

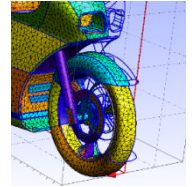
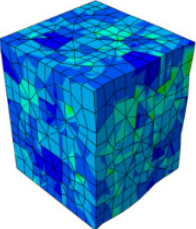
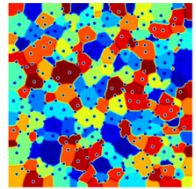
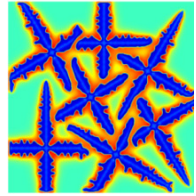
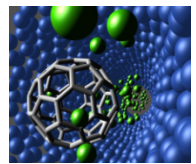
Integrated computational materials engineering (ICME) is an emerging discipline that aims to integrate computational materials science tools into a holistic system that can accelerate materials development, transform the engineering design optimization process, and unify design and manufacturing. ICME will provide significant economic benefit and accelerate innovation in the engineering of materials and manufactured products (National Academy of Sciences Press).

The primary objective of MS&E 301 ICME course is to introduce different computational tools for studying materials at different length scales. Several atomistic, mesoscale and continuum models will be introduced and bridging between different modeling scales will be discussed. The course has five main sections (in the below), and in each section examples of model development process for different applications will be studied:

- Atomistic simulation
- Molecular dynamics
- Dislocation dynamics
- Phase field modeling
- Continuum based models (mainly based on finite element analysis-FEA)

This course is recommended for senior undergraduate and graduate students.

Prerequisite: either Differential Equations or Calc III is required; Differential Equations is recommended.



### Multiscale Modeling

