

Francis Marion Burns, Ph. D.

University of South Carolina Salkehatchie
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PROFESSIONAL EXPERIENCE

Assistant Professor of Chemistry, University of South Carolina Salkehatchie, 2017 to present

Teach pre-nursing chemistry, general chemistry, and forensic chemistry. Participate in scholarship and service activities.

Instructor of Chemistry, Diné College, 2015 to 2017

Taught general chemistry to Navajo community college students: one semester and two-semester courses. Participated in scholarship and service activities. Mentored students in undergraduate research activities.

Visiting Assistant Professor of Chemistry, Ferris State University, 2005-2011, 2012-2015

Taught general chemistry: one semester and two-semester courses. Supervised “peer-leader” discussion sections for general chemistry. Pursued chemical education research and student assessment activities.

Lecturer, Koya University, Kurdistan, Iraq, 2011 - 2012

Taught analytical and instrumental chemistry in English to Kurdish students. Engaged in environmental science research.

Advanced Placement (AP) Reader, College Board, Princeton, New Jersey, 2010 & 2015

Served as a reader for free response questions on the AP Chemistry exam.

Quality Control Analyst, Perrigo Company, Allegan, Michigan, 2008 - 2009

Performed a variety of analytical tests on over-the-counter drugs, using Food and Drug Administration (FDA) approved procedures.

Consultant, Media Development Group, Houghton-Mifflin Company, 2006 - 2008

Provided editorial review of online and printed content associated with chemistry textbooks, including General, Organic, and Biological Chemistry, 4th Edition (Stoker) and General Chemistry, 8th Edition – Media Enhanced (Ebbing).

Assistant Professor of Chemistry, Grand Valley State University, 1999 - 2005

Taught a range of analytical courses, including instrumental analysis. Participated in student advising, scholarship and service activities.

Graduate Student, College of Arts and Sciences, The University of Toledo, 1995 - 1999

Taught laboratory for the junior physical chemistry, senior instrumental analysis, and the graduate spectroscopy and separation courses. Additional responsibilities included the maintenance and troubleshooting of the instrumentation. Provided technical support for educational software and departmental web page.

Environmental Chemist, OHM Corporation, Findlay, Ohio, Summer 1994

Performed environmental analyses according to EPA protocols using a variety of analytical methods, including titrimetry, gravimetry, and ion chromatography.

Assistant Professor of Chemistry, University of Findlay, 1991 - 1995

Taught liberal arts, general chemistry, and organic chemistry lab. Developed a general chemistry laboratory curriculum for science majors. Coordinated the non-instructional aspects of the chemistry laboratories.

Undergraduate Chemistry Laboratory Coordinator, The University of Houston, 1989 - 1991

Coordinated the non-instructional aspects of the freshman and organic chemistry laboratory courses. Provided supervision and technical support to teaching assistants.

Science Education Graduate Student, The Ohio State University, 1988 - 1989

Taught general biology as a biology-teaching assistant. Investigated the stress and turnover of state directors for the USDA agriculture extension service as an agriculture education research student.

Research Assistant, College of Medicine, The Ohio State University, 1986 - 1988

Collected data for Phase III clinical cancer trials. Resolved questions concerning protocols for the treating physicians and questions regarding study participants for the primary investigators.

EDUCATION

Ph.D. in Analytical Chemistry. 1999. The University of Toledo, Toledo, Ohio

M.A. in Science Education. 1991. The Ohio State University, Columbus, Ohio

B.S. in Entomology. 1986. The Ohio State University, Columbus, Ohio

PUBLICATIONS

1. "Factors Affecting Student Retention and Success of Pre-nursing Students." F.M. Burns and F. Ngwane. *Community College Journal of Research and Practice*. (accepted)
2. "Pedagogical integration of the humanities and sciences." F.M. Burns. In *Insights into the Relationships Between Humanities*. L. Mammino: Editor. (accepted)
3. "Closing the Circle in Student Assessment and Learning." F.M. Burns. In *Research in Chemical Education*, L. Mammino & J. Apotheker: Editors, **2021**, 97-112.
4. "Diné College Students ASCEND! to New Heights" Francis Burns. *2B Buzz Newsletter*. 2B Technologies: Boulder, Colorado. Spring 2019, 3.
https://twobtech.com/newsletters/2B_Newsletter_Spring_2018.pdf (Accessed on 10/26/21).

5. "Evidence of Environmental Mercury in the Kurdish Regional Government (KRG) Region" F.M. Burns (unpublished manuscript).
6. "Assessing students' evaluation skills using "thermochemical stories"." F.M. Burns, D. Frank, L. Clark, & J.N. Asare (unpublished manuscript).
7. "The use of electronic media for chemical education research." F. M. Burns & D. Frank. *Chemistry Education and Sustainability in the Global Age* **2013**, 185-195.
8. "Characterization of Ceramic-based Dual Ultramicroelectrodes by Microscopic and Electrochemical Methods." F. M. Burns, D. M. Giolando, J. R. Kirchoff. *Proceedings: Microscopy and Microanalysis* **1997**, 3(Supplement 2), 1245-1246.

PRESENTATIONS

1. "Flipped classroom model for learning forensic chemistry: A case study" Francis Marion Burns, Atlantic Basic Conference on Chemistry, Marrakech, Morocco, 13-16 December 2022.
2. "Factors Affecting Retention and Success at a Small Two-year Institution" Francis Marion Burns and Fidele Ngwane, NASPA Conferences on Student Success in Higher Education, Baltimore, MD, United States, June 26 - June 29, 2022.
3. "What's the recipe for success? Roundtable discussion on student retention and success" Francis Burns and Fidele Ngwane, Salkehatchie Scholarly Research Forum, University of South Carolina Salkehatchie, April 7, 2022.
4. "Flipped Classrooms: Teaching Students How to Learn," Francis Burns, "I didn't know that I could do that: technology, teaching, and tidbits" virtual conference, University of South Carolina Salkehatchie, December 2021 (Contributed).
5. "Factors Affecting Retention and Success for Pre-nursing Students" Francis Marion Burns and Aaron Ard, NASPA Conferences on Student Success in Higher Education, Baltimore, MD, United States, June 29–July 1, 2020.
<https://www.naspa.org/events/naspa-conferences-on-student-success-in-higher-education1> (Conference canceled).
6. "Assessing critical thinking skills through self and peer evaluation," Francis Burns 224th Conference of the Two-Year Chemistry Consortium, Miramar College, San Diego, California, August 2019 (Contributed).
7. "First-year research projects: solving problems and improving student performance," Francis Burns, 1st International Conference on Pure and Applied Science, Koya University, Kurdistan Iraq, April 2018 (Keynote).
8. "Do My Students REALLY Understand Me? Using Clickers for Formative Assessment," Francis Burns, Education Technology Showcase. University of South Carolina, April 2018 (Contributed).
9. "2017 Solar Eclipse," Francis Burns, University of South Carolina Salkehatchie, Allendale, South Carolina, August 2017 (Invited).

10. "Evidence of Environmental Mercury in the Kurdish Regional Government (KRG) Region," Francis Burns, 1st International Conference of Natural Science, Chamchamal, Kurdish Regional Government, Iraq, July 2016 (Keynote).
11. "Closing the Circle in Student Assessment and Learning," Francis Burns, 2nd African Conference on Research in Chemical Education, Thohoyandou, South Africa, November 2015 (Invited).
12. "Assessing higher order thinking skills through creative writing," Francis Burns, Jesse Asare, and Letoia Clark, 2nd African Conference on Research in Chemical Education, Thohoyandou, South Africa, November 2015 (Invited).
13. "Student Assessment Break-out Session," Francis Burns, Intercampus Day, Diné College, Tsaile, Arizona, October 2015 (Contributed)
14. "Assessing Higher Order Thinking Skills through Creative Writing," F. Burns and D. Frank, Joint Great Lakes and Central Regional Meeting of the American Chemical Society, Grand Rapids, Michigan, May 2015 (Contributed).
15. "Insecticide applications near pollinator habitat: Q & A panel," Francis Burns and Erin Lizotte, MAEAP (Michigan Agriculture Environmental Assurance Program) Phase 1 Meeting, Scottville, Michigan, February 2015 (Invited).
16. "Chemical Stories: Better Chemistry through Creative Writing," Francis Burns and David Frank, 23rd IUPAC International Conference on Chemical Education, Toronto, Canada, July 2014. (Contributed)
17. "The Use of Electronic Media for Classroom Assessment: Looking at Learning Through Students' Eyes" Francis Burns, The 5th Annual Scholarship of Teaching & Learning Academy, Grand Valley State University, Grand Rapids, Michigan, May 2013. (Contributed)
18. "The Use of Electronic Media for Classroom Assessment: Looking at Learning Through Students' Eyes" Francis Burns, Faculty Center for Teaching and Learning, Ferris State University, Big Rapids, November 2013. (Invited)
19. "Mercury Analysis" Francis Burns, Koya University, Kurdistan, Iraq, April 2012. (Invited)
20. "The Use of Electronic Media for Chemical Education Research" Francis Burns, Koya University, Kurdistan, Iraq, May 2011. (Invited)
21. "The Use of Electronic Media for Chemical Education Research" Francis Burns and Dave Frank, 21st International Conference for Chemical Education, Taipei, Taiwan, August 2010. (Contributed)
22. "The effect of online learning logs on student outcomes in general chemistry" Francis Burns, Dave Frank, Tracy Kerr, and Todd Stanislav, 20th Biennial Conference for Chemical Education, Bloomington, Indiana, August 2008. (Contributed)
23. "Open Educational Resources in Chemistry – Empowering the People" Francis Burns, 41st World Chemistry Congress, Turin, Italy, August 2007. (Contributed)
24. "Gazing into the Future with a Fogged Crystal Ball" Francis M Burns, 232nd National Meeting, American Chemical Society, San Francisco, California, September 2006. (Contributed)

25. "Career Opportunities in Food Science" Francis M Burns, Student Affiliate Chapter of the American Chemical Society, Ferris State University, Big Rapids, March 2000. (Invited)
26. "The Human Body in Motion: Biology, Chemistry, and Physics at Work and Play" Francis Burns, Brad Ambrose, and Jim Scott, 17th Biennial Conference for Chemical Education, Bellingham, Washington, August 2002. (Contributed)
27. "Evaluation of a Web-based Chemistry Assignment Using a Course Portfolio" Francis M Burns, 16th Biennial Conference on Chemical Education, Ann Arbor, Michigan, August 2000. (Contributed)
28. "Fabrication and Characterization of Alumina-Coated Tungsten Wire Ultramicroelectrodes by Chemical Vapor Deposition." Ihab N. Odeh, Francis M. Burns, Dean M. Giolando, and Jon R. Kirchhoff, 30th Central Regional Meeting of the American Chemical Society, Cleveland, Ohio, May 1998. (Contributed)
29. "Development of Microsensors Based on the Ring-Disk Ultramicroelectrode." Francis M. Burns, Dean M. Giolando, Jon R. Kirchhoff, 1998 Pittsburgh Conference and Exposition, New Orleans, Louisiana, March 1998. (Contributed)
30. "Investigation of Silicon Carbide as an Electrode Material for Electroanalysis." Jon R. Kirchhoff, Phy Qui Nguyen, Frank Meier, Francis M. Burns, Julie M. Mosher, Dean M. Giolando, 1998 Pittsburgh Conference and Exposition, New Orleans, Louisiana, March 1998. (Contributed)
31. Dual Ultramicroelectrodes Devices for Electroanalysis." Jon R. Kirchhoff, Francis M. Burns, Dean M. Giolando, 24th Annual Conference of the Federation of Analytical and Spectroscopy Societies, Providence, Rhode Island, October 1997. (Invited)
32. "Characterization of Ceramic-based Dual Ultramicroelectrodes by Microscopic and Electrochemical Methods." Francis M. Burns, Dean M. Giolando, Jon R. Kirchhoff, Microscopy and Microanalysis 97, Cleveland, Ohio, August 1997. (Contributed)
33. "Fabrication and Characterization of Ceramic-based Dual Ultramicroelectrodes." Francis M. Burns, Jon R. Kirchhoff, Dean M. Giolando, Sigma Xi Graduate Symposium, Toledo, Ohio, May 1997. (Contributed)
34. "Fabrication of Ceramic-based Dual Ultramicroelectrodes by Chemical Vapor Deposition." Francis M. Burns, Jon R. Kirchhoff, Dean M. Giolando, 1997 Pittsburgh Conference and Exposition, Atlanta, Georgia, March 1997. (Contributed)
35. "Fabrication of Modified Dual Ultramicroelectrodes for Trace Analysis." Francis M. Burns, Dean M. Giolando, Jon R. Kirchhoff, 28th Central Regional Meeting of the American Chemical Society, Dayton, Ohio, June 1996. (Contributed)
36. "The Economics of Laboratory Safety." Francis M. Burns, 209th National Meeting of the American Chemical Society, Anaheim, California, April 1995. (Invited)

WORKSHOPS, SYMPOSIA, & PROFESSIONAL DEVELOPMENT

1. "Getting Started with Learning Analytics" Online Course, Blackboard Academy, March 2021 (participant).
2. "I didn't know that I could do that: technology, teaching, and tidbits" virtual conference, University of South Carolina Salkehatchie, December 2021 (Chair).

3. Carolina Online Teaching & Learning (COLT) workshop, University of South Carolina Columbia, Summer 2020
4. “Opioids: Combatting Addiction with Chemistry” Program, South Carolina Local Section of the American Chemical Society and University of South Carolina Salkehatchie, February 2018 (Local Organizer).
5. “New Faculty Orientation” Workshop, University of South Carolina Columbia, Columbia, South Carolina, August 2017 (Participant).
6. “STEM Student Research Poster” Event, Diné College, Tsaile, Arizona, May 2017 (Organizer).
7. “Closing the Assessment Circle” Workshop, Intercampus Day, Diné College, Tsaile, Arizona, October 2015 (Organizer and facilitator).
8. “Assessment in Chemical Education” Symposium, Joint Great Lakes and Central Regional Meeting of the American Chemical Society, Grand Rapids, Michigan, May 2015 (Organizer).
9. “Using Writing as a Learning Tool,” Francis Burns, Lynn Chrenka, and Debra Courtright-Nash, New Faculty Transition Program, Faculty Center for Teaching and Learning, November 2014. (Facilitator)
10. CITI program for Institutional Review Board (IRB) training for Primary Investigators submitting expedited IRB proposals, October 2014 (Participant).
11. “FSU Freshman Training Workshop,” College of Retention & Student Success, Summer 2014. (Participant)
12. “Self-Compassion and Emotional Resilience (Dr. Kristin Neff)” workshop, Faculty Center for Teaching and Learning, Spring 2014. (Participant)
13. “Certificate for Online Adjunct Teaching (COAT) Course,” Frederick Community College and MarylandOnline.org, May 2013. (participant)
14. “International Visiting Scholar (Dr. Liliana Mammino),” Faculty Center for Teaching and Learning, Office of International Education, College of Arts & Sciences, and Physical Sciences Department, Ferris State University, Big Rapids, Spring 2011. (Organized)
15. “Science at the Crossroads” Francis Burns, Faculty Center for Teaching and Learning – Faculty/Staff Discussion Group, Ferris State University, Big Rapids, Fall 2009. (Organized)
16. “Democritus to Dalton and Beyond” Faculty Center for Teaching and Learning – Faculty Discussion Group, Ferris State University, Big Rapids, Spring 2009. (Organized)
17. "Online Student Journaling Through the Use of Discussion Boards" Faculty Center for Teaching and Learning - Spring Learning Conference, Ferris State University, Big Rapids, February 2008. (Organized)
18. "Qualitative Educational Research: Design and Implementation" 20th Biennial Conference for Chemical Education, Bloomington, Indiana, August 2008. (Participant)
19. “Advanced Leadership Conference” Committee on Local Section Activities, American Chemical Society, Saint Louis, Missouri, October 2003 (Participant)

20. "Leadership Conference" Committee on Local Section Activities, American Chemical Society, Salt Lake City, Utah, February 2003 (Participant)

21. "Laboratory Safety" Workshop, Curry College, July 1991 (Participant)

GRANTS

1. RISE grant (\$5,998), Office of the Vice President for Research, University of South Carolina, 2024
2. Innovative Teaching Course Development Grant (\$2,500), Center for Teaching Excellence, University of South Carolina, 2022
3. RISE grant (not funded), Office of the Vice President for Research, University of South Carolina, 2021
4. USDA Rural Development Grant (\$150,000), Primary Investigator, United States Department of Agriculture, 2020
5. REAP grant (not funded), South Carolina Space Grant Consortium, 2019
6. RISE grant (\$8,000), Office of the Vice President for Research, University of South Carolina, 2018
7. ASCEND grant (\$36,000), NASA/Arizona Space Grant Consortium, 2017
8. STEM tutor grant (\$5,000), Arizona Space Grant Consortium, 2016
9. Passer Travel Grant (\$1000), American Chemical Society – Division of Chemical Education, 2015
10. Student Success Grant, Faculty Center for Teaching and Learning, Ferris State University, 2014
11. Timme Travel Grant, 21st International Conference for Chemical Education, Faculty Center for Teaching and Learning, Ferris State University, 2010
12. Timme Travel Grant, 20th Biennial Conference on Chemical Education, Faculty Center for Teaching and Learning, Ferris State University, 2008
13. Campbell Foundation Grant (not funded), "Trace Elements - The Neglected Antiepileptics" C. E. Pipenger (P. I.), Francis Burns, Linda Goossen, 2003
14. Teaching Circle Grant, Pew Faculty Teaching and Learning Center, Grand Valley State University, 2003
15. Travel Grant, 17th Biennial Conference on Chemical Education, Research and Development Committee, Grand Valley State University, 2000
16. Travel Grant, 16th Biennial Conference on Chemical Education, Research and Development Committee, Grand Valley State University, 2000
17. Travel Grant, 7th Annual National Conference on Undergraduate Research, Research and Development Committee, Grand Valley State University, 2000
18. Pew Faculty Teaching and Learning Center Presidential Teaching Initiative Grant, "A Proposal for an Integrated Science Sequence" by Johnine Callahan, Bradley Ambrose, Francis Burns, Brian Curry, and Stephanie Schaertel, Pew Faculty Teaching and Learning Center, Grand Valley State University, 2000

19. Summer Undergraduate Research Program, "Separation and Detection of Organochromium Compounds in Environmental Samples" by Steve Bremmer and Francis Burns, Division of Mathematics and Science, Grand Valley State University, 2000
20. Faculty Summer Research Stipend, "Purification and Characterization of Environmental Organochromium Compounds," Research and Development Committee, Grand Valley State University, 2000
21. Faculty Research Grant, "Purification and Characterization of Environmental Organochromium Compounds," Research and Development Committee, Grand Valley State University, 2000
22. Travel grant, 8th AAHE Conference on Faculty Roles and Rewards, Pew Faculty Teaching and Learning Center, Grand Valley State University
23. Travel Grant, 1998 Pittsburgh Conference and Exposition, Society for Electroanalytical Chemistry, 1998
24. Travel Grant, Academic Careers in Chemistry Workshop, Camille and Henry Drefus Foundation, 1998
25. Research Grant, Graduate Student Association, University of Toledo, 1995 and 1998

PROFESSIONAL AFFILIATIONS

American Chemical Society (ACS),

- Division of Chemical Education

International Union of Pure and Applied Chemistry

South Carolina Academy of Sciences

Two-Year College Chemistry Consortium

HONORS

Distinguished Research Service Award, Office of the Vice President for Research, University of South Carolina, 2024

John J. Duffy Excellence in Teaching Award, Palmetto College, University of South Carolina, 2022

Graduate Fellow, Instrumentation Center, College of Arts and Sciences, The University of Toledo, 1998

CARI Fellowship, Department of Chemistry, The University of Toledo, 1995 and 1998
Staff Excellence Award, University of Houston, 1990

National Merit Semifinalist, Educational Testing Service, 1980

Varsity Athlete, The Ohio State University, 1982 to 1986

Scholar-Athlete, The Ohio State University, 1982 to 1986

UNIVERSITY SERVICE

University of South Carolina Salkehatchie

Palmetto College Science Assessment Committee Member, 2019 to present

Internal Grants Reviewer (RISE, Magellan, and SPARC): 2019 to present.

Judge (Discover USC): 2021 to present.

IT and Computer Curriculum Committee, 2017 to present

- Committee chair, 2020 to 2023.

Retention Committee, 2018 to present

- Committee chair, 2023 to present
- English Faculty Search Committee, 2024
- Palmetto College Faculty Senator, 2019 to 2023
 - Faculty Welfare Committee member
- Library Committee, 2018 to 2023
- Deans Advisory Council, 2021 to 2023
- Chemistry Faculty Search Committee, 2018

Diné College

- Employee Grievances Committee, 2016 – 2017
- Program Assessment Committee for A.S. in General Science, 2016 – 2017

Ferris State University:

- Laboratory Safety Committee member, 2005-2006
- Faculty Development Committee member, 2006-2007
- Departmental Webmaster, 2007-2011, 2013 – 2014

Grand Valley State University

- Honors Science Curriculum Committee member, 1999-2000
- Honors Program Advisory Committee member, 2000-2002
- Academic Resource Center Advisory Committee, 2001-2003
- Chemical Education Faculty Search Committee, 2001-2002
- Chair of a divisional working group charged with designing a lecture-laboratory facility for Honors science and in-service science teacher workshops, 2001-2002
- Faculty Advisor for the Honors College Student Council, 2002-2003
- Academic Resource Center Advisory Council member, 2000-2002
- Departmental Personnel and Assessment Committees member, 2003-2004

The University of Toledo

- University Research Council member, 1995-1996

PROFESSIONAL SERVICE

- Science Presentation Judge, South Carolina Academy of Sciences, 2017-present
- Nuclear Science Week faculty mentor, USC Salkehatchie, Fall 2019
- University of Possibilities faculty mentor, USC Salkehatchie, Fall 2018
- Program-in-the-Box Webinar local organizer, American Chemical Society, Spring 2018
- Reviewer, ARO Journal (publication of Koya University, Kurdistan, Iraq)
- Officer, Western Michigan Local Section of the American Chemical Society (ACS)
 - Chemistry in the Mall co-coordinator, 2003
 - Chair, 2003-2005
 - Counselor, 2005-2007
 - 2015 Joint Great Lakes & Central Regional ACS Meeting treasurer, 2013-2015
- Science Fair judge, Mecosta County Independent School District, 2008
- Science Odyssey Event Supervisor, Grand Valley State University, 2001
- Science Olympiad supervisor, Grand Valley State University, 2000-2004
- West Michigan Science Festival event sponsor, Grand Valley State University, 2000
- Science Olympiad supervisor, The University of Findlay, 1992