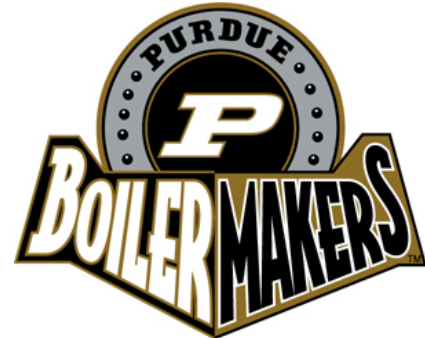


Curriculum Vitae

Eric A. Nauman, Ph.D.



Professor of Mechanical Engineering
Professor by Courtesy in the Weldon School of Biomedical Engineering
and Department of Basic Medical Sciences
Purdue University

Director, Human Injury Research and Regenerative Technologies
(H.I.R.R.T.) Laboratory
Director, College of Engineering Honors Program

Education

1995 B.M.E. University of Delaware, Newark, Delaware
Mechanical Engineering (Minors: Japanese, Mathematics)
Thesis Title: State Space Identification and Control of Chaotic Dynamics. Thesis Advisor: R. V. Roy



1998 M.S. University of California, Berkeley, California
Mechanical Engineering (Major: Bioengineering, Minors: Dynamics, Mathematics)
Thesis Title: Dependence of Inter-Trabecular Permeability on Flow Direction and Anatomic Site. Advisor: Tony Keaveny

2000 Ph.D. University of California, Berkeley, California
Mechanical Engineering (Major: Bioengineering, Minors: Dynamics, Mathematics)
Dissertation Title: The Analytical Design of a Hybrid Bone Substitute. Dissertation Committee: Tony Keaveny (Advisor), Bernard P. Halloran, Lisa A. Pruitt, Carolyn R. Bertozzi



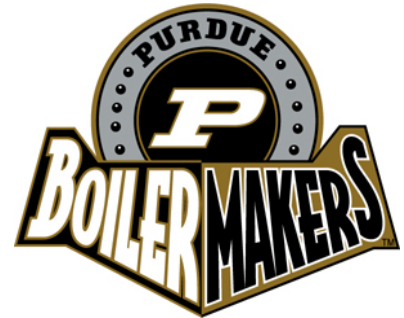
Professional Experience

6/95–8/95 Development Engineer, Lanxide Corporation, Newark, DE
8/95–6/00 Research Assistant, University of California, Berkeley, CA
1/98–6/00 Research Assistant, Endocrine Unit, Veterans Affairs Medical Center, San Francisco, CA
9/98–6/00 NASA Consultant, NASA Ames Research Center, Moffett Field, CA

7/00–6/04 Assistant Professor, Biomedical Engineering Department, Tulane University, New Orleans, LA
6/01–6/04 Adjunct Assistant Professor, Department of Orthopaedic Surgery, Tulane University, New Orleans, LA.



7/04–8/07 Assistant Professor, School of Mechanical Engineering, Purdue University, West Lafayette, IN
7/04–8/07 Assistant Professor, Weldon School of Biomedical Engineering and Department of Basic Medical Sciences, Purdue University, West Lafayette, IN
8/07–8/13 Associate Professor, School of Mechanical Engineering, Purdue University, West Lafayette, IN
8/07–8/13 Associate Professor, Weldon School of Biomedical Engineering and Department of Basic Medical Sciences, Purdue University, West Lafayette, IN
1/13–Present Director, College of Engineering Honors Program
8/13–Present Full Professor, School of Mechanical Engineering, Purdue University, West Lafayette, IN
8/13–Present Full Professor, Weldon School of Biomedical Engineering and Department of Basic Medical Sciences, Purdue University, West Lafayette, IN



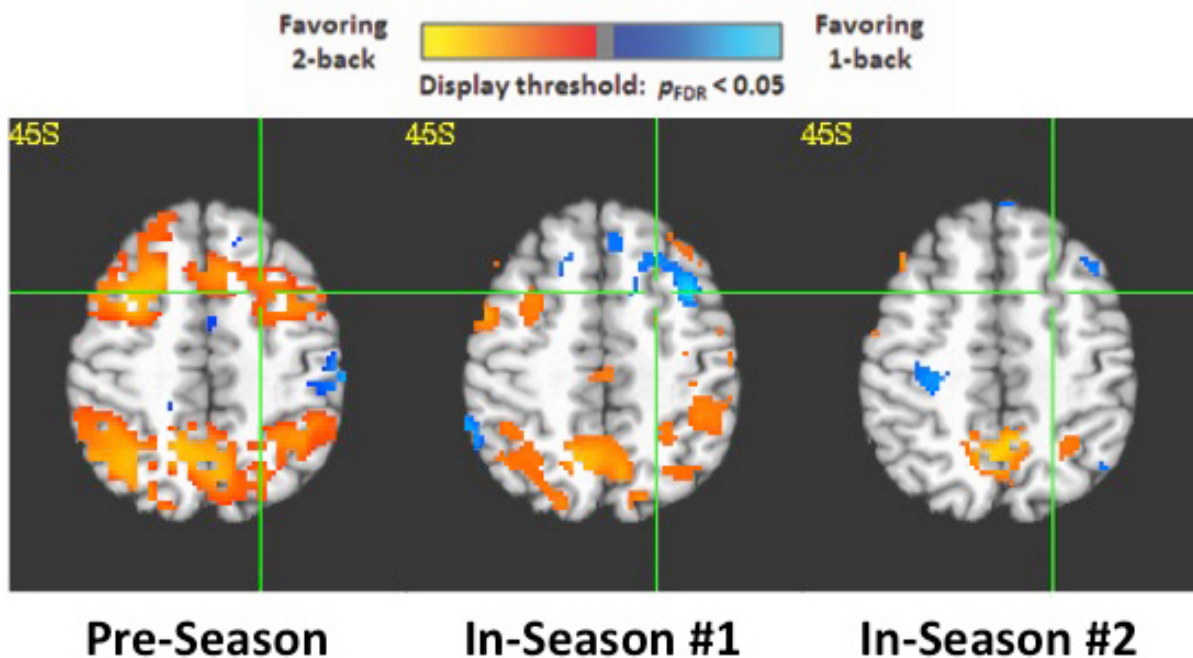
6/09–Present Co-Founder of BioRegeneration Technologies, Inc., West Lafayette, IN, Vice President and Director of New Technologies
6/12–Present Co-Founder of IFoundation/Adapt-IF, West Lafayette, IN

Academic Philosophy

At Purdue, each faculty member, and in broader terms, each laboratory, focus their efforts on learning, discovery, and engagement. In the past, these were often referred to as teaching, research, and service, respectively. Either way, they represent the positive outcomes of our efforts.

As an educator, Dr. Nauman has quantified the positive effects of active learning, the ability of case studies to improve collateral learning, and is currently developing a continuous quality improvement model for teaching mechanics courses that is anticipated to ease faculty adoption of novel teaching techniques. This work led to his participation in Purdue's ENGAGE team where he has helped develop a course in visualization, and educational materials that integrate everyday examples, and active learning into basic mechanics courses.

Dr. Nauman's research interests include orthopaedic tissue regeneration, the repair of vital organs, the development of novel cancer treatments, and the primary and secondary injury patterns of the central nervous system. He and his students have disclosed more than 30 inventions, six of which have been submitted to the patent and trademark office. In particular, the HIRRT lab developed a biomaterial-based solution for the repair of orthopaedic interfaces (cartilage, tendon, and ligament) and soft tissues, which ultimately lead to the foundation of *BioRegeneration Technologies*. The HIRRT lab is currently finalizing the development of a bio-inspired material to mitigate traumatic brain injuries and the effects of blast waves, as well as a low-cost device to reduce the incidence of bed sores. Dr. Nauman co-founded a non-profit (IFoundation/Adapt-IF) to make the wide array of assistive technologies developed by students and faculty at Purdue widely available to patients with disabilities.



Teaching Interests

Recognizing that undergraduate and graduate students have disparate levels of mathematical sophistication and often different motivations for taking a particular class, Dr. Nauman customizes his curriculum and teaching style to suit their abilities. He believes that undergraduates learn best when they are able to apply the theory they are learning in the classroom to interesting or important technical problems and real-world technology. For example, in classes such as *Basic Mechanics I*, he introduces movie physics, MEMS devices, fighter jet design, basic biomechanics, engineering disasters, and technological marvels such as Hoover Dam and the Freedom Ship. In contrast, Dr. Nauman encourages graduate students to embrace larger, more open-ended projects that allow them to incorporate their research topic. In all his courses, Dr. Nauman has implemented a plan for Continuous Quality Improvement (CQI) in order to ensure that the students benefit as much as possible from the content delivery.

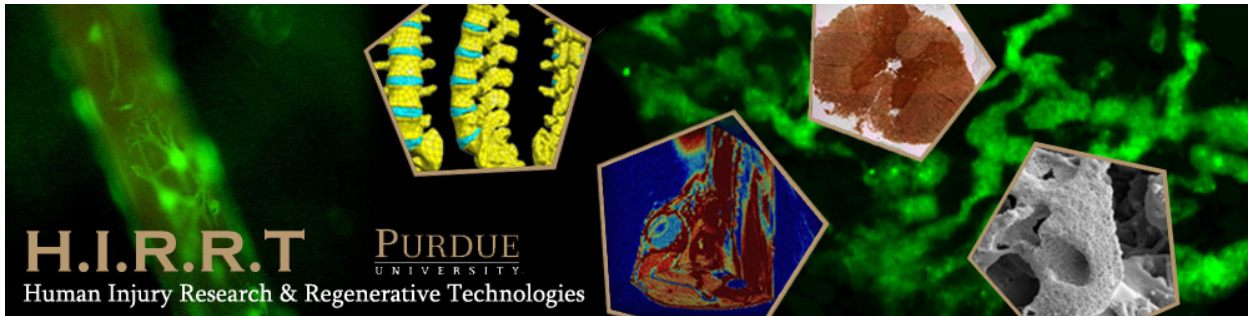
Early in his career, he also led an effort that successfully quantified the efficacy of active learning in an introductory mechanics course. The results indicated that active learning significantly improved student performance, but additional work is needed to determine whether the effects persist deeper into the curriculum [1]. More importantly, he is pursuing efforts to teach more material in less time, curb the potential for breaches of academic integrity, and to integrate professional and global development into courses [2]. There are two important reasons for the limited incorporation of new teaching strategies. The first is that traditional forms of content delivery, especially textbooks, have resisted changes from their standard formats [3]. The second reason that few proven advances in engineering education achieve system-wide adoption is that education research focuses primarily on the students when the rate-limiting step is technique adoption by faculty. Consequently, Dr. Nauman is currently developing instructional tools, in collaboration with Drs. Krousrill and Rhoads, that incorporate many of the recent advances in engineering education such as: (i) active learning breaks; (ii) everyday examples; (iii) global case studies; (iv) visualization activities; and (v) increased faculty-student interactions and subsequently evaluate their effectiveness for both students and faculty [4-6]. The materials are being tested in ME 270 (Basic Mechanics I), a class taken by almost 40% of the students in Purdue's College of Engineering.

References

1. Nauman, E.A., Dee, K.C., and Livesay, G.A. *Benefits and Challenges of Active Learning: Experiences at Tulane University*. American Society of Mechanical Engineers/International Mechanical Engineering Congress and Exposition, Nov. 17-22, New Orleans, LA 2002.
2. Camuti PA. *Engineering the Future: Staying Competitive in the Global Economy*. Online Journal for Global Engineering Education 2006;1(1).
3. Rugarcia A, Felder RM, Woods DR, Stice JE. *The future of engineering education. I. A vision for a new century*. Chem Engr Education 2000;34(1):16-25
4. Felder RM, Felder GN, Dietz EJ. *A longitudinal study of engineering student performance and retention. V. Comparisons with traditionally-taught students*. Journal of Engineering Education 1998;87(10):469-480.
5. Felder RM, Silverman LK. *Learning and teaching styles in engineering education*. Engineering Education 1988;78(7):674.

Research Interests

Professor Nauman is the director of the Human Injury Research and Regenerative Technologies (H.I.R.R.T.) Laboratory at Purdue University. Its mission is to explore the mechanisms that govern a variety of pathologies including traumatic brain injury (TBI), spinal cord injury (SCI), musculoskeletal damage, atherosclerosis, and cancer metastasis. In addition, we strive to develop novel protective and reconstructive therapeutic treatment methods. Our methods are collaborative and focus on improving our understanding of the damage mechanisms, and simultaneously developing treatment and delivery methods targeted directly to those damage mechanisms.



Some of our specific interests include:

- Adult stem cell-based therapies for bone defects, osteoporosis, ligament and cartilage damage, adipose tissue augmentation, spinal cord injuries, glaucomatous degeneration, and head injuries
- Human injury, especially sports injuries, traumatic brain injuries, spinal cord injuries, gunshot wounds and bruising
- Biofluids and fluid flow in porous media
- Mechanics of hierarchical materials
- Tumor identification and treatment, especially via nanoparticles
- Spine Mechanics and orthopaedic implant development
- Tissue-engineered models of osteoporosis and glaucoma
- Medical informatics
- Biophysics and cell metabolism

Honors and Awards

- 1992, Barry M. Goldwater Scholarship–University of Delaware
- 1994, W. F. Lindell Mechanical Engineering Achievement Award – University of Delaware
- 1995, Taylor Award (Outstanding Male Graduating Student) – University of Delaware
- 1995, National Defense Science and Engineering Graduate Fellowship
- 1995, Berkeley Fellowship – University of California, Berkeley
- 1996, Outstanding Graduate Student Instructor Award–University of California, Berkeley
- 2002 AHMB Biomedical Engineering “Teacher of the Year” Award – Tulane University
- 2003, Faculty Marshall for 2003 Graduation – Tulane University
- 2004 AHMB Biomedical Engineering “Teacher of the Year” Award – Tulane University
- 2010 Purdue College of Engineering Early Career Research Award of Excellence
- 2010 Purdue University Faculty Scholar
- 2010 B.F.S. Schaefer Outstanding Young Faculty Scholar, School of Mechanical Engineering, Purdue University

- 2013 College of Engineering Team Award (Purdue Neurotrauma Group) with Thomas Talavage and Larry Leverenz.
- 2013 Willis A. Tacker Prize for Outstanding Teaching in Biomedical Engineering
- 2014 A. A. Potter Best Teacher Award for Purdue's College of Engineering

Publications

Google Scholar

Citations: 2,151 (1,420 since 2010)

H-index: 26 (20 since 2010)

I10-Index: 46 (40 since 2010)

Peer-Reviewed Journals

1. Roy, R.V. and **Nauman, E.A.** *Noise-Induced Effects on a Nonlinear Oscillator*. Journal of Sound and Vibration. Vol. 183, No. 2: 269-95, 1995.
2. **Nauman, E.A.**, Chang, W.C.W., Satcher, R.L., and Keaveny, T.M. *Microscale Engineering Applications in Bone Adaptation*. Microscale Thermophysical Engineering. Vol. 2, No. 3: 139-172, 1998.
3. **Nauman, E.A.**, Risic, K.J., Keaveny, T.M., and Satcher, R.L. *Quantitative Assessment of Steady and Pulsatile Flow Fields in a Parallel Plate Flow Chamber*. Annals of Biomedical Engineering. Vol. 27: 194-199, 1999.
4. Haddock, S.M., Debes, J.C., **Nauman, E.A.**, Fong, K.E., Arramon, Y.P., and Keaveny, T.M. *Structure-Function Relationships for Coralline Hydroxyapatite Bone Substitute*. Journal of Biomedical Materials Research. Vol. 47: 71-78, 1999.
5. **Nauman, E.A.**, Fong, K.E., and Keaveny, T.M. *Dependence of Inter-Trabecular Permeability on Flow Direction and Anatomic Site*. Annals of Biomedical Engineering. Vol. 27: 517-524, 1999.
6. **Nauman, E.A.**, Satcher, R.L., Keaveny, T.M., Halloran, B.P., and Bikle, D.D. *Osteoblasts in Culture Respond to Pulsatile Fluid Flow with Short-Term Increases in PGE₂ Production but No Change in Proliferation or Mineralization*. Journal of Applied Physiology. Vol. 90: 1849-1854, 2001.
7. Bikle, D.D., Majumdar, S., Laib, A., Powell-Braxton, L., Rosen, C., Beamer, W., **Nauman, E.**, Leary, C., Halloran, B. *The Skeletal Structure of Insulin-Like Growth Factor-I Deficient Mice*. Journal of Bone and Mineral Research, Vol. 16, No. 12: 2320-2329, 2001.
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12. Sander, E.A., Shimko, D.A., Dee, K.C., and **Nauman, E.A.** *Microscale and Macroscale Examination of Human Vertebral Cancellous Bone Using Combined Cellular Solid Models*. Biomechanics and Modeling in Mechanobiology. Vol. 2, No. 2: 97-107, 2003.

13. Sander, E.A., and **Nauman, E.A.** *Permeability of Musculoskeletal Tissues and Scaffolding Materials: Experimental Results and Theoretical Predictions*. Critical Reviews in Biomedical Engineering. Vol. 31, Issues 1-2, p. 1-26, 2003.
14. Shimko, D. A., White, K.K., **Nauman, E.A.**, and Dee, K.C. *A Device for Long-Term, In Vitro Loading of Three-Dimensional Natural and Engineered Tissues*. Annals of Biomedical Engineering. Vol. 31: 1347-1356, 2003.
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39. Routh, R.H., Nobes, K.M., Burshell, A.L., and **Nauman, E.A.** *The Effects of Anti-Resorptive Therapies and Estrogen Withdrawal in Adult Scoliosis Measured by Sub-Segmental Vertebral BMD Analysis.* Bone. Vol. 45, No. 2, 193-199, 2009.
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 59. Schuff, M.M., Gore, J.P., and **Nauman, E.A.** *A Mixture Theory Model of Fluid and Solute Transport in the Microvasculature of Normal and Malignant Tissues, I, Theory*. Journal of Mathematical Biology, Vol. 66, No. 6, p. 1179-1207, 2013.
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68. Cook, D. D, Julias, M., and **Nauman, E.A.** *Biological Variability in Biomechanical Engineering Research: Significance and Meta-Analysis of Current Modeling Practices*. Journal of Biomechanics. Vol. 47, No. 6, p. 1241-1250, 2014.
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71. Walker, E.K., Nauman, E.A., Allain, J.P., and Stanciu, L.A. An in vitro Model for Preclinical Testing of Thrombogenicity of Resorbable Metallic Stents. J Biomed Mater Res A. In Press.
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73. Poole, V.N., Abbas, K., Shenk, T.E., Breedlove, E.L., Breedlove, K.M., Robinson, M.E., Leverenz, L.J., Nauman, E.A., Talavage, T.M., and Dydak, U. MR Spectroscopic Evidence of Brain Injury in the Non-Diagnosed Collision Sport Athlete. Dev Neuropsychol. Vol. 39, No. 6, pp. 459-473, 2014.
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In Review

- Schuff, M.M., Vlashi, E., Low, P.S., and **Nauman, E.A.** *Mixture theory based microvascular model of receptor mediated targeting in tumors*. *Journal of Nanotechnology in Engineering and Medicine*.
- Chan, D. D., Butz, K. D., **Nauman, E.A.**, Dickerson, D. A. and Neu, C. P. *Partial Recovery of Normal Strains in Cartilage After Tissue Engineered Implant Measured by dualMRI*.
- Chan, D. D., Gossett, P.C., Butz, K. D., **Nauman, E. A.** and Neu, C. P. *Comparison of Intervertebral Disc Displacements Measured Under Applied Loading with MRI at 3.0 T and 9.4T*.
- Butz, K. D., Chan, D. D., Neu, C. P., and **Nauman, E. A.** *Noninvasive Stress and Material Property Estimation in the Intervertebral Disc from MRI-Based Finite Strains*.
- Chan, D. D., Butz, K. D., Trippel, S. B., **Nauman, E. A.**, and Neu, C. P. *In Vivo Quantification of Internal Strain and Deformation in the Human Knee During Joint Contact*.

Book Chapters

1. Arramon, Y.P. and **Nauman, E.A.** *The Intrinsic Permeability of Cancellous Bone*. Bone Mechanics, 2nd Edition. Edited by Stephen Cowin. CRC Publishing. 2001.
2. Gentleman, E., Livesay, G.A., Dee, K.C., and **Nauman, E.A.** *Tissue Engineering, Ligament*. Encyclopedia of Biomaterials and Biomedical Engineering. 2004.
3. Burshell, A.L. and **Nauman, E.A.** *Adult Scoliosis, Degenerative Disease, and BMD: A Subsegmental Analytic Approach*. Osteoporosis, 3rd Edition. Edited by Marcus, R., Feldman, D., Nelson, D.A., and Rosen, C.J. Academic Press, 2007.
4. Butz, K.D., Chan, D.D., Neu, C.P., and Nauman, E.A. *Noninvasive Determination of Material Properties for Biological Materials*. *CRC Handbook of Imaging in Biological Mechanics*. 2014.

Invited Lectures

1. **Nauman, E.A.** *Damage Repair in Compact and Trabecular Bone: Functional Characterization*. Sponsored by the LSU Civil Engineering Department - Center for Micromechanics and Damage of Advanced Composite Materials Planning Symposium. 2001.
2. **Nauman, E.A.** *Short-Term and Long-Term Effects of Fluid Flow on Osteoblast Differentiation*. Fluid Flow in Bone Workshop, Phoenix, AZ, 2001.
3. Livesay, G.A., Suh, J-K.F., Dee, K.C., **Nauman, E.A.** *Current Challenges in the Design and Characterization of Materials for Orthopaedic Tissue Engineering: Tendons/Ligaments*. At the 6th Annual Orthopaedic Tissue Engineering Conference pre-conference symposium, May, 2002.
4. Suh, J-K.F., Livesay, G.A., **Nauman, E.A.**, Dee, K.C. *Current Challenges in the Design and Characterization of Materials for Orthopaedic Tissue Engineering: Cartilage*. at the 6th Annual Orthopaedic Tissue Engineering Conference pre-conference symposium, May, 2002.
5. Suh, J-K.F., Livesay, G.A., **Nauman, E.A.**, Dee, K.C. *Current Challenges in the Design and Characterization of Materials for Orthopaedic Tissue Engineering: Tendon-Bone Interface*. At the 6th Annual Orthopaedic Tissue Engineering Conference pre-conference symposium, May, 2002.
6. **Nauman, E.A.**, Dee, K.C., Suh, J-K.F., Livesay, G.A. *Current Challenges in the Design and Characterization of Materials for Orthopaedic Tissue Engineering: Bone*. At the 6th Annual Orthopaedic Tissue Engineering Conference pre-conference symposium, May, 2002.
7. Dee, K.C., **Nauman, E.A.**, Livesay, G.A., Suh, J-K.F. *Current Challenges in the Design and Characterization of Materials for Orthopaedic Tissue Engineering: Cell-Biomaterial*

Interactions. At the 6th Annual Orthopaedic Tissue Engineering Conference pre-conference symposium, May, 2002.

8. **Nauman, E.A.**, Dee, K.C., and Livesay, G.A. *Benefits and Challenges of Active Learning: Experiences at Tulane University*. American Society of Mechanical Engineers/International Mechanical Engineering Congress and Exposition, Nov. 17-22, New Orleans, LA 2002.
9. **Nauman, E.A.**, Talavage, T., Breedlove, E., Robinson, M., Yoruk, U., Morigaki, K., and Leverenz, L. *Detecting TBI – sideline assessment and clinical evaluation*. 1st Annual Midwestern Conference on Traumatic Brain Injury, 2010.
10. Schuff, M.M., Gore, J.P., and **Nauman, E.A.** *A volume fraction-based mixture theory model to predict capillary level transport of nanoparticles in tumors*. InterPore Conference, Texas A&M, 2010.
11. Morigaki, K.E., Breedlove, E.L., **Nauman, E.A.**, Talavage, T.M., Leverenz, L.J., Zakrajsek, A.E., Robinson, M.E., Yoruk, U., and Butz, K. *Predictive Modeling of Cognitive Impairments from Head Trauma*. Keynote Lecture at the 2011 EATA Convention, Philadelphia, PA, January 8-10, 2011
12. **Nauman, E.A.**, Breedlove, E.L., Morigaki, K.E., Talavage, T.M., Leverenz, L.J., Zakrajsek, A.E., Robinson, M.E., Yoruk, U., and Butz, K. *Traumatic Brain Injury: Comparing Military to Civilian Trauma*. Presentation to the National Academy of Sciences, 2011.
13. TM Talavage, EL Breedlove, KE Morigaki, ME Robinson, RD Ranaweera, **E.A. Nauman**, LJ Leverenz, *fMRI Assessment of Effects of Technique on Neurological Impairment in High School Football Players*. 19th Annual Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine, Montreal, Quebec, Canada, May 2011, CD-ROM #3642
14. Leverenz, L.J., **Nauman, E.A.**, Talavage, T.M. *Use of Computer-Based Neurocognitive Testing to Identify Impairments in Patients Without Symptoms*. 2011 Big Sky Athletic Trainer and Sports Medicine Conference, Big Sky, MT, February 1, 2011.
15. Leverenz, L.J., **Nauman, E.A.**, Talavage, T.M. *Can We Play Football Safely? Lessons learned from studying High School football players,* Science on Tap Lafayette, Lafayette, IN, April 21, 2011.
16. Leverenz, L.J., **Nauman, E.A.**, and Talavage, T.M. *CRASH: High School Football Head Injuries*, Purdue University President's Council "Back to Class," September 30, 2011.
17. **Nauman, E.A.** *The Role of the University in Social Entrepreneurship and Technology Development: The Experience at Purdue University*. Keynote Address at Congreso XI La Investigacion en Pontificia Universidad Javeriana, Bogota, Colombia. September 20-23, 2011.
18. Talavage, T.M. and **Nauman, E.A.** *Biomechanical Linkage of History of Head Collisions to Neurophysiological Impairments in High School Athletes*. 2011 Big Sky Athletic Trainer and Sports Medicine Conference, Big Sky, MT, February 2, 2012.

Abstracts, Conference Presentations, and Technical Reports

1. Roy, R.V. and **Nauman, E.A.**, *Analog Electronic Simulations of a Nonlinear System*. Proceedings of the Ninth Engineering Mechanics Conference. Texas A&M University, May 25 - 27, 1992. Published by the ASCE. New York, NY, p.668-671.
2. **Nauman, E.A.** and Keaveny, T.M. *Mathematical Modeling of Inter-Trabecular Fluid Flow*. Biomedical Engineering Society 1997, 451 (Annals of Biomedical Engineering).
3. Haddock, S.M., **Nauman, E.A.**, Fong, K.E., and Keaveny, T.M. *Permeability of Coralline Hydroxyapatite*. Trans. Orthopaedic Research Society 1999.
4. **Nauman, E.A.**, Halloran, B.P., Powell-Braxton, L., and Bikle, D.D. *Insulin Like Growth Factor-I is Required for Osteoprogenitor Cell Development*. American Society of Bone and Mineral Research. 21st Annual Meeting, 1999.

5. **Nauman, E.A.**, Risic, K.J., Keaveny, T.M., Satcher, R.L., Halloran, B.P., and Bikle, D.D. *Characterization of a Device to Apply Combined fluid Shear Stress and Extracellular Matrix Deformation*. American Society of Bone and Mineral Research. 21st Annual Meeting, 1999.
6. Bikle, D.D., Halloran, B.P., Leary, C., Wieder, T., **Nauman, E.**, Rosen, C.J., Laib, A., Majumdar, S. *Insulin Like Growth Factor-I (IGF-I) is Required for Anabolic Actions of Parathyroid Hormone (PTH) on Bone*. American Society of Bone and Mineral Research. 22nd Annual Meeting, 2000.
7. **Nauman, E.A.**, Halloran, B.P., Bikle, D.D., and Keaveny, T.M. *Basic Fibroblast Growth Factor Accelerates Bone Marrow Stromal Cell Differentiation and Mineralization In Vitro in the Presence of β -glycerophosphate*. American Society of Bone and Mineral Research. 22nd Annual Meeting, 2000.
8. **Nauman, E.A.**, Satcher, R.L., Keaveny, T.M., Halloran, B.P., and Bikle, D.D. *Osteoblasts in Culture Respond to In Vitro Pulsatile Fluid Flow with Short Term Increases in PGE₂ and Long Term Increases in Cell Proliferation*. American Society of Bone and Mineral Research. 22nd Annual Meeting, 2000.
9. **Nauman, E.A.**, Ebenstein, D.M., Hughes, K.F., Pruitt, L, Halloran, B.P., Bikle, D.D., and Keaveny, T.M. *The Effects of β -glycerophosphate on the Chemical and Mechanical Characteristics of Mineral Produced by Bone Cells In Vitro*. Trans. Orthopaedic Research Society, 2001.
10. Dee, K.C., Livesay, G.A., **Nauman, E.A.**, Rice, D., and Rice, J. *An Assessment of Biomedical Engineering Student Learning Styles*. American Society for Engineering Education Annual Meeting, 2001.
11. Livesay, G. A., Dee, K. C., **Nauman, E.A.** and Hart, R.T. *Active Learning in Mechanics Courses in Biomedical Engineering*. Advances in Bioengineering. BED-Vol. 51, ASME 2001.
12. Youn, I., Cohen, S., **Nauman, E.A.**, Jones, D., and Suh, J. *Stimulative Effects of Periosteum in Tendon-Bone Attachment: In Vivo and In Vitro Studies*. Trans. Orthopaedic Research Society, 2002.
13. Hites, L., Dee, K.C., Livesay, G.A., **Nauman, E.A.**, and O'Neal, E. *The Tulane University Biomedical Assessment Model*. American Society for Engineering Education Annual Meeting, 2002.
14. Livesay, G.A., **Nauman, E.A.**, Hites, L. Jr., O'Neal, E., Dee, K.C., Felder, R.M. *Statistical Evaluation of the Index of Learning Styles*. American Society for Engineering Education Annual Meeting, 2002.
15. Sander, E. A., Shimko, D. A., Dee, K. C., and **Nauman, E. A.** *Predicting Cellular Level Stress and Strain in the Vertebral Body – Development of a Cellular Solid-Mixture Theory Model*. . Louisiana EPSCoR 2002 State Conference, Baton Rouge, LA, 2002.
16. Rea, K. L., **Nauman, E. A.**, Witt, T. L., and Anderson, N. E. *Use of Stem Cells to Generate Neuronal Tissue*. Louisiana EPSCoR 2002 State Conference, Baton Rouge, LA, 2002. **First place award in the Biotechnology group.**
17. Kazakia, G., **Nauman, E.A.** Halloran, B.P., Keaveny, T.M. Design and *in vitro* production of an autologous trabecular bone substitute. Materials Research Society Spring Meeting, San Francisco, CA, April 1-5, 2002.
18. Sander, E.A., Shimko, D.A., Dee, K.C., and **Nauman, E.A.** *A Cellular Solid – Mixture Theory Model of Bone Remodeling in Response to High Frequency Loads*. FASEB, New Orleans, LA, April, 2002.
19. Shimko, D.A., White, K.K., Dee, K.C., and **Nauman, E.A.** *A Novel In Vitro Device for Mechanical Loading of Three Dimensional Natural and Tissue Engineered Constructs*. FASEB, New Orleans, LA, April, 2002.
20. Rea, K.L., **Nauman, E.A.**, Witt, T.L., and Anderson, N.E. *Multi-factor Differentiation of Adult Bone Marrow Stem Cells Along the Neuronal Pathway*. FASEB, New Orleans, LA, April, 2002.

21. Youn, I., Dee, K.C., **Nauman, E.A.**, Jones, D.G., Suh, J-K.F. *Differential Phenotypes in the Periosteal Precursor Cell Population*. FASEB, New Orleans, LA, April, 2002.
22. Morency, R., Livesay, G.A., and **Nauman, E.A.** *Development and Application of a Combined Imaging and Modeling Technique for Determining Biomechanical Response of Roller Coaster Passengers*. 2002 ASME International Mechanical Engineering Congress and Exposition, New Orleans, LA, Nov. 17-22, 2002. **Finalist in the Bachelor of Science level student paper competition, awarded Honorable Mention.**
23. Livesay, G.A., Dee, K.C., and **Nauman, E.A.** *Learning Styles of Biomechanics Students*. 2002 ASME International Mechanical Engineering Congress and Exposition, New Orleans, LA, Nov. 17-22, 2002.
24. Gentleman, E., **Nauman, E.A.**, Dee, K.C., and Livesay, G.A. *The Use of Short Collagen Fibers to Control Contraction and Permeability of Cell-Seeded Collagen Gels*. Trans. Orthopaedic Research Society, 2003.
25. Youn, I., **Nauman, E.A.**, Drinnan, C.T., Ma, L., Dee, K.C., Jones, D.G., and Suh, J-K.F. *Differential Phenotypic Characteristics of Heterogeneous Cell Populations in the Periosteum*. Trans. Orthopaedic Research Society, 2003.
26. Kazakia, G., **Nauman, E.A.** Halloran, B.P., Keaveny, T.M. *In Vitro Production and Mechanical Characterization of a Composite Autologous Trabecular Bone Substitute*. Trans. Orthopaedic Research Society, 2003.
27. Dee, K.C., Livesay, G.A., and **Nauman, E.A.** *Learning Styles of First- and Second-Year Engineering Students*. ASEE/WFEO Joint Conference, 2003.
28. Burks, C.A., Shimko, D.A., Dee, K.C., and **Nauman, E.A.** *Analysis of Mineral Produced In Vitro by Adult and Embryonic Stem Cells*. Biomedical Engineering Society 2003 (Annals of Biomedical Engineering).
29. White, K.K., Shimko, D.A., **Nauman, E.A.**, and Dee, K.C. *A Mechanical Loading Device for Three-Dimensional Natural and Engineered Tissues*. Biomedical Engineering Society 2003 (Annals of Biomedical Engineering).
30. Sander, E.A., **Nauman, E.A.**, Alb, A.M., Reed, W.F., Dee, K.C. *Solvent Effect on PLGA Foam Morphology*. Biomedical Engineering Society 2003 (Annals of Biomedical Engineering).
31. Shimko, D.A., Burks, C.A., Dee, K.C., and **Nauman, E.A.** *A Direct Comparison of Bone Mineral Production by Adult and Embryonic Stem Cells: Effect of bFGF*. Biomedical Engineering Society 2003 (Annals of Biomedical Engineering).
32. Gentleman, E.D., **Nauman, E.A.**, Livesay, G.A., and Dee, K.C. *Controlled Contraction and Permeability of Collagen Fiber/Gel Composite Biomaterials*. Biomedical Engineering Society 2003 (Annals of Biomedical Engineering).
33. Rea Fureigh, K.L., Lewus, K.E., and **Nauman, E.A.** *Influence of a Pulsed Magnetic Field on the Neuronal Differentiation of Bone Marrow Stromal Cells*. Biomedical Engineering Society 2003 (Annals of Biomedical Engineering).
34. Rea Fureigh, K.L., Vu, J.F., Lewus, K.E., and **Nauman, E.A.** *The Effects of Electromagnetic Field Induction on the Growth and Differentiation of Adult Stem Cells Along the Neuronal Pathway*. European Tissue Engineering Society, Genova, Italy, September 3-6, 2003.
35. Gentleman, E., Dee, K.C., **Nauman, E.A.**, and Livesay, G.A. *Tensile and Viscoelastic Properties of Collagen Fiber/Collagen Gel Composites*. Trans. Orthopaedic Research Society, 2004.
36. **Nauman, E.A.**, Woods, F. IV, Sander, E.A., Downs, J.C., and Burgoyne, C.F. *A Cellular Solid Model of the Lamina Cribrosa*. ARVO, Ft. Lauderdale, FL, 2004.
37. Sander, E.A., Downs, J.C., Burgoyne, C.F., **Nauman, E.A.** *Effects of Limited O₂ and Nutrient Availability on Cell Number and Viability in Cultured Scleral Fibroblasts*. ARVO, Ft. Lauderdale, FL, 2004.

38. Gentleman, E., Dee, K.C, **Nauman, E.A.**, and Livesay, G.A. *Controlled, Predictable Contraction of a Novel Collagen Composite Scaffold for Tissue Engineering*. Annual Meeting of the Biomedical Engineering Society (BMES), Philadelphia, PA, October 13-16, 2004.
39. Gentleman, E., Livesay, G.A., **Nauman, E.A.**, and Dee, K.C. *Adipocyte Maturation and Proliferation in Collagen Gels of Controlled Shape and Size*. Annual Meeting of the Biomedical Engineering Society (BMES), Philadelphia, PA, October 13-16, 2004.
40. Shimko, D.A., Franz Shimko, V., Sander, E.A., Dickson, K.F., and **Nauman, E.A.** *Mechanical Properties and Fluid Flow Characteristics of Porous Tantalum Scaffolds*. Annual Meeting of the Biomedical Engineering Society (BMES), Philadelphia, PA, October 13-16, 2004.
41. Franz Shimko, V., **Nauman, E.A.**, and Claycomb, W.C. *Mechanical Loading Enhances Structural Development of 3D Cardiac Tissue Engineered Constructs*. Annual Meeting of the Biomedical Engineering Society (BMES), Philadelphia, PA, October 13-16, 2004.
42. Sander, E.A., Shimko, D.A., and **Nauman, E.A.** *Cellular Solid Modeling of the Mechanics of the Lamina Cribrosa in Glaucomatous Axon Death*. Annual Meeting of the Biomedical Engineering Society (BMES), Philadelphia, PA, October 13-16, 2004.
43. Routh, R.H., Burshell, A.L., and **Nauman, E.A.**, "The Response to Bisphosphonates and No Treatment Varies on the Concave and Convex Sides of the Scoliotic Spine." ASBMR, M435, Seattle, WA, 2005.
44. Sander, E.A., Downs, J.C., Hart, R.T., Burgoyne, C.F., **Nauman, E.A.** *A Cellular Solid Model for Analysis of the Microstructural Mechanics of the Lamina Cribrosa*. ARVO Annual Meeting, May 1-5, 2005, in Fort Lauderdale, FL.
45. **Nauman, E.A.**, Sander, E.A., Down, J.C., Hart, R.T., Burgoyne, C.F. *Comparison of Animal Eye Geometries and Their Impact on Ocular Biomechanics*. ARVO Annual Meeting, May 1-5, 2005, in Fort Lauderdale, FL.
46. Galle, B.J., Ouyang, H., Shi, R., and **Nauman, E.A.** *Mechanical properties of the guinea pig spinal cord: A combined experimental and computational approach to determine hyperelastic material parameters*. National Neurotrauma Society Symposium, St. Louis, MO., July 7-9, 2006.
47. Ouyang, H., Galle, B.J., **Nauman, E.A.** and Shi, R. *Distinct pattern of axonal damage consistent with Von mises stress distribution in compressed spinal cord white matter*. National Neurotrauma Society Symposium, St. Louis, MO., July 7-9, 2006.
48. Dickerson, D.A., Sander, E.A., and **Nauman, E.A.** *Modeling the Mechanical Consequences of Vibratory Loading in the Vertebral Body*. Biomedical Engineering Society Annual Meeting, Chicago, IL, October 11-14, 2006.
49. Ouyang, H., Galle, B., **Nauman, E.A.**, and Shi, R. *The Distribution of Axonal Damage in Isolated Spinal Cord White Matter Subject to Compression*. Biomedical Engineering Society Annual Meeting, Chicago, IL, October 11-14, 2006.
50. Galle, B., Ouyang, H., Shi, R., and **Nauman, E.A.** *Longitudinal and Transverse Mechanical Properties of Porcine Spinal Cord*. Biomedical Engineering Society Annual Meeting, Chicago, IL, October 11-14, 2006.
51. Habeger, J., Al-Mischwit, H., Kerr, W., Mauck, M., Michlitsch, R., Schwinke, A., Hillberry, B., and **Nauman, E.A.** *Spinal Implant Wear Testing*. Biomedical Engineering Society Annual Meeting, Chicago, IL, October 11-14, 2006.
52. Schuff, M.M., **Nauman, E.A.**, and Gore, J.P. *Microstructural Models of Fluid and Heat Transfer in Tumors*. Biomedical Engineering Society Annual Meeting, Chicago, IL, October 11-14, 2006.
53. Sander, E.A. and **Nauman, E.A.** *Effects of Reduced Oxygen and Glucose Levels on Ocular Cells In Vitro*. Biomedical Engineering Society Annual Meeting, Chicago, IL, October 11-14, 2006.
54. Smith, L. and **Nauman, E.A.** *Poly(lactic-co-glycolic acid) with nano-scale topography influences murine mesenchymal stem cell function and differentiation*. Society for Biomaterials, Annual Meeting, Chicago, IL, 2007.

55. Feng, B., **Nauman, E.**, and Schild, J. *A Finite Element Model of Rat Aortic Arch for Mechanical Analysis about Baroreceptor Nerve Terminals*. Biomedical Engineering Society Annual Meeting, Los Angeles, CA, Sept. 27-29, 2007.
56. Gordon, T., Nobes, K. **Nauman, E.**, and Burshell, A.L. *Biomechanics of Scoliosis and its Effects on Postmenopausal Women*. Biomedical Engineering Society Annual Meeting, Los Angeles, CA, Sept. 27-29, 2007.
57. Schuff, M.M., **Nauman, E.**, and Gore, J. A Mixture Theory Analysis of Nanoparticle Transport in Normal and Malignant Breast Tissues. Biomedical Engineering Society Annual Meeting, St. Louis, MO, 2008.
58. Gordon, T. and **Nauman, E.** *Three Dimensional Unit Cell Model of Osteoporotic Vertebral Cancellous Bone*. Biomedical Engineering Society Annual Meeting, St. Louis, MO, 2008.
59. Cook, D.D., **Nauman, E.**, and Mongeau, L.,(2007) “Analytical methods for reducing the number of independent parameters required to model the vocal folds” Proceedings of the COMSOL Conference Oct. 4-6, 2007. Newton , MA. Edited by Dravid, V.
60. Cook, D.D., **Nauman, E.**, and Mongeau, L., (2008) “Parametric evaluation of vocal fold model sensitivities using population profiles.” The 6th International Conference on Voice Physiology and Biomechanics. Tampere, Finland, August 6-9 2008. (oral)
61. Cook, D.D., **Nauman, E.A.**, Mongeau, L., (2007) “Structural analysis of a three-layered vocal fold model.” 153rd Meeting of the Acoustical Society of America, Salt Lake City, June 4-8 2007. (poster)
62. Darryl A. Dickerson, Alexander Proctor, Davis Brimer, **Eric A. Nauman**, Donna M. Ebenstein. Elucidation of the Functional Relevance of Orthopaedic Interface Heterogeneity Using Mixture Theory. Biomedical Engineering Society Annual Meeting, 2009.
63. Darryl A. Dickerson, Alexander Proctor, Davis Brimer, **Eric A. Nauman**, Donna M. Ebenstein. Mechanical Properties of Sheep Shoulder Joint Tissues Measured by a Handheld Indenter. Biomedical Engineering Society Annual Meeting, 2009.
64. **Butz KD**, Chan DD, **Nauman EA**, Neu CP. Stress distributions determined in articular cartilage by nonlinear elasticity and MRI-based finite strain. *World Congress in Biomechanics*, Singapore, 2010.
65. **Butz KD**, Chan DD, **Nauman EA**, Neu CP. Moduli and stress patterns determined from heterogeneous MRI-based strains. *ASME Summer Bioengineering Conference*, Naples, FL, 2010.
66. T Talavage, L Leverenz, **E Nauman**, E Breedlove, U Yoruk, K Morigaki, M Robinson, D Miller, C Bouman, “Functionally-Observed Concussion in High School Athletes: Hidden Brain Injury with Lasting Effect?” *16th Annual Meeting of the Organization for Human Brain Mapping*, Barcelona, Spain, June 2010, #457 WTh.
67. T.M. Talavage, E.L. Breedlove, K.E. Morigaki, M.E. Robinson, R.D. Ranaweera, **E.A. Nauman** and L.J. Leverenz, “fMRI Assessment of Effects of Technique on Neurological Impairment in High School Football Players,” *19th Annual Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine*, Montreal, Quebec, Canada, May 2011, CD-ROM #3642. {Invited E-Poster}
68. V.N. Poole, E. Breedlove, M. Robinson, K. Morigaki, L. Leverenz, E. Nauman, U. Dydak and T. Talavage, “Asymptomatic high school contact sport athletes exhibit metabolic changes that correlate with head collision history,” *Neuroscience 2012*, New Orleans, LA, October 13–17, 2012, #552.07/L13.
69. Chan, D.D., Butz, K.D., **Nauman, E.A.**, Dickerson, D.A., and Neu, C.P. “Altered Internal Strain Distributions in Adult Ovine Cartilage Before and After Full-Thickness Cartilage Defect.” *ASME Summer Bioengineering Conference*, Fajardo, PR, June 20 – 23, 2012.

70. Ouyang, H., **Nauman, E.**, Shi, RY. “Contribution of cytoskeletal elements to the mechanical property of axons.” *IEEE Biennial University/Government/Industry Micro-Nano Symposium*, West Lafayette, IN, June 28 – July 1, 2010.
71. Beier, B.L., Brandner, E.M., Musick, K.M., Matsumoto, A., Panitch, A., **Nauman, E.A.**, Irazoqui, P.P. “Preliminary Characterization of a Glucose-Sensitive Hydrogel.” *IEEE 32nd Annual International Conference*. Buenos Aires, Argentina, August 30 – September 04, 2010.

Professional Memberships

(Past and Present)

American Society of Mechanical Engineers, Associate Member; Biomedical Engineering Society, Member; American Society of Bone and Mineral Research, Member; American Society for Engineering Education, Member; Tau Beta Pi National Engineering Honor Society, Member; Pi Tau Sigma Mechanical Engineering Honor Society, Member; National Society of Black Engineers, Member; National Neurotrauma Society, Member; Association for Research in Vision and Ophthalmology, Member.

Courses Taught

Purdue University

(excluding sections of EPICS taught continuously since Fall 2005)

Course	Semester	Number of Students	Instructor Rating*
<i>ME 270 – Basic Mechanics I</i>	Fall 2004	102	4.4
<i>BME 601 – Principles of Biomedical Engineering I**</i>	Fall 2004	16	4.6
<i>ME 274 – Basic Mechanics II</i>	Spring 2005	70	4.5
<i>ME 597K – Human Motion Kinetics †</i>	Spring 2005	NA	NA
<i>ME 270 – Basic Mechanics I</i>	Summer 2005	82	4.6
<i>ME 270 – Basic Mechanics I</i>	Fall 2005	116	4.5
<i>ME 697S – Continuum Mechanics</i>	Fall 2005	7	4.8
<i>ME 577 – Human Motion Kinetics</i>	Spring 2006	13 [8]	4.8 [4.75]
<i>ME 270 – Basic Mechanics I</i>	Summer 2006	88	4.8
<i>ME 577 – Human Motion Kinetics</i>	Spring 2007		
<i>ME 274 – Basic Mechanics II</i>	Summer 2007		
<i>ME 270 – Basic Mechanics I</i>	Fall 2007	121	4.7
<i>ME 270 – Basic Mechanics I</i>	Fall 2007	128	4.8
<i>BME 541 – Biomedical Fluid Dynamics</i>	Fall 2007	20	4.9
<i>ME 297H – Engineering Disasters**</i>	Fall 2007	22	4.3
<i>ME 577 – Human Motion Kinetics</i>	Spring 2008	33	?
<i>ME 274 – Basic Mechanics II (co-taught)</i>	Summer 2008	43	?
<i>ME 270 – Basic Mechanics I (Section 1)</i>	Fall 2008	135	4.5
<i>ME 270 – Basic Mechanics I (Section 2)</i>	Fall 2008	135	4.9
<i>ME 297H – Multiphysics Modeling</i>	Fall 2008	6	4.9
<i>ME 577 – Human Motion Kinetics</i>	Spring 2009	20	4.3
<i>BME 595 – Stem Cells for Tissue Engineering</i>	Spring 2009	9	4.3
<i>ME 270 – Basic Mechanics I</i>	Fall 2009	74	4.8
<i>ME 697/BME 695 – Biomedical Fluid Dynamics</i>	Fall 2009	13	4.9

<i>ME 577 – Human Motion Kinetics</i>	Spring 2010	32	4.9
<i>ENGR 103 – Visualization in Engineering</i>	Fall 2010	25	4.5
<i>ME 270 – Basic Mechanics I (S)</i>	Fall 2010	120	4.7
<i>ME 297H – Engineering Disasters</i>	Fall 2010	15	4.9
<i>ME 597 – Computational Fluid Mechanics and Biology</i>	Spring 2011	5	4.7
<i>ME 577 – Human Motion Kinetics</i>	Spring 2011	36	4.8, 4.7
<i>ME 297H – Biological Applications of Transport</i>	Spring 2011	4	5
<i>ME 270 – Basic Mechanics I</i>	Summer 2011	89	4.8
<i>ME 597 – Introduction to Continuum Physics and Applied Mathematics</i>	Fall 2011	14	4.8
<i>ME 270 – Basic Mechanics I (S)</i>	Fall 2011	120	4.6
<i>ME 297H – Engineering Disasters</i>	Fall 2011	6	4.5
<i>ME 697/BME 595 Biomedical Fluid Dynamics</i>	Spring 2012	17	5.0*
<i>ME 577/BME 595 Human Motion Kinetics</i>	Spring 2012	67	5.0*
<i>ME 270 – Basic Mechanics I (S)</i>	Fall 2012	119	4.7
<i>BME 595 – Continuum Models in Biomedical Engineering</i>	Fall 2012	7	5
<i>ME 577 – Human Motion Kinetics</i>	Spring 2013	16	5.0
<i>ME 270 – Basic Mechanics I (S)</i>	Spring 2013	120	4.2
<i>ME 270 – Basic Mechanics I (S)</i>	Fall 2013	109	4.7
<i>HONR – History of Great Ideas</i>	Fall 2013	11	5.0
<i>BME 595 – Continuum Models in Biomedical Engineering</i>	Fall 2013	11	4.6
<i>ME 297H – Engineering Disasters</i>	Fall 2013	7	4.8
<i>ME 697/BME 595 Biomedical Fluid Dynamics</i>	Spring 2014	9	4.8
<i>ME 577/BME 595 Human Motion Kinetics</i>	Spring 2014	45	4.7
<i>ME 270 – Basic Mechanics I (with honors section)</i>	Fall 2014	112	4.8

<i>BME 595 – Continuum Models in Biomedical Engineering</i>	Fall 2014	14	4.9
<i>HONR 399 – It's a Complex World</i>	Fall 2014	14	4.8
<i>HONR ??? – Toy Design</i>	Spring 2014	25	

* Average student response to: “Overall, I would rate this instructor as:” of the course evaluation (5 = highest, 1 = lowest).

** Teaching obligation was 1/2 of one semester. † Teaching obligation was 1/3 of one semester.

Brackets indicate distance learning students. * Only responses from the BME offering were available through the online course survey system.

Courses Taught – Tulane University

Course	Semester	Number of Students	Instructor Rating*	SOE Median Instructor Rating
ENGR 241 – Statics	Fall, 2000	57	1.0	1.8
BMEN 665 – Structure-Function Relationships in Biological Tissues	Spring, 2001	13	1.3	1.7
ENGR 241 – Statics	Fall, 2001	65	1.1	1.9
BMEN 663 – Mechanics of Collisions and Human Injury	Spring, 2002	11	1.2	1.8
ENGR 241 – Statics	Fall, 2002	77	1.0	1.7
BMEN 663 – Mechanics of Collisions and Human Injury	Spring, 2003	22	1.45†	Not Available
ENGR 241 – Statics	Fall, 2003	63	1.0	Not Available
BMEN 631 – Continuum Models in Biomedical Engineering	Fall, 2003	16	Not Available	Not Available
BMEN 652 – Biophysics and the Cell	Spring, 2004	21	1.4	1.7

* Average student response to Question 16 of the School of Engineering (SOE) Course Evaluation (1 = highest and 5 = lowest). † indicates first semester of online evaluations.

Student Advising – Primary Advisor

Ph.D. Students (Green text indicates Tulane students, black text indicates Purdue students)

1. Dan A. Shimko (Conferred 2004) – Design and Optimization of a Tissue-Engineered Bone Graft Substitute.
2. Kathleen L. Rea Fureigh (Conferred 2004) – Development of an In Vitro Model of Parkinsonian Degeneration.

3. Edward A. Sander (Conferred 2006) – A Link Between Ischemia and Mechanical Failure in the Optic Nerve Head.
4. Eileen Gentleman (Conferred 2005) – Collagen-Based Biomaterials for Soft Tissue Engineering. (Co-advisors, KC Dee, Glen Livesay).
5. Dawn Sabados (Conferred 2005) – Autofluorescence Imaging of Cell Level Metabolic Activity and Dependence on the Microenvironment.
6. Beth Galle (Conferred 2008) – A Combined Experimental and Computational Approach to Investigate the Mechanism of Spinal Cord Slow Compression Primary Cellular Injury.
7. Darryl Dickerson (Conferred 2009) – Development of a Naturally Derived Biomaterial with Controlled Regional Extracellular Matrix Heterogeneity for Orthopaedic Interface Regeneration.
8. Lester Smith (Conferred 2009) – A Practical Analysis of Adipose Stromal Cell Functional Differentiation Response to Multiple Microenvironmental Stimuli.
9. Cathy Slater (Conferred 2009) – Patient-Specific Three-Dimensional Geometric Segmentation and Model Development for use with Image-Guided Robotics Systems for Minimally Invasive Spine Surgery.
10. Theresa Gordon (Conferred 2010)– Development of Mathematical Models for the Improvement of Healthcare Delivery to Patients with Osteoporosis.
11. Mary Schuff – (Conferred 2010) Multiphysics models of fluid and solute transport in the microvasculature of normal and malignant breast tissues with application to the detection and treatment of cancer (Co-advisor, Jay Gore)
12. Byron Deorosan – (Conferred 2011) In Vitro Metabolic Assessment of Bone Marrow-Derived Stem Cells and its Application to Central Nervous System Trauma.
13. Monica Susilo – (Conferred 2011) A Combined Unit Cell and Mixture Theory Model to Investigate Cell Microenvironment in Three-Dimensional Fibrillar Extracellular Matrix During Dynamic Loading. (Co-advisor, Klod Kokini)
14. Scott Van Dyke – Biophysical Factors Affecting Regeneration of the Enthesis (Co-advisor, Ozan Akkus)
15. Kent Butz – Computational Modeling of Stresses in the Knee and Spine
16. Evan Breedlove – Computational Modeling of Physical Insults to the Brain

M.S. Students (Green text indicates Tulane students, black text indicates Purdue students)

1. Richard M. Morency (Conferred 2003) Application of the Serret-Frenet Basis for the Analysis of Variation of Accelerations on Roller Coaster Passengers. Co-advised with Dr. Glen A. Livesay.
2. Kirsten E. Lewus (Conferred 2004) The Development and Analysis of a Bone Marrow Stromal Cell-Seeded Collagen Based Composite Soft Tissue Graft.
3. Jayna Belt (Conferred 2004) A Theoretical Model of Osteophyte Formation on the Human Spine and its Relationship to Osteoporosis.
4. Dawn Reda (Conferred 2004) Experimental and Theoretical Analysis of Shoe-Surface Interactions and Their Relationship to Knee Injuries.
5. Jeremie Wade (Conferred 2005) – An Investigation of Ovine Lumbar Kinematics Using the Purdue Spine Simulator. (Co-advisor, Ben Hillberry)
6. Kim Campana (Conferred 2005) – Finite Element Analysis of the Lumbar Spine to Evaluate the Performance of a Total Facet Arthroplasty System. (Co-advisor, Ben Hillberry)
7. Michael Wilczek (Conferred 2008) – In Vitro Lumbar Spine Testing with Simulated Muscular Preloads
8. Jarren Stratton (Conferred 2006) – Limited Wavelength IR Sensing of Glucose and E. Coli. (Co-advisor, Jay Gore)

9. Jason Habeger (Conferred 2007) – Effects of Implant Offset on the Wear Characteristics of an Artificial Disc Replacement Analogue.
10. Kent Butz (Conferred 2008) – Analysis of Forces and Stresses Incurred in the Joints of the Hand and Development of a Magnetic Composite for Use in Finger Joint Replacements.
11. Kara Tellio (Conferred 2009) – Wear Analysis of an Intervertebral Disc Replacement Analogue: Effect of Implant Offset.
12. Becky Gunn (Conferred 2009) – Continuum Characterization of Flexible Foams for Medical Applications and Computational Evaluation of Pressure Profile.
13. Demetri Andrisani (Conferred 2009) – Determination of the Transport Properties of Brain Tumors Using Contrast-Enhanced Magnetic Resonance Imaging.
14. Justin Floro (Conferred 2010) – High Strain Cervical Spinal Cord Stresses During Motor Vehicle Accidents.
15. Jocelyn Dunn (Conferred 2011) – Tissue Engineering of a Naturally-Derived Scaffold with Adjustable Mechanical Properties, Modified Surface Chemistry, and Interconnected Pores.
16. Anne Dye (Conferred 2011) – Design of Micro- and Macro-Scale Impact Mitigating Material Toward the Development of Helmet Padding Design Criteria.
17. Julia Alspaugh – Next Generation Orthopaedic Implants.

Undergraduates (Senior Thesis Projects)

1. Nelson Anderson (2000 – 2001) Effects of Various Surface Coatings on the Differentiation of Bone Marrow Stem Cells into Neurons and Their Long-Term Survival.
2. Crystal Simon (2000 – 2001) Neural Adult Marrow Stromal Cell Culture in Collagen Gels: The Mechanical Effects of Cross-linking with Chondroitin-6-Sulfate.
3. Richard Michael Morency (2000 – 2001) Development and Application of a Combined Modeling and Imaging Method for Determining Biomechanical Response of Roller Coaster Passengers. Co-advised with Dr. Glen A. Livesay.
4. Scot M. Campbell (2000 – 2001) Development of an On-Site Testing Device for Biomechanical Testing of Athletic Surfaces. Co-advised with Dr. Glen A. Livesay.
5. Robert Routh (2001 – 2002) A Study of Bone Adaptation in the Scoliotic Spine when Affected by Osteoporosis.
6. Sara Rumancik (2001 – 2002) Mechanical Analysis and Bone Adaptations in the Scoliotic Spine.
7. Luke Hooper (2001 – 2002) Experimental Cushioning Characterization Techniques for Athletic Shoes. Co-advised with Dr. Glen A. Livesay.
8. Michael Palazzolo (2001 – 2002) Design of a Device for the Analysis of Insole Shear Force During Gait for Diabetic Patients with Peripheral Neuropathy. Co-advised with Dr. Glen A. Livesay.
9. Matthew Struck (2001 – 2002) Development of an Umbilical Cord Blood-Derived Fibrin Gel for 3D Neural Grafts.
10. Megan M. Kaneda (2001 – 2002) Validation of the Existence of Spore-Like Stem Cells. Co-advised with Dr. K. C. Dee.
11. Jennifer Berumen (2001 – 2002) Verification and Characterization of “Spore-Like” Cells in Rats. Co-advised with Dr. K. C. Dee.
12. Meghana Kamath (2001 – 2002) Design of a Device to Isolate Mesenchymal Stem Cells from Bone Marrow.
13. Jayna Belt (2001 – 2002) A Dynamic Model of Calcium Homeostasis in the Body.
14. Stephen Holmberg (2002 – 2003) A Device for Applying Biaxial Loads to Cell-Seeded Collagen Gels.

15. John Vu (2002 – 2003) The Effect of Electromagnetic Field Stimulation on the Proliferation of Stem Cells.
16. Jessica Tyra (2002 – 2003) Locomotor Function of Neandertals as Compared to that of both Archaic and Modern Species in the Hominid Lineage. Co-advised with Dr. Glen A. Livesay.
17. Fred E. Woods, IV (2002 – 2003) Cellular Solid Models of the Lamina Cribrosa.
18. Elizabeth M. Novick (2002 – 2003) A Biomechanical Analysis of Ball-Head Impacts in Soccer.
19. David R. Houston (2002 – 2003) Development of a Microelectrode Apparatus for Stimulation of Gel Mediums.
20. Lori Townsend. (2002 – 2003) Investigation of the Existence of Spinal Cord Tissue-Derived Spore-Like Stem Cells. Co-advised with Dr. K. C Dee.

Student Advising – Thesis Committee Member

Ph.D. Students

1. Anthony Bellezza (2001 – 2002) Biomechanical Properties of the Normal and Early Glaucomatous Optic Nerve Head: An Experimental and Computational Study Using the Monkey Model.
2. Anastacia Bilek (2000 – 2003) Investigations of Distal Airway Epithelial Cell Responses to Mechanical Stresses in Relation to Acute Lung Injury.
3. Danielle C. Giliberti (2001 – 2003) The Effects of Bone Growth Factors and Integrin-Binding Peptides on Osteoblast Function.
4. Kyle White (2001 – Present) The Effects of Mechanical Loading on Three-Dimensional Scaffolds Seeded with Osteoblasts.
5. Eileen Gentleman (2002 – Present) Controlling the Permeability and Mechanical Properties of Collagen Matrices for the Engineering of Soft Tissues.
6. Inchan Youn (2000 – 2003) Osteogenic Properties of the Periosteum: *In Vitro* Characterization and its Potential Application to Bone-Tunnel Healing.

M.S. Students

1. Adam Sorkin (2000 – 2002) Development of Biodegradable Polymer Scaffolds with Highly Organized Microarchitecture for Bone Tissue Engineering.
2. Vinoop Daggubati (2000 – 2002) Experimental Investigation of the Hydraulic Permeability in Bovine Flexor Tendon.
3. Christopher J. Rintalan (2001 – 2002) Measures of Anterior Scleral Canal Architecture within Sagittal Sections of Normal and Early Glaucomatous Monkey Optic Nerve Heads.
4. Elizabeth J. Tritschler (2001 – 2002) Cell Functions on Substrates Modified with Novel Peptides Derived from Basic Fibroblast Growth Factor.
5. Kristina M. Smith (2001 – 2002) Variation of Collagen Crimp Microstructure in Ligaments and Tendons.
6. Andrea N. Lay (2001 – 2002) Fabrication and Characterization of Fibrous Scaffolds as Potential Ligament Analogues.
7. Eileen D. Gentleman (2001 – 2002) Studies Towards Assessing the Biological and Mechanical Effects of Applying Controlled Cyclic Strain to Cell/Soft Tissue Constructs *In Vitro*.
8. Li Cao (2002 – 2003) Experimental Investigation of Biphasic Poroviscoelastic Model of Articular Cartilage.
9. Maximillian E. Zimmer (2002-2003) Investigations of Surfactant Transport During Oscillatory Airway Reopening.
10. Torrence D. J. Welch (2002-2003) Correlation of the Acoustic, Mechanical, and Biochemical Properties of Human Articular Cartilage: Implications in the Evaluation and Diagnosis of Osteoarthritis.

Undergraduates (Honors Thesis Projects)

1. Kimberly A. Bridges (2000) The Development of a Non-Contact Method of Measuring Cross-Sectional Area of Engineered Tissues.
2. Ronald S. Winokur (2000 – 2001) Electrographic Seizures and New Recurrent Excitatory Circuits in the Dentate Gyrus of Hippocampal Slices from Pilocarpine-Treated Mice.
3. Jadrien A. Young (2000 – 2001) Strength of Adhesion of Lung Epithelial Cells.
4. Sarah J. Cohen (2000 – 2001) Periosteum Use in Tendon-Bone Tunnel Healing: An *In Vitro* Study.
5. Kevin J. Wasco (2001 – 2002) Multi-Axial Functional Evaluation of Normal Anterior Cruciate Ligament and Replacement Graft.
6. Darryl A. Dickerson (2001 – 2002) Creation of a Tissue-Engineered Soft Tissue-Hard Tissue Interface Through Cytokine Diffusion.
7. Alycia M. Wanat (2001 – 2002) Three-Dimensional Characterization of a Normal Soft Tissue to Hard Tissue Enthesis.
8. Joseph E. Olberding (2001 – 2002) A Comparative Study of Viscoelastic and Biphasic Poroviscoelastic Computational Models of the Brain for Simulating Traumatic Injury.
9. Melanie Ross. (2002 – 2003) A Critical Investigation of the Existence of Spore-Like Stem Cells.
10. Manuel A. Figueroa. (2002 – 2003) Adaptation of a Liquid Cooling/Warming Garment for Performance Enhancement.
11. Mary Margaret Seale (2002 – 2003) Development of a Method to Examine Regional Surface Strains Near the Ligament Bone Interface of the Medial Collateral Ligament.
12. April E. Austin. (2002 – 2003) Investigation of Vacuum as a Cell-Seeding Technique for Three-Dimensional Scaffolds.

Selected Media Appearances (Engagement and Outreach)

Television Appearances

- Purdue and Jeff High School teaming up. J. Krizen, WLFI Channel 18 News. Aug. 7, 2009.
- Football hits affect without symptoms. WLFI Channel 18 News. Oct. 3, 2010.
- Purdue researchers track football concussions. D. MacAnally, Eyewitness News, WTHR. Oct. 9, 2010.
- Hard tackles just as bad as concussions for football players. CNN American Morning. Oct. 27, 2010.
- Deep Impact. Robert Bazell, NBC Nightly News. Oct. 27, 2010.
- Research Measures Power of Football Hits. Dan Spehler, WRTV Channel 6 News. Oct. 29, 2010.
- Changes found in football players thought to be concussion-free. H. Feldmeyer, BoilerBytes. Big Ten Network. Nov. 24, 2010.
- NOVA – Making Stuff Safer, 2013.

Magazine Appearances

- Head Injury Study Scores Early Touchdown. K. Mayer, Purdue ECE Impact. Spring 2010.
- The Damage Done. David Epstein, Sports Illustrated. Nov. 1, 2010.
- Blows to the Brain: Insight from Tragedy. signaPULSE. Autumn, 2010. ppg. 64-67.
- Head Game, Josh Dean, Hemispheres Inflight Magazine. Jan. 1, 2011.

Newspaper Appearances

- E. Weddle, Journal & Courier. Aug. 21, 2009.

- Friday night lights' risk: 1,800 hits to the head. Rex W. Huppke, Chicago Tribune. Oct. 6, 2010, Sec. 1, Pg. 1.
- Purdue study sheds light on football-related trauma. Nathan Baird, Journal & Courier. Oct. 7, 2010, Sec. A, Pg. 1.
- Undiagnosed brain damage possible: Purdue study finds players can suffer injury without showing concussion symptoms. Nat Newell, Indianapolis Star. Oct. 7, 2010, Sec. C, Pg. 1.
- Gray Matter: Attitudes toward brain injuries changing with more knowledge: fMRI gauges concussions in high school football players. Scott Sandsberry, Yakima Herald, online ed. Oct. 29, 2010.

Radio Appearances

- Live interview KRLD 1080, Dallas, TX. Oct. 4, 2010.
- Interview. S. Klemet, WBAA 920 News, West Lafayette, IN. Oct. 27, 2010.
- Interview. Joe Staysniak, Big Joe Show, 1070 The Fan, Indianapolis, IN. Oct. 27, 2010
- Head Games. R. Meyer, InfoTrak, TalkZone Talk Channel. Nov. 5, 2010.

Online Appearances (Selected)

- Ten Things I Think I Think. Peter King, Monday Morning Quarter Back. Nov. 1, 2010.
- fMRI gauges concussions in high school football players. Wayne Forrest, AuntMinnie.com. Nov. 22, 2010.
- Brain Changes Found in Football Players Without Concussion. Lisa Collier, healthymagination. Nov. 29, 2010.
- The National Brain-Damage League. Shankar Vedantam, Slate. Jan. 18, 2011.

Contact Information

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