



MECHANICAL ENGINEERING

Graduate Programs

STRATEGIC RESEARCH AREAS

Application Areas: Energy, Manufacturing, Biotechnology

Technical Areas: Thermal Fluids and Transport Phenomena, Solid and Structural Mechanics, Advanced Materials Science and Engineering, Nano-and Micro-scale Engineering, Robotics and Intelligent Systems, Clean and Renewable Energy Technology

DEGREES OFFERED

The Master of Science in Mechanical Engineering (MSME)

program offers both thesis and non-thesis options. The thesis option requires a minimum of 24 hours of approved coursework, six hours of thesis research, and submission of a thesis defended in a final examination. The non-thesis option requires a minimum of 30 hours of approved coursework and a six credit-hour project for a master report, which needs to be defended in a final examination.

The Accelerated Master of Science in Mechanical Engineering (ASME)

can be pursued by LSU juniors with a minimum GPA of 3.5 who are working towards a BSME. While the non-thesis option is open to all eligible students, the thesis option is reserved for exceptional students invited by the department after having completed a prescribed portion of the BSME coursework. The requirements are the same as for the regular MSME, and the program is structured so that completion of this degree is possible one year after receiving the BSME.

The PhD in Mechanical Engineering (PME)

requires candidates to conduct research with original outcomes and produce a dissertation with creative scholarship. Candidates must complete 18 hours of dissertation research. Candidates must also complete 36 hours of approved coursework directly from a Bachelor of Science degree or at least 18 hours of approved coursework from a Master of Science degree. The program also requires passing a qualifying examination, a general examination (dissertation proposal), and a final examination (dissertation defense).

Full-time graduate students register for a one-credit-hour class every semester, the Dr. Robert "Bob" W. Courter Graduate Seminar Series lectures.

GRADUATE DIRECTOR

Ingmar Schoegl
Assoc. Professor
ischoegl@lsu.edu
225-578-4332

GRADUATE COORDINATOR

Elise Bridgewater
gradmie@lsu.edu
225-578-5828

FACULTY RESEARCH AREAS

Corina Barbalata

cbarbalata@lsu.edu - marine robotic systems, autonomous mobile manipulation, cooperative robotics, multi-body control and planning theory, underwater perception systems and algorithms

Tryfon T. Charalampopoulos

mechar@lsu.edu — combustion, heat and mass transfer, aerosol dynamics, optical diagnostics, combustion synthesis of materials

Marcio De Queiroz

mdeque1@lsu.edu — dynamic systems and control; non-linear control systems and their stability applications to robotic, biological/biomedical, and aerospace systems

Ram Devireddy

rdevir1@lsu.edu — heat and mass transport in biological systems, stem cell differentiation, next-generation sequencing, tissue engineering and 3D bioprinting

Manas R. Gartia

mgartia@lsu.edu — molecular biophotonics, label-free sensor development, cancer biology, lipidomics

Hunter B. Gilbert

hbgilbert@lsu.edu — robotics and autonomous systems, medical devices, flexible and soft robots, dynamic systems and control, instrumentation

Keith A. Gonthier

kgonth1@lsu.edu — multi-physics, multi-scale computation, energetic materials, reactive solids, multi-phase and high-speed flows

Shengmin Guo

sguo2@lsu.edu — advanced manufacturing, additive manufacturing, plasma spray coatings, gas turbine aerodynamics and heat transfer, materials synthesis and processing

Robert Herbert

rherbert@lsu.edu — biomedical devices, implantable and wearable soft electronics, cardiovascular sensors, soft robotics, multifunctional elastomers, printing and additive manufacturing, in-space applications

Michael M. Khonsari

khonsari@lsu.edu — tribology (friction, lubrication, and wear), fatigue and fracture, machinery performance analysis, heat transfer

Guoqiang Li

lguoqi1@lsu.edu — multifunctional polymers and polymer composites, mechanical and functional metamaterials, constitutive modeling, machine learning, additive manufacturing

Christopher Marvel

cmarvel@lsu.edu — ceramic sintering, thermal spray, high energy ball milling, grain boundaries, microstructure characterization, atomic-resolution electron microscopy, grain growth simulations

Wen Jin Meng

wmeng1@lsu.edu — nanostructured thin films and coatings, plasma-assisted vapor deposition, micro/nanofabrication, plasticity, failure and functionality across length and time scales, advanced materials characterization

Shyam Menon

smenon@lsu.edu — multiphase flows, compressible high-speed flows, combustion, propulsion and power generation, low-carbon and zero-carbon fuels, laser diagnostics, emissions, reacting flow simulations

Dorel Moldovan

dmoldo1@lsu.edu — atomistic and mesoscale modeling and simulation of materials (interfacial materials, thin films, membranes, biomolecules confined in nanoscale systems)

Dimitris E. Nikitopoulos

medimi@lsu.edu — experimental and numerical fluid dynamics and transport, flow control, multiphase flows, multiscale phenomena, microfluidics, gas turbine cooling, microfabrication

Ope Owoyele

oowoeyele@lsu.edu — computational fluid dynamics, turbulent combustion, scientific machine learning, reduced-order modeling and digital twinning, high performance computing (HPC)

Geneviève Palardy

gpalardy@lsu.edu — composite thermoplastic materials, manufacturing, characterization and joining of composites, repair and recycling mechanisms, additive manufacturing of composites

Sunggook Park

sunggook@lsu.edu — nanofabrication technology and applications, nanoimprint lithography, bioMEMS/NEMS, bioengineering, polymer photonic devices, liquid crystal displays, surface coatings

Ingmar Schoegl

ischoegl@lsu.edu — combustion theory and applications, optical diagnostics, computational modeling, mechatronics and instrumentation

Adrian Stein

astein@lsu.edu — precision motion control, uncertainty quantification, optimal control, additive manufacturing

Kshitiz Upadhyay

kshitizu@lsu.edu — mechanics of soft materials, constitutive modeling, high strain rate mechanical characterization, scientific machine learning, tissue biomechanics, traumatic brain injury

Warren N. Waggenspack

mewagg@lsu.edu — computer-aided geometric design, mechanical design, computer graphics, biomedical engineering

Muhammad A. Wahab

mwahab1@lsu.edu — fatigue and fracture mechanics, composite materials, computational weld mechanics, structural stability, stress analysis

Ying Wang

ywang@lsu.edu — new materials for energy and environmental cleaning, advanced battery technologies, photovoltaics, photo- and electrocatalysis, nanomaterials synthesis and characterizations, atomic layer deposition

Harris Wong

hwong@lsu.edu — solid thin films, micro and nano liquid films and threads, two-phase flow and heat transfer in microchannels, dynamic surface tension

RESEARCH CENTERS AND RESOURCES

Center for Rotating Machinery (CeRoM)

M. M. Khonsari, Director

Center for Transformative Innovation in Energy Research (TIER)

S. Guo, Director

NIH Resource Center (P41): Center for Bio-Modular Multiscale Systems (CBMM)

S. Park, Lead LSU PI.

NSF CREST: Next Generation Multifunctional Composites Center

G. Li LSU Lead PI.

Consortium for Innovation in Manufacturing and Materials (CIMM)

W. J. Meng, Lead PI.

Consortium for Innovation in Structural Integrity Assurance (CISIA)

M. M. Khonsari, Technical Director

MIE Advanced Manufacturing and Machining Facility (AMMF)

R. Green, Manager.

MIE Materials Manufacturing Testing and Evaluation (MMTEF)

M. Brennan, Manager.

LSU Shared Instrumentation Facility (SIF)

D. Cao, Director