

BUSINESS ADDRESS:
Chemical Engineering Education
5200 NW 43rd St., Suite 102-239
Gainesville, FL 32606
PHONE: 352-682-2622
FAX: 866-CEE-0576
e-mail: cee@che.ufl.edu

EDITORS

Phillip C. Wankat and Jennifer Sinclair Curtis

ASSOCIATE EDITOR

Richard B. Dickinson

MANAGING EDITOR

Lynn Heasley

PROBLEMS EDITOR

David Silverstein, University of Kentucky

LEARNING IN INDUSTRY EDITOR

Lisa G. Bullard, North Carolina State University

EDITOR EMERITUS

Tim Anderson, Massachusetts, Amherst

PUBLICATIONS BOARD

• CHAIR •

C. Stewart Slater
Rowan University

• VICE CHAIR •

Milo Koretsky
Oregon State University

• MEMBERS •

Pedro Arce
Tennessee Tech University

David DiBiasio
Worcester Polytechnic Institute

Stephanie Farrell
Rowan University

Richard Felder
North Carolina State

Tamara Floyd-Smith
Tuskegee University

Suzanne Kresta
University of Alberta

Marcel Liauw
Aachen Technical University

Matthew Liberatore
Colorado School of Mines

Polly Piergiovanni
Lafayette College

Margot Vigeant
Bucknell University

Donald Visco
University of Akron

Chemical Engineering Education

Volume 49 Number 1 Winter 2015

► **DEPARTMENT**

- 2 Chemical Engineering at Tuskegee University
Tamara Floyd-Smith, Shamim Begum, Nader Vahdat, Qinghua Peter He, Kyung Kwon, Jonathan Mbah, and Allen Smith

► **EDUCATOR**

- 58 Matthew Liberatore of the Colorado School of Mines
Charles R. Vestal and Ronald L. Miller

► **LABORATORY**

- 9 Ultrafiltration of Protein Solutions: A Laboratory Experiment
Vikram J. Pansare, Daniel Tien, and Robert K. Prud'homme
- 37 Novel Hands-on Water Overflow SIS Experiment in Undergraduate Process Control Laboratory
Yan Fang, M.A.K. Rasel, Tracy J. Benson, and Peyton C. Richmond

► **CURRICULUM**

- 19 First-Year Hands-On Design Course: Implementation & Reception
Anthony E. Butterfield, Kyle Branch, and Edward Trujillo
- 29 A New Graduate-Level Seminar to Prepare Students for the Next Step in Their Careers
Kelly L. Fleming, James Matthaei, and Jim Pfaendtner

► **CLASSROOM**

- 47 Program Level Curriculum Reform at Scale: Using Studios to Flip the Classroom
Milo D. Koretsky

► **RANDOM THOUGHTS**

- 27 We Hold These Truths To Be Self-Evident
Richard M. Felder

► **OTHER CONTENTS**

- 18 Teaching Tips: Dramatically Improving Student Attendance at Office Hours
Frank DeVilbiss
- 57 In Memoriam: Duncan Fraser
Rich Felder

inside front cover Teaching Tips: Student-Initiated Senior Design Projects
Lisa G. Bullard and Steven W. Peretti

CHEMICAL ENGINEERING EDUCATION [ISSN 0009-2479 (print); ISSN 2165-6428 (online)] is published quarterly by the Chemical Engineering Division, American Society for Engineering Education. Correspondence regarding editorial matter, circulation, and changes of address should be sent to CEE, 5200 NW 43rd St., Suite 102-239, Gainesville, FL 32606. Copyright © 2015 by the Chemical Engineering Division, American Society for Engineering Education. The statements and opinions expressed in this periodical are those of the writers and not necessarily those of the ChE Division, ASEE, which body assumes no responsibility for them. Defective copies replaced if notified within 90 days of publication. Write for information on subscription costs and for back copy costs and availability. POSTMASTER: Send address changes to Chemical Engineering Education, 5200 NW 43rd St., Suite 102-239, Gainesville, FL 32606. Periodicals Postage Paid at Gainesville, Florida, and additional post offices (USPS 101900). www.che.ufl.edu/CEE