5-YEAR INDEX • 2017-2021

Volumes 51 through 55

(Note: Author Index begins on page 244)

TITLE INDEX

Note: Titles in italics are book reviews.

A

AIChe Concept Warehouse: A Website Resource for Concept-Based Instruction .................................................. 52(3), 169
Active Learning And Student Performance in a Material And Energy Balance Course .................................... 52(4), 277
Addressing a Diverse Student Population; ........................ 52(2), 98
Alabama, University of .............................................. 55(2), 70
All Roads Start With MEB: A Team-Teaching Approach for Mentoring New Faculty ........................................ 53(1), 18
Alternatives to the Tenure Track ..................................... 54(1), 14
Apps for Chemical Engineering Education: Off the Shelf and Do It Yourself Development Options .................. 54(3), 137
Applying an Optimization Mindset to Engineering Education: Junior Level Course Project Case Study .......... 55(4), 228
Applying Blended Learning Techniques: Perspectives from Chemical Engineering Computation ................. 53(3), 193
Are Our Students Studying Effectively? .......................... 54(1), 31
Augmenting the Classical Change Model to Promote Conceptual Learning in Core Engineering Courses ...... 54(1), 35
Automated Information Retrieval for Efficient and Consistent Grading of Flowsheets Developed in Aspen® Plus Process Simulator .......................................................... 53(1), 10

B

Bad Blood: Secrets and Lies in a Silicon Valley Startup by J. Carreyrou ......................................................... 53(1), 52
Bad Ideas ...................................................................... 54(3), 151
BLACKOUT: Teaching Students about the Power Grid Through Experiential Workshops and Video Gaming .......................................................... 53(3), 167

Book Reviews

Bad Blood: Secrets and Lies in a Silicon Valley Startup, by J. Carreyrou ........................................................ 53(1), 52
Careers in Chemical and Biomolecular Engineering, 1st Ed. by Victor Edwards and Suzanne Shelley .......... 54(4), 188
Fundamental Concepts and Computations in Chemical Engineering by Vivek Utgikar ........................................ 52(1), 21
Green Sustainable Processes for Chemical and Environmental Engineering and Science: Supercritical Carbon Dioxide as Green Solvent, 1st Edition edited by Dr. Inamuddin, Abdullah M. Asiri and Arun M. Isloor ........................................ 55(1), 42

Leadership by Engineers and Scientists: Professional Skills Needed to Succeed in a Changing World by D.W. Hess .................................................................................. 53(1), 52
Scaling Chemical Processes – Practical Guides in Chemical Engineering by Jonathan Worstell ............. 51(4), 187
Teaching and Learning STEM, A Practical Guide by Richard M. Felder and Rebecca Brent ......................... 51(2), 74
Technical Career Survival Handbook. 100 Things You Need to Know by Peter Y. Burke P.E. ......................... 51(2), 95

Bridging the Gap Between Hand Calculations and Chemical Process Simulators Using Spreadsheets .......... 55(4), 218
Brigham Young University ............................................ 51(2), 46
Building Air Quality Sensors and Inspiring Citizen Scientists ................................................................. 52(3), 193
Building Individual Accountability Through Consensus .. 53(2), 71

C

Careers in Chemical and Biomolecular Engineering, 1st Ed. by Victor Edwards and Suzanne Shelley .......... 54(4), 188
Carnegie Mellon, The Center for Advanced Process Decision-making at ................................................. 52(1), 33

CACHE 50th Anniversary Special Section

Introduction to the CACHE 50th Special Section: The Future of Cyber-Assisted Chemical Engineering Education ............................................................... 54(3), 110
Unit Conversions in the 21st Century: Insights into a Routine yet Critical Scientific and Engineering Task as Measured through User Interactions with a Mobile App ......................................................... 54(3), 112
Fostering Motivation for Chemical Engineering Students’ Academic Success: An Example from a Sophomore Materials and Energy Balances Course ................................ 54(3), 121
Enhanced Undergraduate Learning Through Integration of Theory and Computational Tools ..................... 54(3), 129
Apps for Chemical Engineering Education: Off the Shelf and Do It Yourself Development Options .......... 54(3), 137
Computational Notebooks in Chemical Engineering Curricula ...................................................................... 54(3), 143

Challenges to Learning and Teaching Thermodynamics .... 53(1), 2
Cheating Mitigation in Online Assessment ......................................................................................... 55(2), 103
Chem-E-Car As a Vehicle for Service Learning Through K-12 Outreach .................................................. 51(1), 11
Cheme Camp: A Two-Day Workshop to Increase Student Preparedness for Chemical Engineering Curricula ... 52(3), 181

Vol. 55, No. 4, Fall 2021

237
Class and Home Problems
Bridging the Gap Between Hand Calculations and Chemical Process Simulators Using Spreadsheets .................55(4), 218
Energy Balance on an E-Cigarette Device .......................54(2), 83
Exploration of the Design of Distillation Columns - Beyond Reflux and Tray Count ........................................55(2), 104
Gilliland’s Correlation: A Case Study in Regression Analysis ........................................................................54(4), 213
Incorporating Inclusivity and Ethical Awareness Into Chemical Reaction Engineering .................................53(4), 215
Material and Energy Balances: Flow Chemistry Case Study .................................................................53(4), 207
Molecular Design Using the Signature Molecular Descriptor ..................................................................53(4), 230
Programmatic Compilation of Chemical Data and Literature from PubChem® using MATLAB® ..................54(4), 230
Simple Model for Pervaporation Design; A Simple Model for Pervaporation Design; A ................................53(4), 202
Spreadsheet-Based Simulator Of A Flash Drum: Class Project Example For Material & Energy Balances And Phase Equilibria Courses ..........................................................52(4), 251
Virtual Catalytic Reactor Laboratory .........................................55(3), 183
Cognitive and Social Aspects of Engagement in Active Learning ...........................................................51(4), 198
Comparison of R and MATLAB Simulink in Educating High School Students with ODE Modeling Skills ..........53(2), 121
Computer Simulations Versus Physical Experiments: A Gender Comparison of Implementation Methods of Inquiry-Based Heat Transfer Activities ...........................................53(4), 223
Computational Notebooks in Chemical Engineering Curricula ...................................................................54(3), 143
Connection Between Transport Phenomena and Thermodynamics, A “Creating” Alternatives to Exams ...........51(2), 83
Creating an Equitable Learning Environment .........................52(2), 95
Crunchy, Chewy, Creamy, Yummy .....................................55(4), 226

D
Demonstrating Macroscopic Momentum Balances in a Fluid Mechanics Course ........................................51(4), 176
Demonstrating Mixing Time Estimation in a Mechanically Agitated Contactor ..............................................52(1), 68

Departmental Articles
Alabama, University of ...........................................................55(2), 70
Brigham Young University ..................................................51(2), 46
Carnegie Mellon, The Center for Advanced Process Decision-making at .................................................52(1), 33
Louisville, University of ....................................................52(3), 213
Pennsylvania State University ...............................................55(1), 3
Villanova University ...........................................................52(1), 2

Design and Anatomy of a First-Year Connection Course for Chemical Engineering Students; The ..................54(3), 154
Design Your Course to Minimize Cheating ..................................................54(1), 42
Developing Chemical Engineering Acumen by Brewing Kicking Mule Beer ........................................53(2), 101
Developing Chemical Engineering Acumen through Optimization of the Chocolate Process ..................55(2), 97
Developing Responsible Learners ...........................................52(1), 23
Development of a Systems Engineering Undergraduate Elective for Chemical Engineering Students ...........52(4), 233
Differences in Chemical Engineering Student-Faculty Interactions by Student Age and Experience at a Large, Public Research University ..................................................52(2), 136
Direct and Indirect Assessment of Student Perspectives and Performance in an Online/Distance Education Chemical Engineering Bridging Course Sequence ........................................54(2), 59
Diversity and Inclusion in Chemical Engineering Education ..................................................................52(2), 114
Diversity, Equity, and Inclusion: Language, Concepts, and Intent Mapped Through History .........................55(4), 190
Diversity Statement ..............................................................52(2), 115

Diversity Special Section
Introduction to the Special Section on Diversity ..................................................................................52(2), 70
HBCUs and Chemical Engineering: Analysis of Baccalaureate Programs ..................................................52(2), 72
The Power of Peer Mentoring in Enabling a Diverse and Inclusive Environment in a Chemical Engineering Graduate Program .............................................................52(2), 79
The Intersection of Gender and Race: Exploring Chemical Engineering Students’ Attitudes ........................52(2), 89
Addressing a Diverse Student Population; ..52(2), 98
Rurality as an Asset for Inclusive Teaching in Chemical Engineering .........................................................52(2), 99
Building LGBTQ-Inclusive Chemical Engineering Classrooms and Departments ......................................52(2), 107
Invited Guest Editorial: Diversity and Inclusion in Chemical Engineering Education .................................52(2), 114
Drawn to Engineering: Diversity Statement .................52(2), 115
Towards a Stronger Covalent Bond: Pedagogical Change for Inclusivity and Equity ................................52(2), 117
Invited Guest Editorial: Why All the Clamor Over Diversity and Inclusion? ...........................................52(2), 128
Perspective: The Steal of Implicit Bias in Chemical Engineering Education, Its Threat to Diversity, and What Professors Can Do to Promote an Inclusive Future ................52(2), 129
Differences in Chemical Engineering Student-Faculty Interactions by Student Age and Experience at a Large, Public Research University ..................................................52(2), 136
Creating an Equitable Learning Environment .........................52(2), 143
Towards Chemical Engineering Student Diversity: The Case of International Student Experiences at Tuskegee University Creating an Equitable Learning Environment ....52(2), 152
Doing Our Best ... Just Like Our Students ..........................................................54(4), 175

Drawn to Engineering
Bad Ideas ...................................................................54(3), 151
“Creating” Alternatives to Exams .....................................55(2), 95
Diversity Statement ..............................................................52(2), 115
Drying of Apples in a Laboratory Tray Drier; The ...................52(1), 9

E

Edible Thermodynamics.......................................................55(3), 134

Editorials

Announcement: CEE Welcomes a New Assistant Editor .............54(4), 242
Announcement: CEE Welcomes Joseph H. Holles and Carlos Rinaldi 52(3), 212
Announcement: CEE Welcomes New Assistant Editors ..................54(2), 50
Announcement: Changes and More Changes at CEE. 53(2), 66
Diversity, Equity, and Inclusion: Language, Concepts, and Intent Mapped through History..................55(4), 190
Diversity and Inclusion in Chemical Engineering Education ..................52(2), 114
Farewell and Thank You to Editor Philip Wankat ..........................54(1), 3
Goodbye to Managing Editor Lynn Heasley ..............................53(2), 69
Leaving 2020 Behind ..................................................................55(1), 2
New Decade, New Leadership; A .............................................51(1), 2
Professor’s Pandemic Response; A ..............................................54(4), 174
Sorry Pal—It Doesn’t Work That Way (A Tribute to Rich Felder’s Random Thoughts) ..........................51(4), 154
Students Are a Lot Like...Tomatoes ........................................55(1), 55
They Copied It RIGHT OUT of the Solution Manual! ..................51(1), 10
Two Challenges in Teaching Transport Phenomena ..........................53(1), 22
Why All the Clamor Over Diversity and Inclusion? .........................52(2), 128

Educator Articles

Grossmann, Ignacio of Carnegie Mellon University ..........................53(3), 134
Prince, Michael, of Bucknell University ......................................51(3), 120
Noble, Rich of the University of Colorado Boulder ......................52(3), 162

Educational Intensification: A Partnership Between Industry and Academia ..................................................55(4), 211
Effect of Unit Operations Laboratory Course Structure on Learning and Self-Efficacy ..................53(3), 147
Effectiveness of Additional Voluntary Consultations ..................51(3), 119
Emailing a Prospective Graduate Faculty Advisor? ......................54(4), 246

Embedding Hands-On Mini Laboratory Experiences in a Core Undergraduate Fluid Mechanics Course: A Pilot Study ..................................................51(3), 136
Energy Balance on an E-Cigarette Device .....................................54(2), 83
ENGage LSU: How to Organize and Implement an Engineering Outreach Day for Middle Schoolers ..................53(3), 162
Enhanced Undergraduate Learning Through Integration of Theory and Computational Tools ..................54(3), 129
Enrichment Of Student Learning And Homework Management With Use Of GitHub in an Introductory Cross-Disciplinary Engineering Course Series on Software Engineering and Data Science ..................54(4), 189
Errata ..........................................................................................51(3), 135
Evaluation of a Research Experiences for Undergraduates Program in ChE Indicates Benefit From a Collaborative Model .............................................51(3), 145
Everyday Thermodynamics .......................................................54(2), 232
Evolving Your Teaching ..........................................................53(2), 67
Exams are Alive with the Sound of...Music .................................54(2), 294
Experiencing Process Plant Conditions Through a Pilot Plant-Based Laboratory Class .................................55(1), 24
Experiment to Illustrate the Hazards of Exothermic Reaction Scale-up ..................................................51(1), 35
Experiment to Introduce Mass Transfer Concepts Using a Commercial Hollow Fiber Blood Oxygenator ...........51(1), 22
Exploration of the Design of Distillation Columns - Beyond Reflux and Tray Count ..............................55(2), 104

F

Facilitating Deep Learning with a Lava Lamp and a Beer ..................................................................................51(2), 60
Farewell and Thank You to Editor Philip Wankat ..........................54(1), 3
Fifteen Years in the Trenches: An Updated Suite of Scenarios-Based Academic Integrity Videos ..................55(3), 137
Five Minute Essay as a Writing and Reflection Exercise ..........................51(1), 18
Flipping the Classroom for a Material and Energy Balances Course: Effect on Student Learning versus Student Perception and Sentiment ........................................54(3), 160
Fluid and Particle Mechanics Crossword Puzzle ..........................51(4), 186

Food for Thought

Crunchy, Chewy, Creamy, Yummy .............................................55(4), 226
Edible Thermodynamics ..........................................................55(3), 134
Lighten Up! ................................................................................55(2), 119
Oldest Unit Operation; The .......................................................55(1), 9

Forced Choice Exercise to Raise Students’ Awareness of Diversity, ..................................................................51(4), 165
Fostering Motivation for Chemical Engineering Students’ Academic Success: An Example from a Sophomore Materials and Energy Balances Course .................................................54(3), 121
Fostering Student Engagement and Effective Online Learning During the COVID-19 Pandemic ...........................................54(4), 177
“Frack Attack”: An Engaging Classroom Activity to Integrate Sustainability ..................................................52(4), 226
From “Random Thoughts” to “Drawn To Engineering” ..................................................51(2), 61

Vol. 55, No. 4, Fall 2021

239
Fundamental Concepts and Computations in Chemical Engineering by Vivek Utgikar

Future is Meow; The

Gas Separation Membranes: Polymeric and Inorganic
by A.F. Ismail, K.C. Khilbel, and T. Matsuura

Gilliland’s Correlation: A Case Study in Regression Analysis

Goodbye to Managing Editor Lynn Heasley

Grading Exams and Homework More Efficiently and Effectively

Graduate Class in Research Data Management, A

Green Sustainable Processes for Chemical and Environmental Engineering and Science
Supercritical Carbon Dioxide as Green Solvent

Graduate Guide

Emailing a Prospective Graduate Faculty Advisor?

Thinking About Before Hitting Send

Graduate Student...Perspectives from the

Thinking of Graduate School?

Graduate-Level Protein Engineering Class

Improving Student Preparedness for Entering the Workforce:

In the (Fume) Hood: A Podcast for Chemical Engineering Students

Illumination

Illustrating the Benefits of Embracing an Integrated Applied Mathematics Initiative: Transport Parameters, Laplace Transforms, and Residue Theorem

Impact of YouTube Homework Problems on Students’ Learning Attitudes

Importance of Statistical Modeling in Data Analysis and Inference; The

Improving Student Preparedness for Entering the Workforce: A Hands-On Experience in Project Management for a Graduate-Level Protein Engineering Class

In The (Fume) Hood: A Podcast for Chemical Engineering Educators

Inquiring Inclusivity and Ethical Awareness Into Chemical Reaction Engineering

Increasing Student Understanding

Inquiry Based Learning Undergraduate Laboratory Course During the COVID-19 Pandemic; An

Integrating Authentic Research as Intellectual Merit and Broader Impact in an Undergraduate Bioenergy Course

Interactive Self-Study Modules for Chemical Engineering

Interactive Quiz-Yourself Simulations

Intersection of Gender and Race: Exploring Chemical Engineering Students’ Attitudes; The

Introducing High School Students to Chemical Engineering Kinetics With a Simple Experiment-Based Smartphone Application

Is Graduate School Next? Making Informed Decisions About Graduate School

Is Graduate School Next? Making Informed

K (none)

Laboratory Developing Chemical Engineering Acumen by Brewing Kicking Mule Beer

Drying of Apples in a Laboratory Tray Drier

Experiencing Process Plant Conditions Through a Pilot Plant-Based Laboratory Class

Experiment to Illustrate the Hazards of Exothermic Reaction Scale-up

Experiment to Introduce Mass Transfer Concepts Using a Commercial Hollow Fiber Blood Oxygenator

Laboratory Experiment: Pumping Power Law Fluid

Laboratory Experiment to Demonstrate the Principles of Sedimentation in a Centrifuge: Estimation of Radius and Settling Velocity of Bacteria

Learning by Brewing: Beer Production Experiments in the Chemical Engineering Laboratory

Novel Chemical Engineering Laboratory Model at the University of Kansas

Online Teaching of a Lab Course Amid Pandemic — a Challenge and an Opportunity

Pressure Swing Adsorption in the Unit Operations Laboratory

Shape Memory Polymers: A Joint Chemical and Materials Engineering Hands-On Experience

Simple Approach for the Determination and Characterization of Terary Phase Diagrams of Aqueous Two-Phase Systems Composed of Water, Poly(ethylene) Glycol and Sodium Carbonate

Students’ Pilot Laboratory for Homogeneous Chemical Reactor Analysis and Design in Olive Mill Wastewater Treatment

Undergraduate Laboratory Experiment Teaching Fundamental Concepts Of Magnetic Materials in the Context of Nanoparticle Hyperthermia For Cancer Treatment

Using Ongoing Laboratory Problems as Active Learning Research Projects in Transport Phenomena

240
What’s Happening in Lab? Multi-Dimensional Assessment Tools to Track Student Experience through a Unit Operations Laboratory Sequence ...........................................55(3), 147

Lab-Scale Fermentation Course with an Emphasis on Recombinant Protein Production........................................54(4), 202
Laboratory Experiment: Pumping Power Law Fluid ........51(2), 53
Laboratory Experiment to Demonstrate the Principles of Sedimentation in a Centrifuge: Estimation of Radius and Settling Velocity of Bacteria, A .................................. 51(4), 166

Leadership by Engineers and Scientists: Professional Skills Needed to Succeed in a Changing World, by D.W. Hess .........................................................53(1), 52
Leadership Skills Awareness and Development via Interactive Engineering Courses or Workshops................53(1), 33
LearnChemE.com: Teaching/Learning Resources for Chemical Engineering .................................................. 52(3), 176
Learning by Brewing: Beer Production Experiments in the Chemical Engineering Laboratory..................51(4), 205
Leaving 2020 Behind ......................................................55(1), 2
Leveraging Students to Help Generate Senior Plant Design Project Topics ....................................................53(3), 186

Lifelong Learning
Alternatives to the Tenure Track ........................................54(1), 14
Center for Advanced Process Decision-making at Carnegie Mellon ......................................................... 52(1), 33
Educational Intensification: A Partnership Between Industry and Academia .............................................. 55(4), 211
“Help Me Help You”: Implementing Reference Request Guidelines to Improve the Recommendation Letter Process ..........................................................54(1), 32
New Model Frameworks for University and Industrial Partnerships .........................................................52(1), 38
Preparing Students for Lifelong Learning ......................53(2), 130
Retreat to Advance: A Lifelong Learning Opportunity for Research Student Development .......................54(2), 89
What Students and Faculty Should Know About Professional Licensure .................................................. 53(1), 42
Lighten Up! .........................................................................55(2), 119
Little Things ........................................................................55(1), 61
Louisville, University of ....................................................52(3), 213

M
Machine Learning as a Tool to Identify Critical Assignments ................................................................. 52(4), 243
Manuscript Submission Rules .............................................53(2), 131

Martin Award Recipient
Computer Simulations Versus Physical Experiments: A Gender Comparison of Implementation Methods of Inquiry-Based Heat Transfer Activities ........................................53(4), 223

Material and Energy Balances:
Flow Chemistry Case Study ..............................................53(4), 207

Materials Engineering Hands-On Experience; Shape Memory Polymers: A Joint Chemical and ..............................................52(1), 60
MatLab App to Introduce Chemical Engineering Design Concepts to Engineering Freshmen through a Pharmaceutical Dosing Study; A .................................. 53(2), 85
Mentoring: In Honor of Phil Wankat .................................54(1), 43
Modernist Cuisine as an Introduction to Chemical Engineering .................................................................... 53(2), 80
Molecular Design Using the Signature Molecular Descriptor ........................................................................53(4), 230
MOOC on Effective Engineering ‘Teaching’: A ................ 52(4), 242
Motivation ...........................................................................51(3), 98

N
New Decade, New Leadership, A ........................................54(1), 2
New Model Frameworks for University and Industrial Partnerships ...........................................................52(1), 38
Nonverbal Communication: A Tool for Managing the Active Classroom ........................................... 51(2), 94
Novel Chemical Engineering Laboratory Model at the University of Kansas; A ........................................... 54(4), 178

O
Oldest Unit Operation; The ..................................................55(1), 9
Online Teaching of a Lab Course Amid Pandemic — a Challenge and an Opportunity .................................. 55(2), 76

P
Pedagogical Approaches to Teach Fluid Mechanics and Mass Transfer to Nonengineers with a Biotechnology Focus ........................................................................ 51(2), 202
Pennsylvania State University ................................................55(1), 3

Position Available
Northeastern University ....................................................53(3), inside front cover
University of Cincinnati ...................................................53(2), inside front cover
Planning for Remote or Socially-distanced Labs .............55(3), 146
Power of Peer Mentoring in Enabling a Diverse and Inclusive Environment in a Chemical Engineering Graduate Program; The ........................................ 52(2), 79
Pre-req or Co-req, To: An Assessment of Why Chemical Engineering Students Elect to Take a Course as a Prerequisite or as a Corequisite ........................................ 55(2), 86
Preparing Students for Lifelong Learning ......................53(2), 130
Presenting Audiences ...........................................................51(4), 163
Pressure Swing Adsorption in the Unit Operations Laboratory ................................................................. 52(1), 44
Problem-Solvers ................................................................. 51(2), 62
Professor’s Pandemic Response; A .....................................54(4), 174
Programmatic Compilation of Chemical Data and Literature from PubChem® using MATLAB® .................. 54(4), 230

Q
Question Question; The .......................................................52(1), 31
Five Minute Essay as a Writing and Reflection Exercise ........................................... 51(1), 18
Fluid and Particle Mechanics Crossword Puzzle .......................................................... 54(4), 186
Forced Choice Exercise to Raise Students’ Awareness of Inclusivity And Equity ................. 51(4), 165
Fostering Student Engagement and Effective Online Learning During the COVID-19 Pandemic ................................................................. 54(4), 177
Grading Exams and Homework More Efficiently and Effectively .............................................. 53(2), 100
Group Quizzes to Promote Collaborative Learning ......................................................... 54(2), 51
Helping Teams Cope with Slackers .................................................................................... 51(2), 64
Increasing Student Understanding ...................................................................................... 51(1), 21
Inquiry Based Learning Undergraduate Laboratory Course During the COVID-19 Pandemic; An .................. 55(2), 85
Interactive Self-Study Modules for Chemical Engineering .................................................. 54(3), 171
MOOC on Effective Engineering ‘Teaching’; A ................................................................... 52(4), 242
Motivation ......................................................................................................................... 51(3), 98
Nonverbal Communication: A Tool for Managing the Active Classroom ......................... 51(2), 94
Planning for Remote or Socially-distanced Labs .................................................................. 55(3), 146
Remote Presentations for Unit Operations Laboratory ........................................................... 54(3), 153
Running Effective Meetings ............................................................................................... 51(3), 108
Skittles in Water: From First Grade to Fick’s Law .............................................................. 54(2), 71
Stakeholders Presentations: A Technical Presentation to a General Audience ....................... 55(1), 23
Supporting Grad Students’ Emotional Challenges .............................................................. 53(4), 229
Take Advantage of Survey Tools to Engage Younger Students in Process Safety and Ethics Topics ......................................................................................... 54(4), 201
Tips for Writing a Technical Document for a Technical Audience ........................................ 52(3), 220
What is the Re in a Whale’s Aorta? ................................................................................... 55(1), 63
Where to Start When Teaching a New Course or Updating an Older Course? ......................... 52(3), 192

Technical Career Survival Handbook. 100 Things You Need to Know by Peter Y. Burke P.E. .......... 51(2), 95
They Copied It RIGHT OUT of the Solution Manual! .......................................................... 51(1), 10
Thinking of Graduate School? Perspectives from the CEE Editorial Team and Publications Board ................................................................. 55(4), 250
Tips for Writing a Technical Document for a Technical Audience ......................................... 52(3), 220
Towards a Stronger Covalent Bond: Pedagogical Change for Inclusivity And Equity .................... 52(2), 117
Towards Chemical Engineering Student Diversity: The Case of International Student Experiences at Tuskegee University Creating an Equitable Learning Environment ......................................................... 52(2), 152
Two Challenges in Teaching Transport Phenomena ................................................................ 55(1), 22

U
Undergraduate Laboratory Experiment Teaching Fundamental Concepts Of Magnetic Materials in the Context of Nanoparticle Hyperthermia For Cancer Treatment .................................................. 52(4), 268
Undergraduate-Led, Research-Based Course that Complements a Traditional Chemical Engineering Curriculum; An ......................................................................................... 54(2), 97
Unit Conversions in the 21st Century: Insights into a Routine yet Critical Scientific and Engineering Task as Measured through User Interactions with a Mobile App ........................................................................ 54(3), 112
Using Ongoing Laboratory Problems as Active Learning Research Projects in Transport Phenomena ................................................................. 55(1), 51

V
Villanova University ............................................................................................................. 52(1), 2
Virtual Catalytic Reactor Laboratory ...................................................................................... 55(3), 183

W
Web-Based Simulation Games for the Integration of Engineering and Business Fundamentals ........................................................................ 51(2), 88
What’s Happening in Lab? Multi-Dimensional Assessment Tools to Track Student Experience through a Unit Operations Laboratory Sequence ........................................................................ 55(3), 147
What Students and Faculty Should Know About Professional Licensure ........................................... 53(1), 42
What is the Re in a Whale’s Aorta? ................................................................................... 55(1), 63
Where to Start When Teaching a New Course or Updating an Older Course? ......................... 52(3), 192
Why All the Clamor Over Diversity and Inclusion?............................................................... 52(2), 128

X (none)
Y (none)
Z (none)
Author Index

A
Adams, Thomas A. ........................................ 53(3), 167
Al Alshaik, Ali ............................................ 54(4), 230
Alger, Monty M .......................................... 51(2), 88
Almeel, Saeed ............................................. 55(2), 103
Amos, Delaina A .......................................... 52(4), 277
Anastasio, Daniel D ...................................... 54(1), 22
Anstrom, Matthew ...................................... 53(2), 101
Anderson, Audrey C .................................... 55(1), 51
Anderson, Ryan ........................................... 52(4), 226
Arredondo, Jacob H .................................... 55(2), 85
Asogwa, Uchenna ........................................ 55(3), 175
Atatturi, Anilchandra ......................... 52(4), 268

B
Baah, D.A .................................................... 52(2), 152
Banholtzer, William F .............................. 51(2), 88
Barker, Jason E ........................................... 54(3), 112
Baru, Nitay .................................................. 54(3), 137; 54(4), 230; 55(2), 70
Barua, Niloy ............................................... 55(1), 51
Barzilai, Abigail ........................................... 55(3), 157
Bayles, Taryn M ......................................... 53(1), 34
Bell, David A. C ........................................... 54(4), 189
Beck, Matthew .......................................... 52(1), 60
Becker, Yakira ............................................ 54(1), 11
Bechel, Thomas ......................................... 52(3), 193
Begum, S.A .................................................. 52(2), 152
Bequette, B. Wayne ..................................... 53(4), 110
Biaglow, Andrew ........................................ 53(2), 101
Biegler, Loren T ........................................... 52(1), 33
Bird, R. Byron ............................................. 53(3), 134
Blowers, Paul .............................................. 53(2), 91
Boal-Palheiros, Isabel ............................. 53(2), 112
Bodnar, Cheryl ........................................... 54(2), 70
Boley, Janessa K ......................................... 51(4), 165
Bothwell, Michelle ...................................... 52(2), 117
Boudouvis, Bryan W ................................... 54(3), 121
Boukouvalas, Fani ...................................... 54(3), 143
Bourland, Kimberly R .................................. 54(3), 171
Boyston-Payton ......................................... 55(2), 97
Brauner, Neima .......................................... 51(2), 75
Brennan, Jamie .......................................... 53(3), 147
Bundy, Bradley C ........................................ 55(4), 228
Pull, Geoffrey R ........................................... 53(2), 101
Bullard, Lisa G ............................................. 51(2), 60
Burke, Daniel ............................................. 54(1), 22
Burkeholder, Eric ....................................... 55(3), 122
Burman, Nicholas W .................................. 51(3), 119
Burton, Leah D ............................................ 52(1), 38
Butler, Brittany .......................................... 54(1), 22

C
Cabriada, Ana ........................................... 55(1), 61
Cafaro, Bruno A ......................................... 51(2), 88
Capela, Emanuel V ..................................... 53(2), 112
Carmasciai, Maria-Isabel ...................... 52(2), 136
Carter, Tracy .............................................. 55(3), 146
Carvalho, Pedro J ...................................... 53(2), 112
Cerratana, Colin C ...................................... 51(4), 205
Chen, Kaiyuan ............................................ 53(2), 121
Chapman, Kayla E ...................................... 55(1), 43
Chen, Kaiyuan ............................................ 53(2), 121
Chenette, Heather C.S ................................ 55(3), 147
Chirdon, William M .................................... 51(1), 11
Ciccarielli, Bradley A ............................... 52(3), 181
Ciston, Shannon .......................................... 52(2), 136
Clark, William M ......................................... 51(1), 35
Clay, John .................................................. 54(2), 83
Cloutier, Robert .......................................... 52(4), 233
Coker, Marya .............................................. 55(2), 85
Collins, Eric ............................................... 52(4), 83
Cooper, Matthew E ..................................... 51(4), 154
DeGrazia, Janet ........................................... 52(3), 176
De Jesús Vega, Marisel ............................. 51(2), 65
Delgado, Miguel A ...................................... 55(4), 218
Dickerson, Kelbie ........................................ 51(1), 35
Dixon, Laura .............................................. 51(1), 18
Doherty, Michael F ...................................... 51(2), 88
Dowling, Alexander ................................. 54(3), 143
Drenenberg, Emily ...................................... 54(1), 22
Duckett, T. Ryan ......................................... 55(3), 175

D
Daher, Tareq .............................................. 53(3), 193
Dane, Adam H ............................................ 51(4), 165
Davidson, Megan E ................................... 55(1), 43
Davis, Richard ........................................... 54(4), 213
Davis, Robert H .......................................... 55(4), 205
Davis, Susanah C ........................................ 52(2), 117
DeGrazia, Janet ........................................... 52(3), 176
De Jesús Vega, Marisel ............................. 51(2), 65
Delgado, Miguel A ...................................... 55(4), 218
Dickerson, Kelbie ........................................ 51(1), 35
Dixon, Laura .............................................. 51(1), 18
Doherty, Michael F ...................................... 51(2), 88
Dowling, Alexander ................................. 54(3), 143
Drenenberg, Emily ...................................... 54(1), 22
Duckett, T. Ryan ......................................... 55(3), 175

E
Eastep, Carley V ......................................... 53(2), 85
Elkhataf, Ahmed ........................................ 55(2), 103
Elliott Jr., J. Richard ................................. 52(1), 21
Elswick, Khaled ........................................... 55(2), 103
Eniola-Adefeso, Omolola .......................... 52(2), 79
Enszer, Joshua .......................................... 54(4), 188
Escamilla, Alicia Font .............................. 55(2), 104

F
Falco, John L .............................................. 52(3), 176
Farrell, Stephanie ....................................... 51(1), 22
Fávero, Claudio Vilas Boas ....................... 52(2), 79
Felder, Richard M ....................................... 51(1), 19
Filipovic, Nicholas .................................... 55(1), 11
Finberg, Ethan ........................................... 54(4), 178
Fisher, Robert J .......................................... 53(1), 23
Floyd-Smith, Tamara ............................... 52(2), 152
Foley, Greg ............................................... 54(3), 202
Follmer, D. Jake ......................................... 51(3), 145
Ford, Hayley ............................................. 55(4), 228
Ford, Laura ............................................... 55(1), 23
Forest, J. ...................................................... 53(3), 146
Ford Versyp, Ashlee N ............................... 53(2), 85
Freire, Mara G ........................................... 53(2), 112
Fried, J. R. ............................................... 52(3), 213

G
Gadoury, Carrine Megan ............................ 53(4), 223
Gaillardon, Pierre-Emmanuel ................... 52(3), 193
Galarza, Sualyneth ...................................... 51(1), 2
Ganley, Jason C .......................................... 52(1), 44
Gannon, Paul .............................................. 52(4), 226
Gao, Jie ...................................................... 55(2), 76
Garcia-Morales, Moises ............................ 55(4), 218
Gautam, Satyen .......................................... 52(1), 23
Geng, Jianming .......................................... 53(2), 121
Genga, Rodney M ....................................... 51(3), 119
Genzer, Jan ............................................... 54(2), 89
Gerstle, J ...................................................... 52(3), 213
Getman, Rachel B ....................................... 54(3), 137
Ghorashi, Bahman ...................................... 54(3), 154
Gill, Tracy R ............................................... 52(4), 233
Glover, T. Grant .......................................... 52(4), 233
Godwin, Allison ......................................... 52(2), 89
Goldberg, Deborah ..................................... 54(1), 32
Golightly, Amy Frances ............................ 54(3), 233
Gomez, Esther ........................................... 51(3), 145
<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith, A.J.</td>
<td>52(2), 152</td>
</tr>
<tr>
<td>Smoot, L. Douglas</td>
<td>52(1), 46</td>
</tr>
<tr>
<td>Snyder, Mark A.</td>
<td>53(3), 178</td>
</tr>
<tr>
<td>Snyder, Kate E.</td>
<td>52(4), 277</td>
</tr>
<tr>
<td>Solomon, Erin D.</td>
<td>53(3), 147</td>
</tr>
<tr>
<td>Spencer, Dan</td>
<td>54(2), 59</td>
</tr>
<tr>
<td>Stanley, Simone M.</td>
<td>51(4), 189</td>
</tr>
<tr>
<td>Steele, Adrienne</td>
<td>53(3), 162</td>
</tr>
<tr>
<td>Subathra, N.R.</td>
<td>52(1), 68</td>
</tr>
<tr>
<td>Sublette, Kerry L.</td>
<td>55(1), 23</td>
</tr>
<tr>
<td>Süülbäv, Cihan Ö.</td>
<td>53(4), 202</td>
</tr>
<tr>
<td>Summers, Ryan M.</td>
<td>55(2), 70</td>
</tr>
<tr>
<td>Suraikumar, G. K.</td>
<td>52(4), 242</td>
</tr>
<tr>
<td>Sviha, Vanessa</td>
<td>52(2), 99</td>
</tr>
<tr>
<td>S3(2), 71</td>
<td></td>
</tr>
<tr>
<td>Swaney, Ross E.</td>
<td>51(2), 83</td>
</tr>
<tr>
<td>Sweeney, James D.</td>
<td>52(2), 117</td>
</tr>
<tr>
<td>Saha, Rajib</td>
<td>53(3), 193</td>
</tr>
<tr>
<td>Sahinidis, Nikolaos V.</td>
<td>52(1), 33</td>
</tr>
<tr>
<td>Santos, João H.P.M.</td>
<td>53(2), 112</td>
</tr>
<tr>
<td>Satterfield, Derrick</td>
<td>52(2), 89</td>
</tr>
<tr>
<td>Satterfield, M. Barclay</td>
<td>51(1), 38</td>
</tr>
<tr>
<td>Scaffani, Vincent</td>
<td>54(4), 230</td>
</tr>
<tr>
<td>Schieve, Bailey</td>
<td>55(2), 97</td>
</tr>
<tr>
<td>Schmidt, Lawrence O.</td>
<td>52(1), 52</td>
</tr>
<tr>
<td>Scholes, Colin A</td>
<td>55(1), 24</td>
</tr>
<tr>
<td>Schultz, Kelly M.</td>
<td>53(3), 178</td>
</tr>
<tr>
<td>Scott, Allison J.</td>
<td>55(1), 11</td>
</tr>
<tr>
<td>Sehgal, Sanya</td>
<td>52(2), 136</td>
</tr>
<tr>
<td>Seif, Mujan N.</td>
<td>52(1), 60</td>
</tr>
<tr>
<td>Self, Brian</td>
<td>54(1), 35</td>
</tr>
<tr>
<td>Shacham, Mordechai</td>
<td>51(2), 75</td>
</tr>
<tr>
<td>Shaffer, Justin F.</td>
<td>54(2), 52</td>
</tr>
<tr>
<td>Siny, 63; 55(2), 86</td>
<td></td>
</tr>
<tr>
<td>Shi, Michael</td>
<td>55(1), 31</td>
</tr>
<tr>
<td>Sherer, Eric A.</td>
<td>52(3), 181</td>
</tr>
<tr>
<td>Shiflett, Mark B.</td>
<td>54(4), 178</td>
</tr>
<tr>
<td>Siny, 31</td>
<td></td>
</tr>
<tr>
<td>Shih, Arthur J.</td>
<td>51(4), 176</td>
</tr>
<tr>
<td>Silverstein, David</td>
<td>53(3), 139</td>
</tr>
<tr>
<td>Skaf, Dorothy</td>
<td>52(1), 2</td>
</tr>
<tr>
<td>Siny, 10</td>
<td></td>
</tr>
<tr>
<td>Skaf, Dorothy</td>
<td>53(1), 10</td>
</tr>
<tr>
<td>Skaf, Dorothy</td>
<td>52(1), 2</td>
</tr>
<tr>
<td>Smith, A.J.</td>
<td>52(2), 152</td>
</tr>
<tr>
<td>Smoot, L. Douglas</td>
<td>52(1), 46</td>
</tr>
<tr>
<td>Snyder, Mark A.</td>
<td>53(3), 178</td>
</tr>
<tr>
<td>Snyder, Kate E.</td>
<td>52(4), 277</td>
</tr>
<tr>
<td>Solomon, Erin D.</td>
<td>53(3), 147</td>
</tr>
<tr>
<td>Spencer, Dan</td>
<td>54(2), 59</td>
</tr>
<tr>
<td>Stanley, Simone M.</td>
<td>51(4), 189</td>
</tr>
<tr>
<td>Steele, Adrienne</td>
<td>53(3), 162</td>
</tr>
<tr>
<td>Subathra, N.R.</td>
<td>52(1), 68</td>
</tr>
<tr>
<td>Sublette, Kerry L.</td>
<td>55(1), 23</td>
</tr>
<tr>
<td>Süülbäv, Cihan Ö.</td>
<td>53(4), 202</td>
</tr>
<tr>
<td>Summers, Ryan M.</td>
<td>55(2), 70</td>
</tr>
<tr>
<td>Suraikumar, G. K.</td>
<td>52(4), 242</td>
</tr>
<tr>
<td>Sviha, Vanessa</td>
<td>52(2), 99</td>
</tr>
<tr>
<td>Siny, 71</td>
<td></td>
</tr>
<tr>
<td>Swaney, Ross E.</td>
<td>51(2), 83</td>
</tr>
<tr>
<td>Sweeney, James D.</td>
<td>52(2), 117</td>
</tr>
<tr>
<td>Thompson, Audie K.</td>
<td>52(2), 72</td>
</tr>
<tr>
<td>Timko, Michael T.</td>
<td>52(4), 259</td>
</tr>
<tr>
<td>Tinge, Kyle</td>
<td>52(3), 193</td>
</tr>
<tr>
<td>Tong, Yen Wah</td>
<td>54(2), 72</td>
</tr>
<tr>
<td>Trafford, Russell</td>
<td>52(4), 268</td>
</tr>
<tr>
<td>Thompson, Audie K.</td>
<td>52(2), 72</td>
</tr>
<tr>
<td>Ulissi, Zachary</td>
<td>54(3), 143</td>
</tr>
<tr>
<td>Vahdat, N.</td>
<td>52(2), 152</td>
</tr>
<tr>
<td>Valdés-Parada, Francisco J.</td>
<td>53(1), 22</td>
</tr>
<tr>
<td>Ventura, Sónia P.M.</td>
<td>53(2), 112</td>
</tr>
<tr>
<td>Verdín, Dina</td>
<td>52(2), 89</td>
</tr>
<tr>
<td>Verne, Andrea Jennifer</td>
<td>52(4), 268</td>
</tr>
<tr>
<td>Verre, Jonathan</td>
<td>54(3), 143</td>
</tr>
<tr>
<td>Vega, Marisol De Jesús</td>
<td>51(2), 65</td>
</tr>
<tr>
<td>Vigeant, Margot A.</td>
<td>53(4), 223</td>
</tr>
<tr>
<td>Siny, 35; 55(1), 9; 55(2), 119; 55(3), 134; 55(4), 226</td>
<td></td>
</tr>
<tr>
<td>Vinod, A. Venu</td>
<td>51(4), 186</td>
</tr>
<tr>
<td>Visco Jr., Donald P.</td>
<td>51(2), 74</td>
</tr>
<tr>
<td>Witter, Paul M.</td>
<td>55(4), 211</td>
</tr>
<tr>
<td>Wolf, Caitlyn M.</td>
<td>54(4), 189</td>
</tr>
<tr>
<td>Wong, Michael S.</td>
<td>55(2), 85</td>
</tr>
<tr>
<td>Worman, Haley</td>
<td>52(1), 9</td>
</tr>
<tr>
<td>Ydstie, B. Erik</td>
<td>53(3), 134</td>
</tr>
<tr>
<td>Yenke, Kirti</td>
<td>54(3), 129</td>
</tr>
<tr>
<td>Ymele-Leki, Patrick</td>
<td>51(4), 189</td>
</tr>
<tr>
<td>Yung, Lammy Lin Y.</td>
<td>54(2), 72</td>
</tr>
<tr>
<td>Zammit, Alexa</td>
<td>55(2), 97</td>
</tr>
<tr>
<td>Zalluhoglu, Fulya Sudur</td>
<td>51(2), 65</td>
</tr>
<tr>
<td>Zappe, Sarah</td>
<td>51(3), 145</td>
</tr>
<tr>
<td>Zavala, Victor</td>
<td>54(3), 143</td>
</tr>
<tr>
<td>Zhou, Kang</td>
<td>54(2), 72</td>
</tr>
<tr>
<td>Zydney, Andrew L.</td>
<td>55(1), 3</td>
</tr>
</tbody>
</table>