

Michael J. McShane
Curriculum Vitae
Current as of December 2, 2014

Professor, Texas A&M University
Department of Biomedical Engineering & Department of Materials Science and Engineering
5065 Emerging Technologies Building / MS 3120
College Station, TX 77843-3120
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mcshane@tamu.edu

EDUCATION

B.S., *Magna Cum Laude*, Bioengineering, December 1994, Texas A&M University.

Ph.D., Biomedical Engineering, August 1999, Texas A&M University.

Design of an optical probe and signal processing for an implantable fluorescence-based glucose sensor

PROFESSIONAL EXPERIENCE

- 09/13-Present *Professor of Biomedical Engineering*: Teach Biomedical Engineering undergraduate and graduate classes; Lead research in biomedical applications of nanotechnology, biosensors, and biomaterials microfabrication; Lead departmental initiatives for excellence, growth, outreach, and expansion of expertise; Texas A&M University, College Station, TX.
- 07/06-08/13 *Associate Professor of Biomedical Engineering*: Teach Biomedical Engineering undergraduate and graduate classes; Lead research in biomedical applications of nanotechnology, biosensors, and biomaterials microfabrication; Texas A&M University, College Station, TX.
- 11/06-Present *Faculty Member, Materials Science and Engineering Interdisciplinary Program*: Conduct research and mentor students in materials science/engineering, Texas A&M University, College Station, TX.
- 09/05-07/06 *Interim Director*, Center for Biomedical Engineering and Rehabilitation Science, Louisiana Tech University, Ruston, LA.
- 09/04-07/06 *Associate Professor of Biomedical Engineering*: Teach Biomedical Engineering undergraduate and graduate classes; Lead research in biomedical applications of nanotechnology, biosensors, and biomaterials microfabrication; Louisiana Tech University, Ruston, LA.
- 08/04-07/06 *Program Chair, PhD in Biomedical Engineering*: Advise, recruit, retain students; secure and award fellowships; coordinate and assess curriculum.
- 09/99-08/04 *Assistant Professor of Biomedical Engineering*: Teach Biomedical Engineering undergraduate and graduate classes; Conduct research in biomedical applications of μ -manufacturing, nanotechnology, and optics; Advise students on academic issues: Louisiana Tech University, Ruston, LA.
- 09/96-08/99 *Predoctoral Fellow*: Research in optical and fiber optic physiological sensors: Texas A&M University, College Station, TX.
- 01/96-08/96 *Research Assistant*: Research in near-infrared sensors for monitoring components of cell culture media: Texas A&M University, College Station, TX.
- 01/95-12/95 *Graduate Fellow*: Research in near-infrared sensors for monitoring components of cell culture media: Texas A&M University, College Station, TX.
- 05/94-12/94 *Undergraduate Researcher*: Research in mathematical and statistical processing of spectral data: Texas A&M University, College Station, TX.
- 05/93-05/94 *Co-op Experience*, NIH, Bethesda, MD.

HONORS AND AWARDS

TEES Faculty Fellow, TAMU, 2014-2015

E.D. Brockett Professorship, TAMU, 2010-2011

George Armistead '23 Faculty Fellow, TAMU, 2008.

George Armistead '23 Faculty Fellow, TAMU, 2007.

W.W. Chew Professor of Engineering, LA Tech, 2004-2006.

COES Nominee for the Virgil Orr Junior Faculty Award, LA Tech, 2004.

Outstanding Young Scientist, Houston Society for Engineering in Medicine and Biology, 2/2004.

Research Excellence Award—"Million Dollar Club," College of Engineering and Science, LA Tech University, 9/2002.

Researcher of the Year, Sigma Xi National Society, LA Tech Chapter, 5/2002.

Research Excellence Award—"NSF EPSCoR Grant Team," College of Engineering and Science, LA Tech, 9/2001.

Distinguished Graduate Award, Texas A&M Assoc. of Form. Stud., 4/2000.

RESEARCH GRANTS

Current

- “Redundant Multimode Chemo-optical Transducers,” *NSF Nano-Biosensing Program*, PI: McShane. \$328,805, 08/01/2014-07/31/2017.
- “Implantable multi-analyte sensors for the continuous monitoring of body chemistries”, *NIH Director’s Transformative Research Award*, PI: McShane, Wisniewski; \$4,122,519 (TAMU portion: \$1,244,657), 09/15/12-06/30/16.
- “Multiscale Smart Coatings with Sustained Anticorrosive Action,” *NSF / The G8 Research Councils Initiative on Multilateral Research Funding* (international PI: Möhwald; US PI: Lvov; sub PI: McShane) \$150,000 subcontract value (€1,350,000 total), 6/1/2012-5/31/2015.
- “Energy Transfer Between Nanomaterials: Fundamentals and Sensor Applications,” *NSF Biosensing Program (CBET)*, \$380,000, 8/15/2011 – 07/31/2014.

Completed

- "Microstructures for Control and Guidance of Smooth Muscle Cell Growth," *Louisiana Board of Regents Research Competitiveness Subprogram*, \$125,000, 7/2001-6/2004 (Co-Inv).
- "Fabrication and testing of a Fabry-Perot spectrometer and integrated liquid channel using surface micromachining," *Defense Intelligence Agency MASINT Program Contract* (through Sandia National Labs), \$100,000, 3/2001-12/2001, (Co-Inv).
- "Fluorescent nanoparticles for monitoring extracellular and intracellular electrolyte levels," *The Rockefeller Brothers Fund Biomedical Pilot Initiative*, \$24,766, 7/1/01-6/30/2002 (PI).
- "Instrumentation for a Fiber Optics Laboratory," *Louisiana Board of Regents Enhancement Program*, \$47,048, 7/1/2002-6/30/2003, (co-PI).
- "Nanoengineered Fluorescent Sensors for Monitoring Neural Biochemical Dynamics," *The Whitaker Foundation Grants for Young Investigators*, \$239,318, 6/2001-5/2004 (PI).
- "Optical Nanosensors for Medical and Biological Applications," *Louisiana Board of Regents Research Competitiveness Subprogram*, \$147,744, 7/2001-6/2004 (PI).
- "The Louisiana Microsystems Development Initiative: Toward Low-cost (Bio)chemical Production and Environmental Monitoring," *NSF/EPSCoR Research Infrastructure Initiative*, \$3,000,000, 1/2001-12/2004, (Co-Inv).
- "BioMEMS and Biomedical Nanotechnology Training Laboratory and Instrumentation," *Louisiana Board of Regents Enhancement Program*, \$118,060, 7/1/2003-6/30/2004, (PI).
- "Nanoengineered Shells for Encapsulation and Controlled Release," *NSF Nanoscale Interdisciplinary Research Team*, \$901,103, 9/1/2002-8/31/2006, (co-PI).
- "One-Two-Three-Go-A Strategic Initiative for Rapid Research Competitiveness in Microsystems Development," *Louisiana Board of Regents Departmental Excellence through Faculty Excellence*, \$911,000, 6/2000-present, (Co-Inv).
- "Nanoscale Biotechnology: Molecules, Methods, Devices, and Applications" *Louisiana Board of Regents Governor's Biotechnology Initiative*, \$1,950,000, 1/1/2003-12/31/2007, (co-PI).
- "Innovative Ventures for Emerging Technologies in Rural North Louisiana," *NSF Partnerships for Innovation*, \$599,937, 11/1/2003-10/31/2006 (co-PI).
- “Undergraduate Experiences in Micro and Nano Engineering,” *NSF Research Experiences for Undergraduates*, \$365,087, 2/1/03 – 1/30/06 (co-Inv).
- “Novel Micro/Nano Approaches to Glucose Measurement with pH-Sensitive Hydrogels,” *US Army – Technologies for Metabolic Monitoring (Glucose sensors)*, \$300,000, 6/1/2004-5/31/2006, (PI).
- “Graduate Fellows in Biomedical Engineering,” *LA BoR Graduate Fellows Program*, \$286,500, 7/1/06-6/30/09 (PI).
- “Acquisition of a Field Emission Scanning Electron Microscope for Nanotechnology Research, Training, and Education,” *NSF Major Research Instrumentation*, \$524,875, 8/15/05-8/14/08 (co-PI).
- “Hydrogel Scaffolds for Corneal Tissue Engineering,” *NIH IDeA Networks of Biomedical Research Excellence*, \$499,222, 10/1/05-9/30/10 (mentor for Dr. Huiguang Zhu).
- “A Modular Lab-in-a-Sphere: Multifunctional Nanoparticles Incorporated within Hydrogel Microspheres,” *NSF Nanoscale Exploratory Research*, \$100,000, 8/1/05-7/31/07 (PI).
- "Fluorescent Glucose Sensors from Polyion Shells," *NIH R01 - Sensor Development and Validation*, \$1,328,872, 9/30/2002-8/31/2007, (PI).
- “Engineering Nanocomposite Diffusion-Limiting Membranes for Biosensors” *NSF Bioengineering Research Grants*, \$276,196, 6/1/06-5/31/10 (PI).
- “Advanced BioMaterials as Implantable Chemical Sensors (BioMICS),” DARPA/DoD subcontract from PROFUSA, Inc. (McShane, sub. PI; PI: Wisniewski) \$86,387 subcontract value, 3/15/2011 – 12/1/2011.
- “Nanosphere Encapsulation of Active Enzymes,” PROFUSA, Inc., \$45,000, 7/1/2012-12/31/2012.
- “Effects of Oxygen on Optical Glucose Sensors,” PROFUSA, Inc., \$45,000, 3/1/2012-3/31/2013.
- “Long-Term Fluorescence-Based Glucose Monitoring,” *NIH R43 Artificial Pancreas Grant*, subcontract from PROFUSA, Inc. (PI: Wisniewski; subcontract PI: McShane) \$199,989 subcontract value (\$750,000 total), 9/15/2011 – 8/14/2014. (In final report, Phase II application stage)

STUDENTS GRADUATED (TOTAL: 16 MS, 14 PHD, 4 POSTDOCTORAL SCHOLARS)

Name, Degree, Date – Initial or Current Position, if Known

(MS Graduates from Louisiana Tech University)

Urvi Gururaj Shenoy, MS Biomedical Engineering, May 2002 – Manager of Honeywell’s India MEMS Division
Swetha Chinnayelka, MS Electrical Engineering, August 2002 – Finished Ph.D. at LA Tech (see below)
David Chang-Yen, MS Biomedical Engineering, August 2002 – Finished Ph.D. at University of Utah, now with Wasatch Microfluidics Inc., Taylorsville, UT
Javeed Shaikh Mohammed, MS Electrical Engineering, November 2002 – Finished Ph.D. at LA Tech (see below)
Ravi Deverkadra, MS Biomedical Engineering, November 2002 – Research Engineer, CardioMEMS, Atlanta, GA
Kishore Kondabatni, MS Biomedical Engineering, November 2002 – Research Engineer, Icon Interventional Systems, Cleveland, OH
Michael Barnidge, MS Biomedical Engineering, August 2003 – Completed M.D. at LSUHSC-Shreveport, LA
John Glawe, MS Biomedical Engineering, November 2003 – Research Technician, Biomedical Research Institute, Shreveport, LA
Swati Kaul, MS Electrical Engineering, March 2004 – status unknown
Deepti Terala, MS Biomedical Engineering, March 2004 – St. Jude, Memphis, TN
Amitava Sen, MS Biomedical Engineering, November 2004 – status unknown
Ryan Simpson, MS Biomedical Engineering, May 2005 – Research Technician, Biomedical Research Institute, Shreveport, LA
Kevin Driggers, MS Biomedical Engineering, November 2005 – Biomedical Engineer, HealthCareFirst, Springfield, MO
Aaron Mack, MS Molecular Science and Nanotechnology, November 2006 – Research Assistant, UT Health Science Center, Houston, TX

(PhD Graduates from Louisiana Tech University)

Mengyan Li, PhD Engineering, August 2003 – Research Associate Professor, Drexel University, Philadelphia, PA
Patrick Grant, PhD Biomedical Engineering, May 2004 – Product Manager, Alcon, Dallas, TX
Rohit Srivastava, PhD Biomedical Engineering, May 2005 – Associate Professor, School of Biosciences and Bioengineering, Indian Institute of Technology - Bombay
Suman Nayak, PhD Biomedical Engineering, May 2005 – Research Scientist, Human Genome Sciences, Rockville, MD
Quincy Brown, PhD Biomedical Engineering, August 2005 – Assistant Professor, Tulane University
Swetha Chinnayelka, PhD Engineering, November 2005 – Technology Development Engineer, Bayer Medical, NJ
Javeed Shaikh Mohammed, PhD Engineering, May 2006 – Assistant Professor, Biomedical Technology, College of Applied Medical Sciences, King Saud University, Saudi Arabia
Erich Stein, PhD Biomedical Engineering, November 2006 – Product Design Engineer, Avail Medical, Irving, TX

(Graduates from Texas A&M University)

Saniya Ali, MS Biomedical Engineering, December 2010 – Ph.D. Candidate, Duke University
Saurabh Singh, PhD Biomedical Engineering, May 2010 – Research Associate, Los Alamos National Lab, NM
Ruiqi Long, PhD Biomedical Engineering, May 2012 – Optical Design Engineer, Hysitron, Silicon Valley, CA
Jaebum Park, PhD Materials Science and Engineering, August 2012 – Hyundai, Detroit, MI
Merene Phillip, MS Biomedical Engineering, May 2013 – IT Consultant, Dallas, TX
Bradley Collier, PhD Biomedical Engineering, May 2012 – Postdoctoral Scholar at UC-Davis medical center, Sacramento, CA
Jason Roberts, PhD Biomedical Engineering August 2014 – Medical device application reviewer, US FDA, Silver Spring, MD
*Dustin Ritter, PhD Biomedical Engineering, December 2014 – Postdoctoral Scholar at Dept of Chemistry, Pennsylvania State University, State College, PA **Has completed all requirements for graduation*

(Postdoctoral Scholars)

Huiguang Zhu, Sulolit Pradhan, Jitendra Solanki, Sakib Elahi

CURRENT STUDENTS (6 PHD, 1 MS) **indicates student has passed qualifier and been admitted to candidacy*

Ashvin Nagaraja, BS Electrical Engineering, Kansas State (PhD BMEN)
Rachel Unruh, BS Engineering, Baylor University (PhD BMEN)
Aniket Biswas, BSE, ME Biotechnology, IIT Karaghpur (PhD BMEN)
Liam Andrus, BS Mechanical Engineering, Northern Arizona University (MS BMEN)
Yil-Hwan You, BS, ME Materials Science and Engineering, Hongik University, Seoul, Korea (PhD MSEN)
Matthew Jones, BS Chemical Engineering, Missouri Institute of Science and Technology (PhD BMEN)
Lindsey Bornhoeft, BS Biochemistry, University of Tennessee-Chattanooga (PhD BMEN)

PATENT APPLICATIONS

Fiber-optic Sensors for Measurement of Gastric pH (National Institutes of Health)
Optical sensors and related methods (Louisiana Tech University)
Nanoscale Films with Specific Cell Interaction Properties and Integrated Optical Sensors (Louisiana Tech University)
Urea Sensor for Online Dialysate Monitoring using Optical Thin Film Indicators (Louisiana Tech University)

INVENTION REPORTS

Novel peak-hopping stepwise feature selection method (Texas A&M University)
A Broadband Optical Coupler (Louisiana Tech University)
Cellular Photobiomodulation Control System Utilizing Nano-Shell Sensor Feedback (Louisiana Tech University)
Fabrication Method for Thin Oxygen Sensitive Film (Louisiana Tech University)
Nanoscale Films With Specific Cell Interaction Properties And Integrated Optical Sensors (Louisiana Tech University)
Multicomponent Patterning for Multilayer Nanofilms (Louisiana Tech University)
Urea Sensor for Online Dialysate Monitoring using Optical Thin Film Indicators (Louisiana Tech University)
Nanoengineered Surface Plasmon-based Fiber Optic Biosensors (Louisiana Tech University)
Fluorescent Microcapsule Sensors Employing Apo-Enzyme and Competitive Binding Ligand (Louisiana Tech University)
A Modular Lab-in-a-Sphere: Multifunctional Nanoparticles Incorporated within Hydrogel Microspheres (Louisiana Tech)

(Texas A&M University)

Method of Compensation for Local Oxygen Variation for Implanted Enzymatic Biosensors
Luminescent Enzymatic Sensors based on Porous Matrices
Dynamic Windowing Algorithm for the Luminescence Lifetime Determination of One or More Luminophores
A Subcutaneous, Multi-Element ON/OFF Sensor for Analyte Range Determination
Cross-Linked Protein Cores with Floppy Polymeric Shells for Steric Protection
Orthogonal Attachment of a Single-Layered Protein Shell Around a Central Glycoprotein Core
Moldable Ionotropically-Gelated Alginate Hydrogel Containing Diffusion-Controlled Micro- and/or Nano-Cavities

PROFESSIONAL SOCIETIES

IEEE *Senior Member*: 2009-present; IEEE: *Member*, 1997-present; IEEE EMBS: *Member*, 1997-present; BMES: *Member*, 1999-present; SPIE: *Member*, 1997-present; Society for Applied Spectroscopy (SAS): *Member*, 1996-2003; AIChE: *Member*, 2002-2003; ACS: *Member*, 2004-present.

LEADERSHIP IN PROFESSIONAL SOCIETIES

IEEE Sensors Council Representative for IEEE-EMBS (Appointed; 2006, 2007, 2008)
IEEE Sensors Council Secretary/Treasurer (Appointed; 2009, 2010)
Note: Secretarial duties included preparing and presenting the 5-year Council Review Report for IEEE
IEEE-EMBS North America Representative (Elected; 2010-2012)
IEEE Sensors Council Vice President of Finances (Elected; 2011-2013)
IEEE Sensors President-Elect (Elected; Terms: President-Elect=2014-2015; President =2016-2017; Immediate Past-President=2018-2019; Senior Past-President=2020-2021)

OTHER SERVICE ACTIVITIES

*Technical Committee & Session Chair (Significant leadership positions indicated in **BOLD**)*
Photonics West - Optical Diagnostics and Sensing (2000-2013)
Biomedical Engineering Society - Imaging and Biomedical Optics track, Biosensors and Light Delivery Session, Instrumentation and Microsystems (2001-2003)
IEEE-EMB Society – Biomedical Instrumentation Track (2002, 2009, 2011, 2012)
American Institute of Chemical Engineers – BioMEMS Session Vice Chair (2002)
IfM Nanoassembly Seminar – co-chair (2001-2006)
Texas A&M University Student Research Week – Evaluator and Session Chair (2007, 2008)
Society for Biomaterials – Abstract Reviewer (2008)
Houston Society for Engineering in Medicine and Biology, Track Organizer and Session Chair (2004-2009), **Steering Committee (2009)** [Conference deactivated in 2009]
IEEE Special Topics Conference on Microtechnology in Medicine and Biology, Technical Committee (2004-2009) / **Conference Program Chair (2005)**
Southern Biomedical Engineering Conference, Technical Committee, Theme Chair, Session Chair (2011-2012)
IEEE Special Topics Conference on Micro- and Nano-Engineering in Medicine Conference (MNMC), Technical Committee (2011-2012)
Track Chair, Biomedical Engineering Society, Device Technologies and Biomedical Robotics Track, BMES 2014 Annual Meeting

Proposal Peer Reviewer

Panel /Study Sections

NSF SBIR/STTR program (1999)
NSF Biomedical Engineering Program and Research to Aid Persons with Disabilities Program (2002-2004)
Juvenile Diabetes Foundation - Glucose Monitors (1999)
NIH SBIR Study Section Panelist (2003-2011, 7 panels total)
NIH Bioengineering, Technology, and Surgical Sciences (10/2005, 2/2006, 5/2006)
NIH Predoctoral/Postdoctoral Fellowships for Technology Development Research (2006, 2007)
NIH Small Grants ((NIAMS R03) 2006, 2010)
NIH Quantum Grants (2007)
NSF Graduate Fellowships (2007, 2009)
National Space Biomedical Research Institute (NSBRI) (2009, 2010); **CHAIR (2011)**
NIH SBIR – Bioanalytical Chemistry (2009)
NIH SBIR – Biomaterials, Nanotechnology, Drug Delivery Systems (2009, 2011)
NIH SBIR – Artificial Pancreas (2009)
NIH Cancer Centers of Nanotechnology Excellence (CCNE) (2010)
NIH Enabling Bioanalytical and Imaging Technologies Study Section (6/2011)
NSF Engineering Research Centers – NanoBio/Healthcare (2011)

Mail Reviews

NSF Postdoctoral Fellowships (2004)
European Science Foundation - EUROCORES (Collab. Research Programme) Self-Organised Nano-structures (2003)
USDA SBIR (2003-2005)
ACS Petroleum Research Fund Mail Review (2004)
NSF International Research Fellowship (2005)
Ireland Health Research Board (2005)
Singapore Agency for Science, Technology and Research (A*STAR) Biomedical Research Council (BMRC) (2005)
Army Research Office SBIR (2006)
Army Research Office Chemical and Biological Defense Basic Research Program (2007)
NSF Inorganic, Bioinorganic, and Organometallic Chemistry Program (2007)
American Diabetes Association (2007)
Canadian National Science and Engineering Research Council (2007-2008)
UK Medical Research Council (2008)
DOE SBIR Program (2008, 2009)
NIH Challenge Grants (2009)
American Institute of Biological Sciences (2011)
Austrian Science Fund (FWF), Erwin Schroedinger Program (2011)

Manuscript Peer Reviewer

Associate Editor, *Journal of Sensors*, 2007-present

Associate Editor, *Sensors* (MDPI), 2009-present

Associate Editor, *IEEE Transactions on Nanobioscience*, 2003-present

Associate Editor, *IEEE Transactions on Biomedical Engineering*, 2006

Guest Editor, “Special Issue on Glucose Sensors,” *Sensors* (MDPI), 2011

Guest Editor, “Special Issue on Fluorescent Glucose Sensors,” *Diabetes Science and Technology* (Liebert), 2012.

Guest Editor, “Special Issue on Tissue Response to Implanted Devices,” *Diabetes Science and Technology* (Liebert), 2014-2015.

Reviewer: Acta Biomaterialia, Advanced Materials, Analyst, Analytica Chimica Acta, Analytical Chemistry, Analytical Methods, Angewandte Chemie, Annals of Biomedical Engineering, Applied Materials and Interfaces, Applied Spectroscopy, Applied Optics, Biochimica et Biophysica Acta – Proteins and Proteomics, Biomacromolecules, Biomaterials, Biosensors and Bioelectronics, Biotechnology and Bioengineering, Chemistry of Materials, Diabetes Science and Technology, Diabetes Technology and Therapeutics, IEEE Engineering in Medicine and Biology Magazine, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Nanobioscience, IEEE Sensors Journal, FASEB Journal, International Journal of Food Science and Technology, Journal of the American Chemical Society, Journal of Biomedical Materials Research: B, Journal of Biomedical Nanotechnology, Journal of Biomedical Optics, Journal of Fluorescence, Journal of Luminescence, Journal of Microencapsulation, Journal of Micromechanics and Microengineering, Journal of Nanoscience and Nanotechnology, Journal of Physical Chemistry, Langmuir, Macromolecules, Macromolecular Bioscience, NanoLetters, Nanomedicine, Nanotechnology Journal (Institute of Physics), Nature Protocols, PNAS – Proceedings of the National Academy of Science, Physiological Measurements, Sensors, Sensors and Actuators B: Chemical, Journal of Sensors, Small, Thin Solid Films, Trends in Biotechnology

COURSES TAUGHT

Louisiana Tech University (NOTE: quarter system; hours noted in parentheses are semester credits)

Academic Year	Fall	Winter	Spring
1999-2000	BIEN 425 – Advanced Bioinstrumentation (3)	BIEN 310 – Clinical Engineering (3)	<i>BIEN 550 – Biomedical Optics (3)</i>
2000-2001	BIEN 425 – Advanced Bioinstrumentation (3)	BIEN 510 – Bioinstrumentation – Graduate Level (4)	BIEN 310 – Clinical Engineering (3)
2001-2002	BIEN 550 – Biomedical Optics (3)	BIEN 510 – Bioinstrumentation – Graduate Level (4)	BIEN 420 – Biomaterials and Biomechanics (3)
2002-2003	BIEN 225 – Biomedical Systems (3)	<i>BIEN 557 – Fiber Optic Sensors (3)</i>	<i>BIEN 230 – Biomaterials (2)</i>
2003-2004	BIEN 225 – Biomedical Systems (3)	BIEN 610 - Graduate Seminar (1)	BIEN 310 – Clinical Engineering (3)
2004-2005	BIEN 225 – Biomedical Systems (3) BIEN 610 - Doctoral Enhancement Seminar (1)	<i>BIEN 557 – BioMEMS Lab (3)</i> <i>BIEN 610 - Doctoral Enhancement Seminar (1)</i>	BIEN 533 – Biomedical Optics (3) BIEN 610 - Doctoral Enhancement Seminar (1)
2005-2006	BIEN 225 – Biomedical Systems (3) BIEN 610 - Doctoral Enhancement Seminar (1)	BIEN 425 – Advanced Bioinstrumentation (3) BIEN 610 - Doctoral Enhancement Seminar (1)	BIEN 310 – Clinical Engineering (3) BIEN 610 - Doctoral Enhancement Seminar (1)

BOLD indicates my first time teaching the course; *Italics* indicates NEW COURSE

Texas A&M University

Academic Year	Fall	Spring	Summer
2006-2007	N/A	BMEN 489/689 – Fluorescence-Based Biosensors (3)	N/A
2007-2008	BMEN 489/689 – Biomedical Nanotechnology (3)	BMEN 489/689 – Optical Biosensors (3) BMEN 306 – Biomeasurements Lab (1)	N/A
2008-2009	BMEN 489/689 – Biomedical Nanotechnology (3)	BMEN 426/626 – Optical Biosensors (3) BMEN 306 – Biomeasurements Lab (1)	N/A
2009-2010	BMEN 486/686 – Biomedical Nanotechnology (3)	BMEN 426/626 – Optical Biosensors (3) BMEN 306 – Biomeasurements Lab (1)	BMEN 453 – Design Projects I (2) BMEN 454 – Design Projects II (2)
2010-2011	BMEN 486/686 – Biomedical Nanotechnology (3) BMEN 453 – Design Projects I (2) BMEN 454 – Design Projects II (2)	BMEN 453 – Design Projects I (2) BMEN 454 – Design Projects II (2)	BMEN 454 – Design Projects II (2)
2011-2012	BMEN 486/686 – Biomedical Nanotechnology (3) BMEN 453 – Design Projects I (2)	BMEN 454 – Design Projects II (2)	
2012-2013	BMEN 453 – Design Projects I (2)	BMEN 454 – Design Projects II (2) BMEN 486/686 – Biomedical Nanotechnology (3)	
2013-2014	BMEN 453 – Design Projects I (2)	BMEN 253 – Design Controls (1) BMEN 353 – Needs Analysis (1) BMEN 454 – Design Projects II (2)	

BOLD indicates my first time teaching the course; *Italics* indicates NEW COURSE

Special Guest Lectures: Introduction to MEMS and Microfabrication – "Optical MEMS"; Nanoconstruction by Self-Assembly – "Fluorescent Micro/NanoSensor Fabrication"; Biosensors – "Spectroscopy-based Biosensors,"; Systems Physiology – "Regulation of Osmolarity, Fluid Volumes, and Ion Concentrations"; Biotechnology Principles – "High Throughput Screening for Medical Applications" and "Biosensors"; Microstructure Analysis and Materials Characterization - "Fluorescence, Confocal, and Two-Photon Microscopy" and "Raman Spectroscopy"; BioMEMS – "Surface Modification for BioMEMS" and "Cell Culture for BioMEMS"; Biomaterials – "Dermal Biocompatibility"; Biomedical Engineering Case Studies – "Statistical Analysis of Microscale Optical Biosensor Performance: Control of Response and Effects of Protein Adsorption"

Interdisciplinary University Service

Agricultural and Biological Engineering Faculty Search Team (Nanotechnology), TAMU 2009

Materials Characterization Facility Advisory Board, TAMU 2011-2012
Protein Chemistry Lab Advisory Board, TAMU 2012
Reviewer, Merit & Diversity Fellowships, TAMU 2008, 2010, 2012
Reviewer, Astronaut Scholarship Foundation, TAMU 2012

Departmental Curriculum/Lab Development

Track coordinator for Undergrad Bioinstrumentation and Bioimaging Track – 2007/2008
Track coordinator for Graduate Biomaterials Track - 2008
Equipment acquisition coordinator for undergraduate teaching/shared research labs – 2007-2011

Committee Member

Chair, Biomedical Engineering Design Advisory Committee, 2013-2014
Chair, Biomedical Engineering Safety Committee, 2009-2011
Biomedical Engineering Faculty Search Committee, 2007-2013, TAMU
Biomedical Engineering Tenure and Promotion Committee, 2010-2014
Leader, Biomedical Engineering Shared Facilities Team, 2007-2012
Biomedical Engineering Shared Lab Supervisor Search Team, 2012
Biomedical Engineering Shop Supervisor Search Team, 2012, TAMU
Biomedical Engineering Graduate Program Coordinator Search Team, 2008, TAMU
Biomedical Engineering Graduate Student Recruitment Committee, 2007-2008, TAMU
Biomedical Engineering Program Faculty Search Teams, LA Tech
Biophysics Search Team, LA Tech
Chair, Microfluidics Engineer Search Team, LA Tech
Graduate Course Consolidation Team, LA Tech
KSD 6 Instructional Lab Equipment Team, LA Tech
Chair, Lab and Space Team, Institute for Micromanufacturing, LA Tech
Leadership Team, Institute for Micromanufacturing, LA Tech
Tolbert Pipes Endowed Chair Search Team, Institute for Micromanufacturing, LA Tech
Research and Economic Development Team, COES, LA Tech
Ethics and Professionalism Team, COES, LA Tech

Advisory Roles

Biomedical Engineering Society (faculty advisor), TAMU
Biomedical Engineering Society (faculty advisor), LA Tech
Tau Beta Pi Engineering Honor Society (faculty advisor), LA Tech

PUBLICATIONS (Google Scholar: 3576 Citations, h-index=35; i10-index=70; as of 12/2/2014)

(1) *Refereed Journal Articles (*indicates students)*

- 91) *A Biswas, *AT Nagaraja, MJ McShane. "Fabrication of Nanocapsule Carriers from Multilayer-Coated Vaterite Calcium Carbonate Nanoparticles." *ACS Applied Materials & Interfaces* (2014) Article ASAP, DOI: 10.1021/am5061195 Publication Date (Web): November 5, 2014
- 90) *BB Collier, MJ McShane, "Temperature Compensation of Oxygen Sensing Films Utilizing a Dynamic Dual Lifetime Calculation Technique, *IEEE Sensors*, vol. 14, pp. 2755-2764 (2014). DOI: [10.1109/JSEN.2014.2311327](https://doi.org/10.1109/JSEN.2014.2311327)
- 89) *DW Ritter, *JM Newton, MJ McShane, "Modification of PEGylated enzymes with glutaraldehyde can enhance stability while avoiding intermolecular crosslinking, *RSC Advances*, vol. 4, pp. 28036-28040 (2014). DOI: 10.1039/C4RA03809F.
- 88) *AT Nagaraja, *S. Pradhan, MJ McShane, "Poly(vinylsulfonic acid) assisted synthesis of aqueous solution stable vaterite calcium carbonate nanoparticles," *Journal of Colloid and Interface Science*, vol. 418, pp. 366-372 (2014). <http://dx.doi.org/10.1016/j.jcis.2013.12.008>
- 87) *J. Shaik, *J. Shaikh Mohammed, M.J. McShane, D. K. Mills, "Behavior of Articular Chondrocytes On Nanoengineered Surfaces," *NanoLife* vol. 3 (2013). DOI: 10.1142/S1793984413420014
- 86) *AT Nagaraja, *A Soresh, KE Meissner, MJ McShane, "Processing and Characterization of Stable, pH-sensitive Layer-by-Layer Modified Colloidal Quantum Dots," *ACS Nano*, 2013.
- 85) *BB Collier, MJ McShane, "Time-Resolved Measurements of Luminescence," *Journal of Luminescence*, 2013.
- 84) *JR Roberts, *D Ritter, MJ McShane, "A Design Full of Holes: Functional Nanofilm-Coated Microdomains in Alginate Hydrogels," *J. Mater. Chem. B*, 2013, **1**, 3195-320. DOI: 10.1039/C3TB20477D

- 83) J. Shaik, J. Shaikh Mohammed, M.J. McShane, D.K. Mills, "Chondrocyte Behavior on Micropatterns Fabricated Using Layer-by-Layer Lift-Off: Morphological Analysis," *Journal of Medical Engineering*, vol. 2013, Article ID 560328 (2013). doi:10.1155/2013/560328.
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(4) *Invited Lectures*

- McShane, M.J., "Implantable Luminescent Biosensors," *Invited Presentation* for Texas A&M Biological, Agricultural, and Civil Engineering Multidisciplinary Seminar, December 2014.
- Helton, K.L., et al., "Tissue-Integrating Sensors," *Invited Presentation* for symposium at the Diabetes Technology Society's *Tissue Response to Implanted Devices Meeting*, May 2014.
- McShane, M.J., "Implantable Luminescent Biosensors," *Invited Talk* for Physics of Quantum Electronics Meeting, Snowbird, UT, January 2014.
- McShane, M.J., Wisniewski, N.A., "Toward Multianalyte Monitoring with Tissue-Integrating Sensors," *Invited Presentation* for NIH High-Risk, High-Reward grantee meeting, November 2013.
- McShane, M.J., "Optical Sensors with Micro to Nanoscale Organization," *Invited Lecture, Institute for Micromanufacturing Seminar Series*, Louisiana Tech University, Ruston, LA, January 2013.
- McShane, M.J., "Nanocomposite Materials for Optical Sensing," *Invited Lecture, EMBS Micro and Nanotechnology in Medicine*, Maui, HI, December 2012.
- McShane, M.J., "Next-Generation Implantable Sensors," *Invited Lecture, Tulane University Biomedical Engineering Department*, New Orleans, LA, October 2012.
- McShane, M.J., "Luminescent Optical Biosensors – Materials and Instrumentation for Next-Generation Monitoring," *Seminar, IEEE-EMBS Dallas*, Dallas, TX, May 2012.
- McShane, M.J., "Inline and implantable optical sensors for biochemical monitoring," *Invited Lecture, American Society for Artificial Internal Organs*, San Francisco, CA, June 2012.
- McShane, M.J., "Next-Generation Implantable Sensors," *Invited Lecture, Dallas IEEE-EMBS*, Dallas, TX, May 2012.
- McShane, M.J., "Encapsulation of Luminescent Sensing Chemistry with Engineered Nanofilms," *Invited Lecture, PITTCON*, Orlando, FL, March 2012.
- McShane, M.J., "Nanocomposite Multilayers for Optical Biosensors," *Invited Lecture, Harrington Symposium*, University of Texas – Austin, November 10, 2011.
- McShane, M.J., "Nanomaterials for Biosensors," *Invited Workshop Lecture, IEEE-EMBS Annual Meeting*, Boston, MA, August 2011.
- McShane, M.J., "Fun with Nanofilms: From Neural Networks to Sensors to Backpacks for Cells, there's something for everyone," *Invited Master Series Lecture, Texas A&M Toxicology Program, College Station, TX*, July 2009.
- McShane, M.J., "Nanoscale Biosensors: Opportunities and Challenges," *Invited Keynote Lecture, International Workshop on Nanotech and Healthcare 2007, Thanjavur, India*, October 2007.
- McShane, M.J., "Assembly and testing of microparticle and microcapsule 'smart tattoo' materials," *Invited Lecture, SPIE Photonics West*, January 2007.
- McShane, M.J., "Micro/Nanoscale Particles and Capsules: Emerging Technology for Biochemical Monitoring," *Invited Seminar, University of Wisconsin, College of Pharmacy Seminar*, December 15, 2006.
- McShane, M.J., "Smart Tattoos: Implantable Sensors for Metabolic Monitoring," *Invited Seminar, University of Washington, Center for Nanotechnology Seminar*, May 8, 2006.
- McShane, M.J., "Microcapsule Biochemical Sensors: Assembling Molecules into Useful Micro/Nanosystems," *Invited Seminar, Louisiana State University, Biomedical Engineering Seminar*, December 5, 2005.
- McShane, M.J., "Microcapsule Biochemical Sensors: Assembling Molecules into Useful Micro/Nanosystems," *Invited Seminar, Pennsylvania State University, Biomedical Engineering Seminar*, November 18, 2005.
- McShane, M.J., "Microcapsule Biochemical Sensors: Assembling Molecules into Useful Micro/Nanosystems," *Invited Seminar, Texas A&M University, Biomedical Engineering Seminar*, November 1, 2005.
- McShane, M.J., "Nanotechnology Applied to Engineering Glucose-Sensing, 'Smart Tattoos'," *Invited Presentation* for Nanotechnology" symposium at the Diabetes Technology Meeting, November 2005.

- McShane, M.J., "Biosensor applications of polyelectrolyte nanofilms and microcapsules," *Invited Presentation for the Polymer Materials Science and Engineering Symposium "Smart Nano-Assemblies" at the 228th National Meeting of the American Chemical Society*, Washington, DC, August 28, 2005.
- McShane, M.J., "Biosensor applications of polyelectrolyte nanofilms and microcapsules," *Invited Presentation for the Polymer Materials Science and Engineering Symposium "Smart Nano-Assemblies" at the 228th National Meeting of the American Chemical Society*, Washington, DC, August 28, 2005.
- McShane, M.J., "Micro/Nanostructures to Define and Monitor the Cellular Environment," *Invited Lecture*, Louisiana State University, *Center for Advanced Microdevices/Center for Biomodular Microsystems Summer School*, July 27, 2005.
- McShane, M.J., "Smart Tattoos: Implantable Sensors for Metabolic Monitoring," *Invited Seminar*, Purdue University, *Biomedical Engineering Seminar*, August 30, 2004.
- Chinnayelka, S., McShane, M.J., "Self-Assembly of a Biosensor for Monitoring Glucose based on Resonance Energy Transfer," *Invited Presentation for the Optical Sensors Symposium at the BMES Fall Meeting*, Nashville, TN, October 4, 2003.
- Connolly, B., Daniel, B., McShane, M.J., Bazan, N.G., DeCoster, M.A., "Nanofilms as Substrates for Defining Critical Signaling for Neuronal Survival," *NSF/EPSCoR National Meeting*, Las Vegas, NV, September 12, 2003.
- McShane, M.J., Lvov, Y.M., "Nanoassembled Fluorescent Micro/Nanoshells as Biochemical Sensors," *Invited Presentation for the Polymer Materials Science and Engineering Symposium "Smart Nano-Assemblies" at the 226th National Meeting of the American Chemical Society*, New York, NY, September 8, 2003.
- Lvov, Y.M., Hua, F., Cui, T., McShane, M.J., " 'Marriage' of LbL-Nanoassembly and Traditional Lithography for Micropatterns and Microchannel Devices," *Invited Presentation for the Polymer Materials Science and Engineering Symposium "Smart Nano-Assemblies" at the 226th National Meeting of the American Chemical Society*, New York, NY, September 9, 2003.
- McShane, M.J., "Layer-by-layer Self-Assembly: Micropatterning and Micro/Nanoscale Biosensors," *Invited Presentation, Neuroscience Seminar Series*, New Orleans, LA, January 17, 2003.
- McShane, M.J., "Layer-by-layer Self-Assembly: Micropatterning and Micro/Nanoscale Biosensors," *Invited Presentation, Neuroscience Seminar Series*, New Orleans, LA, January 17, 2003.
- McShane, M.J., "Nanoengineering Devices for Biomedical Research and Clinical Applications," *Invited Presentation, Physiology Seminar Series*, Shreveport, LA, January 27, 2003.
- McShane, M.J., "Nanoengineering of Optical Devices for Chemical Analysis," *Invited Presentation, Neurobiotechnology*, Shreveport, LA, December 4, 2002.
- Lvov, Y.M., McShane, M.J., Jones, S.A., de Villiers, M., "Nanocapsule Technology Based on Layer-by-Layer Self Assembly," *Invited Presentation, Louisiana Conference on Commercial Applications of Microsystems, Materials, and Nanotechnologies*, Ruston, LA, October 21-22, 2002.
- McShane, M.J., "Nanoengineering of Fluorescence-Based Chemical Sensors Using Electrostatic Self-Assembly: Thin Films and Micro/Nanoshells," *Invited Presentation, IEEE Sensors 2002*, Orlando, FL, June 13, 2002.
- Guice, K.B., Nayak, S., Lvov, Y.M., McShane, M.J., "Micro-scale Hollow Core Fluorescent Sensors for the Measurement of Oxygen and Glucose," *Invited Presentation, 2nd Undergraduate/Graduate Research Symposium*, Louisiana Tech University, Ruston, LA, April 12, 2002.
- Srivastava, R., Shenoy, G., Chinnayelka, S., Forrest, S.R., Besser, R.S., McShane, M.J., "Microspectrometer for Infrared Analysis of Gases and Biological Fluids," *Invited Poster, Focus on Bio- & Information Technologies*, LA EPSCoR, Baton Rouge, LA, April 10-11, 2002.
- Brown, J.Q., Duchesne, T.A., Lvov, Y.M., McShane, M.J., "Nanoengineered Polyelectrolyte Microshells as Carriers for Fluorescent Sensors," *Invited Poster, Focus on Bio- & Information Technologies*, LA EPSCoR, Baton Rouge, LA, April 10-11, 2002.
- Grant, P.S., Lvov, Y.M., McShane, M.J., "Nanostructured Fluorescent Biosensor," *Invited Poster, Focus on Bio- & Information Technologies*, LA EPSCoR, Baton Rouge, LA, April 10-11, 2002.
- Nayak, S.R., Guice, K.B., Lvov, Y.M., McShane, M.J., "Nanoengineered Fluorescent Sensors Containing Enzyme Assays," *Invited Poster, Focus on Bio- & Information Technologies*, LA EPSCoR, Baton Rouge, LA, April 10-11, 2002.
- Kim, S.S., Shaikh Mohammed, J., Deverkadra, R., Kondabatni, K.K., McShane, M.J., "Micro Total Analysis System," *Invited Poster, Focus on Bio- & Information Technologies*, LA EPSCoR, Baton Rouge, LA, April 10-11, 2002.
- McShane, M.J., "Nanoengineered Thin Films and ShELLS: Novel Applications to Fluorescence Biomedical Sensor Development," *Invited Seminar*, Texas A&M University, *Biomedical Engineering Seminar*, October 29, 2001.
- McShane, M.J., Lvov, Y.M., "Nanocomposite Thin Films for Optical Sensors and Nanobioreactors," *Invited Presentation, BioMEMS and Biomedical Nanotechnology 2001*, Columbus, OH, September 22-25, 2001.
- McShane, M.J., "Nanoengineered Thin Films and ShELLS: Novel Applications to Fluorescence Biomedical Sensor Development," *Invited Seminar* at the University of Toledo, *Biomedical Engineering Seminar Series*, September 7, 2001.
- McShane, M.J., "Nanoconstruction of Fluorescent Sensors: Thin Films and Microshells," *Invited Presentation, Bio-Micro-Sensors for Biology and Medicine Workshop*, Louisiana Tech University, Ruston, LA, May 9, 2001.

- Duchesne, T., Lvov, Y.M., McShane, M.J., "Nanoassembled Fluorescent Sensors for Physiological Monitoring," **Invited Presentation**, 1st Undergraduate/Graduate Research Symposium, Louisiana Tech University, Ruston, LA, April 12, 2001.
- McShane, M.J., "Nanoassembled Fluorescent Sensors for Physiological Monitoring," **Invited Seminar** at the University of Louisville, *Chemical Engineering Seminar Series*, March 30, 2001.
- McShane, M.J., "Optics and Micro-Optics in Medicine, Biology, and Biotechnology," **Invited Short Course** presented at the University of Taipei, Taiwan, March 6-8, 2001.
- McShane, M.J., Grant, P.S., Nayak, S.R., Duchesne, T., Lvov, Y.P., "Development of Fluorescent Sensors Using Nanofabrication," **Invited Presentation** at the 19th Annual Houston Conference on Biomedical Engineering Research, Houston, TX, 2001.
- Robinson, C.J., Napper, S.A., Gale, B.K., McShane, M.J., "Rehabilitative Microsystems," **Invited Presentation** at the 1st Annual International IEEE-EMBS Special Topic Conference on Microtechnologies in Medicine and Biology, Lyon, France, 2000.
- Spiegelman, C.H., Rock, J.C., Rumgyart, F., Bennett, J., Lee, S.-J., Vannucci, M., McShane, M., and Coté, G.L., "Issues in Spectrographic Calibration", **Invited Paper** presented at the National Consortium for Plutonium, Amarillo, TX, 1999.
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- RM Unruh, JR Roberts, S Nichols, MK Balaconis, NA Wisniewski, MJ McShane, "Evaluation of Luminescent Copolymer Hydrogels as Fully-Implantable Sensors," *Diabetes Technology Meeting*, Bethesda, MD, November 2014.
- M Schechinger, R Unruh, A Nagaraja, J Weaver, MJ McShane, "Reference Sensors using Poly-acrylonitrile (PAN) Nanobeads for Improved Accuracy in Implantable Optical Sensing Devices," *Biomedical Engineering Society*, San Antonio, TX, 2014.
- A Biswas, A Nagaraja, MJ McShane, "Ratiometric Nanocapsule Sensors Fabricated From Sacrificial CaCO₃ Nanoparticles," *Biomedical Engineering Society*, San Antonio, TX, 2014.
- Y You, A Liu, JR Roberts, MJ McShane, "A SERS Sensing System based on Encapsulation of Gold Nanoparticles in Microporous Alginate Hydrogels," *Biomedical Engineering Society*, San Antonio, TX, 2014.
- RM Unruh, S Nichols, NA Wisniewski, MJ McShane, "In Vitro and In Vivo Evaluation of Copolymer Hydrogels as Enzyme-based Luminescence Glucose Sensors," *Biomedical Engineering Society*, San Antonio, TX, 2014.
- D.W. Ritter, J.M. Newton, J.R. Roberts, B.B. Collier, and M.J. McShane, "Enzyme Stabilization Strategies to Prolong Bioanalytical Sensor Function" *Gordon Research Conference on Bioanalytical Sensors*, Newport, RI, 2014.
- RM Unruh, S Nichols, NA Wisniewski, MJ McShane, "Poly (2-hydroxyethyl methacrylate-co-acrylamide) Copolymer Hydrogels as Fully-Implantable Biosensors," *Society for Biomaterials – Regional Biomaterials Day*, College Station, TX, June 2014.
- AT Nagaraja, Y You, KE Meissner, MJ McShane. "Investigating pH-Dependent Layer-by-Layer Assembly on Nanoparticles: A Universal Tool for Engineering Surface Properties for Enhanced Stability," poster and oral presentation *ACS 2014, 247th National Meeting and Exposition*. March 17, 2014; Dallas, TX.
- JR Roberts, MJ McShane "Controlling gelation kinetics of injectable microporous alginate nano/micro composites," *ACS 2014, 247th National Meeting and Exposition*. March 17, 2014; Dallas, TX.
- RM Unruh, JR Roberts, MJ McShane, "Fabrication and Characterization of Optically-Responsive Glucose Sensing Nanoreactors," *ACS 2014, 247th National Meeting and Exposition*. March 17, 2014; Dallas, TX.
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[+18 additional conference presentations; unlisted for space]