



THE UNIVERSITY OF ARIZONA
COLLEGE OF ENGINEERING

Aerospace &
Mechanical Engineering

MECHANICAL ENGINEERING GRADUATE PROGRAMS

Making the machines that move our world



\$9.2 MILLION

in annual research expenditures

RESEARCH FOCUS AREAS

- Dynamics and Control
- Fluid Dynamics
- Solid Mechanics
- Thermosciences

DEGREES

- PhD Mechanical Engineering
- MS Mechanical Engineering
(online option)
- Accelerated Master's Program (AMP)



“ The skills I developed equipped me for success in industry and academia. Through the Accelerated Master's Program, I got an early start building meaningful connections and gaining valuable experience. ”

- Isaac Pimienta, master's student, class of 2025

HIGH-TECH LABS AND FACILITIES



FUNDING

Nearly all students in the program are completely funded, including tuition and stipends.

APPLICATION DEADLINES

- Fall: January 1
- Spring: June 1

CONTACTS

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“The program prepares students to address complex engineering challenges in mechanical systems, energy technologies, design and manufacturing, and advanced materials. They work closely with world-renowned faculty mentors to advance the discipline.”

- Farzad Mashayek, department head

Faculty Expertise

Majid Beidaghi – beidaghi@arizona.edu

discovery and synthesis of advanced functional materials • energy storage materials and devices (batteries and supercapacitors) • synthesis and characterization of MXenes and other 2D materials • advanced manufacturing of energy storage devices, sensors, and membranes

Eric A. Butcher – ebutcher@arizona.edu

spacecraft GNC • astrodynamics • nonlinear dynamics, vibration and control • stability, control and estimation in periodic, delayed and fractional systems

Cho Lik Chan – cholik@arizona.edu

heat transfer • materials processing • boundary elements methods

Stuart A. Craig – sacraig@arizona.edu

aerodynamics • stability and laminar turbulent transition of supersonic and hypersonic boundary layers • experimental fluid mechanics • hydrodynamic stability

Eniko T. Enikov – enikov@arizona.edu

dynamics of charged particles and macro-ions • control of processes driven by electrostatic forces • neural-network-based self-learning methods for control of human-machine interfaces

Hermann Fasel – faselh@arizona.edu

computational fluid dynamics • hydrodynamic stability • laminar turbulent transition • turbulent flows • hypersonic flows • flow control • nonlinear dynamics • aerodynamics • UAVs • flight experiments • autonomous flight

David Hahn – dwhahn@arizona.edu

thermal sciences • laser-based diagnostics • renewable energy • combustion • biophotonics • laser-material interactions • plasma-material interactions

Qing Hao – qinghao@arizona.edu

heat transport inside lithium-ion batteries • high-power electronics • thermal insulation materials • thermoelectrics • measurement & applications of graphene and other two-dimensional materials

Jeffrey W. Jacobs – jwjacobs@arizona.edu

experimental fluid dynamics • hydrodynamic instabilities, including Richtmyer Meshkov and Rayleigh-Taylor instabilities • turbulent mixing

Daniel Larsson – dlarsson@arizona.edu

autonomy • decision-making under uncertainty • path-planning • information-limited control • information-theoretic abstraction • representations for autonomous systems • artificial intelligence • optimization, inference and estimation

Peiwen 'Perry' Li – peiwen@arizona.edu

renewable energy • heat mass transfer in gas turbines and HVACR systems • electrolyzers • energy-water nexus • fuel cells • hydrogen storage and generation • energy and power systems

Erdogan Madenci – madenci@arizona.edu

prediction of deformation and failure modes in metallic and composite materials • characterization of mechanical properties of materials

Farzad Mashayek – mashayek@arizona.edu

turbulent reacting flow • plasma flow • electrostatic atomization • solid ion batteries • computational methods • machine learning applications

Samy Missoum – smissoum@arizona.edu

design optimization • probabilistic design • reliability assessment • vibrations • advanced finite element modeling

Bernard Parent – bparent@arizona.edu

reactive flows • re-entry flows • plasma-assisted combustion • plasma-based fuel reforming • plasma aerodynamics • computational fluid dynamics • scramjets • lightning

Hossein Rastgoftar – hrastgoftar@arizona.edu

decision-making under uncertainty • human-robotic interaction • swarm robotics • system autonomy • UAS traffic management • intelligent transportation • formal specification and verification • finite-state abstraction of dynamical systems

Sergey Shkarayev – svs@arizona.edu

aerodynamics • fluid-structure interactions • unmanned aerial vehicles

Jekan Thanga – jekan@arizona.edu

space robotics • CubeSats and sensor-networks • machine learning applied to dynamics and control of swarms • small satellite propulsion • autonomous systems • power and thermal systems

James Threadgill – jthreadgill@arizona.edu

supersonic and hypersonics related to high-speed airflow • shock waves and boundary layer effects • heat transfer

Xiaoyi Wu – xwu@arizona.edu

tissue engineering • biomechanics • biomaterials and computational biomaterials

Israel Wygnanski – wygy@arizona.edu

aerodynamics related to fixed-wing and rotary aircraft • control of separation • high-lift devices • drag reduction • aeroacoustics, particularly jet noise, cavity noise and screech

Vitaliy Yurkiv – vyurkiv@arizona.edu

multi-physics modeling and machine learning calculation of energy storage and conversion technologies • ab-initio density functional theory calculations • phase-field modeling • thermal measurements of rechargeable batteries • thermal runaway assessment in electric vehicles

Olesya Zhupanska – oiz@arizona.edu

micromechanics of composites • structural composites in extreme environments • low velocity impact of composites • PDE-constrained optimization with applications to mechanics • contact mechanics

Yitshak Zohar – zohar@arizona.edu

biomicrofluidics and microscale manipulation of biospecies, such as proteins, cells and tissues in microfluid systems