

FRANCIS JONES, Ph.D., P.E.

UC Foundation Professor

Program Coordinator of Chemical Engineering and Environmental Engineering

College of Engineering and Computer Science

615 McCallie Avenue

437 EMCS, Department 2502

University of Tennessee at Chattanooga

Chattanooga, TN 37403

(423) 425-4366

Frank-Jones@utc.edu

EXPERIENCE:

UC Foundation Professor of Chemical Engineering
University of Tennessee at Chattanooga

8/07 – Present

Teaching Experience: air pollution control, water pollution control, environmental engineering for environmental scientists, chemical and environmental engineering laboratory, unit operations, fluid mechanics laboratory, chemical/environmental process principles, heat transfer, and control systems laboratory.

Research Interests:

- 1) **Fluid Mechanics.** Sampling suspensions in laminar flow, slip flow, free molecular flow.
- 2) **Membrane separations** with environmental applications. (Solid and Liquid membranes).
- 3) Manufacture of SiO₂ microspheres by an **emulsion liquid membrane reactor**.
- 4) **Chemical Process Miniaturization.** Study of micron-scale chemical process devices including reactors, heat exchangers, and separators along with process control. The goal is to put a self-contained chemical process plant on a microchip. **These devices are fabricated using the techniques developed by the microelectronics industry.** Electronic and fluidic circuits are on the same platform (“chip”). Biological micro scale reactors are fabricated using PDMS and attaching enzymes to the reactor channel walls as catalysts.
- 5) **Biomaterials.** Incorporating enzymes into plastics (especially PDMS) to create catalytically active biomaterials. Using these materials in batch reactors and micro scale continuous flow reactors.
- 6) **Biomicroreactor Simulation.** Numerical simulation of biomicroreactors including fluid mechanics and Michaelis-Menten kinetics. Emphasis on the effects of design and operational changes on conversion. The ultimate goal is to optimize the internal design features (packing) for any job/enzyme.
- 7) **Nanotechnology, enzyme immobilization, and biomicroreactors.** The use of layer-by-layer nano self-assembly to immobilize enzymes on the walls of micro channels.
- 8) **Micromixing.** The effect of design changes on mixing and conversion in microchannels.
- 9) **Alternative Fuels.** The production of biodiesel fuel in a micro scale system.

PREVIOUS EXPERIENCE:

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|---|-------|---------------|
| UC Foundation Associate Professor of Chemical Engineering | (UTC) | 7/06 – 7/07 |
| Associate Professor of Chemical Engineering | (UTC) | 7/00 – 7/06 |
| Assistant Professor of Chemical Engineering | | 9/93-6/00 |
| Louisiana Tech University (LTU) | | |
| Visiting Assistant Professor of Chemical Engineering | (LTU) | 1/92 - 5/93 |
| Adjunct Assistant Professor of Chemical Engineering | | Summer 92, 93 |
| Drexel University (DU), Philadelphia, PA | | |
| Teaching Assistant, Department of Chemical Engineering | (DU) | 9/86 - 9/91 |

EDUCATION: (All degrees in Chemical Engineering)

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| Ph.D. | Drexel University, Philadelphia, 1986-1991. Dissertation: “On the Sampling of Suspensions in Laminar Flow.” C. B. Weinberger, advisor. |
| M.S. | Drexel University, Philadelphia, 1983-1986. Minor in Biochemical Engineering. |
| B.S.E. | University of Pennsylvania, 1969-1973. GM scholarship. |

CONSULTING:

General Hydrogen of Tennessee. I am working on optimizing a process to purify a hydrogen stream from the Olin chemical plant in Charleston, TN. This project also employs MS student Alex Saputa.

Enterprise Center. My role is to be a technical advisor to this technology transfer group who are mostly lawyers and business people. The Center is a community agency that promotes economic development in the region.

P.E. REGISTRATION:

Registered Professional Engineer in the State of Tennessee. Registration number: 108794.

MEDIA REPORTS CONCERNING MY RESEARCH:

- “Micromixing Creates a Stir,” by Claudia M. Caruana, *Chemical Engineering Progress*, Vol. 96/No. 5, pp. 9-10, 2000.
- Honors graduate Stephanie Wilson appeared on the UTC website and in *The Chattanooga Times Free Press* (headline: “UTC graduate Wilson earns research award,” December 30, 2006, page E-3) for winning a national research award at the AIChE Annual Meeting for her work with my research group.

- DHON student Jennifer Lewis won a 2nd place award in an international research competition at the AIChE Annual Meeting in Nashville, TN in November. Jennifer did this research as part of her work for my research group. This research and award were reported in the media several times: on the *UTC homepage* in December 2009; in the *Chattanooga Times Free Press* (“Lewis wins engineers honor”) on Saturday December 12, 2009; Jennifer and FJ were interviewed on *WUTC* (broadcast on January 19, 2010); in the *ECHO* (UTC student newspaper) on Friday January 22, 2010 (“Biodiesel fuel research, poster award at international competition”)
- My research was featured in *Chattanooga Today, Year in Review* (published in June 2010). This feature was due to an invited seminar I gave at the UTC Environmental Symposium on April 1, 2010. My researcher, Jennifer Lewis, was also featured separately for her research award.

AWARDS:

- **Engineering Research Award.** Presented by the UTC College of Engineering and Computer Science on November 30, 2001 (Faculty Honors Day).
- **Engineering Research Award.** Presented by the UTC College of Engineering and Computer Science on November 21, 2003 (Faculty Honors Day).
- **Engineering Research Award.** Presented by the UTC College of Engineering and Computer Science on December 7, 2007 (Faculty Honors Day).
- **Exceptional Merit.** Awarded in yearly faculty evaluation for research in **2005-06**.
- **Exceptional Merit.** Awarded in yearly faculty evaluation for research in **2008-09**.
- **Outstanding Researcher in Chemical Engineering** for AY 2009-10, awarded by UTC College of Engineering and Computer Science on April 13, 2010.

AS PROGRAM COORDINATOR:

Supervised UTC Chemical Engineering Program accreditation by ABET

October 2007 ABET visit. I wrote the self-study and conducted the October 2007 ABET visit to the UTC ChE Program. This was for *initial* departmental accreditation and therefore rather sensitive. The program successfully acquired a six-year accreditation in Chemical Engineering, replacing the UTC College of Engineering’s traditional general engineering accreditation. The ChE student’s degrees now read *B.S.ChE* rather than the previous *B.S.E*.

September 2009 ABET visit. I wrote the self-study and conducted the September 2009 ABET visit to the UTC ChE Program. This “extra” visit was due to ABET putting us on the same cycle as other UTC programs. The ChE program successfully acquired a six-year accreditation (through July 1, 2016).

GRANT FUNDING:

- **The Enterprise Center.** Funds granted from January 2009 to July 2010 to support undergraduate research on vegetable oil to biodiesel in microreactors. **Amount awarded = \$12,000 per year.**
- **Provost Student Research Award.** Funds granted in spring 2008 to support undergraduate student researcher Jason Frizzell to work on the biomicroreactors project.

“A Parametric Study of Temperature Variations and Scale using Heterogeneous Micromixing in Catalytic Microchannels.” **Amount awarded = \$1,000.**

- **Riverbend Technology Institute.** Funds granted in spring 2008 to support undergraduate student researcher Jason Frizzell to work on the bioreactors project. **Amount awarded = \$2,500.**
- **CEACSE.** “Simulation of Biodiesel Production by Microreaction Systems.” PI. July 2007 – July 2008. **Amount awarded = \$25,000.**
- **Riverbend Technology Institute.** Funds granted in fall 2006 to support undergraduate student researcher Stephanie Wilson to work on the bioreactors project. **Amount awarded = \$1,200.**
- **CEACSE** (Center of Excellence in Applied Computational Science and Engineering). “Computational Studies of Microreactor Design.” PI. **Amount awarded = \$37,780.** January 2006 to July 2007.
- **Faculty Development Grant** for Summer 2005. Title: “Computational Studies in Chemical Process Miniaturization.” This grant is for a training course in my research software at ESI in Huntsville, AL, May 17-20. **Amount awarded = \$656.**
- **Faculty Research Grant** for Spring 2005. Title: “Simulation Study of the Effect of Flow Patterns on Conversion in a Microreactor.” **Amount awarded = \$2,650.**
- Access granted to Oak Ridge supercomputers for the simulation and optimization of bioreactors. Fall 2004.
- **CECA Research/CCI Grant** for Summer 2004, “Microreactor Design Optimization via Supercomputer Simulation.” **Amount awarded = \$3,000.** With Rob Bailey.
- **Faculty Research Grant** for Spring 2004, “Simulation Studies of Microreactors.” **Amount awarded = \$3,000.** With Rob Bailey. This grant is awarded in conjunction with a Benwood award for unlimited parallel software appropriate for the supercomputer at Oak Ridge National Lab. **Amount awarded = \$2,000.**
- **CECA Research/CCI Grant** for Spring 2003, “Design and Optimization of a Microreactor via Numerical Simulation.” **Amount awarded = \$3,000.** With Rob Bailey.
- **CECA Research/CCI Grant** for Fall 2002, “Simulation and Testing of Microreactors.” **Amount awarded = \$990.**
- **NSF 02-092**, Fall 2002 - Summer 2003, “Bridges to Engineering Science: Teaching Teachers (B.E.S.T.T.)” **Amount awarded = \$99,806.** Tom Patty is PI. I am one of 6 faculty members on the grant.
- **Benwood grant** for Summer 2002. **Amount awarded = \$5,000** to purchase a plasma etcher to pursue novel enzyme immobilization procedure.
- **CECA Research/CCI Grant** for Spring 2002, “Numerical simulation of a Microreactor.” **Amount awarded = \$3,000.** With Rob Bailey.
- **CECA Research/CCI Grant** for Spring 2001, “The development of chemical and environmental processes using SuperPro Designer.” Funding awarded January 2001. **Amount awarded = \$2,480.**
- PI on **BoRSF Research Competitiveness Grant** (State of Louisiana) LEQSF (1999-02)-RD-A-24, “Fundamental Research in Chemical Process Miniaturization.” Funding awarded July 1999. **Amount awarded = \$118,119.** Funding period 7/99 – 7/02.
- I was a Co-PI (PI on one of the research projects) on **Department of Defense**, DAAH04-96-1-0200, 1996-01, on which R. Warrington was overall PI. Overall title: “The

Development of a Center for Advanced Mold/Mask processes and Applications for the Miniaturization Technologies.” The title of my research project is “Basic Research in Microreactor and Microprocessing Design.” **Total amount awarded = \$1,994,501.** Funding period 4/96 – 4/01.

- **BoRSF Enhancement Grant** (State of Louisiana), LEQSF (1999-00)-ENH-TR-32 “An Interdisciplinary Laboratory for the Integrated Freshman and Sophomore Engineering Curriculum.” **Amount awarded = \$30,313.** I am a Co-PI. Bill Elmore is PI.

PRESENTATIONS:

1) Tricia Thomas, Robert Dacus, Jennifer Lewis, Rob Mebane, Jim Hiestand, Rob Bailey, Mary Lowe, Frank Jones, “Micro Chemical Processing Technology for Production of Biodiesel Fuel,” Submitted to Section 23B03-Developments in Biobased Alternative Fuels, *AIChE Annual Meeting*, Salt Lake City, November 2010.

2) **Invited seminar:** Title: “Use of Microfluidic Technology in Alternative Energy and Environmental Applications.” UTC Symposium on the Environment, April 1, 2010.

3) Jennifer Lewis and Frank Jones, “Design Studies of Heterogeneous Catalysis in Microchannels.” AIChE Annual Meeting, Nashville, TN, November 9, 2009. **Jennifer won a 2nd place award for this presentation in an undergraduate student research competition, Reactor Design Section.**

4) Trip Dacus, Frank Jones, Rob Mebane, “A Kinetic Study of the Production of Biodiesel Fuel from Algae.” AIChE Annual Meeting, Nashville, TN, November 9, 2009.

5) **Invited seminar:** “Microchemical Technology for the Production of Biodiesel Fuel.” Tennessee Tech University, Cookeville, TN, November 17, 2009.

6) **Invited seminar:** “Microchemical Technology for the Production of Biodiesel Fuel.” Chattanooga Engineers Club, October 19, 2009. Delivered by my DHON students: Trip Dacus and Jennifer Lewis.

7) **Invited seminar:** “Microchemical Technology for the Production of Biodiesel Fuel.” CFDRC, Huntsville, AL, October 14, 2009. CFDRC is my software company and they do some experimental work in micro technology. With Tricia Thomas.

8) Robert Bailey, Frank Jones, Stephanie Wilson, Stephen Ryan, and James Hiestand, “The Effects of Packing Patterns on Mixing and Heterogeneous Catalysis in Microchannels,” ASME Fluids Engineering Conference, July 29-August 2, 2007, San Diego, CA.

9) Nesli Alp, Frank Jones, Rob Bailey, and Jim Hiestand, “Conversion Rate Optimization in Biomicroreactors Using the Taguchi Method,” Institute of Industrial Engineers Annual Conference, May 2007, Nashville, TN.

10) Stephanie Wilson and Frank Jones, "The Effects of Micromixing on heterogeneous Catalysis in Microbioreactor Channels," ASEE Southeastern Section Conference, Louisville, KY, April 1-3, 2007.

11) Stephanie Wilson and Frank Jones, "The Effects of Micromixing on Heterogeneous Catalysis in Microbioreactor Channels," AIChE Annual Meeting, San Francisco, CA, November 11-15, 2006. **Stephanie won a 2nd place award for this presentation in an undergraduate student research competition, Biotech Division.**

12) Frank Jones, Robert Bailey, Stephanie Wilson, and James Hiestand, "The Effects of Engineering Design on Heterogeneous Catalysis in Microchannels." 28th Symposium on Biotechnology for Fuels and Chemicals, Nashville, TN, May 2006.

13) J. Wen, B. Elmore, and F. Jones, "A Study of Layer-by-Layer Nano Self-Assembly Techniques for Enzyme Immobilization in Microchannels," 28th Symposium on Biotechnology for Fuels and Chemicals, Nashville, TN, May 2006.

14) Nesli Alp, Frank Jones, Rob Bailey, and Jim Hiestand "The Use of Taguchi Statistical Methods to Optimize the Design of Biomicroreactors." Institute of Industrial Engineers Annual Conference, Orlando, FL, May 2006.

15) *Invited Seminar*: I was invited to speak to the Chattanooga section of the ASME on my research on Micro, Nano, and Bio Technology. March 22, 2006 at UTC.

16) Frank Jones, Chris Martin, Robert Bailey, and James Hiestand, "The Effect of Varying Structured Catalyst Packing on Conversion in Microchannel-based Bioreactors." 27th Symposium on Biotechnology for Fuels and Chemicals, Denver, CO, May 2005.

17) Jen Wen, James Palmer, Bill Elmore, and Frank Jones, "Enzyme Immobilization onto Polydimethylsiloxane using Layer-by-layer Self-assembly Techniques." 27th Symposium on Biotechnology for Fuels and Chemicals, Denver, CO, May 2005.

18) Frank Jones, Bill Elmore, Jim Palmer, and Rob Bailey, "The Effect of Enzyme Attachment Method on Biomicroreactor Design and Operation." 26th Symposium on Biotechnology for Fuels and Chemicals, Chattanooga, TN, May 2004.

19) Robert Bailey, Frank Jones, Ben Fisher and Bill Elmore, "Immobilized Enzymatic Microbioreactor Design Enhancement using Computational Simulation." 26th Symposium on Biotechnology for Fuels and Chemicals, Chattanooga, TN, May 2004.

20) Frank Jones, Scott Forrest, Jim Palmer, Zonghuan Lu, John Elmore, and Bill Elmore, "Immobilized Enzyme Studies in a Micro-Scale Bioreactor." 25th Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, CO, May 2003.

- 21) Rob Bailey and Frank Jones, "Optimization of an Immobilized Enzymatic Microbioreactor via Numerical Simulation." 25th Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, CO, May 2003.
- 22) Frank Jones and Rob Bailey, "Simulation and Experimentation in Microbioreactor Design: Incorporation into Engineering Education." ASEE Southeastern Section Annual Conference, Macon, GA, April 6-8, 2003.
- 23) Zonghuan Lu, Bill Elmore, Francis Jones, Rui Jiang, "Micro-scale Biochemical Reactor Studies Using Immobilized Enzymes in Polydimethylsiloxane (PDMS)," 2002 Louisiana EPSCoR Conference, Baton Rouge, LA, April 10-11, 2002.
- 24) Bill Elmore, Zonghuan Lu, Rui Jiang, and Francis Jones, "A Novel Micro Scale Enzyme Reactor for Environmental Applications." 24th Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg, TN, April 29-30, 2002.
- 25) Robert Bailey, Prakash Damshala, Bill Elmore, and Francis Jones, "Numerical Simulation of an Immobilized Enzyme Microbioreactor," 24th Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg, TN, April 29-30, 2002.
- 26) Bill Elmore, Zonghuan Lu, Rui Jiang, Andrea Forrest, and Francis Jones, "Heterogeneous Catalysis in a Micro Scale Packed Bed Reactor Fabricated From a Biologically Active Plastic," SPIE Symposium on Micromachining and Microfabrication, Micromachining and Microfabrication Process Technology VII, San Francisco, CA, October 2001.
- 27) Bill Elmore, Jim Palmer, Zonghuan Lu, Rui Jiang, and Francis Jones, "Development of a Micro Scale Biochemical Reactor Fabricated form a Biologically Active Plastic," TexMEMS Conference, Dallas, TX, June 2001.
- 28) Francis Jones, Zonghuan Lu, and Bill Elmore, "The Development of a Novel Micro-Scale System as an Immobilized Enzyme Bioreactor." 23rd Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, CO, May 2001.
- 29) Cynthia Dickey, Bill Elmore, and Francis Jones, "Enzyme Catalyzed Biochemical Production in a PDMS Microreactor," SPIE Symposium on Micromachining and Microfabrication, Micro Fluidic Devices and Systems Section, Santa Clara, CA, September 2000.
- 30) Francis Jones, Ron Besser, Bill Elmore, Ji Fang, and Tianhong Cui, "An Experimental System for the Study of Gas-solid Heterogeneous Catalysis in Microreactors," SPIE Symposium on Micromachining and Microfabrication, Micro Fluidic Devices and Systems Section," Santa Clara, CA, September 2000.

- 31) Cindy Furlong, Bill Elmore, and Frank Jones, "Immobilized Enzyme Activity in a Polydimethylsiloxane (PDMS) Micro-scale Bioreactor," 1st Annual Louisiana Microsystems Conference, Ruston, LA, April 2000.
- 32) Francis Jones and Deng Qing, "A Fundamental Study of Gas-Solid Heterogeneous Catalysis in Microreactors," AIChE Spring Conference (IMRET IV), Atlanta, GA, March 2000.
- 33) Ai-Ping Zheng, Francis Jones, and Ji Fang, "Dehydrogenation of Cyclohexane to Benzene in a Membrane Microreactor," AIChE Spring Conference (IMRET IV), Atlanta, GA, March 2000.
- 34) Cynthia Dickey Furlong, Bill Elmore, and Francis Jones, "Pharmaceutical Production Using PDMS Microreactors," AIChE Spring Conference (IMRET IV), Atlanta, GA, March 2000.
- 35) Francis Jones, Anand Kuppusamy, and Ai-Ping Zheng, "Dehydrogenation of Cyclohexane to Benzene in Microreactors and Membrane Microreactors," SPIE Symposium on Micromachining and Microfabrication, Micro Fluidic Devices and Systems Section, Santa Clara, CA, September 1999.
- 36) Jones, F. J., R. T. Thompson, and George Grozdits, "Behavior of Small Oak Specimens in Vacuum Under Microwave field," Annual Meeting of the Forest Products Society, June 1999.
- 37) Jones, F. J., R. T. Thompson, and G. A. Grozdits, "Veneer Dryers as Water Separators, Chemical Engineering Concepts and Design," 1998 Annual Meeting of the Forest Products Society, Merida, Yucatan, Mexico, June 1998.
- 38) Trivedi, P., G. Sathanandam, F. J. Jones, and B. B. Elmore, "Biological Conversion of Carbon Monoxide to Useful Fuels and Chemicals," Nineteenth Symposium on Biotechnology for Fuels and Chemicals, Colorado Springs, May 1997.
- 39) Annamalai, K., and F. J. Jones, "Microreactor Design and Simulation in the Slip-Flow Regime", A.C.S., I&EC Division, Computers in Engineering Conference, Birmingham, Alabama, May 1997.
- 40) Chakravarthy, S. V., and F. J. Jones, "Design Simulation of Membrane Microreactors and Microseparators", presented to A.C.S., I&EC Division, Computers in Engineering Conference, Birmingham, Alabama, May 1997.
- 41) Heller, E., and F. J. Jones, "Design of a Microreactor," AIChE Annual Meeting, Chicago, November 1996.
- 42) Pandya, N., F. J. Jones, C. Sheppard, "Financial and Technical Feasibility of Separating NMOC's from Landfill Gas Using Membranes," American Chemical Society, I&EC Division (Emerging Technologies in Hazardous Waste Management VIII), Birmingham, September 1996.
- 43) Pandya, N., and F. J. Jones, "Removal of Non-methane Organic Compounds from Landfill Gas Using Gas Separation Membranes," AIChE Spring Meeting, New Orleans, February 1996.

44) Flake, J., F. J. Jones, and H. K. Huckabay, "Membrane Separation of Non-Methane Organic Compounds from Landfill Gas," American Chemical Society, I&EC Division (Emerging Technologies in Hazardous Waste Management VII), Atlanta, September 1995.

45) Huckabay, H. K., S. A. Behbahani, B. B. Elmore, F. J. Jones, C. M. Sheppard, R. H. Thompson, "Combining Engineering Science and Design," American Society for Engineering Education, Gulf Southwestern Section, 1995 Annual Conference, Beaumont, Texas.

46) Jones, F. J., and Weinberger C. B., "Sampling of Viscous Suspensions of Neutrally Buoyant Spheres in Laminar Flow through Tubes," AIChE Annual Meeting, Miami, November 1992.

47) Jones, F. J., and Weinberger, C. B., "Sampling of Viscous Suspensions of Neutrally Buoyant Spheres in Laminar Flow Through Tubes," AIChE Annual Meeting, Los Angeles, November 1991.

PUBLICATIONS:

1) (in preparation) Frank Jones, Rob Mebane, Robert Dacus, Jennifer Lewis, James Hiestand, Robert Bailey and Mary Lowe, "Kinetic Studies of Biodiesel Production using Nickel and Nickel Oxide Catalysts." This paper will be submitted to the *Journal Molecular Catalysis A*.

2) R. T. Bailey, S. Ryan, F. Jones, S. Wilson, and J. Hiestand, "Effects of Packing and Aspect Ratio on Mixing and Heterogeneous Catalysis in Microchannels," in *Proceedings of the 5th Joint ASME/JSME Fluids Engineering Conference*, San Diego, CA, July 2007.

3) Frank Jones, Rob Bailey, Stephanie Wilson, and Jim Hiestand, "The Effects of Engineering Design on Heterogeneous Biocatalysis in Microchannels." *Applied Biochemistry and Biotechnology*, Vol. 136-140, 859-873 (2007).

4) Stephanie Wilson and Frank Jones, "A Study of the Effects of Various Flow Obstructions on Heterogeneous Catalysis and Micromixing in Biocatalytic Microchannels," Analytical Sciences Digital Library, eUndergraduate Research Online Journal, March 2007.
http://www.asdlib.org/eUGHUploads/45_eUGH_publication.pdf?PHPSESSID=63458ea223f63d9a15ee548ed6a3a01a.

5) Alp, Neslihan; Jones, Frank; Bailey, Rob; and Hiestand, Jim; "Use of Taguchi Methods to Optimize the Design of Biomicroreactors," Institute of Industrial Engineers (IIE) Annual Conference Proceedings, pp. 108-113, May 20-24, 2006, Orlando, FL.

6) Rob Bailey, Frank Jones, Ben Fisher, and Bill Elmore "Immobilized Enzymatic Microbioreactor Design Enhancement using Computational Simulation." *Applied Biochemistry and Biotechnology*, Vols. 121-124, 639-652 (2005).

- 7) Frank Jones, Scott Forrest, Jim Palmer, Zonghuan Lu, John Elmore, and Bill Elmore, "Immobilized Enzyme Studies in a Micro-Scale Bioreactor." *Applied Biochemistry and Biotechnology*, Vols. 113-116, pp. 261-272 (2004).
- 8) Frank Jones and Rob Bailey, "Simulation and Experimentation in Microbioreactor Design: Incorporation into Engineering Education." ASEE Southeastern Section Annual Conference, Macon, GA, April 6-8, 2003.
- 9) Francis Jones, Zonghuan Lu, Bill B. Elmore, "The Development of a Novel Micro-Scale System as an Immobilized Enzyme Bioreactor," *Applied Biochemistry and Biotechnology*, Vols. 98-100, pp. 627-640 (2002).
- 10) Bill Elmore, Zonghuan Lu, Rui Jiang, Andrea Forrest, and Francis Jones, "Heterogeneous Catalysis in a Micro Scale Packed Bed Reactor Fabricated From a Biologically Active Plastic," *Proceedings of SPIE, Micromachining and Microfabrication Process Technology VII*, Volume 4557, pp. 360-370, San Francisco, CA, October 2001.
- 11) Jones, F. J., and B. B. Elmore, "Incorporating Chemical Process Miniaturization into the Chemical Engineering Curriculum at Louisiana Tech University," *Chemical Engineering Education*, Vol. 34, No. 4, pp. 316-325 (2000).
- 12) Cynthia Dickey, Bill Elmore, and Francis Jones, "Enzyme Catalyzed Biochemical Production in a PDMS Microreactor," *Proceedings of SPIE, Microfluidic Devices and Systems III*, Vol. 4177, pp. 56-64, Santa Clara, CA, September 2000.
- 13) Francis Jones, Ron Besser, Bill Elmore, Ji Fang, and Tianhong Cui, "An Experimental System for the Study of Gas-solid Heterogeneous Catalysis in Microreactors," *Proceedings of SPIE, Microfluidic Devices and Systems III*, Vol. 4177, pp. 124-131, Santa Clara, CA, September 2000.
- 14) Cindy Furlong, Bill Elmore, and Frank Jones, "Immobilized Enzyme Activity in a Polydimethylsiloxane (PDMS) Micro-scale Bioreactor," *Proceedings of the 1st Annual Louisiana Microsystems Conference*, Ruston, LA, April 2000.
- 15) Francis Jones, Deng Qing, Ji Fang, and Tianhong Cui, "A Fundamental Study of Gas-Solid Heterogeneous Catalysis in Microreactors," *Proceedings of the 4th International Conference on Microreaction Technology (IMRET IV)*, pp. 400-409, Atlanta, GA, March 2000.
- 16) Ai-Ping Zheng, Francis Jones, Ji Fang, and Tianhong Cui, "Dehydrogenation of Cyclohexane to Benzene in a Membrane Microreactor," *Proceedings of the 4th International Conference on Microreaction Technology (IMRET IV)*, pp. 284-292, Atlanta, GA, March 2000.
- 17) Cynthia Dickey Furlong, Bill Elmore, and Francis Jones, "Pharmaceutical Production Using PDMS Microreactors," *Proceedings of the 4th International Conference on Microreaction Technology (IMRET IV)*, pp. 293-300, Atlanta, GA, March 2000.

18) Jones, F. J., A. Kuppusamy, and A. Zheng, "Dehydrogenation of Cyclohexane to Benzene in Microreactors and Membrane Microreactors," *Proceedings of SPIE, Microfluidic Devices and Systems II*, Volume 3877, Vol. 3877, pp. 160-168, Santa Clara, CA, September 1999.

19) Devulapalli, R., and F. J. Jones, "Development of an Emulsion Liquid Membrane Process to Remove Aniline from Aqueous Solutions," *Journal of Hazardous Materials*, B70, pp.157-170 (1999).

20) Jones, F. J., and Weinberger, C. B., "Screening Effects When Sampling Suspensions in Laminar Flow through Pores," *AIChE Journal*, Vol. 43, No. 10, 2405 (1997).

21) Annamalai, K., and F. J. Jones, "Microreactor Design and Simulation in the Slip-Flow Regime," *Computers in Engineering Symposium Series, A.C.S., I&EC Division*, pp. 49-53, May 1997.

22) Chakravarthy, S. V., and F. J. Jones, "Design and Simulation of Membrane Microreactors and Microseparators," *Computers in Engineering Symposium Series, A.C.S., I&EC Division*, pp.54-58, May 1997.

23) Pandya, N., F. J. Jones, and C. Sheppard, "Financial and Technical Feasibility of Separating NMOC's from Landfill Gas Using Membranes," *Symposium Series, ACS, I&EC Division, Emerging Technologies in Hazardous Waste Management VIII*, pp. 549-552, Birmingham, September 1996.

24) Flake, J., F. J. Jones, and H. K. Huckabay, "Membrane Separation of Non-Methane Organic Compounds from Landfill Gas," *Symposium Series, ACS, I&EC Division, Emerging Technologies in Hazardous Waste Management VII*, pp. 848-851, Atlanta, September 1995.

25) Huckabay, H. K., S. A. Behbahani, B. B. Elmore, F. J. Jones, C. M. Sheppard, and R. H. Thompson, "Combining Engineering Science and Design," *Conference Proceeding of the ASEE, Gulf Southwestern Section, 1995*.

SUPERVISOR (COMMITTEE CHAIRMAN) FOR THE FOLLOWING M.S. THESES:
Ramanamurthy Devulapalli, "Removal of Aniline from Aqueous Solutions Using Emulsion Liquid Membranes." Completed August 1994.

John Flake, "A Membrane Separation Process for the Removal of Non-Methane Organic Compounds from Landfill Gas." Completed August 1994.

Nikhil Pandya, "Design of a Device that Measures Permeabilities of Gases Through Membranes." Completed May 1996.

Eric Heller, "Design of a Microreactor." Completed August 1996.

Yunlong Wang, “Manufacturing SiO₂ Microspheres Using and Emulsion Liquid Membrane Reactor.” Completed November 1996.

Kuttayan Annamalai, “Microreactor Design and Simulation in the Slip-Flow Regime.” Completed August 1997.

Sundar V. Chakravarthy, “Design and Simulation of Membrane Microreactors.” Completed May 1998.

Ashish Joshi, “Fabrication of a Miniaturized Chemical Process.” Completed August 1998.

Ai-Ping Zheng, “Dehydrogenation of Cyclohexane to Benzene in a Membrane Microreactor.” Completed February 2000.

Deng Qing, “Design, Fabrication, and Simulation of Microreactor Devices for the Louisiana Tech University Universal Testing System.” Completed November 2000.

Jiang Rui, “Immobilization of Enzymes on Polydimethylsiloxane.” Completed December 2002.

Alex Saputa, “GREET Fuel/Energy Analyses for Undergraduate Laboratory Applications,” To be completed by December 2010.

CO-SUPERVISOR FOR THE FOLLOWING Ph.D. DISSERTATION:

Cynthia Dickey, “The Design, Modeling, Fabrication, and Testing of an Immobilized Enzyme Microreactor.” Co-chair with Bill Elmore. Completed May 2000.

SUPERVISOR FOR THE FOLLOWING HONORS THESIS:

Stephanie Wilson, “A Study of the Effects of Various Flow Obstructions on Heterogeneous Catalysis and Micromixing in Biocatalytic Microchannels.” Completed December 2006.

Jennifer Lewis, “Simulation of Biodiesel Production in a Micro Scale Processing Plant.” Completed May 2010.

Robert Dacus, “The Comparison of Algae Oil with Soy Bean Oil with Applications to the Chemical Conversion of Oil into Biodiesel.” Completed May 2010.

PROFESSIONAL SERVICE:

I have been a *Peer Reviewer* for the following professional journals:

- *Environmental Science and Technology*
- *Separation Science and Technology*
- *International Journal of Heat and Mass Transfer*
- *Journal of Membrane Science*
- *Applied Biochemistry and Biotechnology*
- *American Society of Engineering Education*
- *Recent Patents in Engineering*

- *Biochemical Engineering Journal*
Book Review: Heat Transfer, 2nd ed. by Yunus Cengel.

PROFESSIONAL SOCIETY MEMBERSHIPS:

American Institute of Chemical Engineers (AIChE).
American Chemical Society (ACS).
Sigma Xi.
Phi Lambda Upsilon (an honorary chemical society).
American Society for Engineering Education (ASEE).
Council on Undergraduate Research (CUR).

UTC SERVICE: (past or present member or chair of the following departmental, college, and university level committees)

1) Chair of ABET Accreditation Committee for Chemical Engineering Program

Purpose: (2007) Obtained *initial* accreditation of Chemical Engineering Program.
(2009) Obtained re-accreditation.

2) ABET Accreditation Committee for ENGR. (College)

Purpose: (2003) Obtained ENGR re-accreditation.

3) Engineering Petitions Committee. (College)

Purpose: Serving as Chemical and Environmental Engineering representative on college petitions committee.

4) Faculty Research Committee. (University)

Purpose: To distribute university research funds to faculty and students.

5) Faculty Senate. (University)

6) Chair, Rank and Tenure Committee. (College)