

## Material for Week 12

Physics 4488/6562: Statistical Mechanics

<http://www.physics.cornell.edu/sethna/teaching/562/>

Exercises due Mon. May 03

Last correction at January 7, 2021, 2:44 pm

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For Wednesday's in-class question [11.1](#), print out or trace the van der Waals P-V plot.

### Monday

In-class question: [10.16](#) *Harmonic fluctuation-dissipation*

### Wednesday

Read: Chapter 11, Sec. 11.1 (Stable and metastable phases) and 11.2 (Maxwell construction)

Pre-class question: [11.11](#) *Unstable to what?*

In-class question: [11.1](#) *Maxwell and van der Waals*

### Friday

Read: Chapter 11, Sec. 11.3 (Nucleation: critical droplet theory), and 11.4.1 (Coarsening)

Pre-class question: [11.12](#) *Nucleation in 2D*

In-class question: [11.6](#) *Coarsening in the Ising model*

### Monday

Read: Chapter 11, Sec. 11.4 (Morphology of abrupt transitions)

Pre-class question: [11.8](#) *Minimizing sequences and microstructure*

### Exercises for everyone (4488 and 6562)

[11.13](#) *Linear stability of a growing interface.*

[11.5](#) *Nucleation of dislocation pairs.*

### Exercises for Graduate Course (6562 only)

[10.7](#) *Noise and Langevin equations.*

[11.14](#) *Nucleation of cracks.*

[11.15](#) *Elastic theory does not converge.* Completely optional: for an extra challenge