

Mechanics of MEMS

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This course explores fundamental phenomena that emerge at the nano to micrometer scale, with applications to MEMS/NEMS, their materials, fabrication, actuation, and dynamics. At these small scales, system behavior can be strongly influenced by characteristic dimensions - whether the size of a MEMS/NEMS device, the separation between neighboring entities, or the characteristic length scales associated with a material's microstructure.

These scale-dependent phenomena are shared across a broad range of micro and nanoscale systems, spanning nanotechnology, neuroscience, and cell biology. The concepts developed in this course will provide a foundation for designing microsystems while also offering insights into a wide range of phenomena commonly encountered in living systems.

- MEMS/NEMS materials and fabrication
- Scaling laws: electrostatics, magnetics, fluidics
- Thin films for MEMS/NEMS
- Stability of MEMS
- Dynamics of MEMS/NEMS
- MEMS for Neuroscience

