I • N • D • E • X

GRADUATE SCHOOL ADVERTISEMENTS

Graduate Education in Chemical Engineering

at

The University of Akron SM

FIAT LUX
1870

Graduate assistant stipends for teaching and research start at $7,500.

◆

Industrially sponsored fellowships available up to $17,000.

◆

In addition to stipends, tuition and fees are waived.

◆

PhD students may get some incentive scholarships.

◆

The deadline for assistantship applications is March 15th.

Faculty and Research Areas

G. A. ATWOOD[1]
Digital Control, Mass Transfer, Multicomponent Adsorption

G. G. CHASE
Multiphase Processes, Heat Transfer, Interfacial Phenomena

H. M. CHEUNG
Colloids, Light Scattering Techniques

S. C. CHUANG
Catalysis, Reaction Engineering, Combustion, Environmentally Benign Synthesis

J. R. ELLIOTT
Thermodynamics, Material Properties

E. A. EVANS
Materials Processing and CVD Modeling

L. G. FOCHT[1]
Fixed Bed Adsorption, Process Design

K. L. FULLERTON
Fuel Technology, Process Engineering, Environmental Engineering

M. A. GENCER[2]
Biochemical Engineering, Environmental Biotechnology

L. K. JU
Biochemical Engineering, Environmental Bioengineering

S. LEE
Fuel and Chemical Process Engineering, Reactive Polymers, Waste Clean-Up

S. T. LOPINA
BioMateria Engineering and Polymer Engineering

H. C. QAMMAR
Nonlinear Control, Chaotic Processes

R. W. ROBERTS[1]
Plastics Processing, Polymer Films, System Design

[1] *Professor Emeritus* [2] *Adjunct Faculty Member*

Cooperative Graduate Education Program is also available.

• For Additional Information, Write •

Chairman, Graduate Committee

Department of Chemical Engineering • The University of Akron • Akron, OH 44325-3906

Chemical Engineering at the University of Alabama

A dedicated faculty with state-of-the-art facilities offer research programs leading to Master of Science and Doctor of Philosophy degrees.

Research Interests:

Biomass Conversion, Catalysis and Reactor Design, Energy Conversion Processes, Environmental Studies, Interfacial Transport, Magnetic Storage Media, Mass Transfer, Metal Casting, Polymer Rheology, Process Dynamics and Control, Reservoir Modeling, Suspension and Slurry Rheology, Thermodynamics, Transport Process Modeling

Faculty

G.C. April, Ph.D. (Louisiana State)
D. W. Arnold, Ph.D. (Purdue)
E. S. Carlson, Ph.D. (Wyoming)
P. E. Clark, Ph.D. (Oklahoma State)
W. C. Clements, Jr., Ph.D. (Vanderbilt)
R. W. Flumerfelt, Ph.D. (Northwestern)
R. A. Griffin, Ph.D. (Utah State)
I. A. Jefcoat, Ph.D. (Clemson)
P. W. Johnson, Ph.D. (New Mexico Tech.)
A. M. Lane, Ph.D. (Massachusetts)
M. D. McKinley, Ph.D. (Florida)
R. G. Reddy, Ph.D. (Utah)
L. Y. Sadler III, Ph.D. (Alabama)
V. N. Schrodt, Ph.D. (Penn. State)
J. M. Wiest, Ph.D. (Wisconsin)

For Information Contact:

Director of Graduate Studies
Department of Chemical Engineering
The University of Alabama
Box 870203
Tuscaloosa, AL 35487-0203
Phone: (205) 348-6450

University of Alberta
Chemical and Materials Engineering

The University of Alberta is well known for its commitment to excellence in teaching and research. The Department of Chemical and Materials Engineering has 34 professors and over 100 graduate students. Degrees are offered at the M.Sc. and Ph.D. levels in **Chemical Engineering, Materials Engineering, and Process Control**. All full-time graduate students in the research programs receive a stipend to cover living expenses and tuition.

For further information, contact

Graduate Program Officer WCM
Department of Chemical and Materials Engineering
University of Alberta
Edmonton, Alberta, Canada T6G 2G6

PHONE (403) 492-5805 • FAX (403) 492-2881
e-mail: chemical.engineering@ualberta.ca
web: www.ualberta.ca/dept/chemeng

CHEMICAL ENGINEERING FACULTY

R.P. BATYCKY, Ph.D. (Massachusetts Inst. of Technology)
Transport Processes in Porous and Biological Media • Fluid Mechanics

P. CHOI, Ph.D. (University of Waterloo)
Statistical Mechanics of Polymers • Polymer Solutions and Blends

K. T. CHUANG, Ph.D. (University of Alberta)
Mass Transfer • Catalysis • Separation Processes • Pollution Control

I. G. DALLA LANA, Ph.D. (Univ. of Minnesota) EMERITUS
Chemical Reaction Engineering • Heterogeneous Catalysis

J.A.W. ELLIOTT, Ph.D. (University of Toronto)
Thermodynamics • Statistical Thermodynamics • Interfacial Phenomena

D. G. FISHER, Ph.D. (University of Michigan) EMERITUS
Process Dynamics and Control • Real-Time Computer Applications

J.F. FORBES, Ph.D. (McMaster University)
Real-Time Optimization • Control of Sheet Forming Processes

M. R. GRAY, Ph.D. (California Inst. of Tech.) DEAN OF GRADUATE STUDIES
Bioreactors • Chemical Kinetics • Bitumen Processing

M. GUAY, Ph.D. (Queens University)
Nonlinear Process Control • Statistical Modeling • Multivariate Statistics

R. E. HAYES, Ph.D. (University of Bath)
Numerical Analysis • Reactor Modeling • Computational Fluid Dynamics

B. HUANG, Ph.D. (University of Alberta)
Controller Performance Assessment • Multivariable Control • Statistics

S. M. KRESTA, Ph.D. (McMaster University)
Turbulent & Transitional Flows • Multiphase Flows • CFD

S. LIU, Ph.D. (University of Alberta)
Fluid-Particle Dynamics • Transport Phenomena • Mass Transfer

D. T. LYNCH, Ph.D. (University of Alberta) DEAN OF ENGINEERING
Catalysis • Kinetic Modeling • Numerical Methods • Polymerization

J. H. MASLIYAH, Ph.D. (University of British Columbia)
Transport Phenomena • Colloids • Particle-Fluid Dynamics • Oil Sands

A. E. MATHER, Ph.D. (University of Michigan)
Phase Equilibria • Fluid Properties at High Pressures • Thermodynamics

W. C. MCCAFFREY, Ph.D. (McGill University)
Reaction Kinetics • Heavy Oil Upgrading • Polymer Recycling • Biotechnology

P. A. J. MEES, Ph.D. (University of Alberta)
Computational Fluid Dynamics • Transport Phenomena • Pulp and Paper

K. NANDAKUMAR, Ph.D. (Princeton University)
Transport Phenomena • Distillation • Computational Fluid Dynamics

F. D. OTTO, Ph.D. (University of Michigan) EMERITIS
Mass Transfer • Gas-Liquid Reactions • Separation Processes

M. RAO, Ph.D. (Rutgers University)
AI • Intelligent Control • Process Control

S. L. SHAH, Ph.D. (University of Alberta)
Computer Process Control • System Identification • Adaptive Control

S. E. WANKE, Ph.D. (University of California, Davis) CHAIR
Heterogeneous Catalysis • Kinetics • Polymerization

M. C. WILLIAMS, Ph.D. (University of Wisconsin)
Rheology • Polymer Characterization • Polymer Processing

Z. XU, Ph.D. (Virginia Polytechnic Institute and State University)
Surface Science & Engineering • Mineral Processing • Waste Management

CHEMICAL AND ENVIRONMENTAL ENGINEERING

at

THE UNIVERSITY OF ARIZONA

FACULTY / RESEARCH INTERESTS

ROBERT ARNOLD, Professor (Caltech)
Microbiological Hazardous Waste Treatment, Metals Speciation and Toxicity

JAMES BAYGENTS, Associate Professor (Princeton)
Fluid Mechanics, Transport and Colloidal Phenomena, Bioseparations, Electrokinetics

MILAN BIER, Professor Emeritus (Fordham)
Protein Separation, Electrophoresis, Membrane Transport

WILLIAM P. COSART, Associate Professor and Associate Dean (Oregon State)
Heat Transfer in Biological Systems, Blood Processing

JAMES FARRELL, Assistant Professor (Stanford)
Sorption/desorbtion of Organics in Soils

EDWARD FREEH, Adjunct Professor (Ohio State)
Process Control, Computer Applications

JOSEPH GROSS, Professor Emeritus (Purdue)
Boundary Layer Theory, Pharmacokinetics, Microcirculation, Biorheology

ROBERTO GUZMAN, Associate Professor (North Carolina State)
Protein Separation, Affinity Methods

ARTHUR HUMPHREY, Visiting Professor (Columbia)
Biotechnology

KIMBERLY OGDEN, Assistant Professor (Colorado)
Bioreactors, Bioremediation, Organics Removal from Soils

THOMAS W. PETERSON, Professor and Head (CalTech)
Aerosols, Hazardous Waste Incineration, Microcontamination

ALAN D. RANDOLPH, Professor Emeritus (Iowa State)
Crystallization Processes, Nucleation, Particulate Processes

THOMAS R. REHM, Professor Emeritus (Washington)
Mass Transfer, Process Instrumentation, Computer Aided Design

FARHANG SHADMAN, Professor (Berkeley)
Reaction Engineering, Kinetics, Catalysis, Reactive Membranes, Microcontamination

RAYMOND A. SIERKA, Professor (Oklahoma)
Adsorption, Oxidation, Membranes, Solar Catalyzed Detox Reactions

JOST O. L. WENDT, Professor (Johns Hopkins)
Combustion-Generated Air Pollution, Incineration, Waste Management

DON H. WHITE, Professor Emeritus (Iowa State)
Polymers, Microbial and Enzymatic Processes

DAVID WOLF, Visiting Professor (Technion)
Fermentation, Mixing, Energy, Biomass Conversion

MICHAEL R. ZACHARIAH,
Associate Professor (UCLA)
High T Chemistry, Nanostructures, Chemical Vapor Deposition

The Chemical and Environmental Engineering Department at the University of Arizona offers a wide range of research opportunities in all major areas of chemical engineering and environmental engineering, and graduate courses are offered in most of the research areas listed here. The department offers a fully accredited undergraduate degree as well as MS and PhD graduate degrees. Strong interdisciplinary programs exist in bioprocessing and bioseparations, microcontamination in electronics manufacture, and environmental process modification.

Financial support is available through fellowships, government and industrial grants and contracts, teaching and research assistantships.

Tucson has an excellent climate and many recreational opportunities. It is a growing modern city of 450,000 that retains much of the old Southwestern atmosphere.

For further information, write to

Chairman,
Graduate Study Committee
Department of Chemical and Environmental Engineering
University of Arizona
Tucson, Arizona 85721

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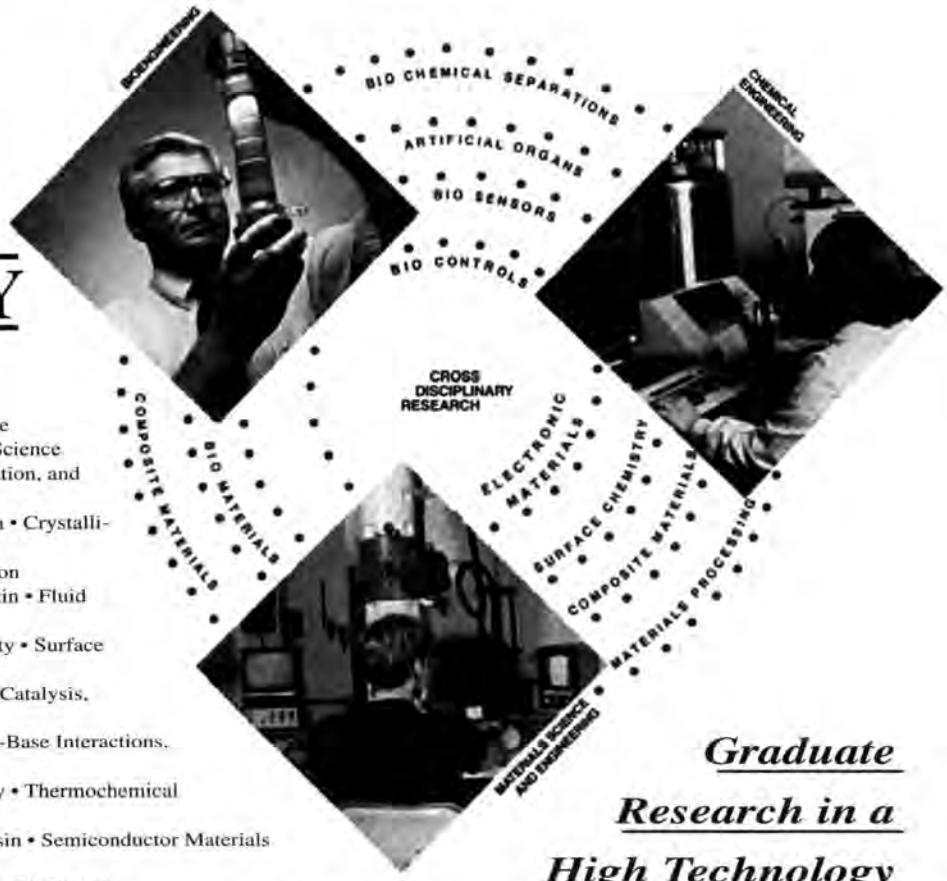
Women and minorities are encouraged to apply.

CHEMICAL, BIO, AND MATERIALS ENGINEERING AT

ARIZONA STATE UNIVERSITY



Graduate Research in a High Technology Environment

Chemical Engineering

Beaudoin, Stephen P., Ph.D., North Carolina State University • Transport Phenomena and Surface Science concering Pollution Prevention, Waste Minimization, and Pollution Remediation
Beckman, James R., Ph.D., University of Arizona • Crystallization and Solar Cooling
Bellamy, Lynn, Ph.D., Tulane • Process Simulation
Berman, Neil S., Ph.D., University of Texas, Austin • Fluid Dynamics and Air Pollution
Burrows, Veronica A., Ph.D., Princeton University • Surface Science, Semiconductor Processing
Cale, Timothy S., Ph.D., University of Houston • Catalysis, Semiconductor Processing
Garcia, Antonio A., Ph.D., U.C., Berkeley • Acid-Base Interactions, Biochemical Separation, Colloid Chemistry
Kuester, James L., Ph.D., Texas A&M University • Thermochemical Conversion, Complex Reaction Systems
Raupp, Gregory B., Ph.D., University of Wisconsin • Semiconductor Materials Processing, Surface Science, Catalysis
Rivera, Daniel, Ph.D., Cal Tech • Process Control and Design
Sater, Vernon E., Ph.D., Illinois Institute of Tech • Heavy Metal Removal from Waste Water, Process Control
Torrest, Robert S., Ph.D., University of Minnesota • Multiphase Flow, Filtration, Flow in Porous Media, Pollution Control

Bioengineering

Dorson, William J., Ph.D., University of Cincinnati • Physicochemical Phenomena, Transport Processes
Guilbeau, Eric J., Ph.D., Louisiana Tech University • Biosensors, Physiological Systems, Biomaterials
He, Jiping, Ph.D., University of Maryland • Biomechanics, Robotics, Computational Neuroscience, Optimal Control, System Dynamics and Control
Kipke, Daryl R., Ph.D., University of Michigan • Computation Neuroscience • Machine Vision, Speech Recognition, Robotics • Neural Networks
Pizziconi, Vincent B., Ph.D. Arizona State University• Artificial Organs, Biomaterials, Bioseparations
Sweeney, James D., Ph.D., Case-Western Reserve University• Rehab Engineering, Applied Neural Control
Towe, Bruce C., Ph.D., Pennsylvania State University• Bioelectric Phenomena, Biosensors, Biomedical Imaging
Yamaguchi, Gary T., Ph.D., Stanford University • Biomechanics, Rehab Engineering, Computer-Aided Surgery

Materials Science & Engineering

Adams, James, Ph.D., University of Wisconsin, Madison • Atomistic Simulation of Metallic Surfaces • Grain Boundaries • Automobile Catalysts • Polymer-Metal Adhesion
Alford, Terry L., Ph.D., Cornell University • Electronic Materials • Physical Metallurgy • Electronic Thin Films • Surface/Thin Film
Carpenter, Ray W., Ph.D., University of California, Berkeley • Atomic Structure and Chemistry of Interfaces and Boundaries in Solids; Phase Transformation Mechanisms in Metals and Ceramics; Electron Microscopy Methods and Instrumentation
Dey, Sandwip K., Ph.D., NYSC of Ceramics, Alfred University • Ceramics, Sol-Gel Processing
Krause, Stephen L., Ph.D., University of Michigan • Ordered Polymers, Electronic Materials, Electron X-ray Diffraction, Electron Microscopy
Mahajan, Subhash, Ph.D., University of Michigan • Semiconductor Defects, Structural Materials Deformation
Mayer, James, Ph.D., Purdue University •Thin Film Processing • Ion Bean Modification of Materials
Stanley, James T., Ph.D., University of Illinois • Phase Transformations, Corrosion

For more details regarding the graduate degree programs in the Department of Chemical, Bio, and Materials Engineering, please call (602) 965-3313 or write to: Dr. Eric Guilbeau, Chair of the Graduate Committee, Department of Chemical, Bio, and Materials Engineering, Arizona State University, Tempe, Arizona 85287-6006.

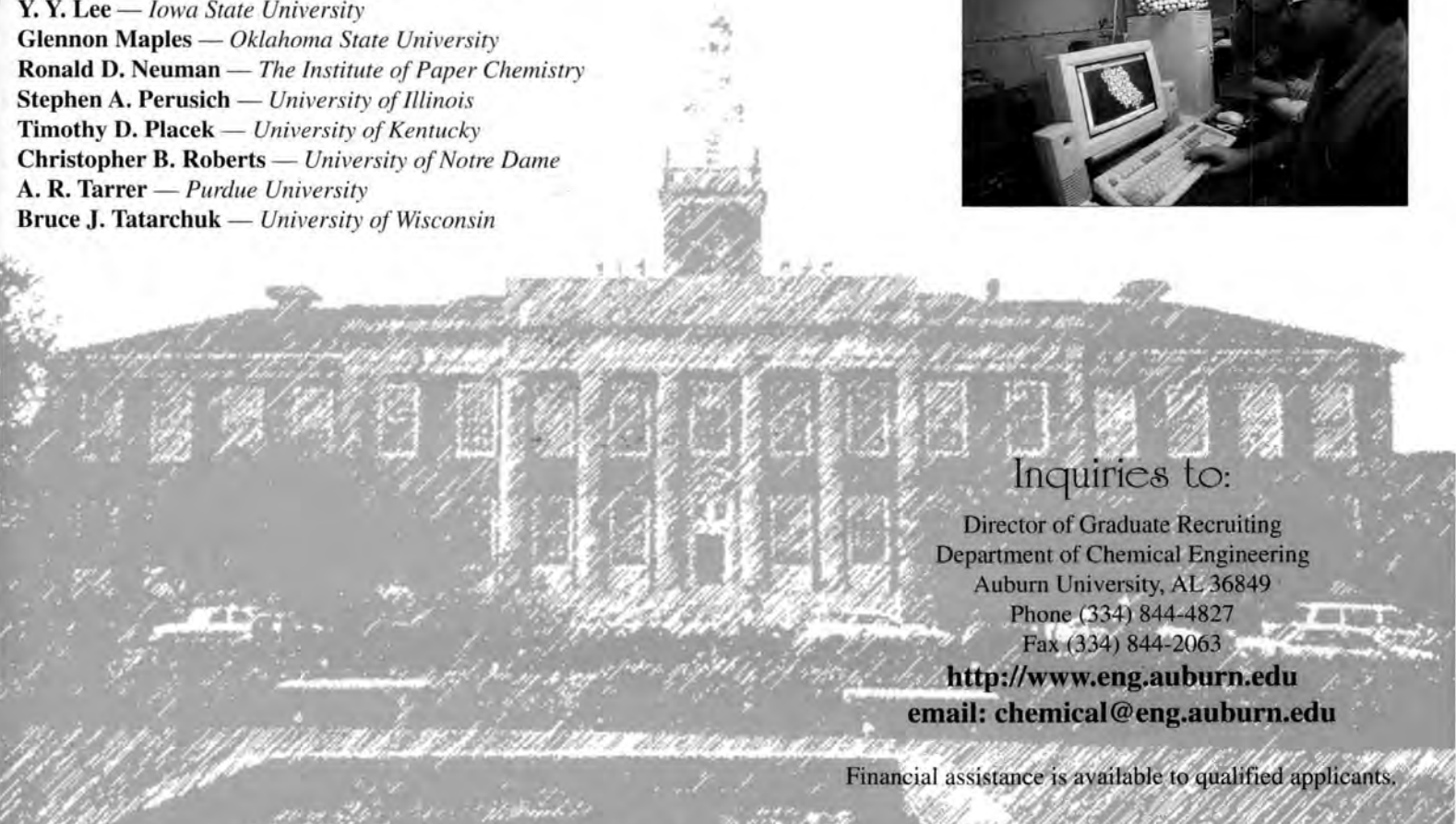
Auburn University
Chemical Engineering

Faculty

Robert P. Chambers — *University of California, Berkeley*
Harry T. Cullinan — *Carnegie Mellon University*
Christine W. Curtis — *Florida State University*
Steve R. Duke — *University of Illinois*
Mahmoud El-Halwagi — *University of California, Los Angeles*
James A. Guin — *University of Texas, Austin*
Ram B. Gupta — *University of Texas, Austin*
Gopal A. Krishnagopalan — *University of Maine*
Jay H. Lee — *California Institute of Technology*
Y. Y. Lee — *Iowa State University*
Glennon Maples — *Oklahoma State University*
Ronald D. Neuman — *The Institute of Paper Chemistry*
Stephen A. Perusich — *University of Illinois*
Timothy D. Placek — *University of Kentucky*
Christopher B. Roberts — *University of Notre Dame*
A. R. Tarrer — *Purdue University*
Bruce J. Tatarchuk — *University of Wisconsin*

Research Areas

• Biochemical Engineering • Biotechnology
• Pulp and Paper • Process Control
• Catalysis and Reaction Engineering
• Computer Aided Process Synthesis, Optimization and Design
• Environmental Chemical Engineering
• Pollution Prevention • Recycling
• Materials • Polymers • Surface Science
• Colloid and Interfacial Phenomena
• Thermodynamics • Supercritical Fluids
• Separation • Electrochemical Engineering
• Fluid Dynamics and Transport Phenomena
• Fuels and Energy



Inquiries to:

Director of Graduate Recruiting
Department of Chemical Engineering
Auburn University, AL 36849
Phone (334) 844-4827
Fax (334) 844-2063
http://www.eng.auburn.edu
email: chemical@eng.auburn.edu

Financial assistance is available to qualified applicants.

DEPARTMENT OF CHEMICAL AND PETROLEUM ENGINEERING

FACULTY

R. G. Moore, Head *(Alberta)*
J. Azaiez *(Stanford)*
A. Badakhshan *(Birmingham, U.K.)*
L. A. Behie *(Western Ontario)*
C. Bellehumeur *(McMaster)*
P. R. Bishnoi *(Alberta)*
R. A. Heidemann *(Washington U.)*
C. Hyndman *(École Polytechnique)*
A. A. Jeje *(MIT)*
A. Kantzias *(Waterloo)*
A. K. Mehrotra *(Calgary)*
B. J. Milne *(Calgary)*
M. Pooladi-Darvish *(Alberta)*
B. B. Pruden *(McGill)*
J. Stanislav *(Prague)*
W. Y. Svrcek *(Alberta)*
E. L. Tollefson *(Toronto)*
M. A. Trebble *(Calgary)*
H. W. Yarranton *(Alberta)*
L. Zanzotto *(Slovak Tech. Univ., Czechoslovakia)*

The Department offers graduate programs leading to the M.Sc. and Ph.D. degrees in Chemical Engineering (full-time) and the M.Eng. degree in Chemical Engineering, Petroleum Reservoir Engineering or Engineering for the Environment (part-time) in the following areas:

- **Biochemical Engineering & Biotechnology**
- **Biomedical Engineering**
- **Environmental Engineering**
- **Modeling, Simulation & Control**
- **Petroleum Recovery & Reservoir Engineering**
- **Process Development**
- **Reaction Engineering/Kinetics**
- **Thermodynamics**
- **Transport Phenomena**

Fellowships and Research Assistantships are available to all qualified applicants.

• ***For Additional Information Write*** •
Dr. A. K. Mehrotra • Chair, Graduate Studies Committee
Department of Chemical and Petroleum Engineering
The University of Calgary • Calgary, Alberta, Canada T2N 1N4

The University is located in the City of Calgary, the Oil capital of Canada, the home of the world famous Calgary Stampede and the 1988 Winter Olympics. The City combines the traditions of the Old West with the sophistication of a modern urban center. Beautiful Banff National Park is 110 km west of the City and the ski resorts of Banff, Lake Louise,and Kananaskis areas are readily accessible. In the above photo the University Campus is shown with the Olympic Oval and the student residences in the foreground. The Engineering complex is on the left of the picture.

THE UNIVERSITY OF CALGARY

The UNIVERSITY OF CALIFORNIA at BERKELEY

. . . offers graduate programs leading to the Master of Science and Doctor of Philosophy. Both programs involve joint faculty-student research as well as courses and seminars within and outside the department. Students have the opportunity to take part in the many cultural offerings of the San Francisco Bay Area and the recreational activities of California's northern coast and mountains.

RESEARCH INTERESTS

Biochemical Engineering
Electrochemical Engineering
Electronic Materials Processing
Energy Utilization
Fluid Mechanics
Kinetics and Catalysis
Polymer Science and Technology
Process Design and Development
Separation Processes
Surface and Colloid Science
Thermodynamics

FACULTY

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DEPARTMENT OF CHEMICAL ENGINEERING • UNIVERSITY OF CALIFORNIA
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University of California Davis

Department of Chemical Engineering & Materials Science

Offering M.S. and Ph.D. degree programs in both Chemical Engineering and Materials Science and Engineering

Faculty

Nicholas L. Abbott, Associate Professor • Ph.D., Massachusetts Institute of Technology, 1991 • *Nanostructured fluids, surfactants, molecular assemblies, liquid crystals*

David E. Block, Assistant Professor • Ph.D., University of Minnesota, 1992 • *Industrial fermentation, biochemical processes in pharmaceutical industry*

Roger B. Boulton, Professor • Ph.D., University of Melbourne, 1976 • *Fermentation and reaction kinetics, crystallization*

Stephanie R. Dungan, Associate Professor • Ph.D., Massachusetts Institute of Technology, 1992 • *Micelle transport, colloid and interfacial science in food processing*

Bruce C. Gates, Professor • Ph.D., University of Washington, Seattle, 1966 • *Catalysis, solid superacid catalysis, zeolite catalysts, bimetallic catalysts, catalysis by metal clusters*

Jeffery C. Gibeling, Professor • Ph.D., Stanford University, 1979 • *Deformation and fatigue of metals and metal matrix composites*

Joanna R. Groza, Professor • Ph.D., Polytechnic Institute, Bucharest, 1972 • *Plasma activated sintering and processing of nanostructured materials*

Brian G. Higgins, Professor • Ph.D., University of Minnesota, 1980 • *Fluid mechanics and interfacial phenomena, sol gel processing, coating flows*

David G. Howitt, Professor • Ph.D., University of California, Berkeley, 1976 • *Forensic and failure analysis, electron microscopy, ignition and combustion processes in materials*

Alan P. Jackman, Professor • Ph.D., University of Minnesota, 1968 • *Protein production in plant cell cultures, bioremediation*

Marjorie L. Longo, Assistant Professor • Ph.D., University of California, Santa Barbara, 1993 • *Hydrophobic protein design for active control, surfactant microstructure, and interaction of proteins and DNA with biological membranes*

Benjamin J. McCoy, Professor • Ph.D., University of Minnesota, 1967 • *Supercritical extraction, pollutant transport*

Karen A. McDonald, Associate Professor • Ph.D., University of Maryland, College Park, 1985 • *Plant cell culture bioprocessing algal cell cultures*

Amiya K. Mukherjee, Professor • D.Phil., University of Oxford, 1962 • *Superplasticity of intermetallic alloys and ceramics, high temperature creep deformation*

Zuhair A. Munir, Professor • Ph.D., University of California, Berkeley, 1963 • *Combustion synthesis, multilayer combustion systems, functionally gradient materials*

Alexandra Navrotsky, Professor • Ph.D., University of Chicago, 1967 • *Thermodynamics and solid state chemistry; high temperature calorimetry*

Ahmet N. Palazoglu, Professor • Ph.D., Rensselaer Polytechnic Institute, 1984 • *Process control and process design of environmentally benign processes*

Ronald J. Phillips, Associate Professor • Ph.D., Massachusetts Institute of Technology, 1989 • *Transport processes in bioseparations, Newtonian and non-Newtonian suspension mechanics*

Robert L. Powell, Professor • Ph.D., Johns Hopkins University, 1978 • *Rheology, suspension mechanics, magnetic resonance imaging of suspensions*

Subhash H. Risbud, Professor and Chair • Ph.D., University of California, Berkeley, 1976 • *Semiconductor quantum dots, high T_c superconducting ceramics, polymer composites for optics*

Dewey D.Y. Ryu, Professor • Ph.D., Massachusetts Institute of Technology, 1967 • *Biomolecular process engineering and recombinant bioprocess technology*

James F. Shackelford, Professor • Ph.D., University of California, Berkeley, 1971 • *Structure of materials, biomaterials, nondestructive testing of engineering materials*

J.M. Smith, Professor Emeritus • Sc.D., Massachusetts Institute of Technology, 1943 • *Chemical kinetics and reactor design*

Pieter Stroeve, Professor • Sc.D., Massachusetts Institute of Technology, 1973 • *Membrane separations, Langmuir Blodgett films, colloid and surface science*

Stephen Whitaker, Professor • Ph.D., University of Delaware, 1959 • *Multiphase transport phenomena*

The multifaceted graduate study experience in the Department of Chemical Engineering and Materials Science allows students to choose research projects and thesis advisors from any of our faculty with expertise in chemical engineering and/or materials science and engineering.

Our department faculty provide excellent access to the scientists and facilities at nearby National Laboratories (LBL and LLNL) and industry in the Silicon Valley and San Francisco Bay Area.

Davis is a small, bike-friendly university town located 17 miles west of Sacramento and 72 miles northeast of San Francisco, within driving distance of a multitude of recreational activities in Yosemite, Lake Tahoe, Monterey, and San Francisco Bay Area.

For information about our program, look up our web site at http://www.engr.ucdavis.edu. or contact us via e-mail at chmsgradasst@chms.ucdavis.edu On-line applications may be submitted via https://secureweb.ucdavis.edu:2443

Graduate Admission Chair
Professor Ronald J. Phillips
Department of Chemical Engineering & Materials Science
University of California, Davis
Davis, CA 95616-5294, USA
Phone (916) 752-2803 • Fax (916) 752-1031

UNIVERSITY OF CALIFORNIA IRVINE

PROGRAM

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The 1,510-acre UC Irvine campus is in Orange County, five miles from the Pacific Ocean and 40 miles south of Los Angeles. Irvine is one of the nation's fastest growing residential, industrial, and business areas. Nearby beaches, mountain and desert area recreational activities, and local cultural activities make Irvine a pleasant city in which to live and study.

For further information and application forms, please visit

http://www.eng.uci.edu/cbe/

or contact

Department of Chemical and Biochemical Engineering and Materials Science
School of Engineering
University of California
Irvine, CA 92697-2575

Graduate Studies in

Chemical and Biochemical Engineering

and

Materials Science and Engineering

for Chemical Engineering, Engineering, and Science Majors

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James C. Earthman *(Stanford University)*

Steven C. George *(University of Washington)*

Juan Hong *(Purdue University)*

Enrique J. Lavernia*(Massachusetts Institute of Technology)*

Henry C. Lim *(Northwestern University)*

Martha L. Mecartney *(Stanford University)*

Farghalli A. Mohamed *(University of California, Berkeley)*

Frank G. Shi *(California Institute of Technology)*

Thomas K. Wood *(North Carolina State University)*

Joint Appointments:

Roger H. Rangel *(University of California, Berkeley)*

William A. Sirignano *(Princeton University)*

RESEARCH AREAS

- **Biomedical Engineering**
- **Bioreactor Engineering**
- **Bioremediation**
- **Ceramics**
- **Combustion**
- **Composite Materials**
- **Control and Optimization**
- **Environmental Engineering**
- **Interfacial Engineering**
- **Materials Processing**
- **Mechanical Properties**
- **Metabolic Engineering**
- **Microelectronics Processing and Modeling**
- **Microstructure of Materials**
- **Nanocrystalline Materials**
- **Nucleation, Chrystallization and Glass Transition Process**
- **Polymers**
- **Recombinant Cell Technology**
- **Separation Processes**
- **Sol-Gel Processing**
- **Two-Phase Flow**
- **Water Pollution Control**

CHEMICAL ENGINEERING AT

UCLA

RESEARCH AREAS

- Molecular Simulations
- Thermodynamics and Cryogenics
- Process Design, Dynamics, and Control
- Polymer Processing and Transport Phenomena
- Kinetics, Combustion, and Catalysis
- Surface and Interface Engineering
- Electrochemistry and Corrosion
- Biochemical Engineering
- Aerosol Science and Technology
- Air Pollution Control and Environmental Engineering

FACULTY

Panagiotis D. Christofides
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(Prof. Emeritus)
V. L. Vilker
(Prof. Emeritus)
A. R. Wazzan

PROGRAMS

UCLA's Chemical Engineering Department offers a program of teaching and research linking fundamental engineering science and industrial practice. Our Department has strong graduate research programs in environmental chemical engineering, biotechnology, and materials processing. With the support of the Parsons Foundation, The National Science Foundation, and the U.S. Department of Education, we are pioneering the development of methods for the design of clean chemical technologies, both in graduate research and engineering education.

Fellowships are available for outstanding applicants in both M.S. and Ph.D. degree programs. A fellowship includes a waiver of tuition and fees plus a stipend.

Located five miles from the Pacific Coast, UCLA's attractive 417-acre campus extends from Bel Air to Westwood Village. Students have access to the highly regarded science programs and to a variety of experiences in theatre, music, art, and sports on campus.

CONTACT

Admissions Officer • Chemical Engineering Department
5531 Boelter Hall • UCLA • Los Angeles, CA 90095-1592
(310) 825-9063

UNIVERSITY OF CALIFORNIA

SANTA BARBARA

FACULTY AND RESEARCH INTERESTS

L. GARY LEAL Ph.D. *(Stanford)* **(Chair)** • Fluid Mechanics, Physics and Rheology of Complex Fluids, including Polymers, Suspensions, and Emulsions.

ERAY S. AYDIL Ph.D. *(University of Houston)* • Microelectronics and Plasma Processing.

SANJOY BANERJEE Ph.D. *(Waterloo)* • Environmental Fluid Dynamics, Multiphase Flows, Turbulence, Computational Fluid Dynamics.

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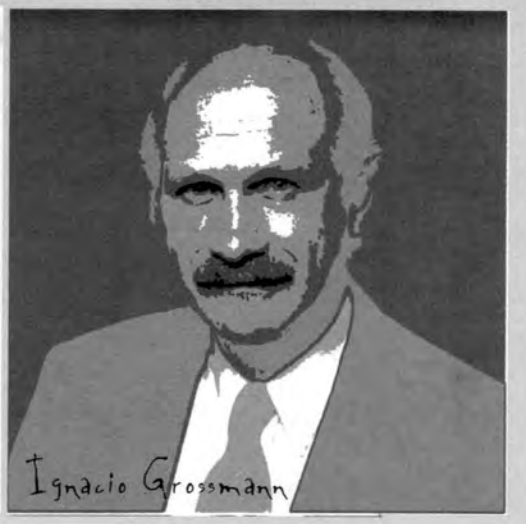

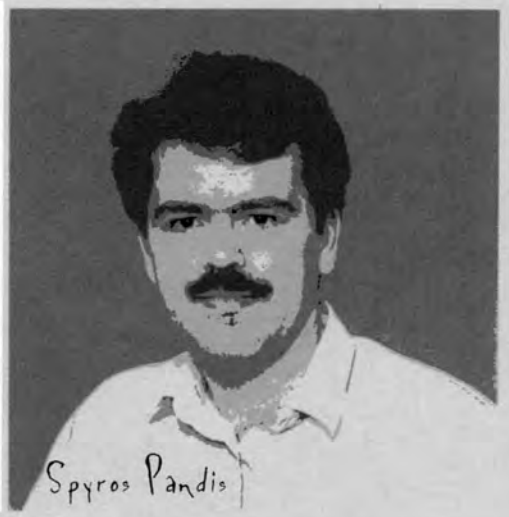

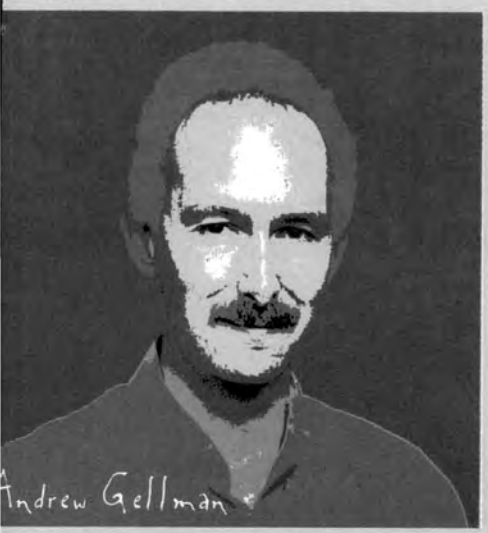

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Biochemical engineering, microbial and animal cell cultures

Athanassios Sambanis

Polymer science and engineering

Robert J. Samuels

Reactor engineering, process control, polymerization, reactor dynamics

F. Joseph Schork

Mass transfer, extraction, mixing, non-Newtonian flow

A. H. Peter Skelland

Process design and simulation

Jude T. Sommerfeld

Membranes, polymers, process economics

Arnold F. Stancell

Process synthesis and simulation, chemical separation, waste management, resource recovery

Daniel W. Tedder

Thermodynamic and transport properties, phase equilibria, supercritical extraction

Amyn S. Teja

Catalysis, kinetics, reactor design

Mark G. White

Biochemical engineering, cell-cell interactions, biofluid dynamics

Timothy M. Wick

Electrochemical engineering, thermodynamics, air pollution control

Jack Winnick

Biofluid dynamics, rheology, transport phenomena

Ajit P. Yoganathan

For more information, contact:
Dr. Ronald Rousseau, Chair
School of Chemical Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332-0100

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Vemuri Balakotaiah
Demetre Economou
Ernest Henley
John Killough
Ramanan Krishnamoorti
Dan Luss
Kishore Mohanty
Mike Nikolaou
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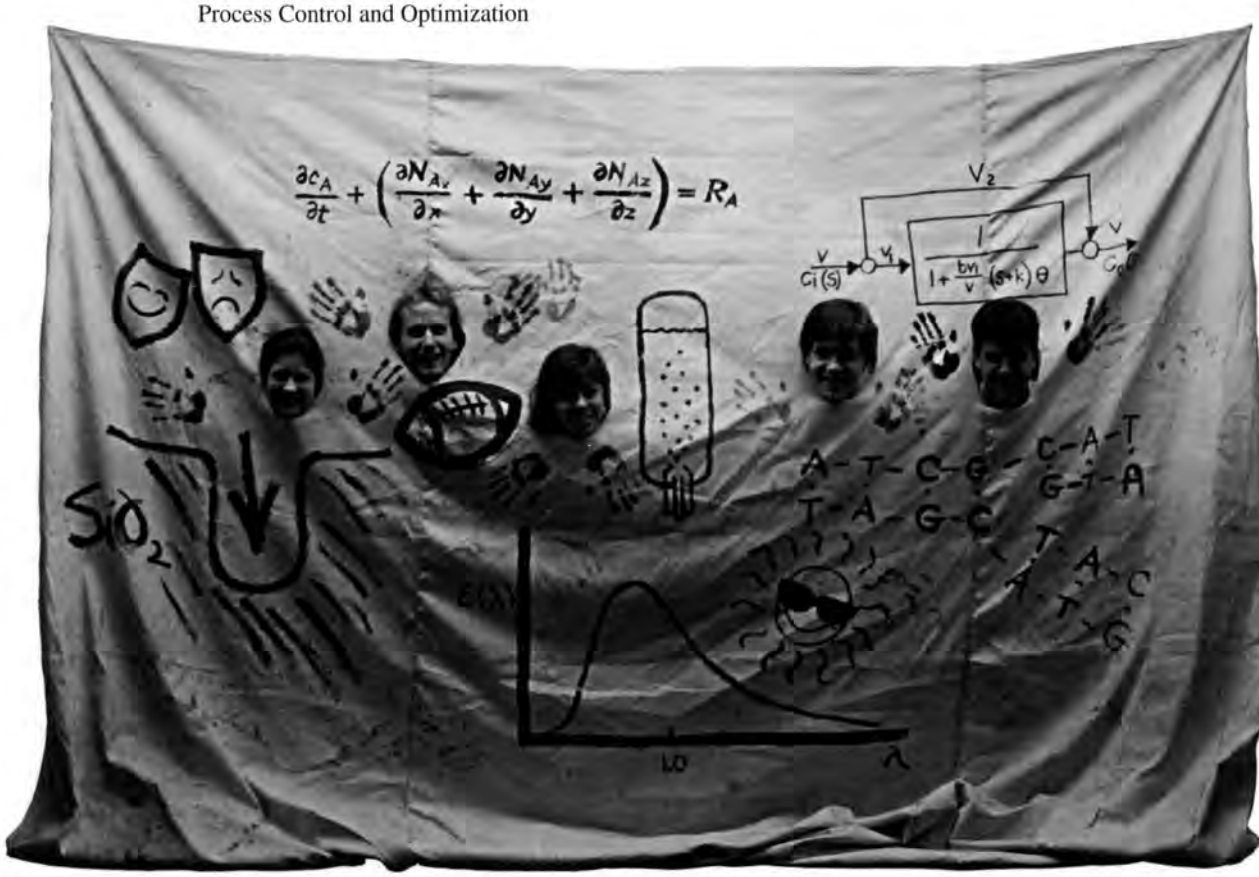

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PhD, University of California, Santa Barbara
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Joseph N. Cannon, Professor • PhD, University of Colorado
Transport phenomena in environmental systems • computational fluid mechanics • heat transfer

Ramesh C. Chawla, Professor • PhD, Wayne State University
Mass transfer and kinetics in environmental systems• bioremediation • incineration • air and water pollution control

William E. Collins, Assistant Professor • PhD, University of Wisconsin-Madison
Polymer deformation, rheology, and surface science • biomaterials • bioseparations • materials science

M. Gopala Rao, Professor • PhD, University of Washington, Seattle
Adsorption and ion exchange • process energy systems • radioactive waste management • remediation of contaminated soils and groundwater

John P. Tharakan, AssociateProfessor • PhD University of California, San Diego
Bioprocess engineering • protein separations • biological hazardous waste treatment • bio-environmental engineering

Robert J. Lutz, Visiting Professor • PhD, University of Pennsylvania
Biomedical engineering • hemodynamics • drug delivery • pharmacokinetics

Herbert M. Katz, Professor Emeritus • PhD, University of Cincinnati
Environmental engineering

M.S. Program

For further information and applications, write to

Director, Graduate Studies • Chemical Engineering Department
Howard University • Washington, DC 20059
Phone 202-806-6624 Fax 202-806-4635

UIC The University of Illinois at Chicago
Department of Chemical Engineering

• MS and PhD Graduate Program •

FACULTY

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Raffi M. Turian, Professor
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E-Mail: Turian@UIC.EDU

RESEARCH AREAS

Transport Phenomena: Transport properties of fluids, slurry transport, multiphase fluid flow and heat transfer, fixed and fluidized bed combustion, indirect coal liquefaction, porous media.

Thermodynamics: Molecular simulation and statistical mechanics of liquid mixtures. Superficial fluid extraction/retrograde condensation, asphaltene characterization. Reverse osmosis separations.

Kinetics and Reaction Engineering: Gas-solid reaction kinetics, diffusion and adsorption phenomena. Energy transfer processes, laser diagnostics, and combustion chemistry. Environmental technology, surface chemistry, and optimization. Catalyst preparation and characterization, structure sensitivity, and supported metals. Chemical kinetics in automotive engine emissions. Enzyme Kinetics. Novel approaches to chemical kinetics and catalysis, in situ surface spectroscopies.

Biochemical Engineering: Biodegradable polymers. Nonaqueous enzymology. Optimization of mycobacterial fermentations. Bioseparations.

Materials: Microelectronic materials and processing, heteroepitaxy in group IV materials, and in situ surface spectroscopies at interfaces. Combustion synthesis of ceramics and synthesis in supercritical fluids.

For more information, write to

Director of Graduate Studies • Department of Chemical Engineering
University of Illinois at Chicago • 810 S. Clinton • Chicago, IL 60607-7000 • (312) 996-3424 • Fax (312) 996-0808
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Jonathan J. L. Higdon	Fluid Mechanics and Transport Phenomena
Deborah E. Leckband	Biomolecular Recognition
Richard I. Masel	Fundamental Studies of Catalytic Processes and Semiconductor Growth
Anthony J. McHugh	Polymer Science and Engineering
Nikolaos V. Sahinidis	Optimization and Process Systems Engineering
William R. Schowalter	Mechanics of Complex Fluids
Edmund G. Seebauer	Laser Studies of Semiconductor Growth
K. Dane Wittrup	Biochemical Engineering
Charles F. Zukoski	Colloid and Interfacial Science

For information and application forms write:

Department of Chemical Engineering

University of Illinois at Urbana-Champaign

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http://www.chee.iit.edu/
e-mail: chee@charlie.cns.iit.edu

FACULTY AND RESEARCH AREAS

Chairman: Hamid Arastoopour

Chemical Engineering Program

Associate Chairman: Ali Cinar

Hamid Arastoopour; *computational multiphase flow, fluidization, material processing, particle technology, fluid-particle flow*
Richard L. Beissinger; *transport processes in biological systems, biomedical engineering, biorheology*
Barry Bernstein; *computational fluid mechanics, material properties, polymer rheology*
Ali Cinar; *chemical and food process control, nonlinear input-output modeling, statistical process monitoring*
Dimitri Gidaspow; *hydrodynamics of fluidization using kinetic theory, gas-solid transport*
Henry R. Linden; *fossil fuel technologies, energy and resource economics, energy and environmental policy*
Satish Parulekar; *biochemical engineering, chemical reaction engineering*
Jay D. Schieber; *kinetic theory, polymer rheology predictions, transport phenomena, non-Newtonian fluid mechanics*
J. Robert Selman; *applied electrochemistry and electrochemical engineering, battery and fuel cell design*
Eugene S. Smotkin; *FTIR spectroscopy of electrode surfaces, electrochemical mass spectroscopy, fuel cells*
Fouad A. Teymour; *polymer reaction engineering, mathematical modeling, nonlinear dynamics*
David C. Venerus; *polymer rheology and processing, transport phenomena in polymeric systems*
Darsh T. Wasan; *thin liquid films; interfacial rheology; foams, emulsion and dispersion, environmental technologies*

Environmental Engineering Program

Associate Chairman: Thomas M. Holsen

Paul R. Anderson; *precipitation kinetics, evaluation of oxide adsorbents for water and wastewater treatment*
H. Ted Chang; *biological processes, hazardous waste remediation, groundwater aquifer remediation*
Thomas M. Holsen; *environmental chemistry, hazardous and industrial waste treatment*
Nasrin R. Khalili; *evaluation of adsorption capacity of solid adsorbents in waste control, industrial waste management strategies*
Demetrios J. Moschandreas; *ambient and indoor air pollution, statistical analysis, environmental impact assessment*
Kenneth E. Noll; *air resources engineering, air pollution meteorology, hazardous waste treatment*
Krishna R. Pagilla; *water and wastewater engineering, environmental microbiology, soil remediation, sludge treatment*

Adjunct and Research Faculty

Nader Aderangi ◆ V.M. Balasubramaniam ◆ Michael Caracotsios
Ellis Fields ◆ Ted Knowlton ◆ Harold Lindahl ◆ Alex Nikolov
Robert Peters ◆ Allen Tulis ◆ Hwa-Chi Wang

Graduate program for M.S. and Ph.D. degrees in Chemical and Biochemical Engineering

FACULTY

Jonathan S. Dordick (Chair)
MIT 1986
Biocatalysis and bioprocessing/ Polymer chemistry

Audrey Butler
(Adjunct)
U. of Iowa 1989
Chemical precipitation processes

Greg Carmichael
U. of Kentucky 1979
Global change/ Supercomputing/ Air pollution modeling

Ravi Datta
UCSB 1981
Reaction engineering/ Catalyst engineering

Stephen K. Hunter
(Adjunct)
U. of Utah 1989
Bioartificial organs/ Microencapsulation technologies

Yuri Khmelnitsky
(Adjunct)
Moscow State U. 1982
Chemical enzymology and biocatalysis

Robert Linhardt
Johns Hopkins 1979
Biopolymers and pharmaceutical applications

David Murhammer
U. of Houston 1989
Insect cell culture/ Bioreactor monitoring/ Prostate cancer cell culture

Tonya L. Peeples
Johns Hopkins 1994
Bioremediation/ Extremophile physiology and biocatalysis

David Rethwisch
U. of Wisconsin 1985
Membrane science/ Polymer science

V.G.J. Rodgers
Washington U. 1989
Transport phenomena in bioseparations/ Membrane separations

John M. Wiencek
Case Western Reserve 1989
Protein crystallization/ Surfactant technology

Iowa

For information and application:

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Chemical and Biochemical Engineering
125 Chemistry Building
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(1-800-553-4692)
chemeng@icaen.uiowa.edu

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R. Dennis Vigil, Ph.D.
Michigan

Chris Baldwin, Ph.D.
Cambridge

For additional information

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Department of Chemical Engineering
Iowa State University
Ames, Iowa 50011
Telephone: 515-294-7643
Fax: 515-294-3177
E-mail: chemengr@iastate.edu

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Polymeric Separation Media

Timothy A. Barbari, PhD
University of Texas, Austin

Insect Cell Culture
Recombinant DNA Technology
Protein Folding and Aggregation

Michael J. Betenbaugh, PhD
University of Delaware

Equations of State
Statistical Thermodynamics
Solvent Replacement

Marc D. Donohue, PhD
University of California, Berkeley

Nucleation
Crystallization
Flame Generation of Ceramic Powders

Joseph L. Katz, PhD
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Fluid Mechanics in Medical Applications
Vascular and Cellular Biology
Thrombosis, Inflammation, Cancer Metastasis

Konstantinos Konstantopoulos, PhD
Rice University

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Polymer Solution Thermodynamics
Supercritical Solvent Extraction

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Phase Transitions and Critical Phenomena
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Particle-Tracking Microrheology

Denis Wirtz, PhD
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For further information contact:

Johns Hopkins University
Whiting School of Engineering
Department of Chemical Engineering
3400 N. Charles Street
Baltimore, MD 21218-2681

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Lawrence, KS 66045-2223
http://www.engr.ukans.edu/cpe-grad/

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Kenneth A. Bishop (Ph.D., Oklahoma)
John C. Davis (Ph.D., Wyoming)
Don W. Green, Chairman (Ph.D., Oklahoma)
Colin S. Howat (Ph.D., Kansas)
Carl E. Locke, Jr., Dean (Ph.D., Texas)
Trung V. Nguyen (Ph.D., Texas A&M)
Russell D. Osterman (Ph.D., Kansas)
Marylee Z. Southard (Ph.D., Kansas)
Bala Subramaniam (Ph.D., Notre Dame)
Galen J. Suppes (Ph.D., Johns Hopkins)
Brian E. Thompson (Ph.D., MIT)
Shapour Vossoughi (Ph.D., Alberta, Canada)
G. Paul Willhite (Ph.D., Northwestern)

RESEARCH AREAS

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Controlled Drug Delivery
Corrosion
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Enhanced Oil Recovery Processes
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Areas of Study and Research

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Process Dynamics and Control
Chemical Reaction Engineering
Intelligent Processing of Materials
Chemical Vapor Deposition of Electronic Materials
Process System Engineering and Artificial Intelligence
Environmental Pollution Control
Computer Simulation and Interfacial Studies
Hazardous Waste Treatment

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Department of Chemical & Materials Engineering

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- ❒ environmental engineering
- ❒ fuel science
- ❒ membranes
- ❒ polymer engineering
- ❒ supercritical fluids processing
- ❒ transport phenomena

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The Faculty:

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D. Bhattacharyya; *Illinois Institute of Technology*
F. Derbyshire; *Imperial College*
E. Grulke; *Ohio State University*
C. Hamrin; *Northwestern*
D. Kalika; *University of California, Berkeley*
R. Kermode; *Northwestern*
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Biochemical engineering

Catalysis

Computer aided simulation and design

Environmental engineering

Polymer engineering

Process modelling and control

Faculty and Research Areas

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- rheological modelling

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- rheology and modelling
- polymer blends and alloys
- polymer physics and engineering

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- animal cell culture
- viral vectors and vaccines production

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- interfacial phenomena
- surface forces

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- neural network modelling
- industrial wastewater treatment

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- catalytic membranes
- industrial catalysis

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- numerical simulation of thermo-electrical problem
- finite element method

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- wet oxidation
- flow instrumentation

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- biokinetics

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- rheology
- oriented polymers

Christian Roy
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- solid wastes
- vacuum pyrolysis

Abdelhamid Sayari
(Ph.D. Tunis/Lyon)
sayari@gch.ulaval.ca
(418) 656-3563
- heterogeneous catalysis
- zeolites and molecular sieves
- superacid catalysts

Jules Thibault
(Ph.D. McMaster)
jules.thibault@gch.ulaval.ca
(418) 656-2443
- process identification and control
- bioreactor engineering
- neural network modelling

Additional information and Applications may be obtained to:

Graduate Program Coordinator
Department of Chemical Engineering
Université Laval
Québec Canada G1K 7P4
info.grad@gch.ulaval.ca
www.gch.ulaval.ca
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Hugo S. Caram (University of Minnesota) ■ gas-solid and gas-liquid systems • optical techniques • reaction engineering
Marvin Charles (Polytechnic Institute of Brooklyn) ■ bioprocess design • cGMP R&D
Manoj K. Chaudhury (SUNY-Buffalo) ■ adhesion • thin films • surface chemistry
John C. Chen (University of Michigan) ■ two-phase vapor-liquid flow • fluidization • radiative heat transfer • environmental technology
Mohamed S. El-Aasser (McGill University) ■ polymer colloids and films • emulsion copolymerization • polymer synthesis and characterization
Christos Georgakis (University of Minnesota) ■ batch control • model predictive control • identification • statistical process control
James T. Hsu (Northwestern University) ■ separation processes • adsorption and catalysis in zeolites
Andrew J. Klein (North Carolina State University) ■ emulsion polymerization • colloidal and surface effects in polymerization
Mayuresh Kothare (California Institute of Technology) ■ constrained control • model predictive control • optimization • industrial control
William L. Luyben (University of Delaware) ■ process design and control • distillation
Janice A. Phillips (University of Pennsylvania) ■ biochemical engineering • instrumentation/control of bioreactors • mammalian cell culture
Maria M. Santore (Princeton University) ■ polymers adsorption processes and blend stability
William E. Schiesser (Princeton University) ■ numerical algorithms and software in chemical engineering
Arup K. Sengupta (University of Houston) ■ use of adsorbents, ion, exchange, reactive polymers, membranes in environmental pollution
Cesar A. Silebi (Lehigh University) ■ separation of colloidal particles • electrophoresis • mass transfer
Leslie H. Sperling (Duke University) ■ mechanical and morphological properties of polymers • interpenetrating polymer networks
Fred P. Stein (University of Michigan) ■ thermodynamic properties of mixtures
Harvey G. Stenger, Jr. (Massachusetts Institute of Technology) ■ reactor engineering
Israel E. Wachs (Stanford University) ■ materials characterization • surface chemistry • heterogeneous catalysis • environmental catalysis
Leonard A. Wenzel, Emeritus (University of Michigan) ■ thermodynamics

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Dr. Maria M. Santore, Chairman • Graduate Admissions Committee
Department of Chemical Engineering • Lehigh University • 111 Research Drive • Iacocca Hall • Bethlehem, PA 18015

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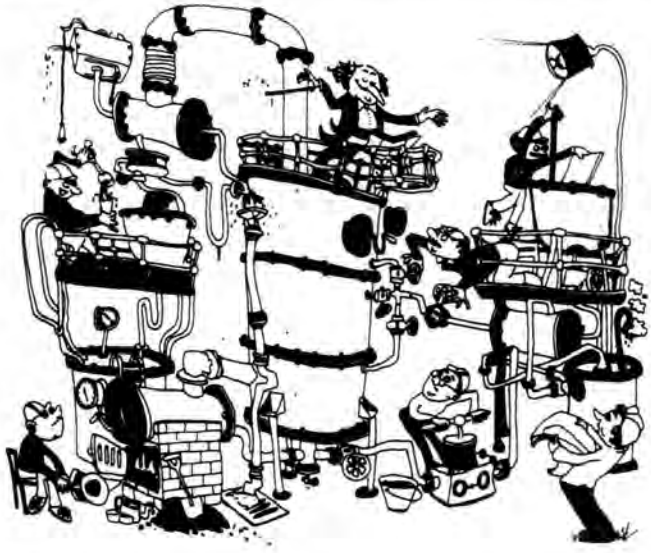

THE CITY

Baton Rouge is the state capitol and home of the major state institution for higher education — LSU. Situated in the Acadian region, Baton Rouge blends the Old South and Cajun Cultures. Baton Rouge is one of the nation's busiest ports and the city's economy rests heavily on the chemical, oil, plastics, and agricultural industries. The great outdoors provide excellent recreational activities year-round, especially fishing, hunting, and water sports. The proximity of New Orleans provides for superb nightlife, especially during Mardi Gras. The city is also only two hours away from the Mississippi Gulf Coast, and four hours from either Gulf Shores or Houston.

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Baton Rouge, LA 70803
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e-mail: gradcoor@che.lsu.edu

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A.B. CORRIPIO (Ph.D., Louisiana State University)
Control, Simulation, Computer-Aided Design

K.M. DOOLEY (Ph.D., University of Delaware)
Heterogeneous Catalysis, High-Pressure Separations

G.L. GRIFFIN (Ph.D., Princeton University)
Electronic Materials, Surface Chemistry, CVD

D.P. HARRISON (Ph.D., University of Texas)
Fluid-Solid Reactions, Hazardous Waste Treatment

M.A.HENSON (Ph.D., UC Santa Barbara)
Nonlinear Process Control, Neural Networks

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Supercritical Fluid Extraction, Ultrafast Kinetics

R.W. PIKE (Ph.D., Georgia Institute of Technology)
Fluid Dynamics, Reaction Engineering, Optimization

E.J. PODLAHA (Ph.D., Columbia University)
Electrical Phenomena, Alloy and Composite Materials

G.L. PRICE (Ph.D., Rice University)
Heterogeneous Catalysis, Zeolites

M. RADOSZ (Ph.D., University of Cracow)
Thermodynamics, Polymer Physical Chemistry

D.D. REIBLE (Ph.D., California Institute of Technology)
Environmental Transport, Transport Modeling

A.M. STERLING (Ph.D., University of Washington)
Transport Phenomena, Combustion

L.J. THIBODEAUX (Ph.D., Louisiana State University)
Chemodynamics, Hazardous Waste Transport

K.E. THOMPSON (Ph.D., University of Michigan)
Transport and Reaction in Porous Media

K.T. VALSARAJ (Ph.D., Vanderbilt University)
Environmental Transport, Separations

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Hazardous Waste Treatment, Drying

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Faculty and Research Interests

DOUGLAS BOUSFIELD Ph.D. (U.C.Berkeley)
Fluid Mechanics, Rheology, Coating Processes, Particle Motion Modeling

ALBERT CO Ph.D. (Wisconsin)
Polymeric Fluid Dynamics, Rheology, Transport Phenomena, Numerical Methods

JOSEPH M. GENCO Ph.D. (Ohio State)
Process Engineering, Pulp and Paper Technology, Wood Delignification

JOHN C. HASSLER Ph.D. (Kansas State)
Process Control, Numerical Methods, Instrumentation and Real Time Computer Applications

MARQUITA K HILL Ph.D. (U.C. Davis)
Environmental Science, Waste Management Technology

JOHN J. HWALEK Ph.D. (Illinois)
Liquid Metal Natural Convection, Electronics Cooling, Process Control Systems

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PIERRE LEPOUTRE Ph.D. (North Carolina State University)
Surface Physics and Chemistry, Materials Science, Adhesion Phenomena

KENNETH I. MUMME Ph.D. (Maine)
Process Simulation and Control, System Identification & Optimization

HEMANT PENDSE Ph.D. (Syracuse)
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Michael T. Harris (Tennessee) • *Nanoparticle technology*
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  Surface Phenomena in Crystallization Processes, Biochemical and Food Engineering, Bioadhesion
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  Kinetics, Catalysis, Reactions in Plasmas, Polymerization Reactions, Composite Processing, Biomass Conversion, Reaction Engineering
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  Polymer Rheology, Processing of Polymer Blends and Composites, Computational Methods
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  Process Dynamics of Environmental Systems, Adsorption in Porous Materials, Statistical Themodynamics and Molecular Simulation
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Process and plant design
Bruce A. Barna, Professor • Ph.D., New Mexico State University, 1985

Demixing-polymerization, polymer materials
Gerard T. Caneba, Associate Professor • Ph.D., University of California, Berkeley, 1985

Process control, neural networks, fuzzy logic control
Tomas B. Co, Associate Professor • Ph.D., Massachusetts, Amherst, 1988

Chemical process safety
Daniel A. Crowl, Professor and Dow Chair in Chemical Process Safety• Ph.D., University of Illinois, Urbana 1975

Metallurgical/nuclear engineering
Thomas G. Ellis, Associate Professor • Ph.D., Iowa State University, 1957

Excited state chemistry and transport processes
Edward R. Fisher, Professor and Department Chair • Ph.D., Johns Hopkins University, 1965

Process control, energy systems
Nam K. Kim, Associate Professor • Ph.D., Montana State University, 1982

Polymers, composites
Julia A. King, Assistant Professor • Ph.D., University of Wyoming, 1989

Polymer rheology, flow instabilities, complex fluids
Faith A. Morrison, Associate Professor • Ph.D., University of Massachusetts, Amherst 1988

Catalysis, ceramic processing, reactor design
Michael E. Mullins, Professor • Ph.D., University of Rochester, 1983

Cell and tissue engineering
David J. Odde, Assistant Professor • Ph.D., Rutgers University, 1995

Chemical process safety
Anton J. Pintar, Associate Professor • Ph.D., Illinois Institute of Technology, 1968

Environmental thermodynamics
Tony N. Rogers, Assistant Professor • Ph.D., Michigan Technological University, 1994

Surface science, catalysis
Kirk H. Schulz, Assistant Professor • Ph.D., Virginia Tech, 1991

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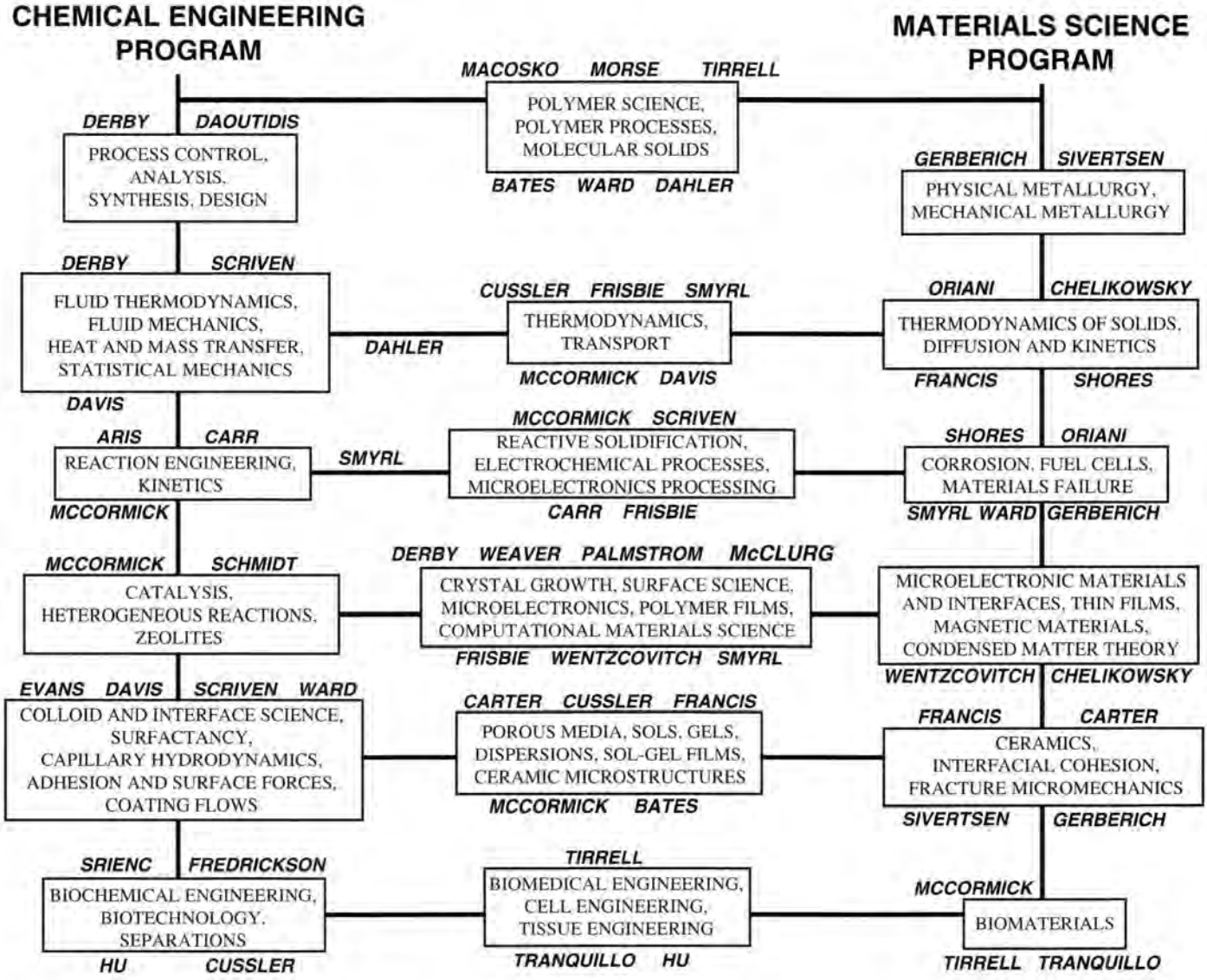

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C. Jeffrey Brinker	• Ceramics, Sol-Gel Processing, Porous Materials, Inorganic Membranes
Joseph L. Cecchi, Chair	• Semiconductor Manufacturing Technology, Plasma Etch and Deposition
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David Kauffman	• Plant Design, Environmental Engineering
Toivo T. Kodas	• Chemical Vapor Deposition & Etching
Ronald E. Loehman	• Glass-metal and Ceramic-metal Bonding and Interfacial Reactions
Gabriel P. López	• Organic Surfaces and Thin Films, Biomaterials
Richard W. Mead	• Unit Operations, Resource Extraction
H. Eric Nuttall	• Environmental Science, Colloid Science, Waste Transport Management
Douglas M. Smith	• Porous Material, Aerosol Physics
Timothy L. Ward	• Aerosol Materials Synthesis, Inorganic Membranes
Ebtisam S. Wilkins	• Biomedical Sensors, Waste Treatment

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The Chemical Engineering Program offers financial aid in the form of research assistantships paying $12-16,000 per year, plus tuition

For more information, contact:

Toivo T. Kodas, Graduate Advisor
Chemical and Nuclear Engineering • The University of New Mexico
Albuquerque, NM 87131-1341

505.277.5431
505.277.5433 • FAX
++kodas@unm.edu

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DEPARTMENT OF CHEMICAL ENGINEERING

Biochemical Engineering • Catalysis, Kinetics, and Reaction Engineering
Computer-Aided Design and Manufacturing • Electronic Materials
Electrochemical Engineering • Environmental Engineering
Polymer Science and Engineering
Thermodynamics and Computer Simulation

FACULTY AND THEIR RESEARCH INTERESTS

Ruben G. Carbonell • *Princeton*
Bioseparations; Colloid and Surface Science; Multiphase Transport Phenomena

Joseph M. DeSimone • *Virginia Tech*
Polymerizations in Supercritical Fluids; Step-Growth Polymerizations; Heterophase Polymeric Solutions

Peter S. Fedkiw • *Cal-Berkeley*
Electrochemical Engineering; Electrocatalysis

Richard M. Felder• *Princeton*
Computer-Aided Manufacturing of Specialty Chemicals; Process Simulation and Optimization

James K. Ferrell • *NC State*
Waste Minimization; Heat Transfer; Process Control

Benny D. Freeman • *Cal-Berkeley*
Polymer Physical Chemistry

Christine S. Grant • *Georgia Tech*
Colloid and Surface Science; Environmental Engineering

Keith E. Gubbins • *London*
Molecular Simulation of Interfacial Phenomena; Nanoporous Materials

Carol K. Hall • *Stony Brook*
Statistical Thermodynamics; Computer Simulation; Polymers; Protein Folding

Harold B. Hopfenberg • *MIT*
Transport and Aging in Glassy Polymers; Controlled Release; Membranes; Barrier Packaging

Robert M. Kelly • *NC State*
Bioenergetics and Physiology of Microorganisms from Extreme Environments; Biocatalysis

Saad Khan • *MIT*
Polymer Rheology; Rheology of Reactive Polymer Solutions and Melts; Polymer Spectroscopy

Peter K. Kilpatrick • *Minnesota*
Interfacial and Surface Science; Biotechnology

H. Henry Lamb • *Delaware*
Heterogeneous Catalysis; Microelectronics; Surface Science

P. K. Lim • *Illinois*
Interfacial Phenomena; Homogeneous Catalysis; Free Radical Chemistry

David F. Ollis • *Stanford*
Photochemical and Biochemical Engineering

Michael R. Overcash • *Minnesota*
Environmental Engineering; Improved Manufacturing Productivity by Waste Reduction

Gregory N. Parsons • *N.C. State*
Semiconductor and Insulator Growth Chemistry; Physics of Amorphous Materials and Devices

Steven W. Peretti • *Caltech*
Genetic and Metabolic Engineering; Microbial, Plant and Animal Cell Culture; Bioremediation

George W. Roberts • *MIT*
Heterogeneous Catalysis; Reaction Kinetics and Engineering; Pollution Prevention

C. John Setzer • *Ohio State*
Plant and Process Economics and Management

Vivian T. Stannett, Emeritus • *Brooklyn Poly*
Pure and Applied Polymer Science

Inquiries to:
Professor Gregory N. Parsons, Recruiting Coordinator • (919) 515-7553 • parsons@che.ncsu.edu

Box 7905 • North Carolina State University • Raleigh, North Carolina 27695-7905

Chemical Engineering at

Northwestern University

Annelise E. Barron, Ph.D., Berkeley, 1995
Bioseparations, biopolymer engineering

Linda J. Broadbelt, Ph.D., Delaware, 1994
Reaction engineering, kinetics modeling, polymer resource recovery

Wesley R. Burghardt, Ph.D., Stanford, 1990
Polymer science, rheology

William C. Cohen, Ph.D., Princeton, 1960
Process dynamics and automatic control

Buckley Crist, Jr., Ph.D., Duke, 1966
Polymer science, thermodynamics, mechanics

Joshua S. Dranoff, Ph.D., Princeton, 1960
Chemical reaction engineering, chromatographic separations

Thomas K. Goldstick, Ph.D., Berkeley, 1966
Biomedical engineering, oxygen transport in the human body

Harold H. Kung, Ph.D., Northwestern, 1974
Kinetics, heterogeneous catalysis

Michael L. Mavrovouniotis, Ph.D., MIT, 1989
Computer-aided process engineering

William M. Miller, Ph.D., Berkeley, 1987
Cell culture for biotechnology and medicine

Lyle F. Mockros, Ph.D., Berkeley, 1962
Biomedical engineering, fluid mechanics in biological systems

Monica Olvera de la Cruz, Ph.D., Cambridge, 1984
Statistical mechanics in polymer systems

Julio M. Ottino, Ph.D., Minnesota, 1979
Fluid mechanics, chaos, mixing in materials processing

E. Terry Papoutsakis, Ph.D., Purdue, 1980
Biotechnology of animal and microbial cells

Bruce E. Rittmann, Ph.D., Stanford, 1979
In situ bioremediation, biofilms

Gregory Ryskin, Ph.D., Caltech, 1983
Fluid mechanics, computational methods, polymeric liquids

Randall Q. Snurr, Ph.D., Berkeley, 1994
Adsorption and diffusion in porous media, molecular modeling

John M. Torkelson, Ph.D., Minnesota, 1983
Polymer science, membranes

For information and application to the graduate program, write

Director of Graduate Admissions
Department of Chemical Engineering
McCormick School of Engineering and Applied Science
Northwestern University
Evanston, Illinois 60208-3120
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- A.E. Miller
- R. A. Schmitz
- M. A. Stadtherr
- W. C. Strieder
- A. Varma
- E. E. Wolf

RESEARCH AREAS

Advanced Ceramic Materials
Catalysis and Surface Science
Chemical Reaction Engineering
Process Design
Gas-Liquid Flows
Nonlinear Dynamics
Parallel Computing
Phase Equilibria
Polymer Science
Process Dynamics and Control
Statistical Mechanics
Superconducting Materials
Supercritical Fluids
Suspension Rheology
Thermodynamics and Separations
Transport Phenomena
Environmentally Conscious Design

The University of Notre Dame offers a program of graduate study leading to a Master of Science or Doctor of Philosophy degree in Chemical Engineering. The requirements for a master's degree are normally completed in sixteen to twenty-four months. The doctoral program requires about four years of full-time study beyond the bachelor's degree. We accept applications from students whose undergraduate degrees are in areas of science or engineering other than chemical engineering.

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For further information, write or call

Dr. Joan F. Brennecke • Department of Chemical Engineering
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www address: http://www.er6.eng.ohio-state.edu/che/ • e-mail address: che@osu.edu

- **Bhavik Bakshi,** *Mass. Inst. Tech. 1992,* Process Control, Intelligent Controllers, Wavelet Neural Networks, Systems Integration, Artificial Intelligence in Design, Planning, and Analysis
- **Robert S. Brodkey,** *Wisconsin 1952,* Turbulent Motion, Mixing and Kinetics, Image Processing and Analysis, Reactor Design, and Rheology
- **Jeffrey J. Chalmers,** *Cornell 1988,* Biochemical Engineering, Hydrodynamic Effects on Cells, Cell Separations, Biodegradation/Bioremediation
- **Kenneth R. Cox,** *Illinois-Urbana 1979,* Molecular thermodynamics, Colloid and Interface Science, Physical Chemistry of Aqueous Systems, Polymer Phase Behavior, and Computational Chemistry
- **James F. Davis,** *Northwestern 1981,* Artificial Intelligence in Diagnosis and Control, Intelligent Control, Data Interpretation, Pattern Recognition, Neural Networks, Systems Integration, Model Integration
- **L. S. Fan,** *West Virginia 1975,* Fluidization, Powder Technology, Multiphase and Particulates Reaction Engineering, and Mathematical Modeling
- **Martin Feinberg,** *Princeton 1968,* Reactors with Complex Chemistry, Reactor Optimization, Applied Mathematics
- **Morton H. Friedman,** *Michigan 1961,* Biomedical Engineering and Hemodynamics
- **Kurt W. Koelling,** *Princeton 1992,* Polymer Processing, Liquid Crystalline Polymers, Biodegradable Polymers, Polymer Rheology and Morphology
- **L. James Lee,** *Minnesota 1979,* Polymer Processing, Composite Manufacturing, and Thermoset Polymers
- **Umit S. Ozkan,** *Iowa State 1984,* Application of Heterogeneous Catalysis to Energy and Environmental Issues, Catalytic Materials, and Heterogeneous Kinetics
- **James F. Rathman,** *Oklahoma 1987,* Chemical Reactions in Surfactant Solutions, Thermodynamics of Micelle Formation, Wetting and Adhesion, Interfacial Adsorption, and Transport
- **David L. Tomasko,** *Illinois-Urbana 1992,* Intermolecular Interactions in Supercritical Fluids, Supercritical Fluid Extraction, Molecular Thermodynamics
- **Shang-Tian Yang,** *Purdue 1984,* Biochemical Engineering and Biotechnology, Fermentation Processes, and Bioseparation
- **Jacques L. Zakin,** *New York 1959,* Surfactant and Polymer Drag Reduction, Micellar Structures, Rheology, and Emulsions

Ohio University

Chemical Engineering

Graduate Programs

The Department of Chemical Engineering offers programs leading to both the M.S. and Ph.D. degrees. The department is located in the Stocker Engineering Center, which recently (1994) underwent expansion and now contains some of the finest state-of-the-art equipment available. The department's activities are enhanced by the Stocker endowment, which was made possible by the generosity of Dr. C. Paul and Beth K. Stocker and which has now grown to over $14 million. The interest on this endowment is used to help support research efforts in such ways as providing competitive graduate fellowships and associateships, matching equipment funds, and seed money for new project areas.

Research Areas

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Coal Conversion Technology and Desulfurization
Aerosol Science and Technology
Process Control
Separations
Energy and Environmental Engineering
Thin Film Materials
Chemical Reaction Engineering
Wastewater Treatment
Bioreactor Analysis
Downstream Processing of Proteins

Financial Aid

Financial support includes teaching and grant-related associateships and fellowships ranging from $10,000 to $15,000 per twelve months. In addition, students are granted a full tuition scholarship for both the regular and summer academic terms. Stocker Fellowships are available to especially well-qualified students.

The Faculty

Calvin H. Baloun, P.E., Emeritus *(Ph.D., Cincinnati, 1962)*
W. J. Russell Chen *(Ph.D., Syracuse, 1974)*
Nicholas Dinos *(Ph.D., Lehigh, 1967)*
Madan Gopal *(Ph.D., Ohio, 1994)*
Tingyue Gu *(Ph.D., Purdue, 1991)*
Daniel A. Gulino *(Ph.D., Illinois, 1983)*
W. Paul Jepson *(Ph.D., Heriot-Watt, 1980)*
Michael E. Prudich, Chair *(Ph.D., West Virginia, 1979)*
Darin Ridgway, P.E. *(Ph.D., Florida State, 1990)*
Kendree J. Sampson *(Ph.D., Purdue, 1981)*
Ben J. Stuart *(Ph.D., Rutgers, 1995)*
Valerie L. Young *(Ph.D., Virginia Tech., 1992)*

For More Information Contact:

Director of Graduate Studies
Department of Chemical Engineering, 172 Stocker Center • Ohio University, Athens OH 45701-2979
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School of Chemical Engineering and Materials Science
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Faculty and Research Interests

- **Miguel J. Bagajewicz**, Associate Professor • *process plant simulation and data reconciliation • design of heat/mass-exchange networks for waste minimization applications • mathematical background, algorithm development and process design applications of optimization theory • high temperature fuel-gas cleaning reactors • modeling of fluid-solid diffusion-reaction problems*
- **Billy L. Crynes**, Professor • *modeling of hydrocarbon pyrolysis • surface effects during pyrolysis of hydrocarbons*
- **Brian P. Grady**, Assistant Professor • *multiphase and block copolymers • ion-containing polymers • x-ray, neutron and light scattering • biodegradable and bioabsorbable polymers • orientation and orientation mechanisms in polymers*
- **Roger G. Harrison, Jr.**, Associate Professor • *production of proteins and peptides using recombinant DNA technology • separation and purification of biochemicals • enzyme reactors • protein engineering • drug delivery systems • applications of biotechnology to waste treatment*
- **Jeffrey H. Harwell**, Conoco/DuPont Professor and Director • *tertiary oil recovery • unconventional low energy separation processes • mass transfer • dynamics of multicomponent mass transfer processes • surface phenomena • adsorption kinetics*
- **Lloyd L. Lee**, C. M. Sliepcevich Professor • *thermodynamics • molecular transport theory • statistical mechanics • structured liquids • Monte Carlo and molecular dynamics studies • conformal solution theory • natural gas properties • polar fluids, ionic solutions, and molten salts • surface adsorption • turbulent flow*
- **Lance L. Lobban**, Associate Professor • *catalytic reaction rate mechanisms and modeling • partial oxidation of hydrocarbons • fuel cells*
- **Richard G. Mallinson**, Associate Professor • *chemical reaction engineering • polymerization • synthetic and alternative fuels*
- **Mathias U. Nollert**, Assistant Professor • *biomedical engineering • cellular metabolism and transport • fluid transport • fluid mechanics*
- **Edgar A. O'Rear, III**, Professor • *catalysis • surface chemistry and physics • kinetics • blood trauma associated with medical devices • biorheology • organic chemistry • coal technology*
- **Daniel E. Resasco**, Associate Professor • *heterogeneous catalysis, reaction engineering and kinetics • design of catalysts for pollutant abatement • transport and adsorption in porous materials • physical chemistry of surfaces • characterization of ceramic supports*
- **Melissa M. Rieger**, Assistant Professor • *electrochemical phenomena and electrochemical engineering • alternative energy sources • material systems and electrochemical processes in microelectronic processing • optoelectronic integration into silicon electronics • electrochemical behavior of polymeric materials • photochemical etching of silicon carbide • porous silicon luminescence*
- **John F. Scamehorn**, Asahi Glass Chair • *surface and colloid science • tertiary oil recovery • detergency • membrane separations • adsorption • pollution control • polymers • paper and plastics deinking*
- **Robert L. Shambaugh**, Professor • *polymerization chemistry • polymer processing technology • fiber spinning, texturing and extrusion • wastewater engineering • physicochemical treatment • ozonation • gas-liquid reactions*

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Faculty

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K.A.M. Gasem (Ph.D., Oklahoma State University)
Karen A. High (Ph.D., Pennsylvania State University)
Martin S. High (Ph.D., Pennsylvania State University)
A.J. Johannes (Ph.D., University of Kentucky)
Randy Lewis (Ph.D., Massachusetts Institute of Technology)
Robert L. Robinson, Jr. (Ph.D., Oklahoma State University)
D. Alan Tree (Ph.D., University of Illinois)
Jan Wagner (Ph.D., University of Kansas)
James R. Whiteley (Ph.D., Ohio State University)

Research Areas

Adsorption
Air Pollution
Artificial Intelligence
Biochemical Processes
Corrosion
Design
Environmental Engineering
Fluid Flow
Gas Processing
Hazardous Wastes
Ion Exchange
Kinetics
Mass Transfer
Modeling
Phase Equilibria
Polymers
Process Control
Process Simulation
Thermodynamics

For more information contact
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School of Chemical Engineering
Oklahoma State University
Stillwater, OK 74078
tree@OKWAY.OKSTATE.EDU

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  Fine Particle Processing, Transport Phenomena
- **S. Kimura**
  Reaction Engineering, High-Temperature Materials
- **J. G. Knudsen**
  Heat Transfer
- **M. D. Koretsky**
  Electronic Materials Processing
- **O. Levenspiel**
  Fluidization, Chemical Reaction Engineering
- **K. L. Levien**
  Process Optimization and Control
- **J. McGuire**
  Protein Adsorption, Biofilm Development
- **W. E. Rochefort**
  Rheology, Characterization of Polymers
- **G. L. Rorrer**
  Biochemical Reaction Engineering
- **C. E. Wicks**
  Mass Transfer

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For further information, write:

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Oregon State University
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Department of Chemical Engineering
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University of Pennsylvania
Philadelphia, Pennsylvania 19104-6393

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Combustion, incineration, Czochralski crystallization, rate processes

Russell J. Composto ■
Polymeric materials science, surface and interface studies

Scott L. Diamond ■
Endothelial cell mechano-biology, drug and gene delivery, biotransport phenomena

Gregory C. Farrington ■
Electrochemistry, solid state and polymer chemistry

William C. Forsman ■
Polymer science and engineering, graphite intercalation

Eduardo D. Glandt ■
Classical and statistical thermodynamics, random media

Raymond J. Gorte ■
Heterogeneous catalysis, supported metals, zeolites

David J. Graves ■
Biochemical and biomedical engineering, biotechnology

Daniel A. Hammer ■
Cellular bioengineering, biointerfacial phenomena, adhesion

Mitchell Litt ■
Biorheology, biofluids, hemorheology, biomedical instrumentation

Alan L. Myers ■
Adsorption of gases and liquids, molecular simulation

Daniel D. Perlmutter ■
Chemical reactor design, gas-solid reactions, gel kinetics

John A. Quinn ■
Membrane transport, biochemical/biomedical engineering

Warren D. Seider ■
Process analysis, simulation, design, and control

Lyle H. Ungar ■
Artificial intelligence in process control, neural networks

T. Kyle Vanderlick ■
Thin-film and interfacial phenomena

John M. Vohs ■
Surface science, catalysis, electronic materials processing

Karen I. Winey ■
Polymer morphology, processing, and property interrelationships

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University Park

Chemical Engineering

Aziz Ben-Jebria *(Univ. of Paris)*—Respiratory Transport, Inhalation Toxicology

Ali Borhan *(Stanford)*—Fluid Dynamics, Transport Phenomena

Alfred Carlson *(Wisconsin)*—Biotechnology, Bioseparations

Lance Collins *(Penn)*—Turbulent Flow, Combustion

Wayne R. Curtis *(Purdue)*—Plant Biotechnology

Ronald P. Danner *(Lehigh)*—Applied Thermodynamics, Adsorption Phenomena

Thomas E. Daubert *(Penn State)*—Applied Thermodynamics

J. Larry Duda *(Delaware)*—Polymers, Diffusion, Tribology, Fluid Mechanics, Rheology

David A. Edwards *(Illinois Institute of Tech.)*—Transport Phenomena, Fluid Dynamics

Kristen Fichthorn *(Michigan)*—Statistical Mechanics, Surface Science, Catalysis

Costas D. Maranas *(Princeton)*—Computational Chemistry, Design and Control, Optimization Theory

Themis Matsoukas *(Michigan)*—Aerosol Processes, Colloidal Particles, Ceramic Powders

John R. McWhirter *(Penn State)*—Gas–Liquid Mass Transfer, Microencapsulation

R. Nagarajan *(SUNY at Buffalo)*—Colloid and Polymer Science

Joseph M. Perez *(Penn State)*—Tribology, Lubrication

Jonathan Phillips *(Wisconsin)*—Heterogeneous Catalysis, Surface Science

John M. Tarbell *(Delaware)*—Cardiovascular Fluid Mechanics and Mass Transfer, Turbulent Reacting Flows

James S. Ultman *(Delaware)*—Physiological Transport Processes, Medical Monitoring

M. Albert Vannice *(Stanford)*—Heterogeneous Catalysis

James S. Vrentas *(Delaware)*—Transport Phenomena, Applied Mathematics, Polymer Science

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For more information, contact:

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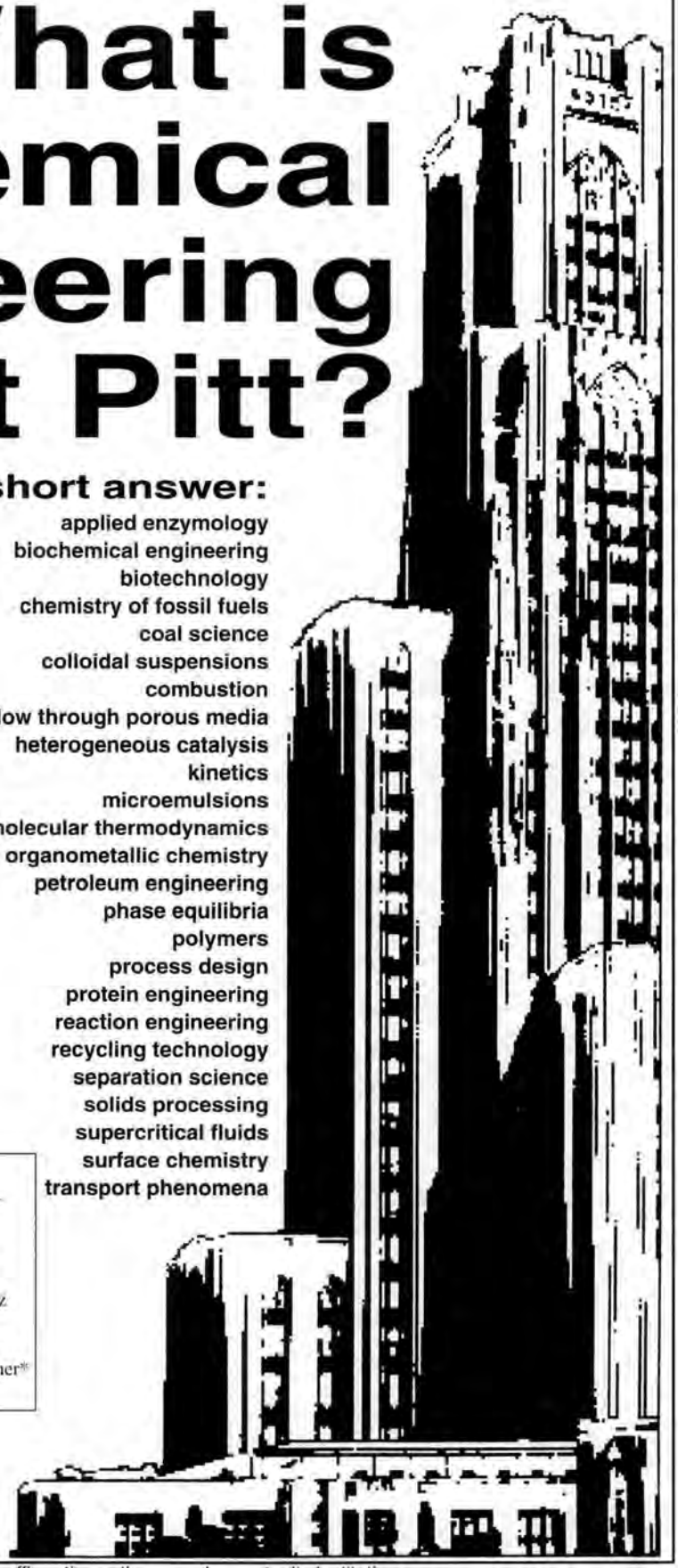

A short answer:

applied enzymology
biochemical engineering
biotechnology
chemistry of fossil fuels
coal science
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combustion
flow through porous media
heterogeneous catalysis
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Department of Chemical and Petroleum Engineering
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Pittsburgh, PA 15261
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Anna C. Balazs	Dan Farcasiu	John F. Patzer*
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T.K. Kwei • *polymer-polymer miscibility, phase relationships in polymers*

J. Mijovic • *dielectric properties of reactive polymers, in-situ real time monitoring of processes, structural relaxation in glassy polymers*

A.S. Myerson • *crystallization, mass transfer*

E.M. Pearce • *polymer synthesis and degradation*

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Faculty

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R.P. Andres
O.A. Basaran
J.M. Caruthers
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W.N. Delgass
F.J. Doyle
R.E. Eckert
E.I. Franses
R.A. Greenkorn
R.E. Hannemann
R.N. Houze
D.P. Kessler
H.S. Lackritz
J. Lauterbach
J.F. Pekny
N.A. Peppas
D. Ramkrishna
G.V. Reklaitis
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J.L. Sinclair
R.G. Squires
G.T. Tsao
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Research Areas

Applied Mathematics
Artificial Intelligence
Biochemical Engineering
Biomedical Engineering
Catalysis and Reaction Engineering
Colloids and Interfacial Engineering
Process Operations and Design
Environmental Science
Fluid Mechanics
Fluid Particle Systems
Materials and Microelectronics Processing
Parallel Computing and Combinatorics
Polymer Science and Engineering
Separation Processes
Surface Science and Engineering
Thermodynamics and Statistical Mechanics
Transport Phenomena

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Fellowships
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Degrees Offered

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For More Information

Graduate Studies
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Web Address:
http://www.che.purdue.edu

Chemical Engineering at

Rensselaer Polytechnic Institute

The Chemical Engineering Department at Rensselaer has long been recognized for its excellence in teaching and research. Its graduate programs lead to research-based M.S. and Ph.D. degrees and to a course-based M.E. degree. Programs are also offered in cooperation with the School of Management and Technology which lead to an M.E. in Chemical Engineering and to an MBA or the M.S. in Management. Owing to funding, consulting, and previous faculty experience, the department maintains close ties with industry. Department web site:

http://www.eng.rpi.edu/dept/chem-eng/

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Application materials and information from:

Graduate Services
Rensselaer Polytechnic Institute
Troy, NY 12180-3590
Telephone: 518-276-6789
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http://www.rpi.edu/dept/grad-services/

Faculty and Research Interests

Michael M. Abbott, abbotm2@rpi.edu
Associate Department Chair
Thermodynamics; equations of state; phase equilibria

Elmar R. Altwicker, altwie@rpi.edu
Spouted-bed combustion; incineration; mass transfer with chemical reaction

Georges Belfort, belfog@rpi.edu
Membrane separations; adsorption; biocatalysis; flow sensing with NMR

B. Wayne Bequette, bequeb@rpi.edu
Process modeling, control, design, and optimization

Henry R. Bungay III, bungah @ rpi.edu
Wastewater treatment; biochemical engineering

Steven M. Cramer, crames@rpi.edu
Displacement, membrane, and preparative chromatography; environmental research

Arthur Fontijn, fontia@rpi.edu
Department Chair
Combustion; high-T kinetics; gas-phase reactions

William N. Gill, gillw@rpi.edu
Microelectronics; reverse osmosis; crystal growth; ceramic composites

Howard Littman, littmh@rpi.edu
Fluidization; spouting fluid/particle systems

Charles Muckenfuss, Professor Emeritus

E. Bruce Nauman, nauman@rpi.edu
Recycling of mixed plastics; structure and properties of polymers; polymer devolatilization

Joel L. Plawsky, plawsky@rpi.edu
Electronic and photonic materials; interfacial phenomena

Todd M. Przybycien, przybt@rpi.edu
Protein aggregation and adsorption phenomena; protein separations, formulation, and delivery

Hendrick C. Van Ness, Institute Professor Emeritus

Peter C. Wayner, Jr., wayner@rpi.edu
Heat transfer; interfacial phenomena

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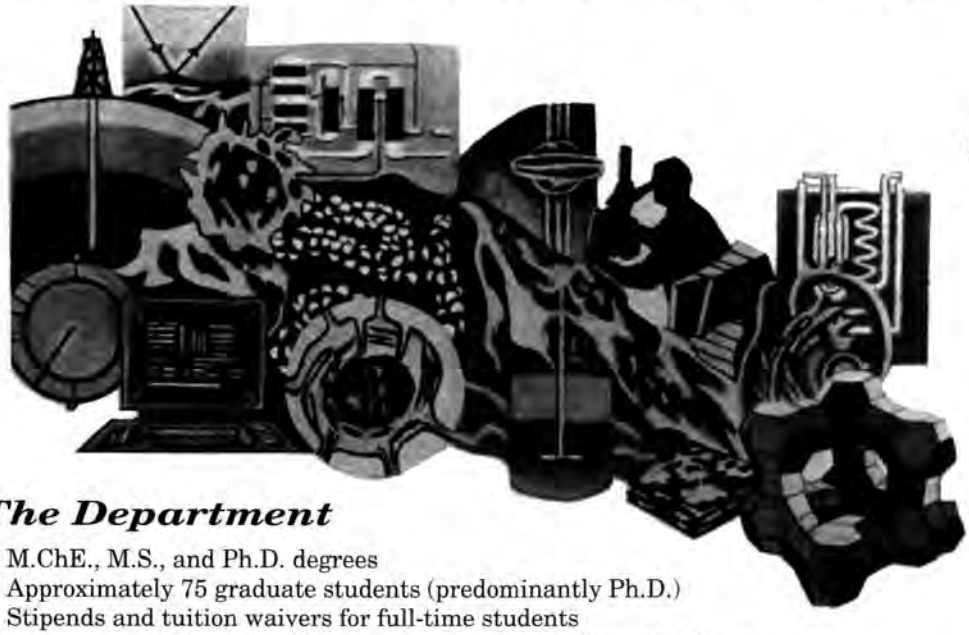

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Chair, Graduate Committee
Department of Chemical Engineering, MS-362
Rice University
6100 S. Main St.
Houston, TX 77005-1892

Additional information is available electronically through our World Wide Web home page located at
http://riceinfo.rice.edu/~dek/CENG/index.html

Research Interests

- Applied Mathematics
- Biochemical Engineering
- Biomedical Engineering
- Equilibrium Thermodynamic Properties
- Fluid Mechanics
- Interfacial Phenomena
- Kinetics and Catalysis
- Polymer Science
- Process Control
- Reaction Engineering
- Rheology
- Statistical Mechanics
- Tissue Engineering
- Transport in Porous Media
- Transport Processes
- Transport Properties

Faculty

▶ **William W. Akers**
(Michigan, 1950)

▶ **Constantine D. Armeniades**
(Case Western Reserve, 1969)

▶ **Thomas A. Badgwell**
(Texas, 1992)

▶ **Walter Chapman**
(Cornell, 1988)

▶ **Sam H. Davis, Jr.**
(MIT, 1957)

▶ **Derek C. Dyson**
(London, 1966)

▶ **J. David Hellums**
(Michigan, 1961)

▶ **Joe W. Hightower**
(Johns Hopkins, 1963)

▶ **George J. Hirasaki**
(Rice, 1967)

▶ **Riki Kobayashi**
(Michigan, 1951)

▶ **Larry V. McIntire**
(Princeton, 1970)

▶ **Antonios G. Mikos**
(Purdue, 1988)

▶ **Clarence A. Miller**
(Minnesota, 1969)

▶ **Mark A. Robert**
(Swiss Fed. Inst. of Tech., 1980)

▶ **Ka-Yiu San**
(CalTech, 1984)

▶ **Jacqueline Shanks**
(CalTech, 1989)

▶ **Kyriacos Zygourakis**
(Minnesota, 1981)

Department of Chemical Engineering

University of Rochester

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Fellowships to $18,000

S. H. CHEN, Ph.D. 1981, Minnesota
Polymer Science and Engineering • Transport Phenomena • Optical Materials

E. H. CHIMOWITZ, Ph.D. 1982, Connecticut
Critical Phenomena • Statistical Mechanics of Fluids • Computer-Aided Design

R. H. HEIST, Ph.D. 1972, Purdue
Nucleation • Aerosols • Ultrafine Particles

S. A. JENEKHE, Ph.D. 1985, Minnesota
Polymer Science and Engineering • Materials Chemistry • Optoelectronic and Photonic Materials and Devices

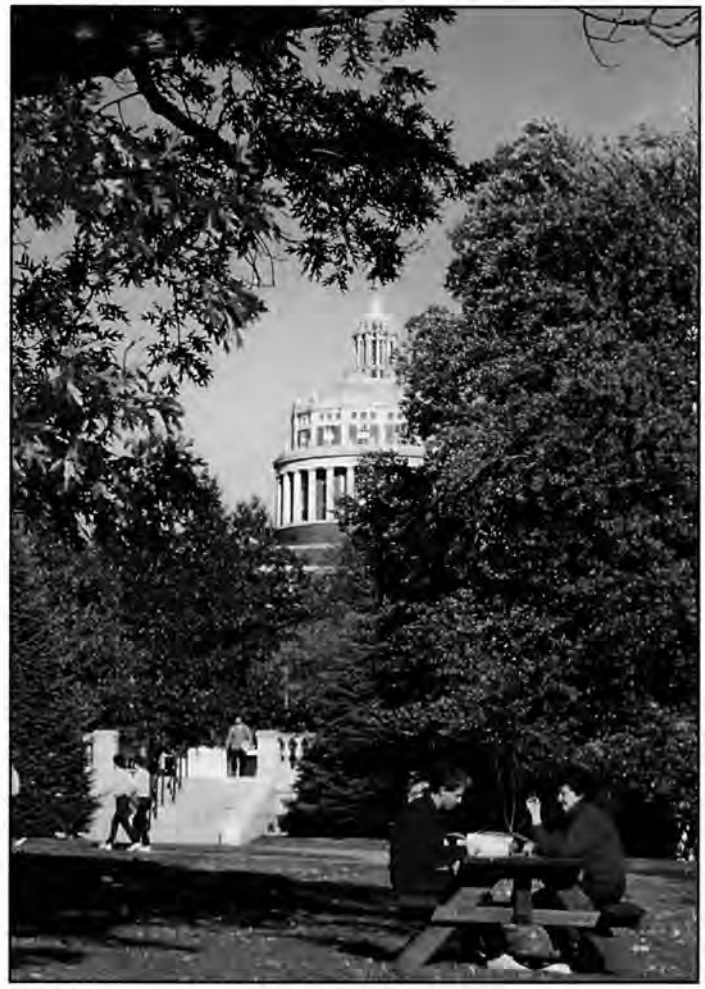
J. JORNE, Ph.D. 1972, California (Berkeley)
Electrochemical Engineering • Microelectronics Processing • Theoretical Biology

R. H. NOTTER, Ph.D. 1969, Washington (Seattle) M.D. 1980, Rochester
Biomedical Engineering • Lung Surfactant • Molecular Biophysics

H. J. PALMER, Ph.D. 1971, Washington (Seattle)
Interfacial Phenomena • Phase Transfer Reactions • Mass Transfer • Bioengineering

S. V. SOTIRCHOS, Ph.D. 1982, Houston
Reaction Engineering • Transport and Reaction in Porous Media • Processing of Ceramic Materials and Composites

J. H. D. WU, Ph.D. 1987, M.I.T.
Biochemical Engineering • Fermentation • Biocatalysis • Bone Marrow Tissue Engineering • Genetic and Protein Engineering



For further information and application, write

Graduate Admissions • Department of Chemical Engineering
University of Rochester • Rochester, New York 14627

Phone: (716) 275-4042 • Fax: (716) 442-6686
e-mail: gradadm@che.rochester.edu

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Faculty

- **Helen M. Buettner,** Associate Professor and Graduate Director; Ph.D., University of Pennsylvania, 1987 • *Applied neurobiology, cell motility, cell-substrate interactions, crystallization*
- **Yee C. Chiew,** Professor; University of Pennsylvania, 1984 • *Statistical thermodynamics, microscopic structures of fluids and particle systems, interfacial phenomena*
- **Alkis Constantinides,** Professor and Chair; D.E.Sc., Columbia University, 1970 • *Biochemical engineering, optimization and control of fermentation processes, applied numerical analysis, artificial intelligence*
- **Peter Couchman,** Professor; Ph.D., University of Virginia, 1976 • *Thermodynamics, transition, and equation of state behavior of single and multicomponent systems, particularly polymers; surface phenomena*
- **Burton Z. Davidson,** Professor; Ph.D., P.E., Northwestern University, 1963 • *Systems simulation and optimization, environmental engineering, health and safety engineering management*
- **Panos G. Georgopoulos,** Associate Professor; Ph.D., California Institute of Technology, 1986 • *Atmospheric/environmental chemical engineering, turbulent transport, biochemodynamic modeling*
- **Benjamin J. Glasser,** Assistant Professor; Ph.D., Princeton, 1995 • *Multiphase flows and reactor; granular materials and particulate suspensions; nonlinear dynamics of transport processes*
- **Masanori Hara,** Professor; Ph.D., Kyoto University, 1981 • *Polymer physics; polymer chemistry, polymer blends and composites, ionic polymers*
- **David S. Kosson,** Professor; Ph.D., Rutgers University, 1986 • *Hazardous waste management, in-situ and on-site remediation, leaching, contaminant fate and transport in wastes, soils, and groundwater*
- **Prabhas V. Moghe,** Assistant Professor; Ph.D., University of Minnesota, 1993 • *Tissue engineering: skin, liver cell-biomaterials interactions, biodegradable polymers in medicine, cardiovascular materials*
- **Fernando Muzzio,** Associate Professor; Ph.D., University of Massachusetts, 1991 • *Transport phenomena, mixing, chaotic flows, powder technology*
- **Balaji Narasimhan,** Assistant Professor; Ph.D., Purdue University, 1996 • *Transport phenomena in polymers, dynamics of entangled polymers, magnetic resonance imaging, controlled drug delivery*
- **Brian A. Newman,** Professor; Ph.D., Bristol, 1966 • *Structure and morphology of electroactive polymers; X-ray diffraction studies of polymers; high-pressure polymer physics*
- **Henrik Pedersen,** Professor; Ph.D., Yale University, 1978 • *Biochemical engineering, immobilized enzymes, plant cell biotechnology, fiber-optic sensors*
- **Carlos B. Rosas,** Visiting Professor and Administrative Director, Pharmaceutical Engineering Program; M.E., Stevens Institute of Technology, 1968 • *Fine chemicals, pharmaceuticals, and biologicals*
- **Jerry I. Scheinbeim,** Professor; Ph.D., University of Pittsburgh, 1975 • *Structure-electrical properties of polymers; dielectric, piezoelectric, pyroelectric, and ferroelectric properties of electroactive polymers*
- **Shaw S. Wang,** Professor; Ph.D., Rutgers University, 1970 • *Kinetics and thermodynamics of food process engineering, and studies of biochemical and biological processes.*
- **Martin L. Yarmush,** Visiting Professor; Ph.D., Rockefeller University, 1979; M.D., Yale University, 1984 • *Applied immunology, artificial organs, bioseparations, protein engineering, biotechnology*

FELLOWSHIPS, TRAINEESHIPS, AND ASSISTANTSHIPS AVAILABLE

For further information contact:

Graduate Program • Department of Chemical and Biochemical Engineering • Rutgers, The State University of New Jersey • Piscataway, NJ 08855-0909 • Phone (908) 445-4950 • Fax (908) 445-2421
E-mail: chemail@sol.rutgers.edu • http://sol.rutgers.edu/

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► *Faculty*

M.D. Amiridis, Wisconsin
P.B. Balbuena, Texas
C.L. Bolton, Princeton
F.A. Gadala-Maria, Stanford
J.H. Gibbons, Pittsburgh
K.A. Kosanovich, Notre Dame
M.A. Matthews, Texas A&M
T. Papathanasiou, McGill
H.J. Ploehn, Princeton
B.N. Popov, Illinois
J.A. Ritter, SUNY Buffalo
T.G. Stanford, Michigan
V. Van Brunt, Tennessee
J.W. Van Zee, Texas A&M
J.W. Weidner, NC State
R.E. White, Berkeley

► *Research Areas*

Adsorption Technology
Batteries and Fuel Cells
Colloids and Interfaces
Composite Materials
Corrosion Engineering
Crossflow Filtration
Electrochemistry
Environmental Restoration
Heterogeneous Catalysis
Numerical Methods
Phase Equilibria
Pollution Prevention
Process Control
Process Design
Rheology
Separations
Sol-Gel Processing
Solvent Extraction
Surface Science
Surface Spectroscopy
Supercritical Fluids
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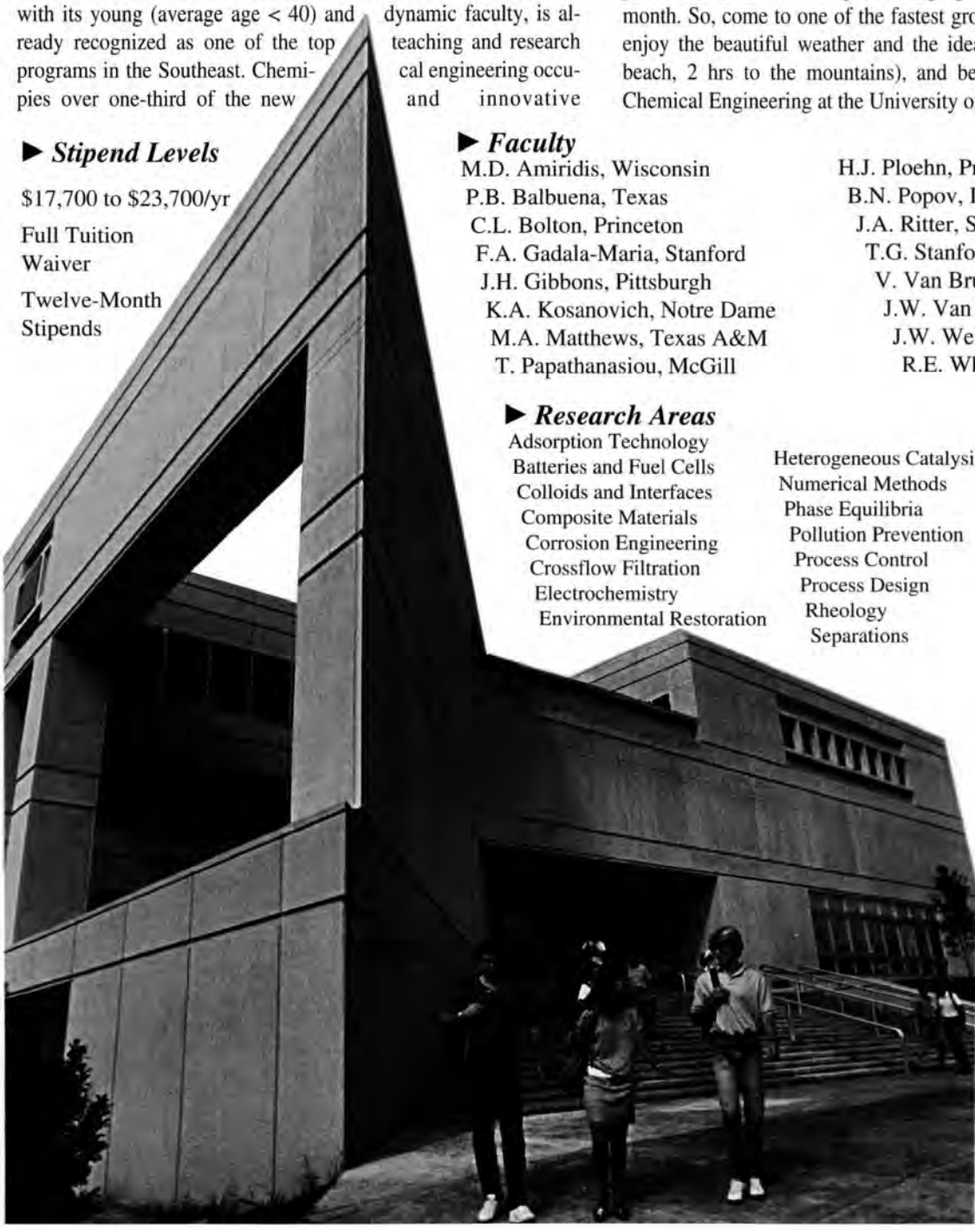
Waste Processing



► *For further information, contact*

The Graduate Director

Department of Chemical Engineering

Swearingen Engineering Center

University of South Carolina

Columbia, South Carolina 29208

phone: (800) 763-0527

fax: (803) 777-8265

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J. A. Biesenberger (PhD, Princeton University)
G.B. DeLancey (PhD, University of Pitsburgh)
C. G. Gogos (PhD, Princeton University)
D. M. Kalyon (PhD, McGill University)
S. Kovenklioglu (PhD, Stevens Institute of Technology)
S. L. Rivera (PhD, Colorado State University)
H. Silla, Director, (PhD, Stevens Institute of Technology)

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For application, contact:
Office of Graduate Studies
Stevens Institute of Technology
Hoboken, NJ 07030
201-216-5234

For additional information, contact:
Department of Chemical Engineering
Stevens Institute of Technology
Hoboken, NJ 07030
201-216-5546

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The University

Founded in 1794 as Blount College, the first non-sectarian college west of the Appalachians, The University of Tennessee today is the state's largest university and Land-Grant institution with about 17,000 undergraduates, 7,500 graduate and professional students, and a faculty of 1,600. The University of Tennessee is located in Knoxville near the headwaters of the Tennessee River. Within an hour's drive are six Tennessee Valley Authority lakes and the Great Smoky Mountains National Park. The Knoxville metropolitan area has a population of 600,000 but enjoys a pleasant, generally uncrowded atmosphere and consistently ranks among the nation's top ten metropolitan areas in surveys on quality of life. East Tennessee has a four-season climate, ranging from summer temperatures in the 90's to winter temperatures cold enough for snow skiing in nearby mountain resorts.

The Faculty

Paul R. Bienkowski (Ph.D., Purdue, 1975)
Bioprocessing, Thermodynamics

Donald C. Bogue (Ph.D., Delaware, 1960)
Polymers, Rheology

Duane D. Bruns (Ph.D., Houston, 1974)
Process Control, Modeling

Robert M. Counce (Ph.D., Tennessee, 1980)
Separations and Transport, Environmental

Peter T. Cummings (Ph.D., Melbourne, 1980)
Molecular Thermodynamics, Design, Environmental

George C. Frazier (D.Eng., Johns Hopkins, 1962)
Bioprocessing, Kinetics

Paul D. Frymier (Ph.D., Virginia, 1995)
Biotechnology, Bioremediation, Environmental

David J. Keffer (Ph.D., Minnesota, 1996)
Molecular Modeling of Adsorption, Diffusion and Reaction in Zeolites

Charles F. Moore (Ph.D., Louisiana State, 1969)
Process Control

John W. Prados (Ph.D., Tennessee, 1957)
Safety and Risk Assessment

Tsewei Wang (Ph.D., M.I.T., 1977)
Process Control, Bioprocessing

Frederick E. Weber (Ph.D., Minnesota, 1982)
Computer-Aided Design, Radiation Chemistry

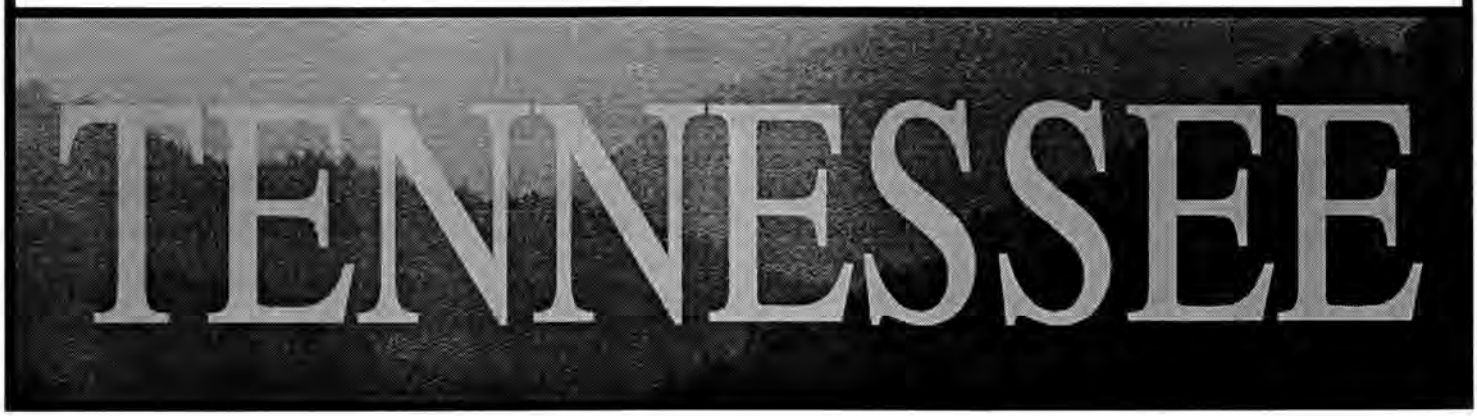
The Next Step

For additional information contact:

Department of Chemical Engineering
University of Tennessee-Knoxville
419 Dougherty Hall
Knoxville, TN 37996-2200
Phone: *(423) 974-2421*
E-mail: *cheinfo@utk.edu*
World Wide Web: *http://flory.engr.utk.edu/che*

Adjunct and Part-Time Faculty at Oak Ridge National Laboratory

Charles H. Byers (Ph.D., Berkeley): *Separations and Transport*
Hank D. Cochran (Ph.D., M.I.T.): *Thermodynamics, Statistical Mechanics*
Brian H. Davison (Ph.D., Caltech): *Biotechnology*
Terrence L. Donaldson (Ph.D., Pennsylvania): *Biotechnology, Kinetics, Mass Transfer*
Jack S. Watson (Ph.D., Tennessee): *Separations and Transport, Nuclear Fusion*



UNIVERSITY OF TEXAS AT AUSTIN

The University of Texas at Austin's Department of Chemical Engineering is a cutting-edge, well-funded program. The Department has been among the top five in the U.S. in sponsored research and Ph.D. degrees granted for the last five years. Both the M.S. and the Ph.D. degrees are offered, with nearly all students pursuing the Ph.D. Fellowships and research assistantships are provided, including tuition and fees.

FACULTY AND RESEARCH

David Allen *(Caltech)* • environmental modeling, reaction engineering
Joel W. Barlow *(University of Wisconsin)* • polymer blends, properties, processing
Roger T. Bonnecaze *(Caltech)* • suspension rheology, transport phenomena, electrical impedance tomography
James R. Brock *(University of Wisconsin)* • aerosols, electronic materials processing
Thomas F. Edgar *(Princeton University)* • process modeling, control, optimization
John G. Ekerdt *(University of California, Berkeley)* • catalysis, electronic materials chemistry
Bruce Eldridge *(University of Texas)* • separations research
James R. Fair *(University of Texas, Austin)* Emeritus • process design, separation processes
George Georgiou *(Cornell University)* • microbial, protein biotechnology
Peter Green *(Cornell University)* • materials science • polymer melts
Adam Heller *(Hebrew University)* • electrochemical biosensing, environmental photoelectrochemistry
David M. Himmelblau *(University of Washington)* • artificial neural networks, fault detection and diagnosis
Keith P. Johnston *(University of Illinois)* • polymer and surface thermodynamics, supercritical fluid science
William J. Koros *(University of Texas, Austin)* • membrane and structure-permeability relationships for polymers
Douglas R. Lloyd *(University of Waterloo)* • polymeric membrane formation, liquid separations
C. Buddie Mullins *(Caltech)* • surface science, molecular beams, semiconductor thin-film growth
Donald R. Paul *(University of Wisconsin)* • polymer blends, membranes, barrier materials
Joseph Qin *(University of Maryland)* • process modeling and control
Gary T. Rochelle *(University of California, Berkeley)* • air pollution control, reactive mass transfer
Isaac C. Sanchez *(University of Delaware)* • statistical thermodynamics of polymer liquids and solutions
Robert S. Schechter *(University of Minnesota)* Emeritus • surface phenomena, flow in porous media with reaction
Christine Schmidt *(University of Illinois)* • biotechnology
Hugo Steinfink *(Polytechnic University, New York)* • crystal chemistry, structure-property relationship
James E. Stice *(Illinois Institute of Technology)* Emeritus • engineering teaching effectiveness, process control
Isaac Trachtenberg *(Louisiana State University)* • semiconductor materials processing
C. Grant Willson *(University of California, Berkeley)* • polymer synthesis, photochemical processing

Inquiries should be sent to

Graduate Advisor • Department of Chemical Engineering • University of Texas • Austin, TX 78712-1062
(512) 471-6991: Fax (512) 475-7824: utgrad@che.utexas.edu

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R.G. Anthony, Head • Ph.D., University of Texas, 1966
C.D. Holland Professor
Catalysis, reaction engineering ion exchange

A. Akgerman, Associate Head • Ph.D., University of Virginia, 1971
Chevron II Professor
Reaction engineering, waste treatment

L.A. Archer, Ph.D. • Stanford University, 1993
Polymers, rheology

John T. Baldwin, Ph.D. • Texas A&M University, 1968
Process Design

D.B. Bukur, Ph.D. • University of Minnesota, 1974
Reaction engineering, math methods

J.A. Bullin, Ph.D. • University of Houston, 1972
Gas sweetening, asphalt characterizations

R. Darby, Ph.D. • Rice University, 1972
Rheology, polymers

R.R. Davison, Ph.D. • Texas A&M University, 1962
Asphalt characterization

L.D. Durbin, Ph.D. • Rice University, 1961
Process control

P.T. Eubank, Ph.D. • Northwestern University, 1961
Joe M. Nesbitt Professor
Thermodynamics

D.M. Ford, Ph.D. • University of Pennsylvania, 1996
Molecular modeling/transport

C.J. Glover, Ph.D. • Rice University, 1974
Polymer solutions

T.A. Good, Ph.D. • University of Wisconsin-Madison, 1996
Biomedical Engineering

K.R. Hall, Ph.D. • University of Oklahoma, 1967
Director of TRC
Thermodynamics

D.T. Hanson, Ph.D. • University of Minnesota, 1968
Biochemical engineering

C.D. Holland, Ph.D. • Texas A&M University, 1953
Professor Emeritus
Separation processes, distillation, unsteady-state processes

J.C. Holste, Ph.D. • Iowa State University, 1973
Thermodynamics

M.T. Holtzapple, Ph.D. • University of Pennsylvania, 1981
Biochemical engineering

Michael V. Pishko, Ph.D. • University of Texas at Austin, 1992
Biomedical Engineering

J.C. Slattery, Ph.D. • University of Wisconsin, 1959
Jack E. and Sarah Brown Chair
Interfacial transport phenomena, multiphase transport phenomena

A.T. Watson, Ph.D. • California Institute of Technology, 1979
Porous media, math modeling

For More Information

Graduate Admissions Office • Department of Chemical Engineering • Dwight Look College of Engineering
Texas A&M University • College Station, Texas 77843-3122
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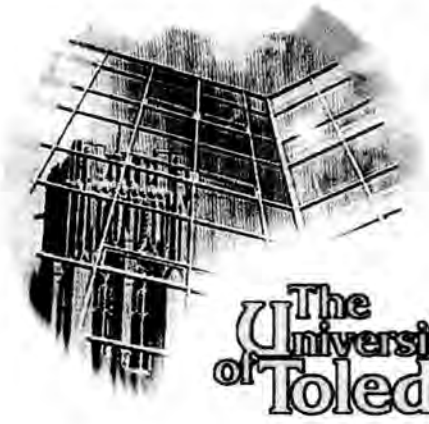

The **Chemical & Environmental Engineering** Department at the University of Toledo offers a graduate program leading to both MS and PhD degrees. The Department recently moved to state of the art facilities in Nitschke Hall (pictured to the left) and is experiencing a period of rapid growth. Our dynamic, young faculty offer a variety of research opportunities in contemporary areas of engineering science.

ChE

Chemical Environmental Engineering

Faculty

Martin A. Abraham, Professor
PhD, University of Delaware
Environmental Reaction Engineering, Supercritical Fluids, Catalytic Processes

Kenneth J. Dewitt, Professor
PhD, Northwestern University
Transport Phenomena, Mathematical Modeling & Numerical Methods

Saleh Jabarin, Professor
PhD, University of Masssachusetts
Physical Properties of Polymers, Polymer Orientation & Crystallization

Steven E. LeBlanc, Professor & Chair
PhD, University of Michigan
Environmental, Membrane Processes, Nonlinear Dynamics & Control

G. Glenn Lipscomb, Associate Professor
PhD, University of California at Berkeley
Membrane Separations, Polymer Science & Engineering

Arunan Nadarajah, Associate Professor
PhD, University of Florida
Transport Phenomena, Protein Crystallization

Bruce E. Poling, Professor
PhD, University of Illinois
Thermodyanmics & Physical Properties

Constance A. Schall, Assistant Professor
PhD, Rutgers
Enzyme Kinetics, Crystallization, Soils Characterization & Remediation

Sasidhar Varanasi, Professor
PhD, State University of New York at Buffalo
Collodial & Interfacial Phenomena, Enzyme Kinetics, Membrane Transport

Send Inquiries to:

Graduate Program Director
Chemical & Environmental Eng.
University of Toledo
2801 W. Bancroft
Toledo, OH 43606-3390

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- ♦ Plasma Polymerization of Thin Films
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- ♦ Biopolymer Engineering
- ♦ Bioseparations
- ♦ Fermentation
- ♦ Protein Refolding

Environmental Engineering
- ♦ Air Pollution Control
- ♦ Enviromental Catalysis
- ♦ Biodegradation

FACULTY

Jerry H. Meldon, Dept. Chair
Ph.D., M.I.T. (1973)

Gregory Botsaris
Ph.D., M.I.T. (1965)

Eliana De Bernardez Clark
Ph.D., U.N.L. Argentina (1984)

Maria Flytzani-Stephanopoulos
Ph.D., Minnesota (1978)

David L. Kaplan
Ph.D., Syracuse (1978)

Daniel F. Ryder
Ph.D., Worcester Polytech (1984)

Nakho Sung
Ph.D., M.I.T. (1972)

Martin V. Sussman
Ph.D., Columbia (1958)

Kenneth A. Van Wormer
Sc.D., M.I.T. (1961)

For further information, please contact

Chair of Graduate Studies
Department of Chemical Engineering
Tufts University
4 Colby Street
Medford, MA 02155
Tel. 617.627.3900 • Fax 617.627.3991 • chemstudent@Infonet.Tufts.Edu

Tulane University

Department of Chemical Engineering

Faculty and Research Areas

Daniel C.R. DeKee • *Rheology of Natural and Synthetic Polymers • Constitutive Equations • Transport Phenomena and Applied Mathematics*

Richard D. Gonzalez • *Synthesis and Characterization of Supported Metal Catalysts • Fundamental Studies in Reactor Design • In-situ Spectroscopic Methods • Reactions in Organized Media*

Vijay T. John • *Biomimetic and Nanostructured Materials • Interfacial Phenomena • Polymer-Ceramic Composites • Surfactant Science*

Daniel J. Lacks • *Molecular Simulation • Thermodynamics of Condensed Phases • Dynamical Processes in Solids • Physical Properties of Polymer Materials • Density Functional Theory*

Victor J. Law • *Modeling Environmental Systems • Nonlinear Optimization and Regression • Transport Phenomena • Numerical Methods*

Brian S. Mitchell • *Fiber Technology • Materials Processing • Composites*

Kim C. O'Connor • *Animal-Cell Technology • Organ/Tissue Regeneration • Recombinant Protein Expression*

Kyriakos D. Papadopoulos • *Colloid Stability • Coagulation • Transport of Multi-Phase Systems Through Porous Media • Colloidal Interactions*

Peter N. Pintauro • *Electrochemical Engineering • Membrane Separations • Electro-organic Synthesis • Environmental Remediation*

Tulane is located in a quiet, residential area of New Orleans, approximately six miles from the world-famous French Quarter. The chemical engineering department currently enrolls approximately 40 full-time graduate students. Graduate fellowships include a tuition waiver plus stipend.

For Additional Information, Please Contact

Graduate Advisor
Department of Chemical Engineering
Tulane University • New Orleans, LA 70118
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- Special Master's degree for nonchemical engineering undergraduates

Financial aid is available, including fellowships and research assistantships.

The Faculty

T. Ariman • Particulate science and technology, multiphase separation processes

K.D. Luks • Thermodynamics, phase equilibria

F.S. Manning • Industrial pollution control, surface processing of petroleum

C.A. Schall • Crystallization, enzyme kinetics

K.L. Sublette • Fermentation, biocatalysis, biological waste treatment

K.D. Wisecarver • Multiphase reactors, multiphase flows

Further Information
Graduate Program Director • Chemical Engineering Department
The University of Tulsa • 600 South College Avenue • Tulsa, Oklahoma 74104-3189
Phone (918) 631-2975 • Fax (918) 631-3268
E-mail: che_kw@centum.utulsa.edu • Graduate School application: 1-800-882-4723

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For further information:

Professor Tomlinson Fort
Director of Graduate Studies
Chemical Engineering Department • Vanderbilt University
Box 1604 Station B • Nashville, TN 37235
1-800-288-7722

Robert J. Bayuzick *(Ph.D., Vanderbilt)*
Microgravity processing of materials, nucleation and growth, rapid solification.

Kenneth A. Debelak *(Ph.D., Kentucky)*
Artificial intelligence in process control; coal conversion with emphasis on particle structure and diffusional processes; hazardous waste minimization.

Tomlinson Fort *(Ph.D., Tennessee)*
Adsorption; surfactant spreading on liquid surfaces; monolayers and thin films; tribology; flow in unsaturated porous media; applications to drying, mining, and environmental cleanup.

M. Douglas LeVan *(Ph.D., Univ. of California, Berkeley)*
Fixed-bed adsorption; adsorption equilibria; adsorption processes (pressure-swing adsorption, temperature-swing adsorption, adsorptive refrigeration); process design.

John A. Roth *(Ph.D., Louisville)*
Physical-chemical wastewater treatment; hazardous waste management; corrosion mechanisms in microcircuitry.

Karl B. Schnelle, Jr. *(Ph.D., Carnegie Mellon)*
Environmental dispersion modeling; use of natural gas in atmospheric pollution control; supercritical extraction of toxic materials in the environment.

Robert D. Tanner *(Ph.D., Case Western Reserve)*
Biochemical engineering; effect of light on yeast growth and protein secretion; aerated solid fermentation fluidized bed processes; bubble and aerosol fractionation of proteins.

University of Virginia

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Founder, University of Virginia

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Department of Chemical Engineering
Thornton Hall
University of Virginia
Charlottesville, VA 22903-2442
Phone (804) 924-7778
E-mail: cheadmis@virginia.edu

■ **Giorgio Carta,** *Ph.D.*
University of Delaware
Absorption, ion exchange, biochemical engineering

■ **Robert J. Davis,** *Ph.D.*
Stanford University
Heterogeneous catalysis, characterization of metal clusters, reaction kinetics

■ **Erik J. Fernandez,** *Ph.D.*
University of California, Berkeley
Purification of biological molecules, transport

■ **Roseanne M. Ford,** *Ph.D.*
University of Pennsylvania
Bioremediation, bacterial migration (chemotaxis)

■ **John L. Gainer,** *Ph.D.*
University of Delaware
Mass transfer including biomedical applications, biochemical engineering

■ **Andrew C. Hillier,** *Ph.D.*
University of Minnesota
Electrochemistry and electrochemical engineering, surface science, materials synthesis and characterization

■ **John L. Hudson,** *Ph.D.*
Northwestern University
Reaction system dynamics, chaos and pattern formation, electrochemistry

■ **Donald J. Kirwan,** *Ph.D.*
University of Delaware
Biochemical engineering, mass transfer, crystallization

■ **Matthew Neurock,** *Ph.D.*
University of Delaware
Computational heterogeneous catalysis, molecular reaction engineering, kinetics of complex reaction systems

■ **John P. O'Connell,** *Ph.D.*
University of California, Berkeley
Statistical thermodynamics with applications to physical and biological systems

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William L. Conger, Professor and Department Head
Ph.D., University of Pennsylvania
Department Administration

Donald G. Baird, The Harry C. Wyatt Professor
Ph.D., University of Wisconsin
Polymer Processing and non-Newtonian Fluid Mechanics

David F. Cox, Associate Professor
Ph.D., University of Florida
Catalysis, Ultrahigh Vacuum Surface Science

Richey M. Davis, Associate Professor
Ph.D., Princeton University
Physical Chemistry and Rheology of Colloids and Polymer Solutions

Kimberly E. Forsten, Assistant Professor
Ph.D., University of Illinois
Computational Bioengineering and Tissue Engineering

Y.A. Liu, The Frank C. Vilbrandt Professor
Ph.D., Princeton University
Artificial Intelligence and Green Engineering Design

Eva Marand, Assistant Professor
Ph.D., University of Massachusetts
Transport through Polymer Membranes, Polymer Spectroscopy

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Heterogeneous Catalysis and New Materials

Len Peters, Professor
Vice Provost/Research & Dean/Graduate School
Ph.D., University of Pittsburgh
Atmospheric Transport

Peter R. Rony, Professor
Ph.D., University of California, Berkeley
Instrumentation

William H. Velander, Professor
Ph.D., Pennsylvania State University
Transgenic Livestock Bioreactors & Immunopurification of Therapeutics, Biosensors

Garth L. Wilkes, The Fred W. Bull Professor
Ph.D., University of Massachusetts
Structure-Property Behavior of Polymeric Materials

For further information, contact the

Department of Chemical Engineering, Virginia Tech
133 Randolph Hall, Blacksburg, VA 24061-0211
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Department of Chemical Engineering
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Seattle, Washington 98195-1750
Phone: (206) 543-2250 Fax: (206) 543-3778
E-mail: grad.admissions@cheme.washington.edu
Web Page: http://weber.u.washington.edu/~chemeng/

Chemical Engineering Faculty • Research Areas

Materials

G. Graham Allan (Joint), Ph.D., D.Sc., Glasgow	•	Fiber and Polymer Science
John C. Berg, Ph.D., California (Berkeley)	•	Interfacial Phenomena; Surface and Colloid Science
J.W. Rogers, Jr., Ph.D., Texas (Austin)	•	Surface Science; Thin-Film Deposition
Daniel T. Schwartz, Ph.D., California (Davis)	•	Electrochemical Engineering; Electrolytic Thin-Film Science
James C. Seferis, Ph.D., Delaware	•	Polymeric Composites; Manufacturing and Teaming
Eric M. Stuve, Ph.D., Stanford	•	Catalytic and Electrochemical Surface Science

Biochemical Engineering and Bioengineering

Albert L. Babb, Ph.D., Illinois	•	Biomedical Engineering; Hemodialysis
François Baneyx, Ph.D., Texas (Austin)	•	Biotechnology; Protein Technology; Biochemical Engineering
Michael W. Chang (Adjunct), Ph.D., Washington; M.D., Texas	•	Rehabilitation Medicine
Thomas A. Horbett (Joint), Ph.D., Washington	•	Biomaterials; Peptide Drug Delivery
Mary E. Lidstrom, Ph.D., Wisconsin	•	Environmental Biotechnology; Molecular Bioengineering
Buddy D. Ratner (Joint), Ph.D., Brooklyn Polytechnic	•	Biomaterials; Polymers; Surface Characterization

Environmental Technology

E. James Davis, Ph.D., Washington	•	Colloid Science; Aerosol Chemistry and Physics; Electrokinetics
Barbara Krieger-Brockett, Ph.D., Wayne State	•	Reaction Engineering

Computers and Process Control

Bruce A. Finlayson, Ph.D., Minnesota	•	Mathematical Modeling
Bradley R. Holt, Ph.D., Wisconsin	•	Process Design and Control
N. Lawrence Ricker, Ph.D., California (Berkeley)	•	Process Control and Optimization

Transport Phenomena and Physics

René M. Overney, Ph.D., Basel, Switzerland	•	Nanoscale Surface Science and Polymer Physics
Lewis E. Wedgewood, Ph.D., Wisconsin	•	Polymer Rheology

WASHINGTON STATE UNIVERSITY

Chemical Engineering Department

Here at Washington State University, we are proud of our graduate program, and of our students. For a department of this size, the range of faculty interests is very broad. Students choose research projects of interest to them, then have the opportunity—and responsibility—to make an individual contribution.

Through a combination of core courses and many electives, students can gain a thorough understanding of the basics of chemical engineering. For more information, contact the graduate coordinator listed below or visit our homepage on the World Wide Web (http://www.che.wsu.edu).

FACULTY AND RESEARCH INTERESTS

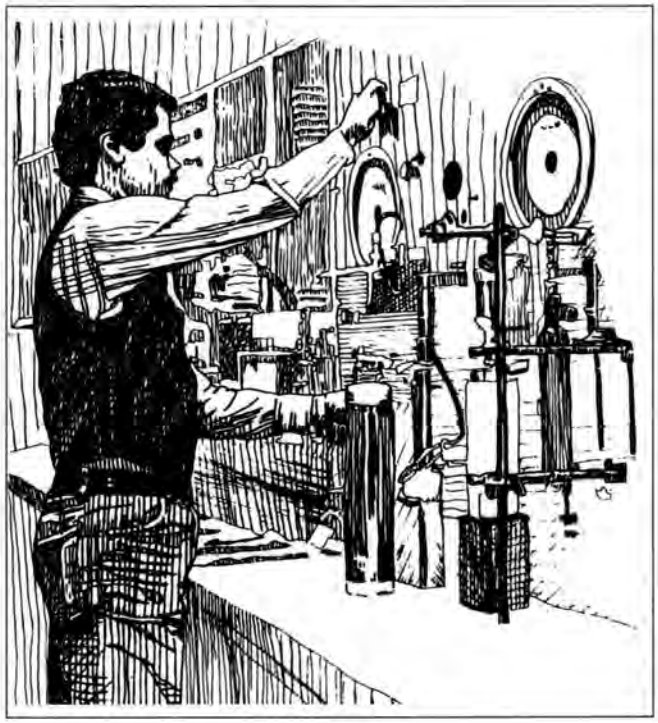
C. F. Ivory (Ph.D., Princeton): bioseparations, including electrophoresis, electrochromatography and field flow fractionation.

J. M. Lee (Ph.D., University of Kentucky): plant tissue cultivation, genetic engineering, enzymatic hydrolysis, mixing

K. C. Liddell (Ph.D., Iowa State University): electrodeposition of magnetic recording materials; environmental applications of supercritical fluid separations; mineral and electrode kinetics; mathematical models for reactive flow

R. Mahalingam (Ph.D., University of Newcastle-upon-Tyne): multiphase reactors, aerosols, air toxics, hazardous wastes, fossil energy conversion, polymer thin films, process development and design

R. C. Miller (Ph.D., University of California, Berkeley); thermodynamic properties of natural gases and liquified petroleum gases; thermophysical properties of cryogenic liquids; environmentaly compatible refrigerants



J. N. Petersen (Ph.D., Iowa State University); bioremediation of chlorinated solvents and metal ions, mathematical modeling of in-situ bioremediation and bioprocessing operations

B. M. Peyton (Ph.D., Montana State University); process modification, extremophilic bioprocessing, *in-situ* bacterial transport, bioremediation/bioprocessing of heavy metals, biofilm systems

W. J. Thomson (Ph.D., University of Idaho); kinetics of solid state reactions, development of solid acid and perovskite membrane catalysts, chemical reaction engineering

B. J. Van Wie (Ph.D., University of Oklahoma); membrane biosensors, kinetics and reactor design for blood chemistry analysis, mammalian tissue cultures

R. L. Zollars (Ph.D., University of Colorado); colloidal phenomena, solid entrainment in flowing liquids, polymer reactor design, chemical reaction engineering

GRADUATE DEGREE PROGRAMS AT WSU

M.S. in Chemical Engineering

Twelve credits in graduate chemical engineering courses, nine credits in supporting courses, and a thesis are required.

Ph.D. in Chemical Engineering

Eighteen credits in graduate chemical engineering courses, sixteen credits in supporting courses, and a dissertation are required. Upon successful completion of the coursework and the Ph.D. preliminary examination, a student is admitted to candidacy for the degree. The dissertation must represent a significant original contribution to the research literature.

Conversion Program

Students with B.S. degrees in the physical or life sciences may apply for admission to the conversion program. Normally a small number of undergraduate courses must be taken in addition to the regular requirements for the M.S. or Ph.D.

FINANCIAL ASSISTANCE

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WANT TO APPLY? Contact: Dr. B. J. Van Wie, Graduate Coordinator, Department of Chemical Engineering, Washington State University, Pullman, WA 99164-2710

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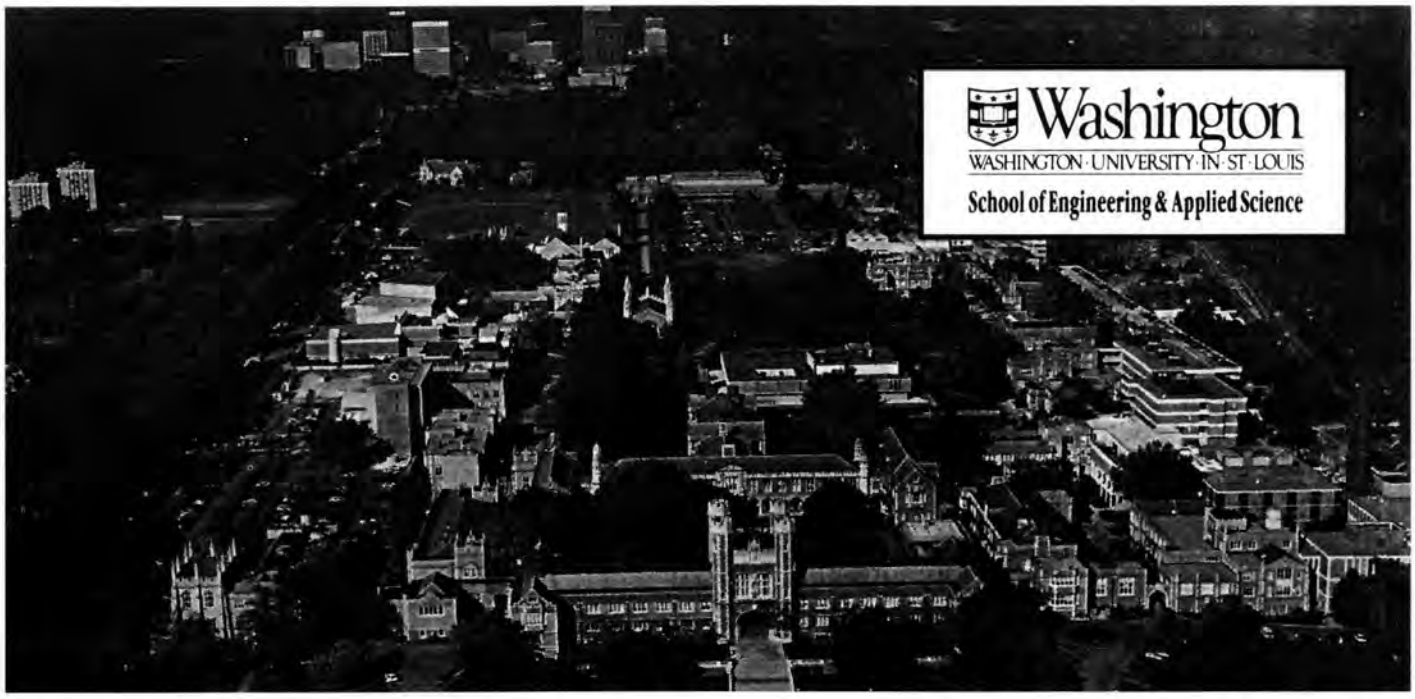

GRADUATE STUDY IN **CHEMICAL ENGINEERING**

MASTER'S AND DOCTORAL PROGRAMS

• *Faculty and Research Areas* •

M. Al-Dahhan Chemical Reaction Engineering, Multiphase Reactors, Mass Transfer, Process Engineering

M. P. Dudukovic Chemical Reaction Engineering

J. T. Gleaves Heterogeneous Catalysis, Surface Science, Microstructured Materials

B. Joseph Process Control, Process Optimization, Expert Systems

J. L. Kardos Composite Materials and Polymer Engineering

B. Khomami Rheology, Polymer and Composite Materials Processing

J. M. McKelvey Polymer Science and Engineering

R. L. Motard Computer Aided Process Engineering, Knowledge-Based Systems

P. A. Ramachandran Chemical Reaction Engineering

R. Sureshkumar Applications of transport processes involving complex polymeric and celloidal fluids

C. Thies Biochemical Engineering, Microencapsulation

J. Turner Environmental Reaction Engineering, Air Quality Policy and Analysis, Air Pollution Control

For Information Contact

Graduate Admissions Committee • Washington University
Department of Chemical Engineering
Campus Box 1198 • One Brookings Drive
St. Louis, Missouri 63130-4899

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Esin Gulari, Chair
egulari@cheml.eng.wayne.edu

Chemical Engineering and Materials Science Department

Wayne State University

Detroit, Michigan 48202

• Web Page •
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look under CHE and MSE

John Benci, Ph.D., Pennsylvania, 1989

Deformation and fracture of materials ◆ High temperature mechanical properties of alloys, intermetallic compounds and ceramics

Esin Gulari, Ph.D., Caltech, 1973

Thermodynamics and transport properties of polymer solutions and melts ◆ Processing of polymers with supercritical fluids ◆ Light scattering based particle and drop sizing techniques

Yinlun Huang, Ph.D., Kansas State, 1992

Pollution prevention and waste minimization ◆ Process design and synthesis

Rangaramanujam Kannan, Ph.D., Caltech, 1994 — Dynamics of polymeric systems and interfaces ◆ Rheo-optical spectroscopy and scattering techniques

Ralph Kummler, Ph.D., John Hopkins, 1966 — Modeling of combined sewer overflows and sediments ◆ Chemical kinetics ◆ Computer simulation

Charles Manke, Ph.D., California, Berkeley, 1983 — Polymer processing and rheology ◆ Molecular dynamics and kinetic theory of polymeric liquids

Guang-Zhao Mao, Ph.D., Minnesota, 1994 — Optoelectronic properties of thin films and crystans ◆ Self-assembly of polymers and surfactants ◆ Colloidal stability of waterborne paints ◆ Real time imaging of surface phenomena at the molecular level

Howard Matthew, Ph.D., Wayne State, 1992 — Tissue engineering and biomaterials ◆ Artificial organ substitutes

James McMicking, Ph.D., Ohio State, 1961 — Correlation of thermodynamic data

Simon Ng, Ph.D., Michigan, 1985 — Heterogeneous catalysis ◆ Polymer kinetics ◆ Spectroscopic and thermal analysis of material surfaces

Susil Putatunda, Ph.D., IIT Bombay, 1983 — Effects of microstructure on fatigue ◆ Fracture toughness ◆ Creep in metals and alloys

Erhard Rothe, Ph.D., Michigan, 1959 — Applications of high-powered UV lasers ◆ Machining of electronic chips ◆ Diagnostics of internal combustion

Steven Salley, Ph.D., Detroit, 1976 — Biochemical/medical engineering ◆ Design of artificial organs ◆ Immobilized enzyme reactors

Gina Shreve, Ph.D., Michigan, 1991 — Environmental and biochemical applications ◆ Microbially mediated biotransformations

Paul VanTassel, Ph.D., Minnesota, 1993 — Shape selective catalysis ◆ Protein adsorption and bioseparations

Contact:

Charles W. Manke, Jr., Professor; Graduate Advisor, Materials Science and Eng. • cmanke@cheml.eng.wayne.edu
Yinlun Huang, Assistant Professor; Graduate Advisor, Chemical Engineering • yhunag@cheml.eng.way.edu

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Surface and Colloid Phenomena
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Biochemical Engineering

Eung H. Cho
(University of Utah)

Eugene V. Cilento, Chairman
(University of Cincinnati)

Dady B. Dadyburjor
(University of Delaware)

Rakesh K. Gupta
(University of Delaware)

Hisashi O. Kono
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Edwin L. Kugler
(Johns Hopkins University)

Aubrey L. Miller
(Illinois Institute of Technology)

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(Carnegie-Mellon University)

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(West Virginia University)

Richard Turton
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(Carnegie-Mellon University)

For Application Information, Write

Professor Richard Turton ◆ Graduate Admission Committee
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◪ ***Douglas C. Cameron***
Biotechnology, metabolic engineering

◪ ***Thomas W. Chapman***
Electrochemical reaction engineering

◪ ***Juan de Pablo***
Molecular thermodynamics, statistical mechanics, polymer physics

◪ ***James A. Dumesic***
Kinetics and catalysis, surface chemistry

◪ ***Michael D. Graham***
Fluid mechanics, applied and computational mathematics

◪ ***Charles G. Hill, Jr.***
Immobilized enzyme technology, photocatalysis, kinetics and catalysis, composite wood products, membrane separations

◪ ***Sangtae Kim (Chairman)***
Fluid mechanics and rheology, protein dynamics, parallel computing

◪ ***Daniel J. Klingenberg***
Colloid science, complex fluids, suspension rheology

◪ ***Thomas F. Kuech***
Semiconductor and materials processing, solid-state and electronic materials, thin films

◪ ***Regina M. Murphy***
Biomedical engineering, protein-protein interactions, targeted drug delivery

◪ ***Paul F. Nealey***
Polymers, surface and interfacial phenomena, nanofabrication

◪ ***James B. Rawlings***
Process modeling, dynamics and control, particle technology, crystallization

◪ ***W. Harmon Ray***
Reaction engineering, polymerization processes, process dynamics and control

◪ ***Thatcher W. Root***
Surface chemistry, catalysis, solid-state NMR, MRI, and protein chromatography

◪ ***Ross E. Swaney***
Process design, synthesis, modeling, and optimization

Graduate Studies in Chemical Engineering

Areas of Research:

Advanced Materials
- Inorganic Membranes
- Molecular Sieve Zeolites
- Nanostructured Materials
- Diamond Thin Films

Biochemical Engineering
- Bioreactor Analysis
- Bioseparations

Catalysis and Reaction Engineering
- Adsorption and Transport in Porous Media
- Heterogeneous and Homogeneous Catalysis
- Zeolite Catalysis
- Environmental Catalysis

Environmental Engineering
- Aerosol Dynamics
- Nucleation and Phase Transitions
- Waste Reduction Technology

Faculty:

William M. Clark • *Ph.D., Rice*

David DiBiasio • *Ph.D., Purdue*

Anthony G. Dixon • *Ph.D., Edinburgh*

Yi Hua Ma • *Sc.D., MIT*

William R. Moser • *Ph.D., MIT*

Fabio Ribeiro • *Ph.D., Stanford University*

Karen McNamara Rutledge • *Ph.D., MIT*

Robert W. Thompson • *Ph.D., Iowa State*

Barbara E. Wyslouzil • *Ph.D., CalTech*

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Chemical Engineering Department
Worcester Polytechnic Institute
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D. A. Bell	*recycling processes • surface science • explosives*
C. Y. Cha	*solid waste utilization • microwave induced reaction • gas clean-up*
D. O. Cooney	*mass transfer • adsorption • air and water pollution*
H. A. Deans	*enhanced oil recovery • carbon dioxide flooding * electric downhole steam generation*
P. C. Gilcrease	*biodegradation • explosives remediation • solids grinding • slurry reactors*
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M. P. Sharma	*two phase flows • air pollution control • thermal enhanced oil recovery • drilling and production*
B. F. Towler	*reservoir simulation and modeling • phase behavior • enhanced oil recovery*
D. L. Whitman	*enhanced oil recovery institute • microcomputers • economics*

We offer exciting opportunities for research in many processing areas, especially energy related and environmental control technology development. In recent years we have developed enhanced oil recovery, clean coal, solid waste utilization, and advanced gas clean-up technologies up to bench scale levels. Currently we are working with industry to construct and operate pilot units of these technologies. This will provide excellent opportunities for students to obtain hands-on experience on industrial projects. Also, research has been conducted in the areas of kinetics, catalysis, adsorption, extraction, computer modeling, coal processing, and enhanced oil recovery.

The Western Coal Consortium has been established by the Chemical and Petroleum Engineering Department with western coal producers and utilities. The Western Coal Consortium, Enhanced Oil Recovery Institute, NSF/EPSCoR and DOE/EPSCoR Programs provide excellent financial aid packages to graduate students.

The University of Wyoming is located in Laramie, Wyoming at an elevation of 7200 feet. The town is surrounded by state and national parks which allow for beautiful year-round outdoor activities. The nearby Snowy Range mountains provide ideal sources of recreation for mountain and rock climbing, skiing, fishing, and hunting.

Graduates of any accredited chemical and petroleum engineering engineering programs are eligible for admission, and the department offers both M.S. and Ph.D. chemical and petroleum accredited programs. Financial aid is available, and all recipients receive full fee waivers.

For more information contact

Dr. David O. Cooney, Coordinator for Graduate Studies • Chemical & Petroleum Engineering Department
University of Wyoming • P. O. Box 3295 • Laramie, WY 82071-3295
Telephone (307) 766-2500

YALE

Department of Chemical Engineering

Eric Altman, *Ph.D. Pennsylvania*

Marshall Grant, *Ph.D. Princeton*

Gary L. Haller, *Ph.D. Northwestern*

Csaba G. Horváth, *Ph.D. Frankfurt*

Michael Loewenberg, *Ph.D. Cal Tech*

Lisa D. Pfefferle, *Ph.D. Pennsylvania*

Daniel E. Rosner, *Ph.D. Princeton*

John Y. Walz, *Ph.D. Carnegie Mellon*

Adjunct Professors

- **F. Peter Boer**
- **Donald M. Crothers**
- **Alexander V. Neimark**
- **Robert Weber**
- **L. Lee Wikstrom**

Joint Appointments

- **Thomas Graedel** (School of Forestry & Environmental Studies)
- **Kurt Zilm**

Lecturers

- **Bela G. Lipták**
- **Joseph J. Levitzky**

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Materials Synthesis and Processing

Multiphase Transport Phenomena

Separation Science and Technology

Statistical Thermodynamics

Supercritical Fluid Phenomena

Surface Science

BRIGHAM YOUNG UNIVERSITY

Graduate Studies in Chemical Engineering

M.S. and Ph.D. Degree Programs

Faculty and Research Interests

Calvin H. Bartholomew *(Stanford)* • kinetics and catalysis
Merrill W. Beckstead *(Utah)* • propellant combustion, modeling
Thomas H. Fletcher *(BYU)* • coal pyrolysis and combustion
Hugh B. Hales *(MIT)* • reservoir engineering
John H. Harb *(Illinois)* • coal combustion, electrochemical engineering
William C. Hecker *(UC Berkeley)* • kinetics and catalysis
Paul O. Hedman *(BYU)* • energy, combustion, chemical propulsion
John L. Oscarson *(Michigan)* • calorimetry and thermodynamics
William G. Pitt *(Wisconsin)* • materials science
Richard L. Rowley *(Michigan State)* • thermophysical properties
L. Douglas Smoot *(Washington)* • fossil energy and combustion
Kenneth A. Solen *(Wisconsin)* • biomedical engineering
Ronald E. Terry *(BYU)* • engineering education, process control
W. Vincent Wilding *(Rice)* • thermodynamics, environmental engineering

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Brigham Young University • Provo, UT 84602 • (801) 378-2586

BYU

Department of Chemical and Bio-Resource Engineering

University of British Columbia

Vancouver, Canada

The UBC Department of Chemical and Bio-Resource Engineering offers three graduate degrees in the Chemical Engineering Program: Master of Applied Science (M.A.Sc.), Master of Engineering (M.Eng.), and Doctor of Philosophy (Ph.D.). Thesis topics are available in the fields of faculty research that include

Pulp and Paper Research ■ ***Biochemical/Biomedical Engineering*** ■ ***Biotechnology*** ■ ***Electrochemical Engineering*** ■ ***Environmental Engineering*** ■ ***Reaction Engineering*** ■ ***Kinetics and Catalysis*** ■ ***Thermodynamics*** ■ ***Polymer Rheology*** ■ ***Process Control*** ■ ***Transport Phenomena***

Financial Aid: All students admitted to the graduate programs leading to the M.A.Sc. or Ph.D. degrees receive at least a minimum level of financial support regardless of citizenship. This amount is approximately $15,000/year and is intended to be sufficient to cover expenses for the year. This financial assistance is in the form of external fellowships or research assistantships. Research assistantships are provided by the professor under whose supervision the student is doing his or her thesis. Teaching assistantships also are available (up to approximately $2,000/year).

For further information visit our web site at
http://www.chml.ubc.ca

The Department operates joint research programs at the M.A.Sc. and Ph.D. levels with the UBC Biotechnology Laboratory and the Pulp and Paper Research Institute of Canada (PAPRICAN) in areas of common interest. An interdisciplinary M.Eng degree in Pulp and Paper Engineering is also offered by the Department in collaboration with PAPRICAN, and the Department plays a direct role in the M.Eng. degree program in Fire Protection Engineering

Application forms can be obtained from
web@chml.ubc.ca.
or from
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University of British Columbia • 2216 Main Mall
Vancouver, B.C., Canada V6T 1Z4
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CLEVELAND STATE UNIVERSITY

Graduate Studies in Chemical Engineering
M.Sc. and D.Eng. Programs

RESEARCH AREAS

- Materials Synthesis and Processing
- Process Modeling, Simulation
- Adsorption Processes
- Computation Fluid Dynamics and Combustion
- Environmental Pollution Control
- Surface Phenomena and Mass Transfer
- Thermodynamics and Fluid Phase Equilibria
- Transport Phenomena, Fluid Mechanics
- Tribology
- Zeolites: Synthesis, Sorption, Diffusion
- Artificial Pancreas Design

FACULTY

G. A. Coulman (Case Reserve)
N. H. Dural (Missouri-Columbia)
R. P. Elliott (Illinois Inst. of Tech.)
J. E. Gatica (SUNY at Buffalo)
B. Ghorashi (Ohio State)
E. S. Godleski (Oklahoma State)
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O. Talu (Arizona State)
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Cleveland State University has 18,000 students enrolled in its academic programs. It is located in the center of the city of Cleveland, with many outstanding cultural and recreational opportunities nearby.

FOR FURTHER INFORMATION, WRITE TO

Graduate Program Coordinator • Department of Chemical Engineering
Cleveland State University • Cleveland, OH 44115

Telephone (216) 687-2569 • e-mail: cheme@opus.csuohio.edu • www: http://www.csuohio.edu/chemical_engineering/

CSU Cleveland State University

COLUMBIA UNIVERSITY

NEW YORK, NEW YORK 10027

Graduate Programs in Chemical Engineering, Applied Chemistry, and Bioengineering

Faculty and Research Areas

H. Y. CHEH	F	*Electrochemical Engineering*
P. DUBY	F	*Electro Chemistry*
C. J. DURNING	F	*Polymer Physical Chemistry*
C. C. GRYTE	F	*Polymer Science, Separation Processes, Pharmaceutical Engineering*
C. HARRIS	F	*Solid Processing*
E. F. LEONARD	F	*Biomedical Engineering, Transport Phenomena*
B. O'SHAUGHNESSY	F	*Polymer Physics*
P. SOMASUNDARAN	F	*Colloid and Surface Science*
J. L. SPENCER	F	*Applied Mathematics, Chemical Reactor Engineering*
N. THEMELIS	F	*Earth Engineering*
J. THOMAS	F	*Biomolecular Engineering*
A. C. WEST	F	*Electrochemical Engineering, Mathematical Modeling*

Financial Assistance is Available

For Further Information, Write
Chairman,
Graduate Committee
Department of
Chemical Engineering
and
Applied Chemistry
Columbia University
New York, NY 10027
(212) 854-4453

University of Idaho

Chemical Engineering M.S. and Ph.D. Programs

FACULTY

W. ADMASSU	*Synthetic Membranes for Gas Separations, Biochemical Engineering with Environmental Applications*
T. E. CARLESON	*Mass Transfer Enhancement, Chemical Reprocessing of Nuclear Wastes, Bioseparation*
D. C. DROWN	*Process Design, Computer Application Modeling, Process Economics and Optimization with Emphasis on Food Processing*
L. L. EDWARDS	*Computer Aided Process Design, Systems Analysis, Pulp/Paper Engineering, Numerical Methods and Optimization*
R. A. KORUS	*Polymers, Biochemical Engineering*
J. Y. PARK	*Chemical Reaction Analysis and Catalysis, Laboratory Reactor Development, Thermal Plasma Systems*
J. J. SCHELDORF	*Heat Transfer, Thermodynamics*
M. VON BRAUN	*Hazardous Waste Site Analysis, Computer Mapping*

The department has a highly active research program covering a wide range of interests. The northern Idaho region offers a year-round complement of outdoor activities including hiking, white water rafting, skiing, and camping.

A wide range of fellowships and assistantships is available.

FOR FURTHER INFORMATION AND APPLICATION WRITE

Graduate Advisor
Chemical Engineering Department
University of Idaho
Moscow, Idaho 83844-1021

Imperial College of Science, Technology, and Medicine

University of London

Department of Chemical Engineering and Chemical Technology
and the Interdisciplinary Research Center (IRC) in Process Systems Engineering

Applications are invited for postgraduate studies for the following degrees:

MSc in Advanced Chemical Engineering or Process Systems Engineering • One-year MSc courses combining a research project with 4-7 taught modules chosen from a comprehensive list of technical and business studies courses. EPSRC grants are available to qualified students.

PhD in Chemical Engineering • This is a three-year research degree that may be undertaken in the Department and/or the IRC. EPSRC grants and other forms of financial support are available.

The Department adopts an interdisciplinary approach to research with interests ranging from fundamentals to practical applications.

Current fields of RESEARCH include:

Applied Catalysis & Reaction Engineering, Biotechnology, Separations & Environmental Applications, Combustion, Mechanics and Thermophysics of Fluids, Multiphase Flow, Particle Technology, Polymers, Process Systems Engineering

The teaching and research laboratories are exceptionally well equipped and fully backed by comprehensive technical services. First-class computing facilities are provided in both the Department and the IRC.

For an information pack and application form, please contact:

Dr. N. Shah, Department of Chemical Engineering and Chemical Technology, Imperial College, London SW7 2BY
Tel: +44-171-5946621 • Fax: +44-171-5946606 • E-mail: n.shah@ic.ac.uk • http://viking.ce.ic.ac.uk

LOUISIANA TECH UNIVERSITY

Master of Science and Doctor of Engineering Programs

The Department of Chemical Engineering at Louisiana Tech university offers a well-balanced graduate program for either the Master's or Doctor of Engineering degree. Students are pursuing research in Alternative Fuels, Biotechnology, Chemical Process Hazards and Fire Safety, Micro Reactor Design, Nuclear Process Environmental Effects, and Process Simulation and Design.

Faculty

Bill B. Elmore
University of Arkansas

Stephanie Farrell
New Jersey Institute of Technology

Francis Jones
Drexel University

Charles M. Sheppard
Washington University

Ronald H. Thompson
University of Arkansas

For More Information, Contact

Dr. Bill Elmore
Assoc. Professor & Chairman
Chemical Engineering
Louisiana Tech University
Ruston, Louisiana 71272

(318) 257-2483

belmore@engr.latech.edu

University of Louisville

Chemical Engineering M.S. and Ph.D. Programs

RESEARCH AREAS

Biotechnology • Catalysis • Polymers • Polymer Processing
Process Control • Separations • The Environment • Molecular Modeling
Waste Management • CVD of Diamond Films

FACULTY

Dermot J. Collins
Pradeep B. Deshpande
Marvin Fleischman
Walden L. S. Laukhuf
Thomas R. Hanley
Dean O. Harper
Raul Miranda
Hugh T. Spencer
Mahendra Sunkara
James C. Watters

Facilities include state-of-the-art Materials Research, Biotechnology and Food Engineering Laboratories

Competitive fellowships and assistantships are available to qualified students.

Write to: Graduate Student Advisor • Chemical Engineering Department
University of Louisville • Louisville, KY 40292

Inquiries can be addressed via Electronic Mail to: DOHARP01@ULKYVM.LOUISVILLE.EDU

THE UNIVERSITY OF NEW SOUTH WALES

Sydney, Australia

POSTGRADUATE STUDY IN CHEMICAL ENGINEERING AND INDUSTRIAL CHEMISTRY

• RESEARCH AREAS •

Air and Water Pollution Control
Battery Research and Development
Catalysis and Reactor Design
Characterization and Optimization in Minerals Processing
Chemical Separations
Computer-Aided Design and Process Synthesis for Energy Conservation
Electrochemistry
Fuel Technology
Glass Technology
High Temperature Materials
Membrane Technology
Particle Technology
Petroleum Engineering
Polymer Science and Engineering
Particle Technology
Process Control and Microporcessor Applications
Pyrometallurgical Reactor Modeling
Solvent Extraction
Supercritical Fluids
Two-Phase Flow
Waste Processing

This is the largest Chemical Engineering School in Australia, with 23 academic staff, over 400 undergraduates, and about 80 postgraduates. The School is well supplied with equipment and is supported by reasearch grants from Government and Industry. The main departments of Chemical Engineering and Industrial Chemistry offer course work and research work leading to M.SC., M.E., and Ph.D. degrees. The breadth and depth of experience available leads to the production of well-rounded graduates with excellent job potential. International recognition is only one of the many benefits of a degree from UNSW.

The University is the largest in Australia and is located between the center of Sydney and the beaches. The cosmopolitan city and the wide range of outdoor activities make life very pleasant for students, and people from America, Europe, Africa, and the East feel welcome from their first arrival.

For further information concerning specific research areas, facilities, and financial conditions, write to:

Professor R.P. Chaplin
School of Chemical Engineering & Industrial Chemistry
University of New South Wales • Sydney 2052, Australia

North Carolina A&T State University

GRADUATE STUDY IN CHEMICAL ENGINEERING

The department offers Masters of Science in Engineering degree and also participates in the cooperative PhD program with the North Carolina State University. Research emphasizes both experimental and theoretical work in areas of national interest, with modern research equipment available for most areas of studies. The department is a major participant in a $3.35 million, six-year project recently funded by the Air Force Office of Scientific Research titled "FAST Center for Environmental Remediation, Fate and Transport of Hazardous Chemicals," with Dr. Kabadi as Project Director. Generous financial assistance is available to all qualified students.

Faculty

- **Yusuf G. Adewuyi**
  Associate Professor, PhD, University of Iowa
- **Shamsuddin Ilias**
  Associate Professor, PhD, Queen's University
- **Vinayak N. Kabadi**
  Professor, PhD, Pennsylvania State University
- **Franklin G. King**
  Professor and Chairman, DSc, Stevens Institute of Technology
- **Kenneth L. Roberts**
  Assistant Professor, PhD, University of South Carolina
- **Keith A. Schimmel**
  Associate Professor, PhD, Northwestern University
- **Gary B. Tatterson**
  Professor, PhD, Ohio State University
- **Gary L. White**
  Assistant Professor, PhD, Michigan State University

Research Areas

Biochemical Engineering
Bioremediation
Catalysis
Chemical Reaction Engineering
Coal Research
Composite Materials
Computational Fluid Dynamics
Diffusion through Porous Media
Environmental Engineering
Fluid Phase Equilibria
Interfacial Phenomena
Membrane Separations/Reactors
Process Control
Supercritical Extraction
Thermodynamics
Turbulence and Mixing

For Information and Application, Write to

Graduate Program Coordinator • Department of Chemical Engineering
North Carolina A&T State University • Greensboro, NC 27411
Tel: (910)334-7564 • Fax: (910) 334-7904

NORTHEASTERN UNIVERSITY

Graduate Study in Chemical Engineering

Northeastern University has educated superior engineers who have contributed significantly to the technological advances of our country.

The Chemical Engineering Department offers full and part-time graduate programs leading to M.S. and Ph.D. degrees. Our programs are designed to provide up-to-date knowledge and skills necessary to keep abreast of today's changing technology. Courses are offered in the late afternoon and early evening to allow students to advance their academic and professional careers.

RESEARCH AREAS:

- Biochemical Engineering
- Biotechnology
- Catalysis
- Microgravity Materials
- Process Control
- Process Design
- Heat/Mass Transfer
- NASA Center for Advanced Microgravity Materials Processing

FOR INFORMATION WRITE:

Ralph A. Buonopane, Ph.D.
Dept. of Chemical Engineering
Northeastern University
360 Huntington, 342 SN-CEE
Boston, MA 02115

Université d'Ottawa • University of Ottawa

The department offers Graduate Programs leading to M.Eng., M.A. Sc., and Ph.D. degrees in Chemical Engineering and in Environmental Engineering. The faculty conducts fundamental and applied research in a variety of Chemical Engineering and related areas.

Research

Adsorption • Biochemical Engineering • Biomedical Engineering • Catalysis • Enhanced Oil Recovery • Environmental Engineering • Equations of State • Excess Thermodynamic Properties • Flow Through Porous Media • Gas and Liquid Separations • Interfacial Tension in Oil/Water Systems • Polymer Processing • Polymer Reaction Engineering and Applied Statistics • Reaction Engineering • Rheology and Filtration • Statistical Modeling and Control • Supercritical Fluid Extraction • Synthetic Membranes • Membrane Separation Technologies

Research and Teaching Assistantships are available for qualified graduate students.

Write for more information to:

Université d'Ottawa
Faculté de génie
Génie chimique
161, rue Louis-Pasteur C.P. 450, Succ. A
Ottawa (Ontario) K1N 6N5 Canada

University of Ottawa
Faculty of Engineering
Chemical Engineering
161 Louis Pasteur St., P.O. Box 450, Stn. A
Ottawa, Ontario K1N 6N5 Canada

Visit our World Wide Web page at http://www.genie.uottawa.ca/gradinfo.html

Faculty

- M. Dubé
- Z. Duvnjak
- V. Hornof
- K.J. Kennedy
- W. Kozicki (Emeritus)
- B.C.-Y. Lu (Emeritus)
- R.S. Mann (Emeritus)
- T. Matsuura
- D.D. McLean
- E. Mitsoulis
- G.H. Neale
- H. Sheardown
- D.G. Taylor
- F.H. Tezel
- A.Y. Tremblay

Princeton University M.S.E. and Ph.D. Programs in Chemical Engineering

RESEARCH AREAS

Applied Mathematics; Ceramic Materials; Chemical Kinetics; Catalysis; Chemical Reactor/Reaction Engineering; Colloidal Phenomena; Computational Chemistry; Computer Aided Design; Crystallization and Dendritic Growth; Electrohydrodynamics; Environmental Science and EngineeringFlow of Granular Media; Fluid Mechanics; Interfacial Phenomena; Molecular Simulations; Nonlinear Dynamics; Optimization; Polymer Science and Materials; Process Design; Process Control; Process Synthesis; Rheology; Statistical Mechanics; Supercritical Fluids; Surface Science; Thermodynamics and Phase Equilibria

FACULTY

Ilhan Aksay, Jay B. Benziger, Jeffery D. Carbeck, Pablo G. Debenedetti (Chairman), Christodoulos A. Floudas, John K. Gillham, William W. Graessley, Roy Jackson, Yannis G. Kevrekidis, Morton D. Kostin, Robert K. Prud'homme, Ludwig Rebenfeld, Richard A. Register, Lynn M. Russell, William B. Russel, Dudley A. Saville, Sankaran Sundaresan, Sandra Troian, T. Kyle Vanderlick, James Wei.

Write to:

Director of Graduate Studies
Chemical Engineering
Princeton University
Princeton, New Jersey 08544-5263

Inquiries can be addressed via Electronic Mail over BITNET to CHEGRAD@PUCC

UNIVERSITY OF RHODE ISLAND

GRADUATE STUDY IN CHEMICAL ENGINEERING

M.S. and Ph.D. Degrees

Applications for financial aid should be received not later than February 1st.

FOR APPLICATIONS, APPLY TO

Chairman, Graduate Committee
Department of Chemical Engineering
University of Rhode Island
Kingston, RI 02881

CURRENT AREAS OF INTEREST

Biochemical Engineering
Biomedical Engineering
Corrosion
Environmental Engineering
Thin Films
Pollution Prevention
Heat and Mass Transfer
Metallurgy and Ceramics
Multiphase Flow
Phase Change Kinetics
Process Simulation
Separation Processes
Surface Phenomena
Transport Phenomena

UNIVERSITY OF SOUTHERN CALIFORNIA

GRADUATE STUDY IN CHEMICAL ENGINEERING

USC
UNIVERSITY
OF SOUTHERN
CALIFORNIA

Please write for further information about the program, financial support, and application forms to:

Graduate Admissions
Department of Chemical Engineering
University of Southern California
University Park
Los Angeles, CA 90089-1211

• FACULTY •

W. VICTOR CHANG
(Ph.D., Ch.E., Caltech, 1976) • Physical properties of polymers and composites; adhesion; finite element analysis

IRAJ ERSHAGHI
(Ph.D., PTE, Southern Cal, 1972) • Well test analyses of fractured, geothermal, and gas storage reservoirs; reservoir characterization; petrophysical modeling

RONALD G. MINET
(Ph.D., Ch.E., New York University, 1959) *(Adjunct)* • Computer aided chemical process and plant design; catalysis; ceramic membranes

CHING-AN PENG
(Ph.D., Ch.E., University of Michigan, 1995) • Biochemical engineering; biotechnology

MUHAMMAD SAHIMI
(Ph.D., Ch.E., Minnesota, 1984) • Transport and mechanical properties of disordered systems; percolation theory and non-equilibrium growth processes; flow, diffusion, dispersion and reaction in porous media

RONALD SALOVEY
(Ph.D., Phys. Chem., Harvard, 1958) • Physical chemistry and irradiation of polymers; characterization of elastomers and filled systems; polymer crystallization

KATHERINE S. SHING
(Ph.D., Ch.E., Cornell, 1982) • Thermodynamics and statistical mechanics; supercritical extraction

THEODORE T. TSOTSIS
(Ph.D., Ch.E., Illinois, Urbana, 1978) • Chemical reaction engineering; process dynamics and control

IAN A. WEBSTER
(D.Sc., Ch.E., M. I. T., 1984) *(Adjunct)* • Catalysis and reaction kinetics; transport phenomena, chemical reaction engineering; surface spectroscopy, biochemical engineering

YANIS C. YORTSOS
(Ph.D., Ch.E., Caltech, 1979) • Mathematical modeling of transport processes; flow and transport in porous media

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CHEMICAL ENGINEERING AT

STATE UNIVERSITY OF NEW YORK AT BUFFALO

FACULTY

P. Alexandridis
R. J. Good
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S. Neelamegham
J. M. Nitsche
E. Ruckenstein
M. E. Ryan
C. J. van Oss
T. W. Weber
S. W. Weller

RESEARCH AREAS

Adsorption
Applied Mathematics
Biomedical Engineering
Catalysis, Kinetics, & Reactor Design
Ceramics
Design
Electronic Materials
Environmental Engineering
Fluid Mechanics
Polymer Processing & Rheology
Process Control
Reaction Engineering
Separation Processes
Surface Phenomena & Colloids
Thermodynamics
Transport Phenomena

Academic programs for M.Eng., MS, and PhD candidates are designed to provide depth in chemical engineering fundamentals while preserving the flexibility needed to develop special areas of interest. The Department also draws on the strengths of being part of a large and diverse university center. This environment stimulates interdisciplinary interactions in teaching and research. The departmental facilities offer an exceptional opportunity for students to develop their research skills and capabilities. These features, combined with year-round recreational activities afforded by the Western New York countryside and numerous cultural activities centered around the City of Buffalo and nearby Toronto, make SUNY/Buffalo an especially attractive place to pursue graduate studies. For more information, please consult the World Wide Web at http://www.eng.buffalo.edu/dept/ce/index.html

For information and applications, write to: ***Chairman, Graduate Committee • Department of Chemical Engineering***
State University of New York at Buffalo • Buffalo, New York 14260-4200

TEXAS A&M UNIVERSITY—KINGSVILLE

FORMERLY TEXAS A&I UNIVERSITY

Chemical Engineering
M.S. and M.E.

Natural Gas Engineering
M.S. and M.E.

• FACULTY •

F. T. AL-SAADOON
Ph.D., University of Pittsburgh, P.E.
Reservoir Engineering and Production

J. L. CHISHOLM
Ph.D., University of Oklahoma
Reservoir Engineering and Production

H.A. DUARTE
Ph.D., Texas A&M University
Thermodynamics; Applied Mathematics

W. A. HEENAN
D.Ch.E., University of Detroit, P.E.
Process Control and Thermodynamics

C. V. MOONEY
M.E., Oklahoma University, P.E.
Gas Measurement and Production

A. A. PILEHVARI
Ph.D., University of Tulsa
Fluid Mechanics, Drilling Fluids

P. W. PRITCHETT
Ph.D., University of Delaware, P.E.
Granular Solids and Petrochemicals

C. RAI
Ph.D., Illinois Institute of Technology, P.E.
Reservoir Engineering and Gasification, Desulfurization

D. L. SCHRUBEN
Ph.D., Carnegie-Mellon University, P.E.
Fluid Systems, Transport

R. W. SERTH
Ph.D., SUNY at Buffalo, P.E.
Rheology and Applied Mathematics

Locted in tropical South Texas, forty miles south of the urban center of Corpus Christi and thirty miles west of Padre Island National Seashore.

FOR INFORMATION AND APPLICATION WRITE:

W. A. HEENAN, Chairman
Department of Chemical & Natural Gas Engineering
Texas A&M University—Kingsville
Campus Box 193
Kingsville, Texas 78363

ASPIRE TO

NEW HEIGHTS

The University of Utah is the oldest state-run university west of the Missouri River. The University is world-renowned for research activities in medicine, science, and engineering. The graduate Chemical Engineering program offers a number of collaborative, interdisciplinary research opportunities.

The University is located in Salt Lake City, the only metropolitan area in the country which is within 45 minutes of seven major ski areas and within a day's drive of five national parks. Entertainment in the city includes: resident ballet, symphony, and theater organizations; professional sports; and a variety of live music performances in public and private establishments throughout the city.

General areas of research:

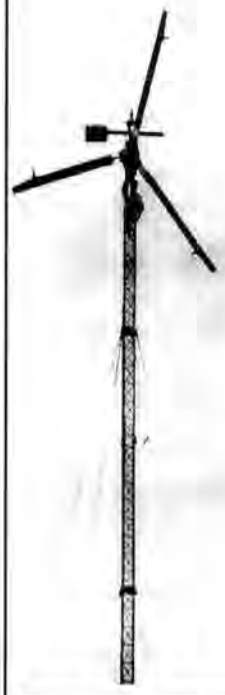
- biotechnology
- catalysis
- ceramics processing
- coal technology
- combustion
- computer-aided design
- fossil-fuels conversion
- hazardous waste management
- minerals processing
- molecular modeling
- polymer science and rheology

For information, write
Director of Graduate Studies • Department of Chemical and Fuels Engineering
University of Utah • Salt Lake City, Utah 84112

Graduate Studies in Chemical and Fuels Engineering

UNIVERSITY OF UTAH

visit our web site at • http://www.che.utah.edu
or e-mail • David.Bodily@m.cc.utah.edu



MONTANA STATE UNIVERSITY

Research Emphases

Materials Science
- Composite Materials Development & Testing (including the new wind turbine testing facilities)
- Surface Chemistry

Biotechnology
- Biofilm & Bioremediation with the NSF Center for Biofilm Engineering

Separations
- Distillation & Membranes

Department of Chemical Engineering
Montana State University Bozeman, MT 59717
406/994-2221 http://www.coe.montana.edu/che

UNIVERSITY OF NORTH DAKOTA

MS and MEngr. in Chemical Engineering
Graduate Studies

PROGRAMS: Thesis and non-thesis options available for MS degree; substantial design component required for M.Engr. program. A full-time student with BSChE can complete program in 9-12 months. Students with degree in chemistry will require two calendar years to complete MS degree. A PhD program in Energy Engineering is also available to students with MS in Chemical Engineering

RESEARCH PROJECTS: Most funded research projects are energy related with the full spectrum of basic to applied projects available. Students participate in project-related thesis problems as project participants.

ENERGY AND ENVIRONMENTAL RESEARCH CENTER: A cooperative program of study/research with research projects related to low-rank coal conversion and utilization sponsored by U.S. Department of Energy and private industry is available to a limited number of students.

FOR INFORMATION WRITE TO

Director of Graduate Admission
Chemical Engineering Department
University of North Dakota, Box 7101
Grand Forks, North Dakota 58202
(701-777-4244)

South Dakota School of Mines and Technology

M.S. in Chemical Engineering
M.S. in Materials Engineering Science

We offer the **M.S. degree in Chemical Engineering** with small classes, opportunities for teaching or research assistantships after the first semester, and thesis or non-thesis options. For individuals wishing to pursue a degree off campus, we offer distance learning courses utilizing video tapes, one-on-one contact with instructors through Internet, video phones, and other communication technologies.

We also offer the **M.S. degree in Materials Engineering and Science** with an emphasis in chemistry. Both thesis and non-thesis options are available for on-campus study in this program.

Both programs can lead to admission to our **Ph.D. degree in Materials Engineering and Science** program.

For more information and to review our current research areas, visit our WWW page at *http://www.sdsmt.edu/campus/chem/chem.html*

For information contact
Dr. Robb M. Winter, Graduate Admissions
Chemistry and Chemical Engineering Department
South Dakota School of Mines and Technology
501 East Saint Joseph Street
Rapid City, South Dakota 57701
Phone: (605) 394-1237 • Fax (605) 394-1232 • rwinter@silver.sdsmt.edu

ACKNOWLEDGEMENT

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Florida State/Florida A&M University
Georgia Institute of Technology
Hampton University
University of Houston
Howard University
University of Idaho
University of Illinois, Chicago
University of Illinois, Urbana
Illinois Institute of Technology
University of Iowa
Iowa State University
Johns Hopkins University
University of Kansas
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Louisiana State University
Louisiana Technical University
University of Louisville
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University of Massachusetts
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Mississippi State University
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Montana State University
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San Jose State University
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University of South Carolina
South Dakota School of Mines
University of South Florida
University of Southern California
University of Southwestern Louisiana
State University of New York, Buffalo
Stevens Institute of Technology
University of Sydney
Syracuse University
University of Tennessee
Tennessee Technological University
University of Texas
Texas A & M University, College Station
Texas Tech University
University of Toledo
Tri-State University
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University of Wisconsin
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University of Wyoming
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