Professor Ali Nayfeh (1933-2017)

Obituary that appeared in the AIAA magazine, Aerospace America, June 2017:
Ali Nayfeh, a University Distinguished Professor Emeritus, Virginia Polytechnic Institute and State Univerity's Department of Engineering Science and Mechanics, died on 27 March. He was 83.
Nayfeh earned all three of his academic degrees at Stanford University: a bachelor's degree in engineering science in 1962 and a master's degree and a Ph.D. in aeronautics and astronautics in 1963 and 1964, respectively.
Nayfeh joined the Virginia Tech community in 1971. He was a renowned teacher and researcher in the field of nonlinear dynamics. During his 37 years of teaching, Nayfeh advised 69 doctoral candidates to completion. He wrote 10 books, published over 400 articles in refereed journals, and gave over 530 presentations at national and international conferences. From 1980 to 1984 Nayfeh took a leave of absence to establish an engineering college at Yarmouk University, Jordan. He served as engineering dean of the college, and as vice-president for engineering affairs at the university.
His Wiley textbooks entitled Perturbation Methods published in 1973, and Introduction to Perturbation Techniques published in 1981, have been considered worldwide as premier reference texts on asymptotic methods over the past four decades. Nayfeh was also the founder of two prestigious journals: Nonlinear

Dynamics and the Journal of Vibration and Control. He also served as the editor of the Nonlinear Science Book Series.
Among his many honors were the 2014 Benjamin Franklin Medal of Mechanical Engineering, the 2008 Academy of Transdisciplinary Learning and Advanced Studies, the 2008 American Society of Mechanical Engineers (ASME) Tom Caughey Award, the 2005 ASME Lyapunov Award, the 2005 Virginia's Life Achievement Award in Science, the 1996 ASME J.P. Den Hartog Award, and the 1981 Kuwait Prize in Basic Sciences. He was a Fellow of the American Academy of Mechanics, ASME, the American Physical Society, the Academy of Transdisciplinary Learning and Advanced Studies, and AIAA. In 1995 AIAA awarded Nayfeh the Pendray Aerospace Literature Award for his seminal contributions to perturbaion methods, nonlinear dynamics, acoustics, and boundary-layer transition.

Obituary by M.I. Younis that appeared in Nonlinear Dynamics, Vol. 88, No. 3, pp 1535-1536, May 2017:

On March 27, the nonlinear dynamics, vibration and control, and applied mathematics communities lost a pioneer scientist and one of the most influential scholars over the past five decades, University-distinguished emeritus Professor Ali Hasan Nayfeh, who passed away suddenly in Amman, Jordan, at the age of 83.
Nayfeh was born in a small village in Palestine, Shuwaikah, in 1933 to illiterate parents and a poor family. His parents nevertheless highly valued education and encouraged their oldest son Ali to acquire the maximum knowledge that he could achieve. At the final high school year, in which students are subjected to national standardized examinations, Nayfeh ranked remarkably sixth among all the students in Jordan and Palestine, which was an early sign of his brilliance. However, due to the harsh conditions and lack of higher-education institutes at the time, Nayfeh had to work as a school teacher teaching mathematics in remote villages and towns, during which he kept searching for an opportunity to continue his education. At that point, the reputation of Nayfeh was spreading around in the cities and villages of Jordan and Palestine as a genius and a go-to math wizard.
After 10 years of working as a teacher, the opportunity came and Nayfeh got a scholarship to study in the USA, in 1959. He spent a year at San Mateo Junior College, then moved to Stanford, where remarkably after a year and a half, he finished his Bachelor's Degree in engineering science with great distinction. A year later, he received a Master of Science degree, and another year later, a PhD, all in aeronautics and astronautics. His graduate research work laid the foundation for his seminal works in perturbation techniques, and especially the method of multiple scales, which he developed to a great depth.
Afterward, Nayfeh worked in the aerospace industry for seven years, while at the same time developing further his perturbation techniques and applying them to various fields in physics and engineering. In 1971, Nayfeh joined Virginia Tech as a Professor, and five years later was named a University Distinguished Professor.
Nayfeh's contribution to science has been immense and at all scales and levels. He authored ten books in nonlinear dynamics and perturbation methods. Several of them have been cited tens of thousands of times and became the most respected and fundamental references in their fields; translated into many languages including Russian, Chinese, and German; and used as core textbooks in top schools. He wrote more than 480 articles in referred journals and contributed more than 36 book chapters. He also founded and served as Editor-in-Chief for two prestigious journals: Nonlinear Dynamics and the Journal of Vibration and Control. Nayfeh advised more than 69 PhD students, many of whom became prominent scholars, department chairs and deans in top ranked institutes around the globe.
Nayfeh also took care of his family. He guided and helped his brothers to follow his steps, and all three of them became prominent professors in the USA. His four sons followed on the family tradition earning PhDs in engineering (with his son Tariq adding in addition a medical degree to become a surgeon). His grandchildren and siblings have been following his steps as well tallying more than 13 PhDs so far.

In addition to the influence of his seminal papers and books; Nayfeh's had also tremendous direct influence in many parts of the world. In 1976, Nayfeh led a group of scientists to establish the college of engineering at King Abdel Aziz University in Jeddah in Saudi Arabia. In 1980 Nayfeh took a leave of absence to establish an engineering college in Jordan and served as its dean, and as vice-president for engineering affairs at the university for four years. In 2002, Nayfeh helped establish a new graduate and internationally reputable program in Mechanics in Tunisia. In his final years after retiring from Virginia Tech, Nayfeh volunteered to work at the University of Jordan, where he helped scientists and researchers and provided valuable advice and consultations. Last but not least, Nayfeh established and fully funded a modern school in his birth village of Shuwaikah, Palestine, to offer the best education and produce the next generation of brilliant scientists.
Nayfeh has been recognized in the scientific community with several awards (more than 30). The most notable of these came in 2014, when he received the Benjamin Franklin Medal in Mechanical Engineering, the highest award in engineering (equivalent to the Nobel Prize in science) putting Nayfeh in the company of the likes of Albert Einstein, Thomas Edison, and Marie and Pierre Curie, for developing novel methods to model complex engineering systems in structural dynamics, acoustics, fluid mechanics, and electromechanical systems. In addition, he received the Pendray Aerospace Literature Award from the AIAA in 1995 for his seminal contributions to perturbation methods, nonlinear dynamics, acoustics, and boundary-layer transition. The American Society of Mechanical Engineers ASME recognized him with the ASME J. P. Den Hartog Award in 1996 in recognition of lifetime contributions to the teaching and practice of vibration engineering. In 2005, Nayfeh was honored by ASME as the first recipient of the Lyapunov Award for his lifelong contributions to the field of nonlinear dynamics, and in 2008, Nayfeh received the Academy Gold Medal of Honor from the Academy of Transdisciplinary Learning and Advanced Studies. That same year, the ASME named him the first recipient of the Tom Caughey Award and he received three honorary doctorates from the Politechnika Szczecinska, of Poland; the Technical University of Munich, Germany; and the Marine Technical University of St. Petersburg, Russia.
Indeed, the life journey of Ali Nayfeh draws a striking picture of a true warrior who never gave up on his dream of seeking higher education and acquiring knowledge, despite the poverty and harsh difficulties. Anyone who has met Dr. Nayfeh knows well his inexhaustible energy and deep desire for knowledge; and more importantly, his passion to share and spread his knowledge with others. Nayfeh has left behind an amazing journey that inspires many generations and a legacy that will last for a long time. He was a brilliant scientist, a distinguished teacher, an inspiring motivator, a great community leader, and an amazing and lovely human. He will be truly and deeply missed.

See:
http://en.wikipedia.org/wiki/Ali_H._Nayfeh
http://www2.esm.vt.edu/~nayfeh/
http://www2.esm.vt.edu/person.php?id=10030
http://imechanica.org/node/3805
http://www2.esm.vt.edu/~nayfeh/Books.htm
http://www.worldcat.org/identities/lccn-n80-57092
http://infiniread.com/author/12081
http://www.mkpsd.com/msnd/dlPast.html
http://journalogy.net/Author/12668960/ali-h-nayfeh
http://www.nestingmode.com/data/Ali-H-Nayfeh/m4751/
http://www.vtnews.vt.edu/articles/2010/06/2010-512.html
http://www.sdpsnet.org/sdps/index.php/fellows/114-dr-ali-h-nayfeh

University Distinguished Professor Emeritus
Department of Engineering Science and Mechanics
Virginia Tech
http://www.esm.vt.edu/~anayfeh/

Dr. Ali H. Nayfeh was born in Shuwaikah, Jordan on December 21, 1933. He received a B.S. degree in Engineering Science in 1962 and M.S. and Ph.D. degrees in Aeronautics and Astronautics in 1963 and 1964 from Stanford University. He has industrial experience with Heliodyne Corporation and Aerotherm Corporation.

He is a fellow of the American Physical Society, the American Institute of Aeronautics and Astronautics, the American Society of Mechanical Engineers, and the American Academy of Mechanics. He is the Editor of the Wiley Book Series on Nonlinear Science and the Editor-in-Chief of Nonlinear Dynamics and the Journal of Vibration and Control.

He is the recipient of the Kuwait Prize in Basic Sciences (Physics), 1981; American Institute of Aeronautics and Astronautics Pendray Aerospace Literature Award, 1995; American Society of Mechanical Engineers J. P. Den Hartog Award, 1997; Honorary Doctorate, St. Petersburg University, Russia, 1996; Frank J. Maher Award for Excellence in Engineering Education, 1997; College of Engineering Dean's Award for Excellence in Research, 1998; Honorary Doctorate, Technical University of Munchen, Germany, 1999; Honorary Doctorate, Politechnika Szczecinska, Poland, 2004.

He established and served as Dean of the College of Engineering, Yarmouk University, Jordan from 1980-1984. He is currently University Distinguished Professor of Engineering at Virginia Polytechnic Institute and State University.

Interests:
Aerodynamics, perturbation methods, nonlinear dynamics and chaos, ship and submarine motions

Education:
1964 Ph.D., Aeronautics and Astronautics, Stanford University
1963 M.S., Aeronautics and Astronautics, Stanford University
1962 B.S., Engineering Science, Stanford University

Patents:
US Patent # 6,631,300, Nonlinear Active Control of Dynamical Systems, October 7, 2003, A. H. Nayfeh, D. T. Mook, Z. N. Masoud, and R. Henry
European Patent # 1,235,735, Nonlinear Active Control of Dynamical Systems, March 13, 2005, A. H. Nayfeh, D. T. Mook, Z .N. Masoud, and R. Henry
Chinese Patent # ZL 00815340.X, Nonlinear Active Control of Dynamical Systems, February 15, 2006, A. H. Nayfeh, D. T. Mook, Z. N. Masoud, and R. Henry
US Patent # 7,044,314, Nonlinear Active Control of Dynamical Systems, May 16, 2006, A. H. Nayfeh, D. T. Mook, Z. N. Masoud, and R. Henry

Honors & Awards:

2008 The Academy Gold Medal of Honor from The Academy of Transdisciplinary Learning and Advanced Studies
2008 AMD/ASME Tom Caughey Award, first recipient of newly instituted award
2005 ASME Lyapunov Award, first recipient of newly established and prestigious award. (Presented for lifelong contributions to the field of nonlinear dynamics.)
2005 Virginia Life Achievement in Science Award
2004 Honorary Doctorate, Politechnika Szczecinska, Poland
2004 Plenary Lecture: Nonlinear Normal Modes of Large Systems with Inertial Nonlinearities, EUROMECH 457 Colloquium, French Riviera, June 7-9
2004 Plenary Lecture: A Smart Controller for Cranes. International Conference on Methods and Models in Automation and Robotics, Technical University of Szczecin, Poland, August 30-September 2
2003 Plenary Lecture: Nonlinear Dynamics Phenomena and Applications, Workshop on Vibrations, Sound and Acoustics for Automotive Industries, Aguascalientes, Mexico, December 4-5
2003 Plenary Lecture: with Z. N. Masoud and N. A. Nayfeh, A Delayed-Position Feedback Controller for Cranes, IUTAM Symposium on Chaotic Dynamics and Control of Systems and Processes in Mechanics, Universita di Roma La Sapienza, Roma, Italy, June 8-13
2002 Plenary Lecture: Nonlinear Dynamics: Phenomena and Applications, The 7th National Congress on Mechanics, Hanoi, Vietnam, December 18-21
2002 Plenary Lecture: Nonlinear Dynamics: Phenomena and Applications, International Conference on Mathematics Trends and Developments, Cairo, Egypt, December 28-31
2001 with S. K. Mazumder and D. Borojevic, A Theoretical and Experimental Investigation of the Fast- and Slow-Scale Instabilities of a DC-DC Converter, IEEE Transactions on Power Electronics, Vol. 16, No. 2, 2001, pp. 201-216. WINNER OF THE IEEE POWER ELECTRONICS SOCIETY TRANSACTIONS PRIZE PAPER AWARD FOR 2001.
2001 Invited Lecture: Predictive Tools for Nonlinear Structural Dynamical Systems, 2001 ASME International Mechanical Engineering Congress and Exposition, New York, NY, November 11-16
2001 Plenary Lecture: Can the Mechanical Engineer Ignore Nonlinear Phenomena, 18th Biennial Conference on Mechanical Vibration and Noise, Pittsburgh, PA, September 9-12
2000 Plenary Lecture: with Z. Masoud, Control of Crane-Cargo Pendulation, 3rd World Conference on Structural Control, Como, Italy, April 7-12
2000 Plenary Lecture: Transfer of Energy from High-Frequency to Low-Frequency Modes, Conference on Mathematics and the 21st Century, Cairo, Egypt, January 15-20
2000 Invited Lecture: On the Discretization of Spatially Continuous Systems with Quadratic and Cubic Nonlinearities, SECTAM XX, Pine Mt., GA, April 16-18
1999 Honorary Doctorate, Technical University of Munich, Munich, Germany
1999 Plenary Lecture: Ship-Mounted Cranes, International Conference on Monitoring and Control of Marine and Harbour Structures, Genoa, Italy, June 1-4
1999 Distinguished Lecture: The Engineer Grapples with Nonlinear Phenomena, 1991 International Mechanical Engineering Congress & Exposition, Nashville, TN, November 14-19
1998 College of Engineering Dean's Award for Excellence in Research
1997 Frank J. Maher Award for Excellence in Engineering Education
1997 ASME J. P. Den Hartog Award (presented in recognition of lifetime contributions to the teaching and practice of vibration engineering)
1997 Invited Lecture: with S. S. Oueini, Experimental Implementation of Saturation Control, IUTAM Symposium on Interaction Between Dynamics and Control in Advanced Mechanical Systems, Eindhoven, The Netherlands, April 21-26

1997 Distinguished Lecture: Can the Design Engineer Ignore Nonlinear Phenomena, Penn State, University Park, PA, April 17
1996 Fellow - Society for Design and Process Science
1996 Plenary Lecture: On the Discretization of Weakly Nonlinear Spatially Continuous Systems, Fourth Workshop on Differential Equations and Chaos, Johannesburg, South Africa, January 11-12
1996 Plenary Lecture: Can Nonlinearities be Ignored?, Fourth Workshop on Differential Equations and Chaos, Johannesburg, South Africa, January 11-12
1996 Plenary Lecture: Transfer of Energy from High-Frequency to Low-Frequency Modes, SES 33rd Annual Technical Meeting, Tempe, AZ, October 22-23
1995 AIAA Pendray Aerospace Literature Award (for seminal contributions to perturbation methods, nonlinear dynamics, acoustics, and boundary-layer transition; praiseworthy for their quality relevance, timeliness, and lasting influence on the aerospace community)
1995 -present Editor-in-Chief, Journal of Vibration and Control
1995 Can the Design Engineer Ignore Nonlinear Phenomena, The First World Conference on Integrated Design & Process Technology, Austin, TX, December 7-9,
1995 Society for Design and Process Science, Founding Board Member, Austin, TX, December 6-9
1994 Plenary Lecture: Can the Practicing Engineer Ignore Nonlinear Phenomena, First Industry/University Symposium on Research for Future Supersonic and Hypersonic Vehicles, Greensboro, NC, December 4-6
1994 Plenary Lecture: Can the Practicing Engineer Afford to Ignore Nonlinear Phenomena, Japan Society of Mechanical Engineers, Tokyo, Japan, March 30
1994 Plenary Lecture: Can the Design Engineer Ignore Nonlinear Phenomena, Second Biennial European Joint Conference on Engineering Systems Design and Analysis, London, England, July 4-7
1992 -present Editor, Nonlinear Science Book Series, Wiley
1992 Plenary Lecture: Modal Interactions in the Nonlinear Response of Dynamic and Structural Systems, Workshop on Bifurcation and Chaos in Mechanical Systems, L'Aquila, Italy, May 19-20
1991 Fellow - American Institute of Aeronautics and Astronautics
1991 Fellow - American Society of Mechanical Engineering
1990 -present Editor-in-Chief, Nonlinear Dynamics Journal
1988 Alexander von Humboldt Foundation Senior Award, Germany
1988 -1990 Contributing Editor - International Journal of Non-Linear Mechanics
1988 Invited Lecture: Numerical-Perturbation Methods in Mechanics, Symposium on Advances and Trends in Computational Structural Mechanics and Fluid Dynamics, Washington, DC, October 17-19
1987 Invited Lecture: Nonlinear Stability of Boundary Layers, AIAA 25th Aerospace Sciences Meeting, Reno, NV, January 12-15
1987 Invited Lecture: On Triple-Deck Structure, The R. T. Davis Symposium on Computational Mechanics, Cincinnati, OH, June 17
1987 Plenary Lecture: Can the Practicing Engineer Afford to be Ignorant of Nonlinear Phenomena?, Second Technical Workshop on Dynamics and Aeroelastic Stability Modeling of Rotorcraft Systems, Boca Raton, FL, November 18-20
1987 Invited Lecture: Can the Practicing Engineer Afford to Be Ignorant of Nonlinear Phenomena?, Electrical Engineering Seminar, VPI&SU, Blacksburg, VA, May 22
1986 Fellow - American Academy of Mechanics
1985 Invited Lecture: Perturbation Methods in Nonlinear Dynamics, in Nonlinear Dynamics Aspects of Particle Accelerators, Lecture Notes in Physics, No. 247, Sardinia, Italy
1985 Invited Lecture: Perturbation Methods in Nonlinear Dynamics, a series of three invited lectures, Joint US/CERN School on Particle Accelerators, Santa Margherita di Pula, Sardinia, Italy, January 31-February 5

1982 Yarmouk University Research Award
1981 State of Kuwait Prize in Basic Sciences (Physics)
1981 Invited Lecture: The Method of Multiple Scales and Nonlinear Coupled Oscillators, Second Conference of the Union of Arab Physicists and Mathematicians, Amman, Jordan, May 4-7
1980 -1983 Society of Engineering Science Certificate of Appreciation in Recognition of Outstanding Service to the Society, Member, Board of Directors
1979 Invited Lecture: Three-Dimensional Stability of Growing Boundary Layers, IUTAM Symposium on Laminar-Turbulent Transition, Stuttgart, West Germany, September 16-22
1979 Invited Lecture: Stability of Three-Dimensional Boundary Layers, 17th Aerospace Sciences Meeting, New Orleans, LA, January 15-17
1979 Short course: Linear and Nonlinear Stability of Boundary Layers, International Centre for Mechanical Sciences, Udine, Italy, October 10-19
1978 Invited Lecture: The Relation Between Temporal and Spatial Stability in Three-Dimensional Flows, AIAA 11th Fluid and Plasma Dynamics Conference, Seattle, WA, July 10-12
1976 Election to the Academy of Teaching Excellence
1976 Named University Distinguished Professor of Engineering
1976 Invited Lecture: Numerical-Perturbation Methods in Nonlinear Mechanics, 2nd International Conference on Numerical Methods in Geomechanics, VPI& SU, Blacksburg, VA, June
1975 Listed in Outstanding Educators of America
1975 Fellow - American Physical Society
1962 Third Annual Stanford School of Engineering Scholastic Prize

Recent Book Publications:
Ali H. Nayfeh and P. Frank Pai, Linear and Nonlinear Structural Mechanics, Wiley Interscience, 2004
Ali H. Nayfeh, Nonlinear Interactions, Wiley, 2000
Ali H. Nayfeh and Bala Balachandran, Applied Nonlinear Dynamics, Wiley Interscience, 1995

Courses Taught:

ESM 4444	Stability of Structures	Spring 2012
ESM 6984	SS: Model/ID Nonlinear Systems	Spring 2010
ESM 5754	Intro Perturbations	Fall 2009
ESM 5414	Nonlinear Systems	Spring 2009
ESM 5994	Research and Thesis	Spring 2008
ESM 7994	Research and Dissertation	Spring 2008
ESM 5754	Intro Perturbations	Fall 2007
ESM 5994	Research and Thesis	Fall 2007
ESM 7994	Research and Dissertation	Fall 2007
ESM 5414	Nonlinear Systems	Spring 2007
ESM 5994	Research and Thesis	Spring 2007
ESM 7994	Research and Dissertation	Spring 2007
ESM 5754	Intro Perturbations	Fall 2005
ESM 5414	Nonlinear Systems	Spring 2005
ESM 5754	Intro Perturbations	Fall 2004
ESM 6754	Perturbation Methods	Spring 2004
ESM 5754	Intro Perturbations	Fall 2003