CHEMICAL ENGINEERING
Graduate Programs

AREAS OF SPECIALIZATION

Energy Engineering, Environmental Engineering, Biochemical Engineering, Advanced Computations, Process Systems Engineering, Catalysis, and Materials Engineering

DEGREES OFFERED

Master of Science in Chemical Engineering

The Master of Science in Chemical Engineering is available with either a thesis or non-thesis option.

- The thesis option is composed of 24 credit hours of formal coursework and a six-credit thesis. Students in this program must pass a final examination consisting of a comprehensive oral examination.
- The non-thesis option is composed of 36 credit hours of formal coursework and a comprehensive examination.

Regardless of their program option, all chemical engineering MS students must complete the chemical engineering graduate core program—CHE 7110 Mathematical Methods in ChE, CHE 7120 ChE Thermodynamics, CHE 7130 Fundamentals of Heat and Mass Transport, CHE 7140 Chemical Reactor Design Methods, or equivalents.

PhD in Chemical Engineering

The Doctor of Philosophy in Chemical Engineering requires 24 hours of credit in dissertation research and a minimum of 30 hours of credit at the graduate level. A minimum of 18 hours of credit in chemical engineering courses at the 7000 level or above are required, exclusive of any type of independent studies credit, except for special project credit earned. The remaining 12 hours of coursework can include graduate-level courses in any department and may constitute a formal minor or an informal collection of courses of interest. Completion of the chemical engineering graduate core program—CHE 7110 Mathematical Methods in ChE, CHE 7120 ChE Thermodynamics, CHE 7130 Fundamentals of Heat and Mass Transport, CHE 7140 Chemical Reactor Design Methods, or equivalents—is required.

NOTE: Full-time graduate students holding a research or teaching assistantship are expected to register and complete at least 12 credit hours of graduate coursework during the fall and spring semesters and nine credit hours of graduate coursework during the summer term.

GRADUATE ADVISORS

Mike Benton, PhD
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FACULTY RESEARCH AREAS

Christopher Arges
carges@lsu.edu—advanced materials for electrochemical processes used in the water-energy nexus, integration of electrochemical processes, water treatment and energy storage and conversion.

Mike Benton
benton@lsu.edu—the role of DNA damage response in cancer prevention, biosensors for the enhanced detection of carcinogens, metabolic engineering of yeast for increased ethanol production.

Bhuvnesh Barti
bbharti@lsu.edu—energy, environmental, advanced computations, nanoscience, colloids and surface science, soft matter and complex fluids.

Kunlun Ding
kunlunding@lsu.edu—catalysis, materials chemistry, spectroscopy.

Kerry Dooley
dooley@lsu.edu—energy, supported acids and mixed metal oxides, synthesis/characterization, rare earth oxide catalysts and energetic material/catalyst composite materials, hydrogenation/dehydrogenation.

James Dorman
jamesdorman@lsu.edu—energy, environmental, catalysis, nanostructure synthesis, charge recombination kinetics (light-emitting diodes, photocatalysis), defect engineering in metal oxides (supercapacitors), semiconductor engineering (photovoltaics), hybrid solar cells.

John Flake
johnflake@lsu.edu—energy, catalysis, electrochemical processes and materials, electrocatalysts for CO2 reduction and materials for lithium batteries.

Gregory Griffin
griffin@lsu.edu—energy, catalysis, preparing improved electrodes for electrochemical conversion of CO2 into usable fuels and chemicals, colloidal and electrochemical methods for preparing nanoparticle electrodes.

Jimmy Lawrence
jimmylawrence@lsu.edu—energy, environmental, advanced computations, functional polymers and nanomaterials, nano mesoscale assemblies, stimuli responsive-adaptive materials, continuous/scale-up preparation of high-performance and advanced materials.

Kevin McPeak
kmcpeak@lsu.edu—environmental, catalysis, photocatalysis, plasmonic materials, nanoscale chirality.

Adam Melvin
melvin@lsu.edu—environmental biochemical, multidisciplinary approach in the development and implementation of new technologies and methods to assess biological phenomena using engineering principles-peptide biosensor development, microfluidics, single cell analysis and tracking, quantifications of ubiquitin-proteasome kinetics, algal growth and migration dynamics, environmental chemodynamics.

Krishnaswamy Nandakumar
nandakumar@lsu.edu—focus on the development and use of advanced multiphase, multiscale, multiphysics computational models for application in energy, environmental, and chemical manufacturing processes; using DNS and DPM framework to study fundamental problems of spontaneous pattern formation and dynamics of fluid-particle suspensions, driven cavity problem of granular flows, suspension dynamics, and multiphase coalescers.

Craig Plaisance
plaisance@lsu.edu—energy, advanced computations, catalysis, computational investigation of the potential for overcoming the challenges of electrocatalytic CO2 reduction by synergistically combining organocatalysts and catalytic transition metal sulfide surfaces.

Jose Romagnoli
jose@lsu.edu—advanced computations, process systems engineering, advanced multi-scale modeling architectures for complex processes, advanced multiresolution image analysis and characterization techniques, design and synthesis with economic-environmental-operability considerations, intelligent data processing, reconciliation, monitoring, advanced process control, enterprise-wide optimization.

Bill Shelton
wshelton@lsu.edu—energy, advanced computations, catalysis, alloy theory, chemistry-surface science.

Jerry Spivey
jjspivey@lsu.edu—energy, catalytic conversion of syngas into clean fuels, fuel processing, C1 catalysis-methane conversion, biomass-derived syngas to higher hydrocarbons and oxygenates, fuel reforming.

K.T. Valsaraj
valsaraj@lsu.edu—transformations of pollutants on atmospheric aerosols (fog, ice, snow, rain), mercury sequestration in sediments, studies on chemical dispersant design for sub-sea oil/gas spill.

Judy Wornat
mjwornat@lsu.edu—energy; high-temperature fuel-conversion processes such as pyrolysis and combustion; formation of environmental pollutants such as polycydic aromatic hydrocarbons and soot; gas-phase, heterogeneous, and supercritical-phase reactions; analytical techniques for the compositional determination of complex organic mixtures.

Ye Xu
yexu@lsu.edu—energy; advanced computations; theoretical and computational investigation of surface chemical thermodynamics, kinetics, and reaction mechanisms; computational heterogeneous catalysis and electrocatalysis; rational design of catalytic materials; energy conversion and storage.