Science and Engineering," **Key Note Lecture**, *International Conference on Nonlinear Differential Equations- Theory, Modeling and Computations*, Research Institute, SRM University, Chennai, India, 8-9 December 2017.

16. J.N. Reddy, "An Overview of Non-Local and Non-Classical Continuum Mechanics Theories," **Opening Plenary Lecture**, *International Conference on Composite Materials and Structures - ICCMS 2017*, 27-29 Dec 2017, Indian Institute of Technology, Hyderabad, India.
17. J.N. Reddy, "Innovations in Shell Finite Elements and Non-Local Effects in Structures," **Opening Plenary Lecture** presented at *2nd International Conference on Innovations in Structural Engineering*, Osmania University College of Engineering, Hyderabad, India, 29-31 December 2017.
18. J.N. Reddy, "The finite element method: the third pillar of scientific discovery and investigation," **Plenary Lecture**, *MechanIST* (a student organized conference), Technical University of Lisbon, Portugal March 13-16, 2018.
19. J.N. Reddy, "A Journey Through Composite Materials and Structures: A Personal Retrospective," **Opening Plenary Lecture**, *First International Conference on Mechanics of Advanced Materials and Structures*, University of Torino, Torino, Italy, 18-20 June 2018.
20. J.N. Reddy, "On Stress and Strain Gradient and Micropolar Theories," **Plenary Lecture**, *12th International Conference on Advanced Computational Engineering and Experimenting (ACE-X 2018)*, Amsterdam, The Netherlands, 1-4 July 2018.
21. J.N. Reddy, "Recent Developments in Shell Finite Elements and Non-Local Continuum Mechanics Theories," **Opening Plenary Lecture**, *11th South African Conference on Computational and Applied Mechanics (SACAM)*, Faculty of Engineering and Technology, Vaal University of Technology, South Africa, 17-19 September 2018.
22. J.N. Reddy, "Journey through Mechanics Research: A Personal Retrospective," *City University Distinguished Lecture Series*, City University of Hong Kong, 12 Oct. 2018.
23. J.N. Reddy, "High Performance Shell Finite Elements for Nonlinear Analysis of Composite Structures and Materials," **Keynote Lecture**, *High Performance Structures and Materials, Sustainability and Resilience of Civil Engineering Infrastructure*, Chongqing University, Chongqing, China, 20-21 October 2018.
24. J.N. Reddy, "On Seven- and Twelve-Parameter Shell Finite Elements and Non-Local Theories for Composite Structures," **Opening Keynote Speaker**, *XXXVIII South American Structural Engineering Congress*, Departmental Council of Lima of College of Engineers of Peru, Lima, 24-26 Oct., 2018.
25. J.N. Reddy, "On Refined Robust (Locking-Free) Shell Finite Elements and Modified Couple Stress Theories for Beams and Plates," **Plenary Lecture**, *International Conference on Nonlinear Solid Mechanics (ICoNSoM 2019)*, 16-19 June 2019, Roma, Italy.
26. J.N. Reddy, "Mechanics and Numerical Simulations: The Pillars of Scientific Inquiry," **Invited Speaker**, *Workshop on Non-Classical Advanced Mechanics of Materials*, Indian Institute of Science, Bangalore, India, July 9-11, 2019.
27. J.N. Reddy, "On nonlocal stress and strain gradient theories with material and structural length scales," **Plenary Lecture**, *Second International Conference on Mechanics of Advanced Materials and Structures*, Nanjing University of Aeronautics & Astronautics, Nanjing, China, 19-22 October 2019.
28. J.N. Reddy, "Innovations in computational mechanics for structural design," **Key Note Lecture**, *International Conference on Sustainable Civil Engineering and Architecture (ICSCEA) 2019*, Ho Chi Minh City, Vietnam, 24-26 October 2019.
29. J.N. Reddy, "Nonlocal material and mechanics models for damage and fracture in solids," **Plenary Lecture**, *2nd International Conference on Materials and Manufacturing Engineering*, BITS Pilani Dubai Campus, Dubai, UAE, 20-22 Nov. 2019.
30. J.N. Reddy, "Personal reflections of my research in structural mechanics: past, present, and future," **Opening Plenary Lecture**, *The Sixteenth East Asia-Pacific Conference on Structural Engineering & Construction*, School of Civil Engineering, The University of Queensland, St Lucia (Brisbane), Queensland, Australia, 4-7 Dec. 2019.

SELECTIVE ARCHIVAL PUBLICATIONS

BOOKS (books with solution manuals are in bold) (8+13)

1. J. T. Oden and J.N. Reddy, *Variational Methods in Theoretical Mechanics*, Springer-Verlag, NY, 1976; **2nd ed.** 1982.
2. J. T. Oden and J.N. Reddy, *A Mathematical Theory of Finite Elements*, John Wiley & Sons, New York, 1976 (now Dover).
3. J.N. Reddy and M. L. Rasmussen, *Advanced Engineering Analysis*, John Wiley, New York, 1982; reprinted by Krieger, Melbourne, FL, 1990.
4. **J.N. Reddy, *An Introduction to the Finite Element Method***, McGraw-Hill, New York, 1984; 2nd ed., 1993; 3rd ed., 2006; 4th ed., 2019.
5. **J.N. Reddy, *Energy Principles and Variational Methods in Applied Mechanics***, John Wiley, NY, 1984; 2nd ed., 2002; 3rd ed. 2017.
6. **J.N. Reddy, *Applied Functional Analysis and Variational Methods in Engineering***, McGraw-Hill, NY, 1986; reprinted by Krieger, Melbourne, FL, 1991.
7. O. O. Ochoa and J.N. Reddy, *Finite Element Analysis of Composite Laminates*, Kluwer Academic Publishers, The Netherlands, 1992.
8. J.N. Reddy and A. Miravete, *Practical Analysis of Laminated Composite Structures*, CRC Press, FL, 1995.
9. **J.N. Reddy, *Mechanics of Laminated Composite Plates and Shells: Theory and Analysis***, CRC Press, Boca Raton, FL, 1996; 2nd ed., 2004.
10. J.N. Reddy and D. K. Gartling, *The Finite Element Method in Heat Transfer and Fluid Dynamics*, CRC Press, FL, 1997; 2nd ed., 2001; 3rd ed., 2010.
11. **J.N. Reddy, *Theory and Analysis of Elastic Plates and Shells***, Taylor & Francis, Philadelphia, PA, 1999; 2nd ed., 2007.
12. C. M. Wang, J.N. Reddy, and K.H. Lee, *Shear Deformation Theories of Beams and Plates. Relationships with Classical Solution*, Elsevier, U.K., 2000.
- 13*. **J.N. Reddy, *An Introduction to Nonlinear Finite Element Analysis***, Oxford University Press, Oxford, U.K., 2004; 2nd ed., 2015.
14. C. M. Wang, C. Y. Wang, and J.N. Reddy, *Exact Solutions for Buckling of Structural Members*, CRC Press, Boca Raton, FL, 2005.
- 15*. **J.N. Reddy, *An Introduction to Continuum Mechanics with Applications***, Cambridge University Press, New York, 2008; 2nd ed., 2013.
- 16*. **J.N. Reddy, *Principles of Continuum Mechanics. A Study of Conservation Principles with Applications***, Cambridge University Press, New York, 2010; 2nd ed., 2018. **Translated into French** and published in 2015 by De Boeck Superieur.
- 17*. R. T. Fenner and J.N. Reddy, ***Mechanics of Solids and Structures***, 2nd ed., CRC Press, Boca Raton, Florida, 2012.
18. S. Roy and J.N. Reddy, *Computational Modelling of Polymer Composites, A Study of Creep and Environmental Effects*, CRC Press, Boca Raton, Florida, 2013.
19. A. Rao, A. R. Srinivasa, and J.N. Reddy, *Design of Shape Memory Alloy (SMA) Actuators*, Springer Briefs in Applied Sciences, Springer-Verlag, Berlin, 2015.
- 20*. K.S. Surana and J.N. Reddy, *The Finite Element Method for Boundary Value Problems, Mathematics and Computations*, CRC Press, Boca Raton, Florida, 2017.
- 21*. K.S. Surana and J.N. Reddy, *The Finite Element Method for Initial Value Problems, Mathematics and Computations*, CRC Press, Boca Raton, Florida, 2018.

SELECTIVE JOURNAL PAPERS SINCE 2015

1. F. Moleiro, C.M. Mota Soares, C.A. Mota Soares, and J.N. Reddy, "Layerwise mixed models for analysis of multilayered piezoelectric composite plates using least-squares formulation," *Composite Structures*, Vol. 119, pp. 134–149, Jan 2015.
2. Fehmi Najar, Sami El-Borgi, J.N. Reddy, and Kais Mrabet, "Nonlinear nonlocal analysis of electrostatic nanoactuators," *Composite Structures*, Vol. 120, pp. 117–128, 2015.
3. K.S. Surana, J.N. Reddy, and D. Nunez, "Ordered rate constitutive theories for thermoviscoelastic solids without memory in Lagrangian description using Gibbs potential," *Continuum Mechanics and Thermodynamics*, Vol. 27, No. 3, pp. 409–431, 2015.
4. C.W. Lim, G. Zhang, and J.N. Reddy, "A higher-order nonlocal elasticity and strain gradient theory and its applications in wave propagation," *Journal of the Mechanics and Physics of Solids*, Vol. 78, pp. 298–313, 2015.
5. S. M. Mousavi, J. Paavola, and J.N. Reddy, "Variational approach to dynamic analysis of third-order shear deformable plates within gradient elasticity," *Meccanica*, Vol. 50, No. 6, pp. 1537–1550, 2015.
6. Feifei Cheng, Sun-Myung Kim, and J.N. Reddy, "Computational modeling of the plastic-damage behavior of porous MAX phase with aligned ellipsoid-like pores under uniaxial compression," *International Journal of Solids and Structures*, Vol. 63, pp. 121–138, Jun 2015.
7. Jinseok Kim and J.N. Reddy, "A general third-order theory of functionally graded plates with modified couple stress effect and the von Karman nonlinearity: theory and finite element analysis," *Acta Mechanica*, Vol. 226 (9), pp. 2973–2998, Sep 2015.
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