

Curriculum Vitae  
C. Frank Abrams, Jr.

Education

- Bachelor of Science (honors), Biological and Agricultural Engineering, N. C. State University, May 28, 1966
- Master of Science, Biological and Agricultural Engineering, N. C. State University, January 24, 1969
- Doctor of Philosophy, Biological and Agricultural Engineering, N. C. State University, May 15, 1971

Employment Record

- Frank Abrams, PhD PE
  - 1970-present Owner and Sole Proprietor
- N. C. State University, Raleigh, N. C.:
  - 2006-present Professor *emeritus* of biomedical engineering (joint with UNC-Chapel Hill)
  - 2006-present Professor *emeritus* of biological and agricultural engineering
  - 2003-2006 Director of Graduate Studies in biomedical engineering (NCSU)
  - 2003-2006 Professor of Biomedical Engineering (joint with UNC-Chapel Hill)
  - 1/99-1/2003 Senior Vice Provost for Academic Affairs and Chief of Staff
  - 1/97-1/99 Senior Associate Provost for Academic Affairs
  - 7/94 -12/96 Associate Provost for Undergraduate Programs
  - 6/91-11/91 Interim Head, Dept. of Bio. & Agr. Engineering;
  - 5/91-6/94 Director of Graduate Programs, Dept. of Bio. & Agr. Engineering;
  - 6/88-2006 Associate Faculty, Companion Animal and Special Species Medicine, College of Veterinary Medicine;
  - 7/84-2006 Professor of Biological and Agricultural Engineering;
  - 7/78-2006 Appointed as full member of the Graduate Faculty;
  - 7/78-6/84 Associate Professor of Biological and Agricultural Engineering; and,
  - 6/72-6/78 Assistant Professor of Biological and Agricultural Engineering, associate member of the Graduate Faculty.
- Department of Agricultural Engineering, University of Kentucky, Lexington, Kentucky:
  - 1/71-6/72 Assistant Extension Professor of Agricultural Engineering.
- Department of Biological and Agricultural Engineering, N. C. State University, Raleigh, N. C.:
  - 7/66-12/70 Graduate Research Assistant, Dr. Charles W. Suggs, director
  - 9/62-6/66 Undergraduate Research Assistant, Dr. Charles W. Suggs, supervisor
- Allis-Chalmers Product Test Center, West Allis, WI
  - 6/64-9/64 Agricultural Engineering Field Test Technician
- Max Planck Institut für Arbeitsphysiologie, Dortmund, West Germany:
  - 6/67-9/67 Scientific Guest

Professional Work in Academia:

- Teaching and Academic Advising

Regularly served as the academic advisor for undergraduate students, generally for about 12 per year. In context of research program, provided academic advice to MS and PhD students in BAE, BME, in other departments in Agriculture & Life Sciences, Engineering, and Veterinary medicine. Served often as faculty advisor to various student organizations including Alpha Zeta (agricultural honorary and professional), Student Branch of American society of Agricultural Engineers, Alpha Epsilon (agricultural engineering honorary), Biomedical Engineering Society Student Chapter, and BAE Graduate Student Association.

Developed and taught undergraduate and graduate regular and special topics courses in mechanical design and analysis, computer applications, farm machinery, and biomechanics. Was first teacher of the Biomedical Engineering Senior Design series (2003-2006). Led the development of an undergraduate biomedical engineering emphasis area in biological and agricultural engineering that subsequently evolved under the leadership of successors into a separate undergraduate degree program in biomedical engineering.

- Research

Research was conducted in a mission-oriented context in which not only was there an effort to contribute to the state of knowledge in the particular technological areas, but there were also specific societal applications of intended results. Topics included agricultural mechanization, machinery operator safety, vibrational response of biological materials, agricultural materials processing and storage, and orthopedic biomechanics. Support was provided variously from the North Carolina Agricultural Research Service and through competitive research contracts. The following individuals, listed with their graduation dates, degrees, and thesis/dissertation titles, have completed graduate study within my various research programs:

Entrekin, Robert R. 1975 M. S. The In Vivo Driving Point Impedance of the Human Ulna and Its Potential in Characterizing Fractures

Trykowski, Tom 1977 M. S. Development of Design Parameters for Hydrohandling of Sweet Potatoes in Flumes

Sarmiento, Isagani A. 1981 Ph.D. Development of a Pneumatic Approach to Transplant Container-grown Rice Seedlings

Dunlevy, Keith H. 1985 M. S. Soil Flow Control System for a Sweet Potato Harvester

Ward, H. C. 1986 M. S. An Investigation of the Dynamic Mechanical Response of Cortical Bone

Lansari, Azzedine 1986 M. S. The Thermal Effects of Trochar-tipped Pin Insertion in Bone

Donahue, Darrell W. 1986 M. S. Mechanical Characterization of Smooth Muscle

Foutz, Timothy L. 1988 Ph.D. Mechanical Modeling of Biological Materials

Heidi A. Wolgamuth 1997 Ph.D. Finite element analysis of the equine digital sesamoid bone.

Capps, Susan G. 1989 M. S. The Effects of Dietary Protein and Amino Acid Level on Body Weight, Tibial Growth Parameters, and Cancellous Bone Strength in Broilers.

George, T. F. II, DVM 1991 M. S. Vibrational Response Analysis to Evaluate Ingrowth into Porous coated Implants (degree in Veterinary Morphology; co-directed research)

Capps, Susan G. 1992 Ph.D. A Finite Element Analysis of the Proximal Avian Tibia.

Lansari, Azzedine 1993 Ph.D. Modeling Heat Transfer in Bone Due to Drilling.

Lansari, Heidi A. 1993 M.S. Modeling the Static Mechanics of the Equine Superficial Suspensory System

Reynolds, Tracey A. 1994 M.S. The effects of active immunization against growth hormone releasing factor on the biomechanical properties of bone.

O'Brien, Jennifer B. 1994 M.S. Mechanical Properties of Swine Bone as Related to Diet

Roedlich, Christine A. 1995 Ph.D. Dynamic Mechanical Analysis of Fracture Healing

Weinhold, Paul S. 1996 Ph.D. Nondestructive Vibrational Testing as a Means of Assessing the Directional Elastic Moduli of Vertebral Cancellous Bone of Ovariectomized Animals

Kay, Matthew W. 1996. M.S. Evaluation of Axial Pin Vibration for the Detection of Changes at the External Fixator Pin-Bone Interface.

Mahmoud, Azza. 1997 Ph.D. Biomechanical Analysis of the Pin-Bone Interface (PBI) in External Fixation

- Extension and Public Service

While at the University of Kentucky, provided education and applied research programs in farm equipment safety and burley tobacco mechanization and handling.

Provided educational programs to sweet potato producers relative to ongoing research in North Carolina.

Provided college informational sessions for high school students at local sites and on campus.

- Administration and Professional Service

North Carolina State University (selected)

Founded the Bioengineering Interest Group at the university, 1975

Served on and chaired numerous standing and *ad hoc* committees including departmental, college-level, university-level, and system committees, 1972-2006.

Served on the Faculty Senate and the systemwide Faculty Assembly, 1988-90.

Served a term as Chair of the Faculty and of the Faculty Senate, 1990-91.

As Senior Vice Provost for Academic Affairs and Chief of Staff of the Office of the Provost

Developed and managed departmental and university academic management processes, in curriculum and faculty development.

Co-led the Inquiry Guided Learning project which led to major improvements in instruction (funded in part by the Hewlett Foundation).

Established and led Project 25, which was the first university-wide experiment in web based instruction (1996).

Led the development and founding the Faculty Center for Teaching and Learning and co-established the associated Learning Technology Service.

Served on system committee and led the implementation of a comprehensive review system for tenured faculty at the university (later called "post tenure review").

Led the complete restructuring of the faculty reappointment, promotion, and policies and processes.

Served on the system committee and led the university negotiation for the UNC (system) - North Carolina Community College System Comprehensive Articulation Agreement.

Led the revision of the undergraduate course and curriculum development and review processes and vested the responsibility with a dean for undergraduate studies.

Served as accreditation reviewer for the Southern Association of Colleges and Schools, 2003

#### Professional Organizations (selected)

Led and served on various bioengineering committees of the American Society of Agricultural Engineers (ASAE) [Now the American society of Agricultural and Biological Engineers (ASABE)], 1971-94.

Served North Carolina State University Chapter of Sigma Xi as a board member and officer, 1978-82 and 2003-2006. Serving as chapter webmaster 2006-present.

Served as board member and officer of the North Carolina State University Chapter of Phi Kappa Phi.

#### Professional Consultation (selected)

- Canine crash simulation model. 1987. Yates, Fleishman, McLamb, and Weyner, Raleigh, N. C.
- Kinetic analysis of automatic car wash mechanism. 1987. David Bennett, Patent Attorney, Raleigh, N. C.
- Analysis and design of produce storage and marketing facility for the Ministry of Agriculture of St. Vincent and the Grenadines. 1983-84. Under a contract with USAID through the Post Harvest Institute for Perishables, University of Idaho.
- Analysis and design of utility cart. 1983. Midlantic Marketing, Dunn, N. C.
- Analysis and design of a portable intravenous delivery system support. 1982. Douglas Medical Supply, Inc., Raleigh, N. C.
- Analysis of hydraulic circuit for "cherry picker" boom control for power line service vehicles. 1981. Technical and Safety Consultants, Raleigh, N. C.
- Volunteers in Technical Assistance. 1975-present. Review plans and blueprints.
- Design of dual purpose curing/greenhouse prototype. 1975. Harrington Manufacturing Co., Lewiston, N.C.
- Farm tractor accident litigation. 1971. Eubanks, Gardner, and Schaefer, Louisville, Ky.
- Scientific and Technical Advisor. 2006-present. Coats & Bennett PLLC, Cary, NC.

### Professional Memberships

- National Society of Professional Engineers (NSPE)
- Professional Engineers of North Carolina (PENC)
- Sigma Xi, The Scientific Research Society
- American Society of Agricultural and Biological Engineering (ASABE)
- American Association for the Advancement of Science (AAAS)
- North Carolina State University Alumni Association

### Professional Registration and Licensure

- Registered Professional Engineer in North Carolina since 1974, No. 6820.

Publications (107): Available upon request.

### Professional Address (as of March 2013)

1385 Bradford Place (Location)  
1385 Fearington Post (US Mail)  
Pittsboro, NC 27312  
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