



# Advanced Thermodynamics II

## CBE 8809

**Credit Hours:**

3.00 - 3.00

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**Course Levels:**

Graduate (5000-8000 level)

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**Course Components:**

Lecture

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**Course Description:**

Continuation of CBE 8808 and special topics of thermodynamics that are of interest to chemical and biomolecular engineering.

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**Prerequisites and Co-requisites:**

Prereq: 8808 or 808, and Grad standing; or permission of instructor.

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**Course Goals / Objectives:**

- For those who wish to understand thermodynamic phenomena at a molecular level
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**Course Topics:**

- Classical Picture (a) Master equation (b) Detailed balance (c) Zeldovich factor
  - Nucleation as a fluctuation in order parameter space (a) Langevin equation (b) Fokker-Planck equation (c) Steady-state solution
  - Thermodynamics of nucleation (a) Thermodynamics of interfaces (b) Classical approximation (c) Tolman-Koenig correction (d) Replacement partition function
  - Molecular theory of nucleation (a) Calculus of functional (b) Theory of liquids (c) Density functional theory (d) Simulation
  - Phenomenological approach (a) Scaling and universality
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**Designation:**

Elective