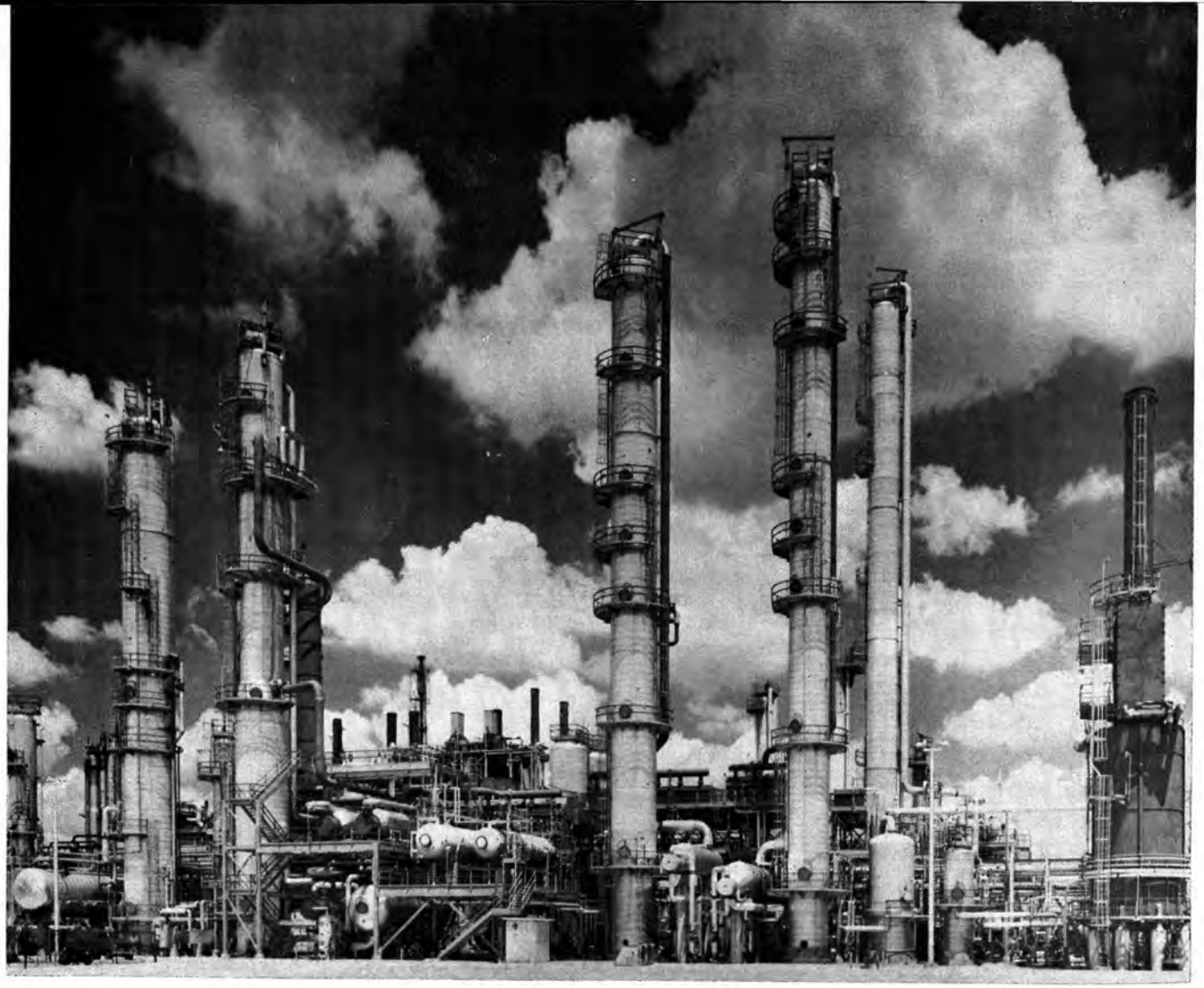

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M.Sc. Candidates: up to $7,000/year.

Commonwealth and Industrial Scholarships are available.

Costs.

Tuition: $692/year.
Married students housing rent: $204/month.
Room and board, University Housing: $228/month.

Department Size

13 Professors, 20 Research Associates
30 Graduate Students.

Applications

For additional information write to:

Chairman
Department of Chemical Engineering
University of Alberta
Edmonton, Alberta, Canada T6G 2G6

Faculty and Research Interests

I. G. Dalla Lana, Ph.D. (Minnesota): Kinetics, Heterogeneous Catalysis.

D. G. Fisher, Ph.D. (Michigan): Process Dynamics and Control, Real-Time Computer Applications, Process Design.

C. Kiparissides, Ph.D. (McMaster): Polymer Reactor Engineering, Optimization, Modelling, Stochastic Control, Transport Phenomena.

J. H. Masliyah, Ph.D. (Brit. Columbia): Transport Phenomena, Numerical Analysis, In situ Recovery of Oil Sands.

A. E. Mather, Ph.D. (Michigan): Phase Equilibria, Fluid Properties at High Pressures, Thermodynamics.

W. Nader, Dr. Phil. (Vienna): Heat Transfer, Air Pollution, Transport Phenomena in Porous Media, Applied Mathematics.

F. D. Otto, (Chairman), Ph.D. (Michigan): Mass Transfer, Computer Design of Separation Processes, Environmental Engineering.

D. Quon, Sc.D. (M.I.T.): Applied Mathematics, Optimazation, Resource Allocation Model 5.

D. B. Robinson, Ph.D. (Michigan): Thermal and Volumetric Properties of Fluids, Phase Equilibria, Thermodynamics.

J T. Ryan, Ph.D. (Missouri): Process Economics, Energy Economics and Supply.

S. Shah, Ph.D. (Alberta): Linear Systems Theory, Adaptive Control, System Identification.

S. E. Wanke, Ph.D. (California-Davis): Catalysis, Kinetics.

R. K. Wood, Ph.D. (Northwestern): Process Dynamics and Identification, Control of Distillation Columns, Modelling of Crushing and Grinding Circuits.

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THE UNIVERSITY OF ARIZONA

TUCSON, AZ

The Chemical Engineering Department at the University of Arizona is young and dynamic with a fully accredited undergraduate degree program and M.S. and Ph.D. graduate programs. Financial support is available through government grants and contracts, teaching, research assistantships, traineeships and industrial grants. The faculty assures full opportunity to study in all major areas of chemical engineering.

THE FACULTY AND THEIR RESEARCH INTERESTS ARE:

WILLIAM P. COSART, Assoc. Professor
Ph.D. Oregon State University, 1973
Transpiration Cooling, Heat Transfer in Biological Systems, Blood Processing

JOSEPH F. GROSS, Professor and Head
Ph.D., Purdue University, 1956
Boundary Layer Theory, Pharmacokinetics, Fluid Mechanics and Mass Transfer in The Microcirculation, Biorheology

JOST O.L. WENDT, Assoc. Professor
Ph.D., Johns Hopkins University, 1968
Combustion Generated Air Pollution, Nitrogen and Sulfur Oxide Abatement, Chemical Kinetics, Thermodynamics Interfacial Phenomena

THOMAS W. PETERSON, Asst. Professor
Ph.D., California Institute of Technology, 1977
Atmospheric Modeling of Aerosol Pollutants, Long-Range Pollutant Transport, Particulate Growth Kinetics.

DON H. WHITE, Professor
Ph.D., Iowa State University, 1949
Polymers Fundamentals and Processes, Solar Energy, Microbial and Enzymatic Processes

ALAN D. RANDOLPH, Professor
Ph.D., Iowa State University, 1962
Simulation and Design of Crystallization Processes, Nucleation Phenomena, Particulate Processes, Explosives Initiation Mechanisms

THOMAS R. REHM, Professor
Ph.D., University of Washington, 1960
Mass Transfer, Process Instrumentation, Packed Column Distillation, Applied Design

JAMES WM. WHITE, Assoc. Professor
Ph.D., University of Wisconsin, 1968
Real-Time Computing, Process Instrumentation and Control, Model Building and Simulation

Tucson has an excellent climate and many recreational opportunities. It is a growing, modern city of 400,000 that retains much of the old Southwestern atmosphere.

For further information, write to:

Dr. A. D. Randolph
Graduate Study Committee
Department of
Chemical Engineering
University of Arizona
Tucson, Arizona 85721

The University of Calgary

Program of Study

The Department of Chemical Engineering provides unusual opportunities for research and study leading to the M.Eng., M.Sc. or Ph.D. degrees. This dynamic department offers a wide variety of course work and research in the following areas: Petroleum Reservoir Engineering, Environmental Engineering, Fluid Mechanics, Heat Transfer, Mass Transfer, Process Engineering, Rheology and Thermodynamics. The University operates on an eight-month academic year, thus allowing four full months per year for research.

The requirements for the M.Eng. and M.Sc. degrees are 6 to 8 courses with a B standing or better and the submission of a thesis on a research project.

The requirements for the Ph.D. degree are 8 to 12 courses and the submission of a thesis on an original research topic.

The M.Eng. program is a part-time program designed for those who are working in industry and would like to enhance their technical education. The M.Eng. thesis is usually of the design type and related to the industrial activity in which the student is engaged. Further details of this program are available from the Department Head, or the Chairman of the Graduate Studies Committee.

Research Facilities

The Department of Chemical Engineering occupies one wing of the Engineering Complex. The building was designed to accommodate the installation and operation of research equipment with a minimum of inconvenience to the researchers. The Department has at its disposal an EA1 690 hybrid computer and a TR48 analog computer and numerous direct access terminals to the University's CDC Cyber 172 digital computer. In addition, a well equipped Machine Shop and Chemical Analysis Laboratory are operated by the Department. Other major research facilities include a highly instrumented and versatile multiphase pipeline flow loop, an automated pilot plant unit based on the Girbotol Process for natural gas processing, an X-ray scanning unit for studying flow in porous media, a fully instrumented adiabatic combustion tube for research on the in-situ recovery of hydrocarbons from oil sands, a laser anemometer unit, and environmental research laboratories for air pollution, water pollution and oil spill studies.

Financial Aid

Fellowships and assistantships are available with remuneration of up to $6,000 per annum, with possible remission of fees. In addition, new students may be eligible for a travel allowance of up to a maximum of $300. If required, loans are available from the Federal and Provincial Governments to Canadian citizens and Landed Immigrants. There are also a number of bursaries, fellowships, and scholarships available on a competition basis to full-time graduate students. Faculty members may also provide financial support from their research grants to students electing to do research with them.

Cost of Study

The tuition fees for a full-time graduate student are $625 per year plus small incidental fees. Most full-time graduate students to date have had their tuition fees remitted.

Cost of Living

Housing for single students in University dormitories range from $172/mo. for a double room, to $205/mo. for a single room, including board. There are a number of new townhouses for married students available, ranging from $177/mo. for a 1-bedroom, to $193/mo. for a 2-bedroom and to $209/mo. for a 3-bedroom unit, including utilities, major appliances and parking. Numerous apartments and private housing are within easy access of the University. Food and clothing costs are comparable with those found in other major North American urban centres.

Student Body

The University is a cosmopolitan community attracting students from all parts of the globe. The current enrolment is about 12,000 with approximately 1,000 graduate students. Most full-time graduate students are currently receiving financial assistance either from internal or external sources.

The Community

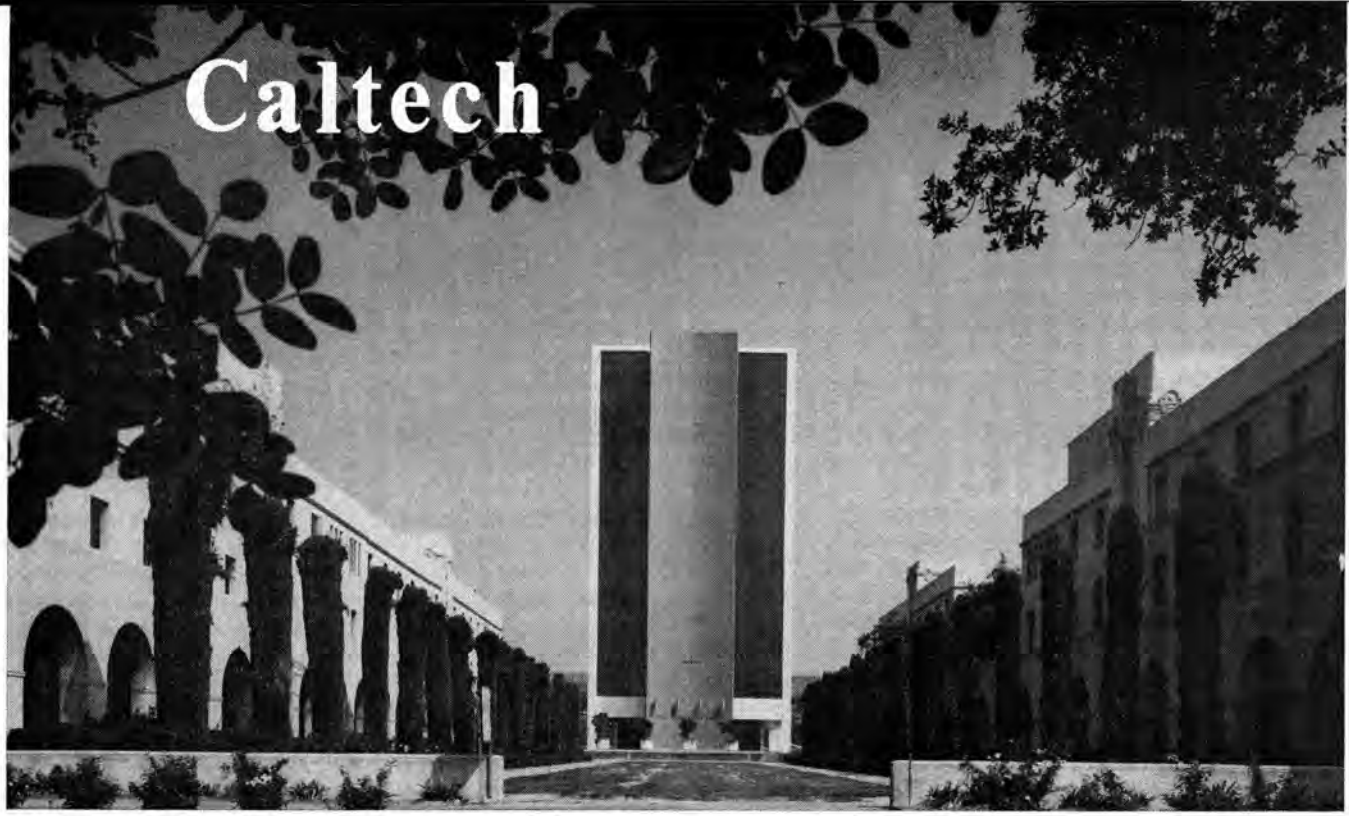
The University is located in Calgary, Alberta, home of the world famous Calgary Stampede. This city of 570,000 combines the traditions of the Old West with the sophistication of a modern, dynamic urban centre. Beautiful Banff National Park is 60 miles from the city and the ski resorts of the Banff and Lake Louise areas are readily accessible. Jasper National Park is only five hours away by car via one of the most scenic highways in the Canadian Rockies. A wide variety of cultural and recreational facilities are available both on campus and in the community at large. Calgary is the business centre of the petroleum industry in Canada and as such has one of the highest concentrations of engineering activity in the country.

The University

The University operated from 1945 until 1966 as an integral part of the University of Alberta. The present campus situated in the rolling hills of northwest Calgary, was established in 1960, and in 1966 The University of Calgary was chartered as an autonomous institution by the Province of Alberta. At present the University consists of 14 faculties. Off-campus institutions associated with The University of Calgary include the Banff School of Fine Arts and Centre of Continuing Education located in Banff, Alberta, and the Kananaskis Environmental Research Station located in the beautiful Bow Forest Reserve.

Applying

The Chairman, Graduate Studies Committee
Department of Chemical Engineering
The University of Calgary
Calgary, Alberta T2N 1N4
Canada



PROGRAM OF STUDY Distinctive features of study in chemical engineering at the California Institute of Technology are the creative research atmosphere in which the student finds himself and the strong emphasis on basic chemical, physical, and mathematical disciplines in his program of study. In this way a student can properly prepare himself for a productive career of research, development, or teaching in a rapidly changing and expanding technological society.

A course of study is selected in consultation with one or more of the faculty listed below. Required courses are minimal. The Master of Science degree is normally completed in one academic year and a thesis is not required. A special terminal M.S. option, involving either research or an integrated design project, is a newly added feature to the overall program of graduate study. The Ph.D. degree requires a minimum of three years subsequent to the B.S. degree, consisting of thesis research and further advanced study.

FINANCIAL ASSISTANCE Graduate students are supported by fellowship, research assistantship, or teaching assistantship appointments during both the academic year and the summer months. A student may carry a full load of graduate study and research in addition to any assigned assistantship duties. The Institute gives consideration for admission and financial assistance to all qualified applicants regardless of race, religion, or sex.

APPLICATIONS Further information and an application form may be obtained by writing

Professor L. G. Leal
Chemical Engineering
California Institute of Technology
Pasadena, California 91125

It is advisable to submit applications before February 15, 1979.

FACULTY IN CHEMICAL ENGINEERING

WILLIAM H. CORCORAN, Professor and Vice-President for Institute Relations
Ph.D. (1948), California Institute of Technology
Kinetics and catalysis; biomedical engineering; air and water quality.

GEORGE R. GAVALAS, Professor
Ph.D. (1964), University of Minnesota
Applied kinetics and catalysis; process control and optimization; coal gasification.

L. GARY LEAL, Professor
Ph.D. (1969), Stanford University
Theoretical and experimental fluid mechanics; heat and mass transfer; suspension rheology; mechanics of non-Newtonian fluids.

CORNELIUS J. PINGS, Professor,
Vice-Provost, and Dean of Graduate Studies
Ph.D. (1955), California Institute of Technology
Liquid state physics and chemistry; statistical mechanics.

JOHN H. SEINFELD, Professor,
Executive Officer
Ph.D. (1967), Princeton University
Control and estimation theory; air pollution.

FRED H. SHAIR, Professor
Ph.D. (1963), University of California, Berkeley
Plasma chemistry and physics; tracer studies of various environmental problems.

GREGORY N. STEPHANOPOULOS, Assistant Professor Ph.D. (1978), University of Minnesota
Biochemical engineering; chemical reaction engineering.

NICHOLAS W. TSCHOEGL, Professor
Ph.D. (1958), University of New South Wales
Mechanical properties of polymeric materials; theory of viscoelastic behavior; structure-property relations in polymers.

ROBERT W. VAUGHAN, Professor
Ph.D. (1967), University of Illinois
Solid state and surface chemistry.

W. HENRY WEINBERG, Professor
Ph.D. (1970), University of California, Berkeley
Surface chemistry and catalysis.

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BERKELEY, CALIFORNIA

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AND RHEOLOGY

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Alexis T. Bell
Alan S. Foss
Simon L. Goren
Edward A. Grens
Donald N. Hanson
C. Judson King (Chairman)
Scott Lynn
David N. Lyon
John S. Newman
Eugene E. Petersen
John M. Prausnitz
Clayton J. Radke
Mitchel Shen
Charles W. Tobias
Theodore Vermuelen
Charles R. Wilke
Michael C. Williams

FOR APPLICATIONS AND FURTHER INFORMATION, WRITE:

Department of Chemical Engineering
UNIVERSITY OF CALIFORNIA
Berkeley, California 94720

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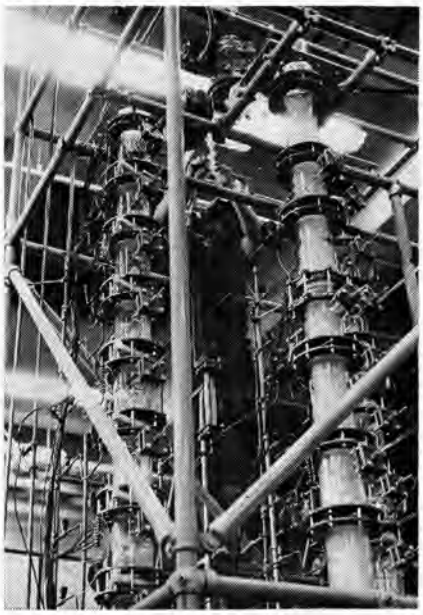

Degrees Offered

Master of Science
Doctor of Philosophy

Course Areas

Applied Kinetics and Reactor Design
Applied Mathematics
Electrochemical Engineering
Process Dynamics
Separation Processes
Thermodynamics
Transport Phenomena

Faculty

R. L. BELL, University of Washington
Mass Transfer, Biomedical Applications
RUBEN CARBONELL, Princeton University
Enzyme Kinetics, Applied Kinetics, Quantum Statistical Mechanics
ALAN JACKMAN, University of Minnesota
Environmental Engineering, Transport Phenomena
B. J. McCOY, University of Minnesota
Chromatographic Proceses, Food Engineering, Statistical Mechanics
F. R. McLARNON, University of California, Berkeley
Electrochemical Engineering, Energy conversion and storage
J. M. SMITH, Massachusetts Institute of Technology
Applied Kinetics and Reactor Design
STEPHEN WHITAKER, University of Delaware
Fluid Mechanics, Interfacial Phenomena

Program

Davis is one of the major campuses of the University of California system and has developed great strength in many areas of the biological and physical sciences. The Department of Chemical Engineering emphasizes research and a program of fundamental graduate courses in a wide variety of fields of interest to chemical engineers. In addition, the department can draw upon the expertise of faculty in other areas in order to design individual programs to meet the specific interests and needs of a student, even at the M.S. level. This is done routinely in the areas of environmental engineering, food engineering, biochemical engineering and biomedical engineering.

Excellent laboratories, computation center and electronic and mechanical shop facilities are available. Fellowships, Teaching Assistantships and Research Assistantships (all providing additional summer support if desired) are available to qualified applicants. The Department supports students applying for National Science Foundation Fellowships.

Davis and Vicinity

The campus is a 20-minute drive from Sacramento and just over an hour away from the San Francisco Bay area. Outdoor sports enthusiasts can enjoy water sports at nearby Lake Berryessa, skiing and other alpine activities in the Sierra (1 1/2 to 2 hours from Davis). These recreational opportunities combine with the friendly informal spirit of the Davis campus to make it a pleasant place in which to live and study.

Married student housing, at reasonable cost, is located on campus. Both furnished and unfurnished one- and two-bedroom apartments are available. The town of Davis is adjacent to the campus, and within easy walking or cycling distance.

Information

For further details on graduate study at Davis, please write to:

Chemical Engineering Department
University of California
Davis, California 95616
or call (916) 752-0400

M.S. and Ph.D. Programs
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CHEMICAL ENGINEERING DEPARTMENT

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ACTIVE RESEARCH AREAS IN CHEMICAL ENGINEERING

Environmental Engineering
Control & Optimization
Computer Simulation
Systems Engineering
Foam & Colloidal Science
Transport Processes
Coal Gasification
Biomedical Engineering
Surface Chemistry & Catalysis
Crystal Growth & Materials
Laser Doppler Velocimetry
Chemical Reaction Engineering

FINANCIAL AID

Fellowships, Teaching Assistantships and Research Assistantships are available to qualified applicants. Applications are welcome from graduates in Chemistry and Chemical Engineering.

FOR FURTHER INFORMATION
Contact: Graduate Student Advisor
Chemical Engineering Department
Case Western Reserve University
Cleveland, Ohio 44106

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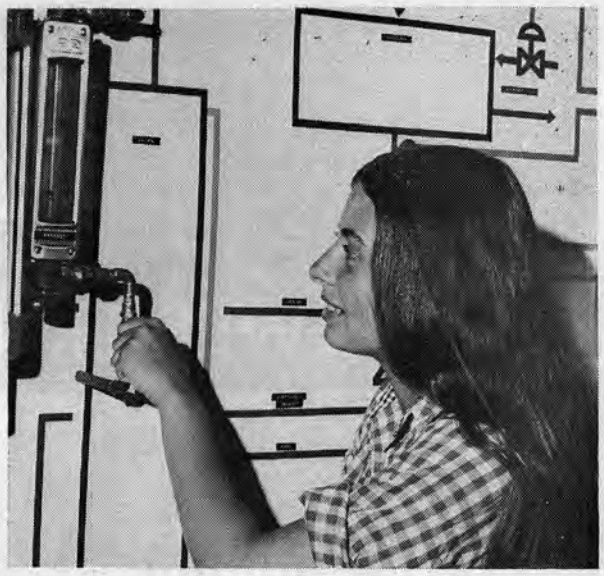
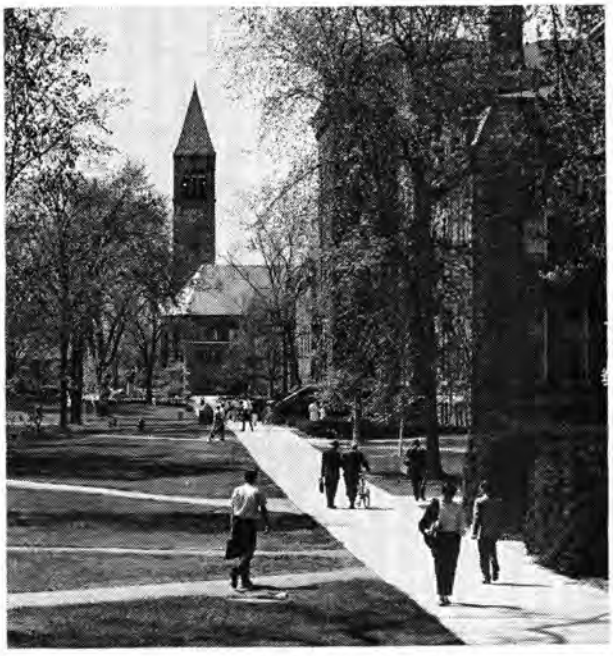


Financial aid in the form of fellowships, research assistantships, and teaching assistantships is available. For more details, please write to:

DEAN OF THE GRADUATE SCHOOL
CLARKSON COLLEGE OF TECHNOLOGY
POTSDAM, NEW YORK 13676



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The faculty members are:

George G. Cocks, Claude Cohen, Robert K. Finn, Keith E. Gubbins, Peter Harriott, Robert P. Merrill, Ferdinand Rodriguez, George F. Scheele, Michael L. Shuler, Julian C. Smith, William B. Streett, Raymond G. Thorpe, Robert L. Von Berg, Herbert F. Wiegandt.

FOR FURTHER INFORMATION: Write to

Professor Keith Gubbins
Cornell University
Olin Hall of Chemical Engineering
Ithaca, New York 14853.

UNIVERSITY OF DELAWARE

Newark, Delaware 19711

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A Ph.D. degree.

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K. B. Bischoff (Chairman)
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C. D. Denson
B. C. Gates
J. R. Katzer
R. L. McCullough
A. B. Metzner
J. H. Olson
M. E. Paulaitis
R. L. Pigford
T. W. F. Russell
S. I. Sandler
G. L. Schrader
G. C. A. Schuit (½ time)
J. M. Schultz
L. A. Spielman

Visiting Faculty
J. M. Dealy
J. Moulijn
A. Teja
M. Teramoto

The adjunct and research faculty who provide extensive association with industrial practice are:

R. J. Anderson ——— Reaction engineering, process design
L. A. DeFrate ——— Single and multiphase fluid mechanics
A. W. Etchells ——— Mixing, fluid mechanics
R. J. Fisher ——— Polymer processing and stability theory
P. J. Gill ——— Polymer reaction kinetics, optimal control systems
P. M. Guillino, M. D. ——— Biomedical engineering
H. F. Haug ——— Chemical engineering design
H. S. Kemp ——— Transfer operations, distillation
T. A. Koch ——— Catalysis
J. C. W. Kuo ——— Catalysis reaction engineering
W. H. Manogue ——— Catalysis, reaction engineering
F. E. Rush, Jr. ——— Mass transfer—distillation, absorption, extraction
R. J. Samuels ——— Polymer science
E. G. Scheibel ——— Mass transfer, separation process
A. B. Stiles ——— Catalysis
E. A. Swabb, M. D. ——— Biomedical engineering
V. W. Weekman, Jr. ——— Reaction engineering
K. F. Wissbrun ——— Polymer engineering

For information and admissions materials contact:

M. M. Denn, Graduate Advisor

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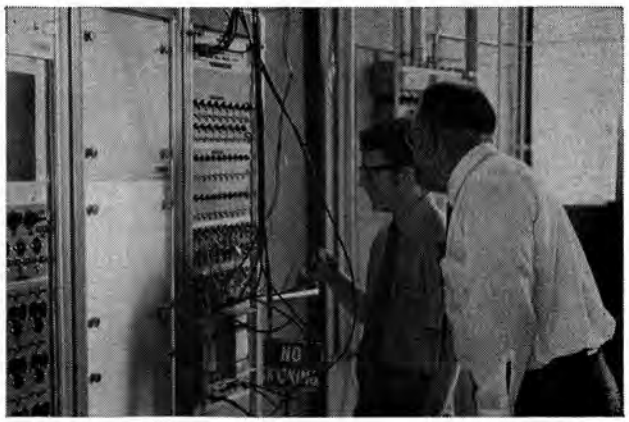

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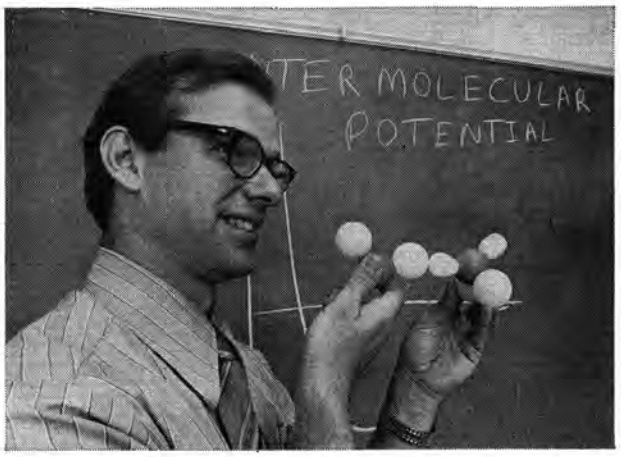

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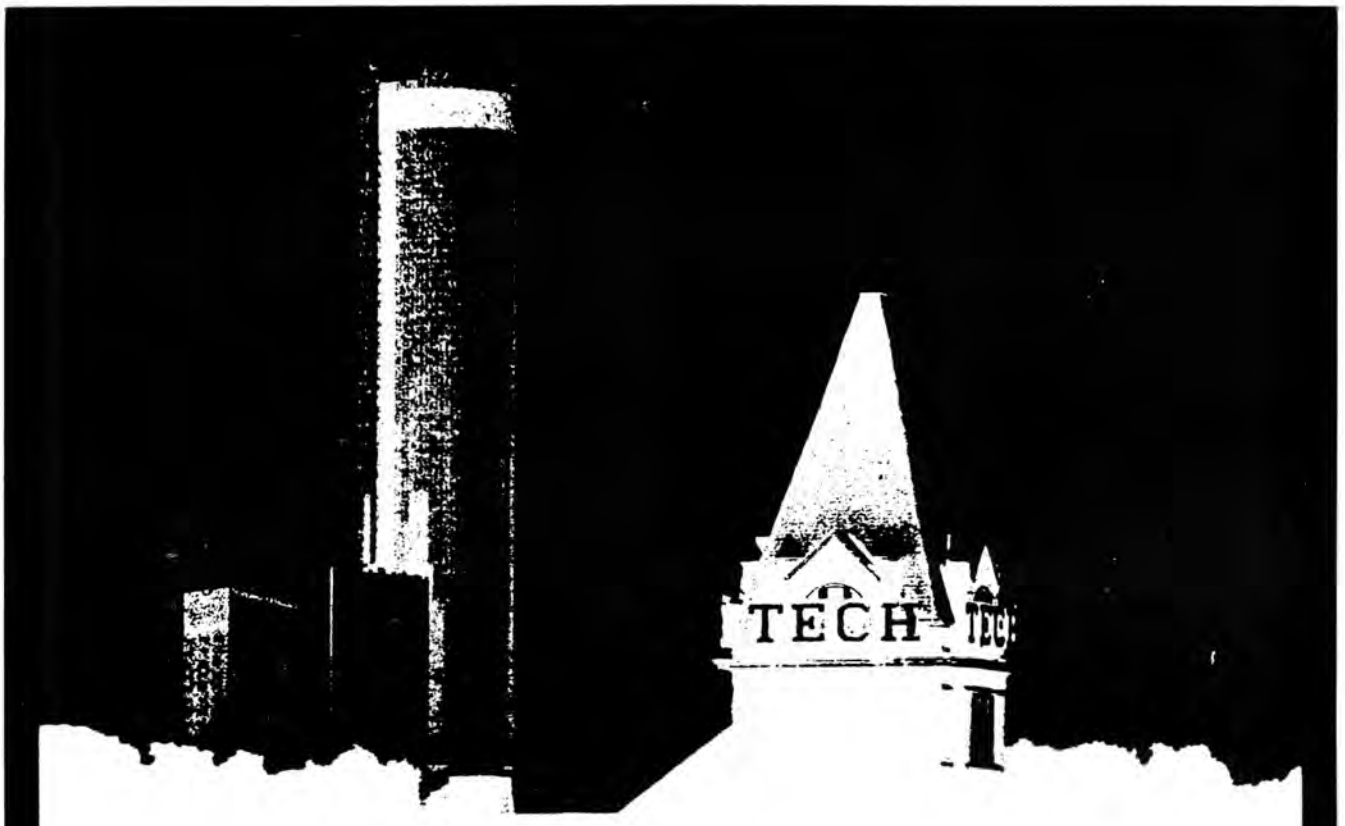
Dr. John C. Biery, Chairman
Department of Chemical Engineering - Room 227
University of Florida
Gainesville, Florida 32611



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Interfacial Phenomena
Kinetics
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Mining and Mineral Engineering
Polymer Science and Engineering
Pulp and Paper Technology
Reactor Design
Stagewise Processes
Transport Phenomena

For more information write:

Dr. Gary W. Poehlein
School of Chemical Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332

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DEPARTMENT OF CHEMICAL ENGINEERING

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DAN LUSS
ALKIVADES PAYATAKES
H. WILLIAM PRENGLE, JR.
JAMES T. RICHARDSON
FRANK M. TILLER
FRANK L. WORLEY, JR.

For information regarding graduate admissions write

Chairman, Admissions Committee
Department of Chemical Engineering
University of Houston
Houston, Texas 77004
(713) 749-4407

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Faculty

D. GIDASPOW	*Heat Transfer and Thermodynamics*
W. M. LANGDON	*Environmental Control and Process Design*
J. R. SELMAN	*Electrochemical Engineering and Energy Conversion*
B. S. SWANSON	*Process Dynamics and Controls*
L. L. TAVLARIDES	*Biochemical Engineering and Reactor Engineering*
J. S. VRENTAS	*Polymer Science and Transport Phenomena*
D. T. WASAN	*Mass Transfer and Surface and Colloid Phenomena*
CHARLES WITTMANN	*Chemical Reaction Engineering Analysis*

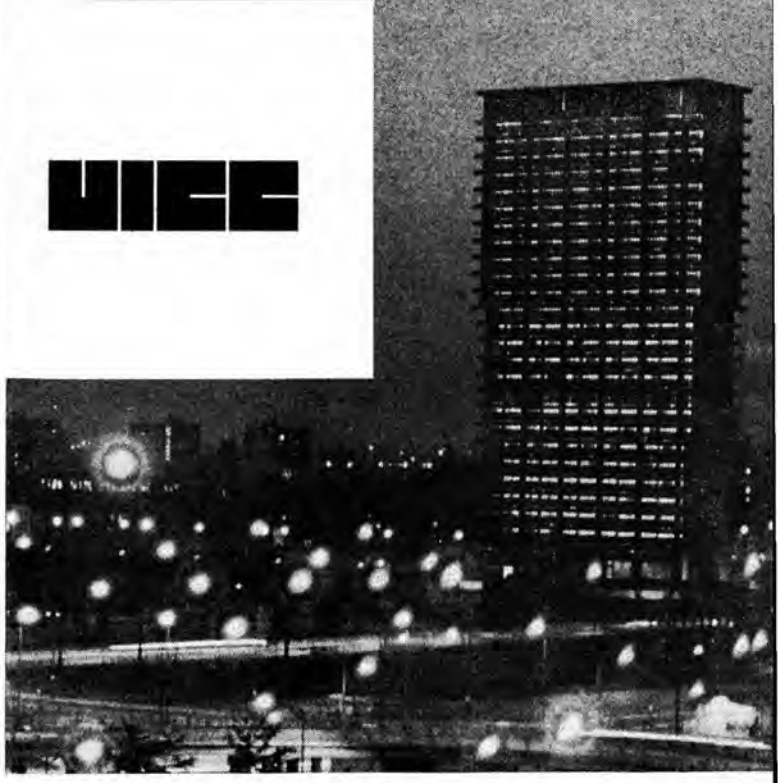
FOR INQUIRIES, WRITE

D. T. Wasan
Chemical Engineering Dept.
Illinois Institute of Technology
10 West 33rd St.
Chicago, IL 60616

GRADUATE STUDY AND RESEARCH

The Department of Energy Engineering

UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE



Graduate Programs in

The Department of Energy Engineering

leading to the degrees of

MASTER OF SCIENCE and

DOCTOR OF PHILOSOPHY

Faculty and Research Activities in
CHEMICAL ENGINEERING

Paul M. Chung
Ph.D., University of Minnesota, 1957
Professor and Head of the Department

Fluid mechanics, combustion, turbulence, chemically reacting flows

David S. Hacker
Ph.D., Northwestern University, 1954
Associate Professor

Chemical kinetics, mass transport phenomena, chemical process design, particulate transport phenomena

John H. Kiefer
Ph.D., Cornell University, 1961
Professor

Kinetics of gas reactions, energy transfer processes, molecular lasers

Victor J. Kremesec, Jr.
Ph.D., Northwestern University, 1975
Assistant Professor

Multi-phase flow, flow in porous media, mass transfer, interfacial behavior, biological applications of transport phenomena, thermodynamics of solutions

G. Ali Mansoori
Ph.D., University of Oklahoma, 1969
Associate Professor

Thermodynamics and statistical mechanics of fluids, solids, and solutions, kinetics of liquid reactions, cryobioengineering

Irving F. Miller
Ph.D., University of Michigan, 1960
Professor

Thermodynamics, biotransport, artificial organs, biophysics

Satish C. Saxena
Ph.D., Calcutta University, 1956
Professor

Transport properties of fluids and solids, heat and mass transfer, isotope separation, fixed and fluidized bed combustion

Stephen Szépe
Ph.D., Illinois Institute of Technology, 1966
Associate Professor

Catalysis, chemical reaction engineering, optimization, environmental and pollution problems

The MS program, with its optional thesis, can be completed in one year. Evening M.S. can be completed in three years.

The department invites applications for admission and support from all qualified candidates. Special fellowships are available for minority students. To obtain application forms or to request further information write:

Professor S. C. Saxena, Chairman
The Graduate Committee
Department of Energy Engineering
University of Illinois at Chicago Circle
Box 4348, Chicago, Illinois 60680

UNIVERSITY OF ILLINOIS

URBANA, CHAMPAIGN

• ACTIVE, RESPECTED, ACCESSIBLE FACULTY

The Department is deeply committed to teaching and research. Everyone is expected to maintain an active, first-class research program. Administrators or "older members" are not exceptions. The standards are high. A third of the faculty are members of the National Academy of Engineers or the National Academy of Sciences. The Department prides itself on the large number of major national or international awards its members have won, an average of 3.6 awards per tenured faculty member.

Even so, the faculty is accessible. The Department views research as the highest form of teaching, where students and faculty work together on a joint project. It is not unusual to find faculty members in the lab, and doors are always open for questions, comments or help.

• EXCEPTIONAL FACILITIES

The Department, as a part of the School of Chemical Sciences maintains some of the most up-to-date facilities in the country, including for example a multichannel analyser capable of counting the nanosecond range, and pressure and vacuum equipment giving a useful operating range of 10^{5} to 10^{-13} atm. The School has extensive service facilities including a glass shop, electronic shop, machine shop, electronic design facility, analytical and laser labs. The shops are some of the best in the country, and the analytical and laser labs are truly exceptional. The campus library is one of the largest in a major university with over 5,000,000 items in its collection including more complete run journals in the chemical sciences than can be found in any other education institution. The School is committed to keeping its equipment up to the state of the art, and so for example, we are currently in the process of purchasing a replacement for our IBM 1800, and have requested money to add NMR capabilities beyond our 220 MHZ machine.

• A DIVERSITY OF RESEARCH INTERESTS

Applied Mathematics
Biological Application of Chemical Engineering
Catalysis
Chemical Reactor Dynamics
Computer-Aided Process Simulation and Design
Corrosion
Electronic Structure of Matter
Electrochemical Engineering
Energy Sources and Conservation
Environmental Engineering
Fluid Dynamics
Heat Transfer
High Pressure
Interfacial Phenomena
Mass Transfer
Materials Science and Engineering
Molecular Thermodynamics
Phase Transformations
Process Control
Reaction Engineering
Resource Management
Statistical Mechanics
Surface Science
Two-Phase Flow

FOR INFORMATION AND APPLICATIONS: Professor J. W. Westwater

Department of Chemical Engineering
113 Adams Laboratory
University of Illinois
Urbana, Illinois 61801

IOWA STATE UNIVERSITY

OF SCIENCE AND TECHNOLOGY

Energy Conversion
(Coal Tech, Hydrogen Production, Atomic Energy)

Renato G. Bautista
Lawrence E. Burkhart
George Burnet
Allen H. Pulsifer
Dean L. Ulrichson
Thomas D. Wheelock

GRADUATE STUDY and GRADUATE RESEARCH in Chemical Engineering

Transport Processes
(Heat, mass & momentum transfer)

William H. Abraham
Renato G. Bautista
Charles E. Glatz
James C. Hill
Frank O. Shuck
Richard C. Seagrave

Process Chemistry and Fertilizer Technology

David R. Boylan
George Burnet
Maurice A. Larson

Biomedical Engineering

(System Modeling, Transport. process)
Richard C. Seagrave
Charles E. Glatz

Biochemical Engineering

(Enzyme Technology)
Charles E. Glatz
Peter J. Reilly

Polymerization Processes

William H. Abraham
John D. Stevens

Crystallization Kinetics
Maurice A. Larson
John D. Stevens

Process Instrumentation and System Optimization and Control
Lawrence E. Burkhart
Kenneth R. Jolls

as well as

Air Pollution Control
Solvent Extraction
High Pressure Technology
Mineral Processing

write to:
Chairman
Department of Chemical Engineering
Iowa State University
Ames, Iowa 50011

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Professor B. G. Kyle
Durland Hall
Kansas State University
Manhattan, Kansas 66502

AREAS OF STUDY AND RESEARCH

TRANSPORT PHENOMENA
ENERGY ENGINEERING
COAL AND BIOMASS CONVERSION
THERMODYNAMICS AND PHASE EQUILIBRIUM
BIOCHEMICAL ENGINEERING
PROCESS DYNAMICS AND CONTROL
CHEMICAL REACTION ENGINEERING
MATERIALS SCIENCE
SOLID MIXING
CATALYSIS AND FUEL SYNTHESIS
OPTIMIZATION AND PROCESS SYSTEM ENGINEERING
FLUIDIZATION
ENVIRONMENTAL POLLUTION CONTROL

UNIVERSITY OF KANSAS

Department of Chemical and Petroleum Engineering

M.S. and Ph.D. Programs
in
Chemical Engineering
M.S. Program
in
Petroleum Engineering
also
Doctor of Engineering (D.E.)
and
M.S. in Petroleum Management

The Department is the recent recipient of a large state grant for research in the area of Tertiary Oil Recovery to assist the Petroleum Industry.

Financial assistance is available for Research Assistants and Teaching Assistants

Research Areas

Transport Phenomena

Fluid Flow in Porous Media

Process Dynamics and Control
Water Resources and Environmental Studies

Mathematical Modeling of Complex Physical Systems

Reaction Kinetics and Process Design

Nucleate Boiling

High Pressure, Low Temperature Phase Behavior

For Information and Applications write:

Floyd W. Preston, Chairman
Dept. of Chemical and Petroleum Engineering
University of Kansas
Lawrence, Kansas, 66045
Phone (913) 864-3922

University of Kentucky

M.S. & Ph.D. Programs
Including Intensive Study in:

ENERGY ENGINEERING:

Synthetic fuel process research
Chemical coal desulphurization
Thermochemical hydrogen production

ENVIRONMENTAL ENGINEERING:

Air pollutant dispersion modeling
Water and air pollution control processes
Physico-chemical separations: indus. wastes

OTHER PROGRAM AREAS:

Thermodynamics
Chemical reactor design
Diffusional mass transfer
Process control and applied math. etc.

Excellent financial aid is available in the form of graduate fellowships & traineeships.

You will find Lexington to be a truly delightful place to live and to study.

Write to:
R. B. Grieves, Chairman
Chemical Engineering Dept.
University of Kentucky
Lexington, Kentucky 40506

department of chemical engineering

CHEMICAL ENGINEERING AT M.I.T.

GENERAL AREAS OF FUNDAMENTAL AND APPLIED RESEARCH

- **Energy Conversion Processes**
- **Environmental Quality**
- **Biochemical and Biomedical Engineering**
- **Transport Phenomena**
- **Chemical Reactor Engineering**
- **Chemical Kinetics and Catalysis**
- **Polymer Chemistry and Engineering**
- **Process Dynamics and Process Control**
- **Computer Aided Design**
- **Surface and Colloid Chemistry**
- **Applied Chemistry**
- **Combustion**

THE FACULTY OF THE DEPARTMENT

R. C. ARMSTRONG, Ph.D. (1973); Assistant Professor,
POLYMER FLUID MECHANICS, TRANSPORT PHENOMENA, APPLIED MATHEMATICS

R. F. BADDOUR, Sc.D. (1951); Professor,
CATALYSIS, PLASMA CHEMISTRY, ENZYME TECHNOLOGY

J. M. BEER, D.Sc. (1968); Professor,
COMBUSTION, FLUIDIZED COMBUSTION OF COAL

R. A. BROWN, Ph.D. (1978); Assistant Professor,
MATHEMATICAL MODELLING, FLUID MECHANICS, TRANSPORT AND INTERFACE PHENOMENA

R.E. COHEN, Ph.D. (1972); Associate Professor,
PHYSICS AND CHEMISTRY OF POLYMERS, VISCOELASTIC THEORY

C. K. COLTON, Ph.D. (1969); Professor,
BIOMEDICAL AND BIOCHEMICAL ENGINEERING, MASS TRANSFER

W. M. DEEN, Ph.D. (1973); Assistant Professor
BIOENGINEERING, FLUID MECHANICS, MASS TRANSFER

R. G. DONNELLY, Ph.D. (1972); Associate Professor,
HETEROGENEOUS CATALYSIS, COLLOID AND SURFACE CHEMISTRY, THERMODYNAMICS

L. B. EVANS, Ph.D. (1962); Professor,
PROCESS CONTROL, OPTIMIZATION, COMPUTER-AIDED DESIGN

C. GEORGAKIS, Ph.D. (1975); Assistant Professor,
CHEMICAL REACTOR DESIGN, PROCESS DYNAMICS AND CONTROL, APPLIED MATHEMATICS

R. A. HITES, Ph.D. (1968); Associate Professor,
ENVIRONMENTAL ORGANIC CHEMISTRY, POLLUTION, ANALYTICAL CHEMISTRY

H. C. HOTTEL, S.M. (1924); Professor Emeritus,
RADIATIVE HEAT TRANSFER, COMBUSTION, SOLAR ENERGY

J. B. HOWARD, Ph.D. (1965); Professor,
COMBUSTION, COAL CONVERSION, ENERGY TECHNOLOGY

J. P. LONGWELL, Sc.D. (1943); Professor,
COMBUSTION, FUELS PROCESSING

M. P. MANNING, Sc.D. (1976); Assistant Professor,
KINETICS AND CATALYSIS, SOLAR ENERGY, PROCESS DESIGN

H. P. MEISSNER, D.Sc. (1938); Professor Emeritus,
ELECTROCHEMISTRY, THERMODYNAMICS, PROCESS METALLURGY

E. W. MERRILL, Sc.D. (1947); Professor,
POLYMER CHEMISTRY, BIOMEDICAL ENGINEERING, MEMBRANE TECHNOLOGY

M. MODELL, Sc.D. (1964); Associate Professor,
THERMODYNAMICS, WASTE TREATMENT, CHEMICAL KINETICS AND CATALYSIS

C. M. MOHR, Sc.D. (1961); Senior Lecturer,
PROCESS DESIGN AND SYNTHESIS, INDUSTRIAL CHEMISTRY

F. A. PUTNAM, Ph.D. (1976); Assistant Professor,
SURFACE PHENOMENA, THERMODYNAMICS, CATALYSIS

R. C. REID, Sc.D. (1954); Professor,
THERMODYNAMICS, PROPERTIES OF MATERIALS, LIQUEFIED NATURAL GAS

A. F. SAROFIM, Sc.D. (1962); Professor,
APPLIED CHEMICAL KINETICS, HEAT AND MASS TRANSFER, COMBUSTION

C. N. SATTERFIELD, Sc.D. (1946); Professor,
CHEMICAL REACTION ENGINEERING, MASS TRANSFER AND HETEROGENEOUS CATALYSIS

S. M. SENKIN, Sc.D. (1977); Assistant Professor,
CHEMICAL REACTOR DESIGN, MATHEMATICAL MODELLING

K. A. SMITH, Sc.D. (1962); Professor,
FLUID MECHANICS, HEAT AND MASS TRANSFER, BIOMEDICAL ENGINEERING

C. G. VAYENAS, Ph.D. (1977); Assistant Professor,
HETEROGENEOUS CATALYSIS, FUEL CELLS

P. S. VIRK, Sc.D. (1967); Associate Professor,
DRAG REDUCTION, PYROLYSIS PATHWAYS, COAL LIQUIDS

J. E. VIVIAN, Sc.D. (1945); Professor and Executive Officer,
MASS TRANSFER AND CHEMICAL KINETICS, SEPARATION PROCESS

J. WEI, Sc.D. (1955); Professor and Department Head,
CATALYSIS AND KINETICS, CHEMICAL REACTORS, TRANSPORT PHENOMENA, BIOCHEMICAL ENGINEERING

G. C. WILLIAMS, Sc.D. (1942); Professor and Graduate Officer,
COMBUSTION, CHEMICAL KINETICS, AIR POLLUTION

University of Massachusetts at Amherst

GRADUATE PROGRAM

IN

Polymer Science and Engineering

Chemical Engineering

FACULTY

PSE

William J. MacKnight, Prof. and Head
Richard J. Farris, Associate Prof.
James C. W. Chien, Professor
Allen S. Hay, Adjunct Professor
S. L. Hsu, Assistant Professor
Frank E. Karasz, Professor
Robert L. Laurence, Professor
Robert W. Lenz, Professor
Stanley Middleman, Professor
Edward P. Otocka, Adjunct Professor
Roger S. Porter, Professor
Isaac Sanchez, Adjunct Professor
Richard S. Stein, Commonwealth Professor
Edwin L. Thomas, Associate Professor
Otto Vogl, Professor

Ch. E.

W. Leigh Short, Prof. and Head
David C. Chappelear, Adjunct Associate
Michael F. Doherty, Assistant Prof.
James M. Douglas, Professor
John W. Eldridge, Professor
Robert S. Kirk, Associate Prof.
James R. Kittrell, Professor
Robert L. Laurence, Professor
Robert W. Lenz, Professor
E. Ernest Lindsey, Emeritus Prof.
Thomas J. McAvoy, Professor
Stanley Middleman, Professor
Marcel Vanpee, Professor

RESEARCH AREAS

MORPHOLOGY OF POLYMERS
SPECTROSCOPY OF POLYMERS
POLYMER PHYSICS
SYNTHESIS
PHYSICAL CHEMISTRY OF POLYMERS
POLYMER ENGINEERING

CHEMICAL PROCESS DESIGN
COMBUSTION
SEPARATION PROCESSES
THERMODYNAMICS
PROCESS CONTROL
REACTOR ENGINEERING

For information contact

Dr. Richard J. Farris
Graduate Program Director
Dept. of Polymer Science & Engineering
University of Massachusetts
Amherst, Massachusetts 01003

For information contact

Dr. R. L. Laurence
Graduate Program Director
Dept. of Chemical Engineering
University of Massachusetts
Amherst, Massachusetts 01003

Department of Chemical Engineering

UNIVERSITY OF MISSOURI — ROLLA

ROLLA, MISSOURI 65401

Contact Dr. M. R. Strunk, Chairman

Day Programs M.S. and Ph.D. Degrees

Established fields of specialization in which research programs are in progress are:

(1) Fluid Turbulence Mixing and Drag Reduction Studies—Dr. G. K. Patterson and Dr. X. B. Reed

(2) Electrochemistry and Reactions at Electrode Surfaces—Dr. J. W. Johnson

(3) Heat Transfer Studies—Dr. J. J. Carr

(4) Bioconversion of Agricultural Wastes to Methane—Dr. J. L. Gaddy and Dr. N. L. Book

(5) Polymers and Polymeric Materials—Dr. H. K. Yasuda

In addition, research projects are being carried out in the following areas:

(a) Optimization of Chemical Systems—Dr. J. L. Gaddy

(b) Design Techniques and Fermentation Studies —Dr. M. E. Findley

(c) Multi-component Distillation Efficiencies and Separation Processes—Dr. R. C. Waggoner

(d) Separations by Electrodialysis Techniques— Dr. H. H. Grice

(e) Process Dynamics and Control; Computer Applications to Process Control—Drs. M. E. Findley, R. C. Waggoner, and R. A. Mollenkamp

(f) Transport Properties, Kinetics, enzymes and catalysis—Dr. O. K. Crosser and Dr. B. E. Poling

(g) Thermodynamics, Vapor-Liquid Equilibrium —Dr. D. B. Manley

Financial aid is obtainable in the form of Graduate and Research Assistantships, and Industrial Fellowships. Aid is also obtainable through the Materials Research Center.

LOOKING

WRITE TO

Prof. Lee C. Eagleton, Head
160 Fenske Laboratory
The Pennsylvania State University
University Park, Pa. 16802

for a
graduate education
in
Chemical Engineering ?
Consider

PENN STATE

Some Current M.S. & Ph.D.
General Research Areas:

BIOMEDICAL ENGINEERING
Physiological Transport Processes
Newborn Monitoring

ENVIRONMENTAL RESEARCH
Gaseous and Particulate Control
Atmospheric Modeling

REACTOR DESIGN AND CATALYSIS
Heterogeneous Catalysis
Cyclic Reactor Operations
Catalyst Characterization

TRANSPORT PHENOMENA
Analytical and Numerical Solutions
Polymer Rheology and Transport
Convective Heating and Mass Transfer
Mass Transfer in Cocurrent Flow

THERMODYNAMIC PROPERTIES
Property Correlations
Statistical Mechanics

PROCESS DYNAMICS AND CONTROL
Nonlinear Stability Theory
Optimal and Periodic Control

APPLIED CHEMISTRY AND KINETICS
Industrial Chemical Processes
Complex Reaction Systems

PETROLEUM REFINING
Process Development
Product Conversion

TRIBOLOGY
Properties of Liquid Lubricants
Boundary Lubrication Fundamentals

INTERFACIAL PHENOMENA
Adsorption Thermodynamics and Kinetics
Monolayer and Membrane Processes

ENERGY RESEARCH
Tertiary Oil Recovery
Nuclear Technology

university of

pennsylvania chemical and biochemical engineering

FACULTY

Stuart W. Churchill (Michigan)
Elizabeth B. Dussan V. (Johns Hopkins)
William C. Forsman (Pennsylvania)
Eduardo D. Glandt (Pennsylvania)
David J. Graves (M.I.T.)
A. Norman Hixson (Columbia)
Arthur E. Humphrey (Columbia)
Mitchell Litt (Columbia)
Alan L. Myers (California)
Melvin C. Molstad (Yale)
Daniel D. Perlmutter (Yale)
John A. Quinn (Princeton)
Warren D. Seider (Michigan)

RESEARCH SPECIALTIES

Energy Utilization
Enzyme Engineering
Biochemical Engineering
Biomedical Engineering
Computer-Aided Design
Chemical Reactor Analysis
Environmental and Pollution Control
Polymer Engineering
Process Simulation
Surface Phenomena
Separations Techniques
Thermodynamics
Transport Phenomena

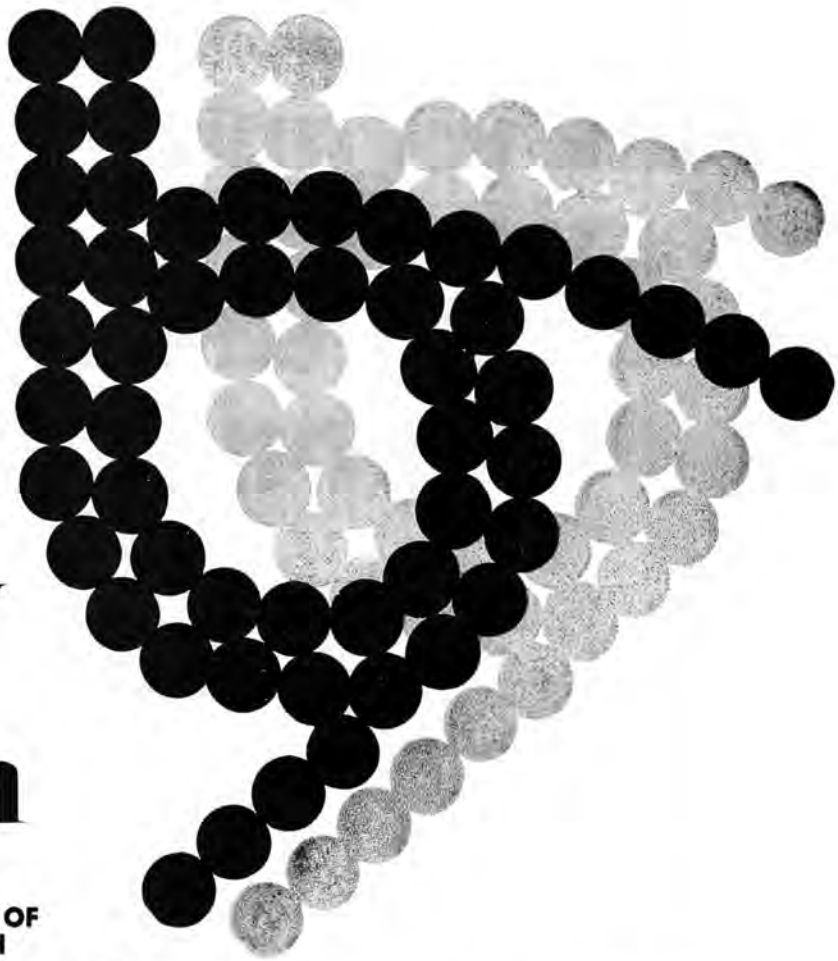
The faculty includes three members of the National Academy of Engineering and three recipients of the highest honors awarded by the American Institute of Chemical Engineers. Staff members are active in teaching, research, and professional work. Located near one of the largest concentrations of chemical industry in the United States, the University of Pennsylvania maintains the scholarly standards of the Ivy League and numbers among its assets a superlative Medical Center and the Wharton School of Business.

PHILADELPHIA: The cultural advantages, historical assets, and recreational facilities of a great city are within walking distance of the University. Enthusiasts will find a variety of college and professional sports at hand. The Pocono Mountains and the New Jersey shore are within a two-hour drive.

For further information on graduate studies in this dynamic setting, write to Dr. A. L. Myers, Chairman,
Department of Chemical and Biochemical Engineering, 220 S. 33rd Street, University of Pennsylvania, Philadelphia, PA 19104.

GRADUATE STUDY IN CHEMICAL AND PETROLEUM ENGINEERING

University of Pittsburgh



Sixty graduate students, along with 300 undergraduates, pursue their education on three floors of Benedum Hall. The facilities are modern and excellently equipped. Graduate applicants should write:

Graduate Coordinator
Chemical and Petroleum Engineering Department
School of Engineering
University of Pittsburgh
Pittsburgh, Pa. 15261

FACULTY

Charles S. Beroes
Alfred A. Bishop
Alan J. Brainard
Shiao-Hung Chiang
James T. Cobb, Jr.
Paul F. Fulton
George E. Klinzing
Alan A. Reznik
Yatish T. Shah
Edward B. Stuart
John W. Tierney

UNIVERSITY OF PITTSBURGH

The first school west of the Allegheny Mountains to offer engineering degrees, the University granted its first undergraduate engineering degree in 1846 and started the graduate program in 1914. Today, approximately 2,000 undergraduates and 600 graduate students are enrolled in the School of Engineering. Students have access to the George M. Bevier Engineering Library of 38,000 volumes; University libraries of over 2,500,000 volumes; libraries in 50 industrial research centers and universities nearby. University of Pittsburgh has a comprehensive computer system with both batch and time-sharing facilities to use in academic and research investigations.

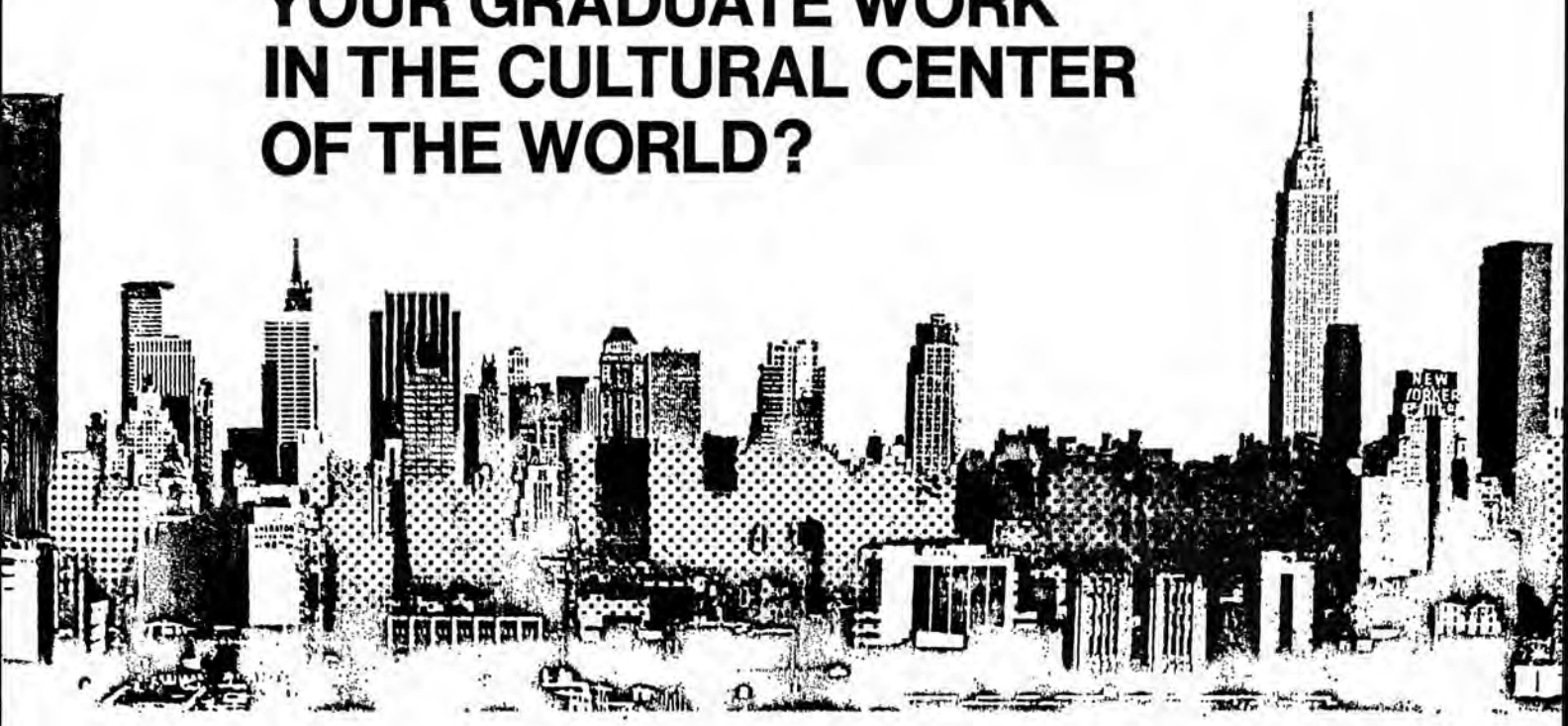
PROGRAMS AND SUPPORT

Master of Science and Doctor of Philosophy degrees in Chemical Engineering and Master of Science degree in Petroleum Engineering are offered. While obtaining advanced degrees, students may specialize in Biomedical, Energy Resources, Nuclear, and Environmental areas. A joint Master of Science degree with the Department of Mathematics is offered. Teaching and Research Assistantships and Fellowships are available.

PITTSBURGH

The city leads a rich cultural life in an exciting geographic and social setting. Pittsburgh Symphony Orchestra, under the direction of Andre Previn, ranks high. A wide range of musical events rocks Heinz Hall. Pittsburgh Laboratory Theatre and Pittsburgh Public Theatre take innovative approaches to drama. Natural history displays at Carnegie Museum and art exhibits at the new Sarah Scaife Gallery draw over a million visitors yearly. For sports followers, Pittsburgh offers Pirates, Steelers, Penguins. And skiers find a variety of slopes just a half-hour, uphill drive from the city.

HOW WOULD YOU LIKE TO DO YOUR GRADUATE WORK IN THE CULTURAL CENTER OF THE WORLD?



CHEMICAL ENGINEERING

POLYMER SCIENCE & ENGINEERING

FACULTY

R. C. Ackerberg
R. F. Benenati
J. J. Conti
C. D. Han
W. H. Kapfer
S. H. Lin
J. S. Mijovic
E. M. Pearce
P. F. Schubert
E. N. Ziegler

RESEARCH AREAS

Air Pollution
Catalysis, Kinetics and Reactors
Fermentation and Food Processing
Fluidization
Fluid Mechanics
Heat and Mass Transfer
Mathematical Modelling
Mechanical Behavior of Polymers
Morphology of Polymers
Polymerization Reactions
Process Control
Rheology and Polymer Processing

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Formed by the merger of Polytechnic Institute of Brooklyn and New York University School of Engineering and Science.

Fellowships and Research Assistantships are available.

Department of Chemical Engineering

Programs leading to Master's, Engineer and Doctor's degrees. Areas of study and research: chemical engineering, polymer science and engineering and environmental studies.

For further information contact

Professor C. D. Han
Head, Department of Chemical Engineering
Polytechnic Institute of New York
333 Jay Street
Brooklyn, New York 11201

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Tsao
Wankat
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Graduate Information
Chemical Engineering
Purdue University
West Lafayette, Indiana 47907

UNIVERSITY OF QUEENSLAND
POSTGRADUATE STUDY
IN
CHEMICAL ENGINEERING

★ **POSTGRADUATE SCHOLARSHIPS AVAILABLE** ★

STAFF AND RESEARCH AREAS

D. J. Nicklin (Cambridge)
Two-phase Flow, Fluidization

P. C. Brooks (M.I.T.)
Process Dynamics and Control

P. F. Greenfield (N.S.W.)
Biochemical and Enzyme Engineering, Mass Transfer and Catalysis, Waste Treatment

G. J. Kelly (Tasmania)
Corrosion, Electrochemical Technology

L. S. Leung (Cambridge)
Fluidization, Gas-solid Flow, Thermodynamics

R. G. Rice (Pennsylvania)
Column Flotation, Mass and Heat Transfer, Adsorption

R. H. Weiland (Toronto)
Fluid Dynamics, Mass and Heat Transfer

E. T. White (Imperial College)
Crystallization, System Analysis, Computer Control

R. J. Wiles (Queensland)
Particulate Conveying, Rheology

R. Y. K. Yang (Princeton)
Reaction and Enzyme Engineering, Numerical Methods, Stability Analysis

THE DEPARTMENT

The Department occupies its own new building and is well supported by research grants and modern equipments including a multi-purpose Varian mini-computer system. It has maintained an active postgraduate programme, which involves course work and research leading to M. Eng. Studies, M. Eng. Science and Ph.D. degrees.

THE UNIVERSITY AND THE CITY

The University is one of the largest in Australia with more than 18,000 students. Brisbane, with a population of about one million, enjoys a pleasant climate and attractive coasts which extend northward into The Great Barrier Reef.

FURTHER IMFORMATION

For further information write to:
Co-ordinator of Graduate Studies, Department of Chemical Engineering, University of Queensland, Brisbane, Qld. 4067, AUSTRALIA.

RENSSELAER POLYTECHNIC INSTITUTE

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

Advanced Study and Research Areas

- ☐ Thermodynamics
- ☐ Heat Transfer
- ☐ Kinetics—Catalysis
- ☐ Fluidization
- ☐ Fluid—Particle Systems
- ☐ Interfacial Phenomena
- ☐ Polymer Materials
- ☐ Polymer Processing
- ☐ Biochemical Systems
- ☐ Air Pollution Control
- ☐ Atmospheric Chemistry
- ☐ Water Resources
- ☐ Environmental Studies

The Faculty

Michael M. Abbott *Ph.D., Rensselaer*
Elmar R. Altwicker *Ph.D., Ohio State*
Donald B. Aulenbach *Ph.D., Rutgers*
Georges Belfort *Ph.D., California—Irvine*
Henry R. Bungay III *Ph.D., Syracuse*
Chan I. Chung *Ph.D., Rutgers*
Nicholas L. Clesceri *Ph.D., Wisconsin*
Dady B. Dadyburjor *Ph.D., Delaware*
Charles N. Haas *Ph.D., Illinois*
David Hansen *Ph.D., Rensselaer*
Arland H. Johannes *Ph.D., Kentucky*
Clement Kleinstreuer *Ph.D., Vanderbilt*
Peter K. Lashmet *Ph.D., Delaware*
Howard Littman *Ph.D., Yale*
Charles Muckenfuss *Ph.D., Wisconsin*
Rajamani Rajagopalan *Ph.D., Syracuse*
George P. Sakellaropoulos *Ph.D., Wisconsin*
William W. Shuster *D.Ch.E., Rensselaer*
Sanford S. Sternstein *Ph.D., Rensselaer*
Hendrick C. Van Ness *D.Eng., Yale*
Peter C. Wayner, Jr. *Ph.D., Northwestern*
Stephen W. Yerazunis *D.Ch.E., Rensselaer*

For full details write

Dr. David Hansen, Chairman
Department of Chemical and Environmental Engineering
Rensselaer Polytechnic Institute Troy, New York 12181

Graduate Study in Chemical Engineering at Rice University

Graduate study in Chemical Engineering at Rice University is offered to qualified students with backgrounds in the fundamental principles of Chemistry, Mathematics, and Physics. The curriculum is aimed at strengthening the student's understanding of these principles and provides a basis for developing in certain areas the necessary proficiency for conducting independent research. A large number of research programs are pursued in various areas of Chemical Engineering and related fields, such as Biomedical Engineering and Polymer Science. A joint program with the Baylor College of Medicine, leading to M.D.-Ph.D. and M.D.-M.S. degrees is also available.

The Department has approximately 30 graduate students, predominantly Ph.D. candidates. There are also several post-doctoral fellows and research engineers associated with the various laboratories. Permanent faculty numbers 12, all active in undergraduate and graduate teaching, as well as in research. The high faculty-to-student ratio, outstanding laboratory facilities, and stimulating research projects provide a graduate education environment in keeping with Rice's reputation for academic excellence. The Department is one of the leading 42 Chemical Engineering Departments in the U.S., ranked by graduate faculty quality and program effectiveness, according to recent evaluations.

MAJOR RESEARCH AREAS

Thermodynamics and Phase Equilibria
Chemical Kinetics and Catalysis
Chromatography
Optimization, Stability, and Process Control
Systems Analysis and Process Dynamics
Rheology and Fluid Mechanics
Polymer Science

BIOMEDICAL ENGINEERING

Blood Flow and Blood Trauma
Blood Pumping Systems
Biomaterials

Rice University

Rice is a privately endowed, nonsectarian, coeducational university. It occupies an architecturally attractive, tree-shaded campus of 300 acres, located in a fine residential area, 3 miles from the center of Houston. There are approximately 2200 undergraduate and 800 graduate students. The school offers the benefits of a complete university with programs in the various fields of science and the humanities, as well as in engineering. It has an excellent library with extensive holdings. The academic year is from August to May. As there are no summer classes, graduate students have nearly four months for research. The school offers excellent recreational and athletic facilities with a completely equipped gymnasium, and the southern climate makes outdoor sports, such as tennis, golf, and sailing year-round activities.

FINANCIAL SUPPORT

Full-time graduate students receive financial support with tuition remission and a tax-free fellowship of $400-460 per month.

APPLICATIONS AND INFORMATION

Address letters of inquiry to:

Chairman
Department of Chemical Engineering
Rice University
Houston, Texas 77001

Houston

With a population of nearly two million, Houston is the largest metropolitan, financial, and commercial center in the South and Southwest. It has achieved world-wide recognition through its vast and growing petrochemical complex, the pioneering medical and surgical activities at the Texas Medical Center, and the NASA Manned Spacecraft Center.

Houston is a cosmopolitan city with many cultural and recreational attractions. It has a well-known resident symphony orchestra, an opera, and a ballet company, which perform regularly in the newly constructed Jesse H. Jones Hall. Just east of the Rice campus is Hermann Park with its free zoo, golf course, Planetarium, and Museum of Natural Science. The air-conditioned Astrodome is the home of the Houston Astros and Oilers and the site of many other events.

University of South Carolina

The College of Engineering offers M.S., M.E. and Ph.D. degrees in Chemical Engineering. Graduate students have the opportunity to work closely with the faculty on research projects. Research and teaching stipends are available from $3000 to $7200.

The University of South Carolina, with an enrollment of 23,800 on the Columbia campus, offers a variety of cultural and recreational activities. Columbia is part of one of the fastest growing areas in the country.

The Chemical Engineering Faculty

B. L. Baker, Distinguished Professor Emeritus, Ph.D., North Carolina State University , 1955 (Process design, environmental problems, ion transport).

M. W. Davis, Jr., Professor, Ph.D., University of California (Berkeley), 1951 (Kinetics and catalysis, chemical process analysis, solvent extraction, waste treatment).

J. H. Gibbons, Professor, Ph.D., University of Pittsburgh, 1961 (Heat transfer, fluid mechanics).

J. G. Goodwin, Jr., Assistant Professor, Ph.D., University of Michigan, 1977 (Kinetics and catalysis, reactor engineering).

F. P. Pike, Professor Emeritus, Ph.D., University of Minnesota, 1949 (Mass transfer in liquid-liquid systems, vapor-liquid equilibria).

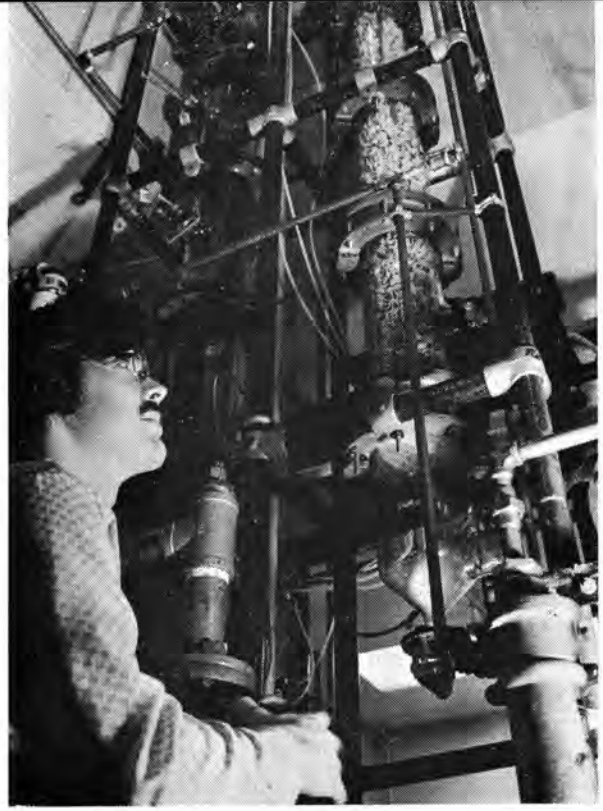
T. G. Stanford, Assistant Professor, Ph.D., The University of Michigan, 1977 (Chemical reactor engineering, mathematical modeling of chemical systems, process design, thermodynamics).

G. B. Tatterson, Assistant Professor, Ph.D., Ohio State University, 1977 (Turbulence, mixing, multi-phase flow, real-time computing)

J. A. Trainham, Assistant Professor, Ph.D., University of California (Berkeley), 1978, (Electrochemical systems)

V. Van Brunt, Assistant Professor, Ph.D., University of Tennessee, 1974 (Mass transfer, computer modeling, fluidization).

For further information contact:
Prof. J. H. Gibbons
Chairman, Chemical Engineering Group
College of Engineering
University of South Carolina
Columbia, South Carolina 29208



Chemical Engineering at Stevens Institute of Technology

Master's–Chemical Engineer–Doctoral Programs in Chemical Engineering Science Design and Polymer Engineering

Research in

Transport Processes – Turbulence – Multiphase Systems

Pollution Modeling and Control – Combustion

Chemical Reaction Engineering – Energy Conversion

Membrane Separation Processes – Absorption – Extraction

Polymerization Kinetics – Polymer Rheology and Processing

Polymeric System Structure – Property Relationships

For further information contact:

Dean of Graduate Studies
Stevens Institute of Technology
Castle Point Station
Hoboken, New Jersey 07030
201–420–5234

THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Graduate Studies in Chemical, Metallurgical, and Polymer Engineering

Programs

Programs for the degrees of Master of Science and Doctor of Philosophy are offered in chemical engineering, metallurgical engineering and polymer engineering. The Master's program may be tailored as a terminal one with emphasis on professional development, or it may serve as preparation for more advanced work leading to the Doctorate.

Faculty

William T. Becker
Donald C. Bogue
Charlie R. Brooks
Duane D. Bruns
Edward S. Clark
Oran L. Culberson
John F. Fellers
George C. Frazier
Hsien-Wen Hsu
Homer F. Johnson, Department Head
Stanley H. Jury
Carl D. Lundin
Peter J. Meschter
Charles F. Moore
Ben F. Oliver, Professor-in-Charge of Metallurgical Engineering
Joseph J. Perona
Joseph E. Spruiell
E. Eugene Stansbury
James L. White, Professor-in-Charge of Polymer Engineering

Research

Process Dynamics and Control

Sorption Kinetics and Dynamics of Packed Beds

Chromatographic and Ultracentrifuge Studies of Macromolecules

Development and Synthesis of New Engineering Polymers

Fiber and Plastics Processing

Chemical Bioengineering

X-Ray Diffraction, Transmission and Scanning Electron Microscopy

Solidification, Zone Refining

Welding

Cryogenic and High Temperature Calorimetry

Flow and Fracture in Metallic and Polymeric Systems

Corrosion

Solid State Kinetics

Financial Assistance

Sources available include graduate teaching assistantships, research assistantships, and industrial fellowships.

The University and Surroundings

Close to the center of Knoxville, the 397 acre campus combines a spacious environment with urban convenience. The proximity of the Oak Ridge National Laboratory and the headquarters of the Tennessee Valley Authority encourages constructive interchange with the activities of this 30,000 student campus.

The moderate Knoxville climate with the nearby Great Smoky Mountain National Park, Appalachian Trail, ski slopes and TVA lakes provides year round recreational challenges. The university and area communities offer a substantial program of cultural activities including a symphony orchestra, several theater companies and fine art museums as well as a wide assortment of rock concerts, folk music, mountain festivals, etc.

Write

Department of Chemical, Metallurgical and Polymer Engineering
The University of Tennessee
Knoxville, Tennessee 37916

TEXAS A&M UNIVERSITY

Texas A&M is a land-grant and sea-grant university, and the oldest public institution of higher learning in Texas. The current enrollment is about 30,000. The university location is Bryan/College Station, Texas—twin cities with a combined population of 122,000 (including students). The surrounding country is deciduous forest—Houston is 95 miles Southeast and Dallas is 160 miles North.

CHEMICAL ENGINEERING DEPARTMENT

The ChE department has an enrollment of about 850 undergraduates and 70 graduates. ChE has excellent facilities in the Zachry Engineering Center. All graduate students have desk space. Graduate stipends are currently $575/month.

Admission to The Texas A&M University System and any of its sponsored programs is open to qualified individuals regardless of race, color, religion, sex, national origin or educationally handicaps.

FACULTY AND RESEARCH INTERESTS

C. D. Holland (department head)—distillation
R. G. Anthony—catalysis
J. A. Bullin—pollution
R. Darby—rheology
R. R. Davison—solar energy
L. D. Durbin—control
P. T. Eubank—thermodynamics
C. J. Glover—oil recovery
K. R. Hall—thermodynamics
D. T. S. Hanson—biochemical
W. B. Harris—methanol fuel
J. C. Holste—polymers
A. I. Liapis—adsorption
A. D. Messina—heat transfer
R. D. Ostermann—bio-mass
A. T. Watson—simulation
R. E. White—electrochemical

FOR INFORMATION CONTACT:

Graduate Advisor
Chemical Engineering Dept.
Texas A&M University
College Station, TX 77843

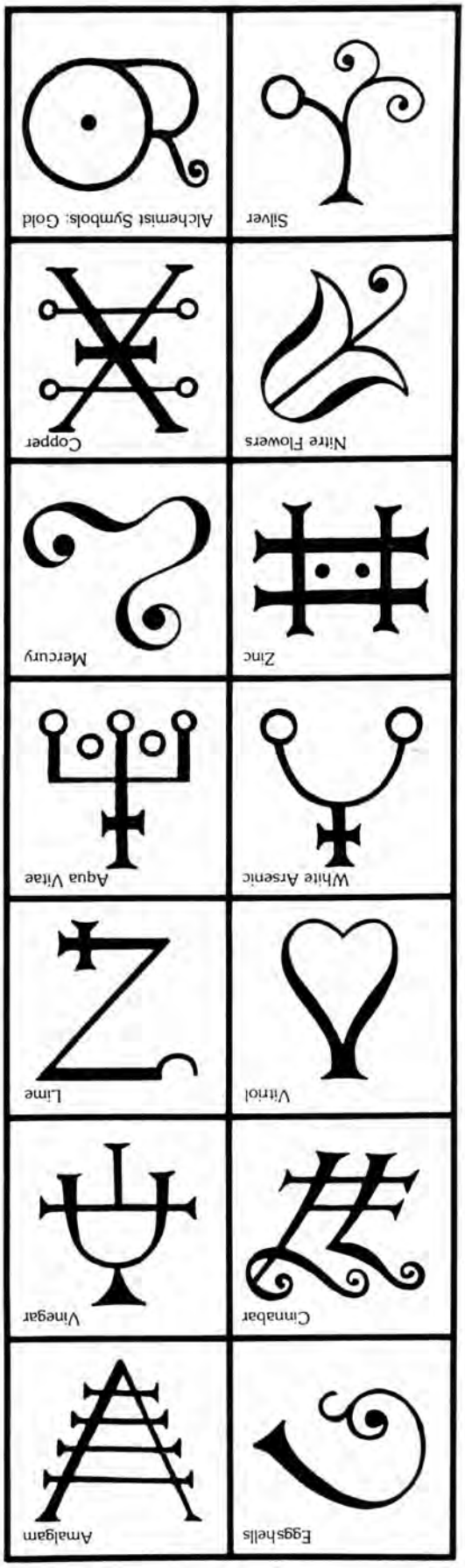
The University of Texas at Austin

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

Faculty research interests include Aerosol Technology, Bioengineering, Combustion, Computer-Aided Design, Energy, Enviromental, Kinetics and Catalysis, Materials, Optimization, Polymer Engineering, Process Control, Process Engineering, Process Simulation, Surface Phenomena, Transport Processes.

for additional information:

Graduate Advisor
Department of Chemical Engineering
The University of Texas
Austin, Texas 78712



Chemical Engineering

at Virginia Polytechnic Institute and State University . . .

applying chemistry to the needs of man.

Study with outstanding professors in the land of Washington, Jefferson, Henry and Lee . . . where Chemical Engineering is an exciting art. Some current areas of major and well-funded activity are,

Renewable Resources
chemical and microbiological processing, chemicals and polymers made from renewable resources

Coal Science and Process Chemistry
chemistry of prompt intermediates, reaction paths in coal liquefaction, fate of trace elements

Coal Combustion Workshop
small-scale systems, fate of trace elements, environmental controls

Microcomputers, Digital Electronics, and Control
digital process measurements, microcomputer interfacing, remote data acquisition, digital controls

Polymer Science and Engineering
processing, morphology, synthesis, surface science, biopolymers, membrane science

Engineering Chemistry
chemically pumped lasers, multiphase catalysis, chemical micro-engineering

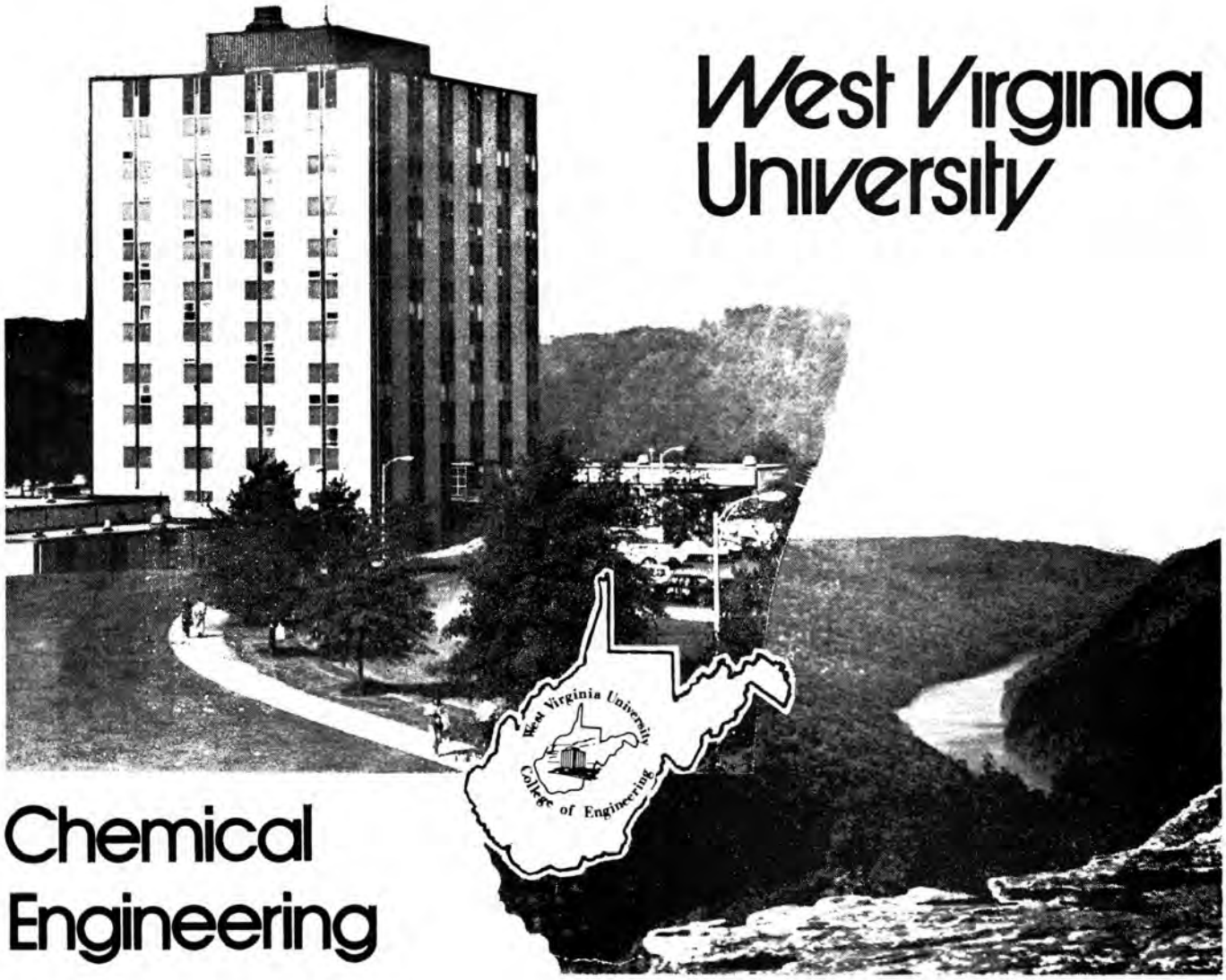
Biochemical Engineering
synthetic foods, food processing, antibiotics, plant-cell tissue culture, fermentation processes and instrumentation, environmental engineering

VPI&SU is the state university of Virginia with 20,000 students and almost 5,000 engineering students . . . located in the beautiful mountains of southwestern Virginia. White-water canoeing, skiing, backpacking, and the like are all nearby, as is Washington, D. C. and historic Williamsburg.

Stipends to $8,000 (tax free) plus all fees.

Write to: Dr. H. A. McGee, Jr., Department Head, Chemical Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061, or call collect (703) 961-6631.

West Virginia University



Chemical Engineering

Energy Engineering

- Coal Conversion
- Combustion
- Conversion of Solid Wastes to Low BTU Gas

Environmental Engineering

- Sludge and Emulsion Dewatering
- SO_2 Scrubbing
- River & Lake Modeling
- Economic Impact of Environmental Regulations

Other Topics

- Optimization
- Chemical Kinetics
- Separation Processes
- Surface and Collaid Phenomena
- Polymer Processing
- Fluidization
- Biochemical Engineering
- Transport Phenomena
- Utilization of Ultrasonic Energy
- Electrochemical Engineering

M.S. and Ph.D. Programs

For further information on financial aid write:

Dr. J. D. Henry
Department of Chemical Engineering
West Virginia University
Morgantown, West Virginia 26506

McMASTER UNIVERSITY

Hamilton, Ontario, Canada

M. ENG. & PH.D. PROGRAMS

THE FACULTY AND THEIR INTERESTS

R. B. ANDERSON	Catalysis, Adsorption, Kinetics
M. H. I. BAIRD	Oscillatory Flows, Transport Phenomena
A. BENEDEK	Wastewater Treatment, Novel Separation Techniques
J. L. BRASH	Polymer Chemistry, Use of Polymers in Medicine
C. M. CROWE	Simulation, Optimization, Chemical Reaction Engineering
I. A. FEUERSTEIN	Biological Fluid Flow and Mass Transfer
A. E. HAMIELEC	Polymer Feactor Engineering, Transport Processes
T. W. HOFFMAN	Heat Transfer, Chemical Reaction Engr., Simulation
J. F. MACGREGOR	Statistical Methods in Process Analysis, Computer Control
K. L. MURPHY	Wastewater Treatment, Physicochemical Separations
L. W. SHEMILT	Mass Transfer, Corrosion, Electrochemical Processes
P. A. TAYLOR	Hierarchical Direct Digital Control of Distributed Chemical Processes
J. VLACHOPOULOS	Process Rheology and Processing, Transport Processes
D. R. WOODS	Interfacial Phenomena, Process Engineering
J. D. WRIGHT	Process Simulation and Control, Computer Control
S. VIJAYAN	Interfacial Phenomena, Transport Processes, Emulsions, Surfactants

DETAILS OF FINANCIAL ASSISTANCE AND ANNUAL RESEARCH REPORT AVAILABLE UPON REQUEST

CONTACT: Dr. A. E. Hamielec, Chairman,
Department of Chemical Engineering
Hamilton, Ontario, Canada L8S 4L7

GRADUATE STUDY IN CHEMICAL ENGINEERING AT MICHIGAN STATE UNIVERSITY

The Department of Chemical Engineering of Michigan State University has assistantships and fellowships available for students wishing to pursue advanced study. With one of these appointments it is possible for a graduate student to obtain the M.S. degree in one year and the Ph.D. in two additional years.

ASSISTANTSHIPS: Teaching and research assistantships pay $556 per month to a student studying for the M.S. degree and approximately $600 per month for a Ph.D. candidate. A thesis may be written on the subject covered by the research assistantship. Students must pay resident tuition, but the additional non-resident fee is waived.

FELLOWSHIPS: Available appointments pay to to $8,000 plus tuition and fees.

CURRENT FACULTY AND RESEARCH INTERESTS

D. K. Anderson, Chairman
Ph.D., University of Washington
Transport Phenomena, Biomedical Engineering, Cardiovascular Physiology

C. M. Cooper
Sc.D., Massachusetts Institute of Technology
Thermodynamics and Phase Equilibria, Modeling of Transport Processes

A. L. DeVera
Ph.D., University of Notre Dame
Chemical & Catalytic Reaction Engineering Transport, Properties of Random Heterogeneous Media and Applied Mathematics

E. A. Grulke
Ph.D., Ohio State University
Food Engineering, Polymer Science, Polymer Engineering

M. C. Hawley
Ph.D., Michigan State University
Porous Media Transport, Kinetics, Catalysis, Plasmas, and Reaction Engineering

K. Jayaraman
Ph.D., Princeton University
Process Dynamics and Control, Nonlinear Rheological Models of Polymeric Materials, Nonlinear System Theory

C. A. Petty
Ph.D., University of Florida
Turbulence, Stability and Transport in Fluidized Beds, Separations

B. W. Wilkinson
Ph.D., Ohio State University
Energy Systems and Environmental Control, Nuclear Reactor and Radioisotope Applications

P. E. Wood
Ph.D., California Institute of Technology
Turbulent Transport Phenomenon, Mathematics Modeling, Applied Mathematics and Numerical Methods

For additional information write:
Dr. Donald K. Anderson, Chairman
Department of Chemical Engineering
197 Engineering Building
Michigan State University
East Lansing, Michigan 48824

UNIVERSITY OF MISSOURI - COLUMBIA

DEPARTMENT OF CHEMICAL ENGINEERING

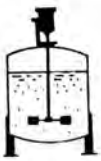
Studies Leading to M.S. and Ph D. Degrees

Research Areas

Air Pollution Monitoring and Control
Biochemical Engineering and Biological Stabilization of Waste Streams
Biomedical Engineering
Catalysis
Energy Sources and Systems
Environmental Control Engineering
Heat and Mass Transport Influence by Fields
Newtonian and Non-Newtonian Fluid Mechanics
Process Control and Modelling of Processes
Single-Cell Protein Research
Themodynamics and Transport Properties of Gases and Liquids
Transport in Biological Systems

WRITE: Dr. George W. Preckshot, Chairman, Department of Chemical Engineering, 1030 Engineering Bldg., University of Missouri, Columbia, MO 65201

UNIVERSITY OF NEBRASKA



OFFERING GRADUATE STUDY AND RESEARCH IN THE AREAS OF:

air pollution
bio-mass conversion
coal tar utilization
energy conversion
kinetics
micro-processor applications and digital control
polymerization
thermodynamics
others

FOR APPLICATION AND INFORMATION ON FINANCIAL ASSISTANCE PLEASE WRITE TO:

Prof. L. C. TAO, Chairman, Department of Chemical Engineering, University of Nebraska, Lincoln, Nebraska 68588

UNIVERSITY OF OTTAWA

CHEMICAL ENGINEERING
OTTAWA, ONTARIO, CANADA
K1N 9B4 — phone (613)231-3476

M.A.Sc. and Ph.D. programs in:

energy storage . . . extraction . . . process control . . . enhanced oil recovery . . . reverse osmosis . . . kinetics and catalysis . . . porous media . . . non-Newtonian flow . . . thermodynamics . . . solar energy . . . experimental design . . . polymer modification . . . pulp & paper . . . phase equilibria

FACULTY

J. A. Golding, Ph.D. (Toronto)
W. Hayduk, Ph.D. (UBC)
V. Hornof, Ph.D. (SFU)
W. Kozicki, Ph.D. (Caltech)
B.C.-Y. Lu, Ph.D. (Toronto)
R. S. Mann, Ph.D. (Hull)
D. D. McLean, Ph.D. (Queens)
G. H. Neale, Ph.D. (Alberta)
S. Sourirajan, Ph.D. (Bombay), D. Eng. (Yale)
F. D. F. Talbot, Ph.D. (Toronto), Chairman who should be contacted for further information.

COME AND JOIN US IN THE EXCITING ENVIRONMENT OF CANADA'S NATIONAL CAPITAL

Princeton University — M.S.E. AND Ph.D. PROGRAMS IN CHEMICAL ENGINEERING

RESEARCH AREAS

Atmospheric Aerosols; Biochemical Engineering; Catalysis; Chemical Reactor/Reaction Engineering; Computer-Aided Design; Energy Conversion and Fusion Reactor Technology; Engineering Physiology; Environmental Studies; Fluid Mechanics and Rheology; Mass and Momentum Transport; Molecular Beams; Polymer Materials Science and Rheology; Process Control and Optimization; Thermodynamics and Phase Equilibria.

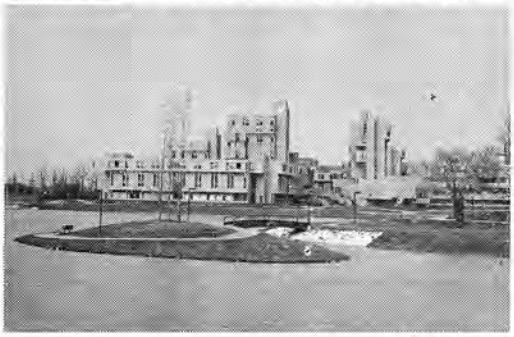
FACULTY

Ronald P. Andres, Robert C. Axtmann, Robert L. Bratzler, Joseph M. Calo, John K. Gillman, Carol K. Hall, Ernest F. Johnson, Morton D. Kostin, Bryce Maxwell, Robert G. Mills, David F. Ollis, Robert K. Prud'homme, Ludwig Rebenfeld, William B. Russel, Dudley A. Saville, William R. Schowalter, Chairman.

WRITE TO
Director of Graduate Studies
Chemical Engineering
Princeton University
Princeton, New Jersey 08540

Chemical Engineering

State University of New York at Buffalo



Academic programs for 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 new 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, make SUNYAB an especially attractive place to pursue graduate studies.

Faculty and Research Interest

D. R. Brutvan — Staged operations
P. Ehrlich — Polymeric materials, polymerization
W. N. Gill — Reverse osmosis, dispersion, fluidization
R. J. Good — Surface phenomena, tertiary oil recovery, adhesion
K. M. Kiser — Fluid mechanics, turbulence
E. Ruckenstein — Catalysis, interfacial phenomena, bioengineering
M. Ryan — Non-Newtonian fluid mechanics, polymer processing
P. Stroeve — Transport, surface science, biomedical engineering
J. J. Ulbrecht — Rheology of dispersed systems, mixing
T. W. Weber — Process control, dynamics of adsorption
S. W. Weller — Catalysis, coal conversion
R. T. Yang — Catalysis, coal conversion, chemical kinetics
D. W. Zabriskie — Biochemical engineering, process dynamics

Further information may be obtained by writing Profess or J. Ulbrecht—Chairman, Department of Chemical Engineering, State University of New York at Buffalo, Amherst, NY 14260.

CHEMICAL ENGINEERING
GRADUATE STUDY IN

SYRACUSE UNIVERSITY

RESEARCH AREAS

Water Renovation
Biomedical Engineering
Membrane Processes
Desalination
Transport Phenomena
Polymer Characterization
Mathematical Modeling
Fluid-Particle Separation

FACULTY

Allen J. Barduhn
George C. Martin
Philip A. Rice
S. Alexander Stern
Gopal Subramanian
Chi Tien
Chiu-Sen Wang

Syracuse University is a private coeducational university located on a 640 acre campus situated among the hills of Central New York State. A broad cultural climate which encourages interest in engineering, science, the social sciences, and the humanities exists at the university. The many diversified activities conducted on the campus provide an ideal environment for the attainment of both specific and general educational goals.

As a part of this medium sized research oriented university, the Department of Chemical Engineering and Materials Science offers graduate education which continually reflects the broadening interest of the faculty in new technological problems confronting society. Research, independent study and the general atmosphere within the Department engender individual stimulation.

FELLOWSHIPS AND GRADUATE ASSISTANTSHIPS AVAILABLE FOR THE ACADEMIC YEAR 1978-1979

For Information:
Contact: Chairman
Department of Chemical Engineering
and Materials Science
Syracuse University
Syracuse, New York 13210

Stipends:
Stipends range from $3,100 to $6,750 with most students receiving at least $4,400 per annum in addition to remitted tuition privileges.

VANDERBILT UNIVERSITY

GRADUATE STUDIES IN CHEMICAL ENGINEERING
M.S. AND Ph.D. DEGREE PROGRAMS

W. Wesley Eckenfelder	Biological and Advanced Waste Water Treatment Processes
Kenneth A. Debelak	Gasification and Liquifaction of coal,, Energy—Environmental Systems, Mathematical Modeling of Chemical Processes.
Thomas M. Godbold	Process Dynamics and Control, Mass Transfer
Thomas R. Harris	Physiological Systems Analysis, Transport Phenomena, Biomedical Engineering, Tracer Analysis
Knowles A. Overholser	Combustion Physics, Biorheology
John A. Roth	Reaction Kinetics and Chemical Reactor Design, Gas Chromatography, Industrial Waste Management and Control
Karl B. Schnelle, Jr.	Air Pollution, Instrumentation and Automatic Control, Dispersion Studies
Robert D. Tanner	Enzyme Kinetics, Fermentation Processes and Kinetics, Pharmacokinetics, Microbial Assays
W. Dennis Threadgill	Unit Operations, Food and Dairy Industry Waste Treatment
FURTHER INFORMATION:	W. Dennis Threadgill, Chairman Chemical Engineering Department Box 1821, Station B, Vanderbilt University Nashville, Tennessee 37235

WASHINGTON STATE UNIVERSITY

Graduate Study in Chemical Engineering
M.S. and Ph.D. Programs

AIR POLLUTION:	Submicron Particulate Collection/High Temperature Catalysis/ Global Monitoring & Meteorological Interaction/Atmospheric Chemistry & Trace Analyses/ Odor Perception/Phytotoxicity
ENERGY:	Combustion & NO_x, SO_x Control/Coal Minerals Recovery/ Petrochemical Substitutes From Coal/Process Development & Design
TRANSPORT PHENOMENA:	Laser-Doppler Velocimetry/Single- & Multi-Phase Flow & Heat Transfer/ Foam Flow
NUCLEAR ENGINEERING:	Radioactive Waste Management/Fuels Reprocessing/LMFBR Technology/ Radiocarbon Dating/Neutron Activation Analyses
POLYMER ENGINEERING:	Electroiniated Polymerization/Polymeric Encapsulation
BIOMEDICAL ENGINEERING:	Biorheology
BIOCHEMICAL ENGINEERING:	Fermentation Kinetics

Several Fellowships, Assistantships and Full-time Summer Appointments Available

Contact: J. A. Brink, Jr., Chairman, Department of Chemical Engineering, Washington State University, Pullman, Wa. 99164/Tel. 509-335-4332.

UNIVERSITY OF WASHINGTON Department of Chemical Engineering BF-10, Seattle, Washington 98195
GRADUATE STUDY BROCHURE AVAILABLE ON REQUEST

WASHINGTON UNIVERSITY

ST. LOUIS, MISSOURI

GRADUATE STUDY IN CHEMICAL ENGINEERING

Washington University is located on a park-like campus at the St. Louis City limit. Its location offers the cultural and recreational opportunities of a major metropolitan area combined with the convenience of a University surrounded by pleasant residential areas with many apartment houses where single and married graduate students can obtain housing at reasonable rates.

The Department of Chemical Engineering occupies a modern building with well-equipped laboratory facilities for research in a large variety of areas. There is close interaction with the research and engineering staffs of major St. Louis chemical companies and also extensive collaboration with the faculty of the Washington University School of Medicine in the biomedical engineering research activities.

PRINCIPAL RESEARCH AREAS

- Biomedical Engineering
- Chemical Reaction Engineering
- Computer-Aided Process Engineering
- Modeling and Simulation
- Polymer Science
- Process Dynamics and Control
- Reinforced Plastics
- Rheology
- Thermodynamics
- Transport Phenomena

For application forms, a catalog, and a brochure which describes faculty research interests, research projects and financial aid write to:

Dr. R. L. Motard, Chairman
Department of Chemical Engineering
Washington University
St. Louis, Missouri 63130

ECOLE POLYTECHNIQUE

AFFILIEE A L'UNIVERSITE DE MONTREAL

GRADUATE STUDY IN CHEMICAL ENGINEERING

Research assistantships are available in the following areas:

- **POLYMER ENGINEERING**
- **RHEOLOGY**
- **RECYCLING OF WASTE MATERIALS**
- **FLUIDISATION**
- **REACTION KINETICS**
- **PROCESS CONTROL AND SIMULATION**
- **INDUSTRIAL POLLUTION CONTROL**

PROFITEZ DE CETTE OCCASION POUR PARFAIRE VOS CONNAISSANCES DU FRANCAIS! VIVE LA DIFFERENCE!*

*Some knowledge of the French language is required.

For information, write to:

M. R. C. Mayer, préposé à l'admission,
Département du Génie Chimique,
Ecole Polytechnique
C.P. 6079, Station A
Montréal H3C 3A7,
CANADA

THE UNIVERSITY OF IOWA

Iowa City

M.S. **Ph.D.**

Research in

Flow through microporous media
Separations using permeation through membranes
Mass transfer operations
Characterization of particulate materials
Materials science
Materials processing
Plasticity
Fracture mechanics

Write: Chairman
Chemical and Materials Engineering
University of Iowa
Iowa City, Iowa 52242

Canada's largest Chemical Engineering Department offers M.A.Sc., Ph.D. and post-doctoral programs in:

- ***Biochemical and Food Engineering**
- ***Environmental and Pollution Control**
- ***Extractive and Process Metallurgy**
- ***Polymer Science and Engineering**
- ***Mathematical Analysis, Control and Statistics**
- ***Transport Phenomena and Kinetics**

with an option in Occupational Health Engineering

Financial Aid: Competitive with any other Canadian University

Academic Staff: E. Rhodes, Ph.D. (Manchester); C. W. Robinson, Ph.D. (Berkeley); I. F. Macdonald, Ph.D. (Wisconsin); T. L. Batke, Ph.D. (Toronto); J J. Byerley, Ph.D. (UBC); K. S. Chang, Ph.D. (Northwestern); F. A. L. Dullien, Ph.D. (UBC); T. Z. Fahidy, Ph.D. (Illinois);R.Y-M. Huang, Ph.D. (Toronto); R. R. Hudgins, Ph.D. (Princeton); K. F. O'Driscoll, Ph.D., (Princeton); D. C. T. Pei, Ph.D. (McGill); P. M. Reilly, Ph.D. (London); A. Rudin, Ph.D. (Northwestern), D.S. Scott, Ph.D. (Illinois); P. L. Silveston, Dr. Ing. (Munich); D. R. Spink, Ph.D. (Iowa State); G. A. Turner, Ph.D. (Manchester); B. M. E. van der Hoff, Ir. (Delft); M. Moo-Young, Ph.D. (London); L. E. Bodnar, Ph.D. (McMaster); C. M. Burns, Ph.D. (Polytechnic Inst., Brooklyn); K. Enns, Ph.D. (Toronto); J. D. Ford, Ph.D. (Toronto); C. E. Gall, Ph.D. (Minn.); G. S. Mueller, Ph.D. (Manchester); G. L. Rempel, Ph.D. (UBC); J. R. Wynnyckyji, Ph.D. (Toronto); J. M. Scharer, Ph.D. (Pennsylvania).

To apply, contact:

The Associate Chairman (Graduate Studies)
Department of Chemical Engineering
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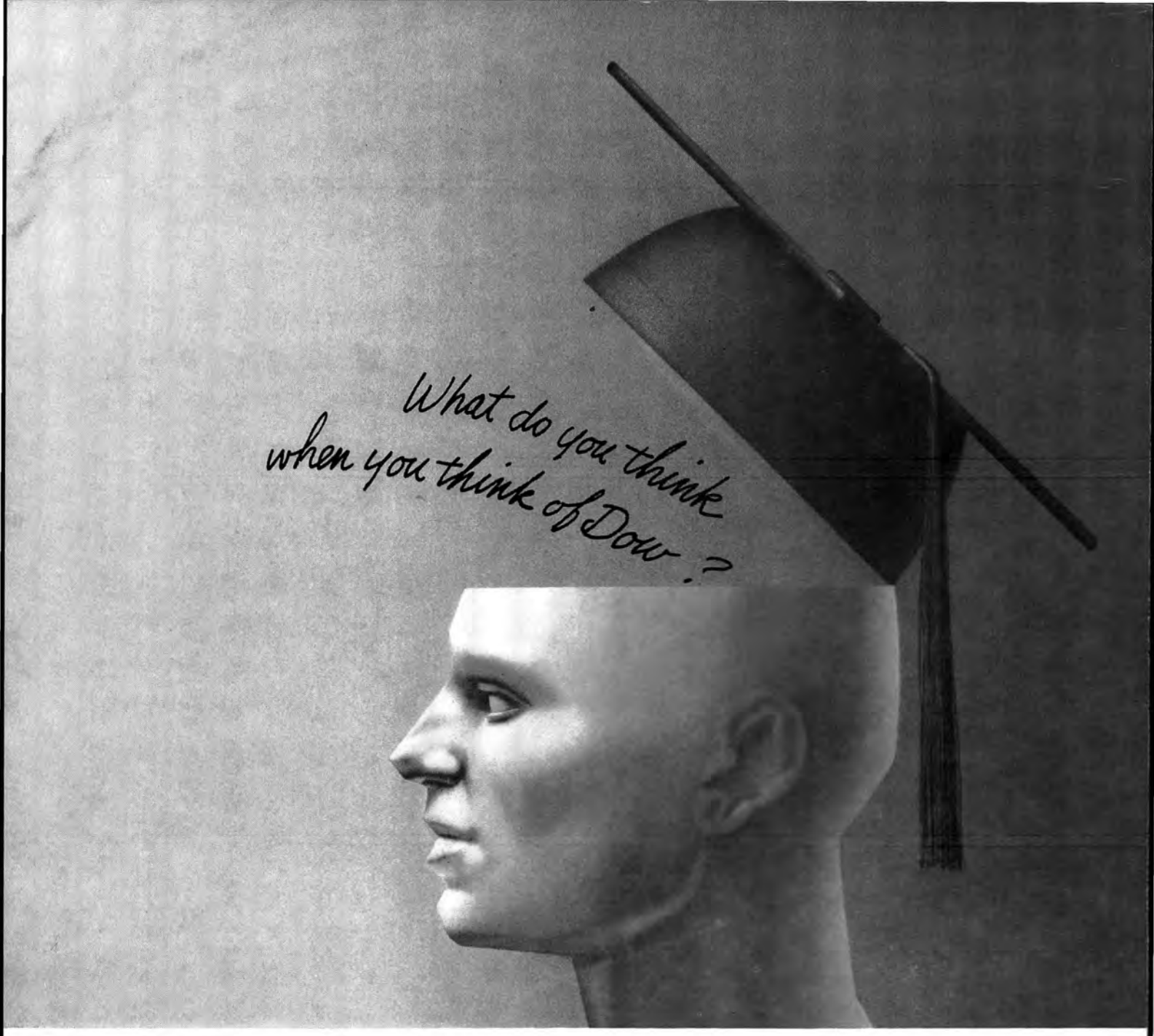

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