

Material for Week 5

Physics 4488/6562: Statistical Mechanics

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

Exercises due Wed. Feb 26

Last correction at March 12, 2020, 4:49 pm

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Have a great February break next Monday.

All exercises are from Version 2.0 of the text: <http://pages.physics.cornell.edu/~sethna/StatMech/v2EntropyOrderParametersComplexity.pdf>

Monday

In-class question: [5.13](#) *How many shuffles?*

Wednesday

Read: Chapter 5, Sec. 5.3.2 (Information entropy)

Pre-class question: [5.20](#) *Gravity and entropy*

In-class question: [5.10](#) *Entropy increases: diffusion*

In-class question: [5.15](#) *Shannon entropy*

Friday

Read: Chapter 6, Sec. 6.1 (Canonical Ensemble), 6.2 (Uncoupled Systems), and 6.3 (Grand canonical ensemble)

Pre-class question: [5.14](#) *Information entropy*

In-class question: [6.18](#) *Langevin dynamics*

In-class question: [5.15](#) *Shannon entropy*

Wednesday

Read: Chapter 6, Sec. (6.4) (What is thermodynamics?) and (6.5) (Mechanics: friction and fluctuations)

Pre-class question: [6.16](#) *Rubber band free energy*

Exercises

Everyone (4488 and 6562)

[5.21](#) *Data compression.*

[5.24](#) *Nucleosynthesis and the arrow of time.*

Graduate (6562 only)

[5.7](#) *Does entropy increase?*

[5.26](#) *Phase conjugate mirror.*