

**VIII. Modified Class Schedule:** Readings serve as background and sources for a given lecture topic, and should be completed by the date on which they appear. For multiple readings on a given day, try to read through at least one. This schedule may need to be modified over the course of the semester.

1	<b>Mon 1/22.</b> <i>Heat Engines and the 2nd Law</i> Background: [RF17] Chap 3	<b>Weds 1/24.</b> <i>Heat Engines and 2nd Law, cont.</i> [Lem13] pp 1-7; [RF17] Chap 4
2	<b>1/29.</b> <i>Thermodynamic Entropy</i> [Lem13] pp. 7-19; [RF17] Chap 5	<b>1/31.</b> <i>Thermodynamic Entropy, cont.</i> <b>Sample research topics; hw1 due</b>
3	<b>2/5.</b> <i>Maxwell's Demon</i> [EN98] pp. 435-464	<b>2/7.</b> <i>Maxwell's Demon, cont.</i> <b>Sources for history &amp; philosophy of physics</b>
4	<b>2/12.</b> <i>Statistical Mechanics: Boltzmann Entropy.</i> [Lem13] Chap 2; [Gol01]	<b>2/14.</b> <i>Stat Mech: Gibbs Entropy.</i> [Lem13] Chap 5; [FW19]. <b>Paper guidelines; hw2 due</b>
5	<b>2/19. No Class (Presidents' Day)</b>	<b>2/21.</b> <i>Gibbs Entropy, cont.</i> <b>How to construct an abstract and outline</b>
6	<b>2/26.</b> <i>Classical Info Theory: Shannon Entropy.</i> [Timp04]; [Lem13] Chap 8	<b>2/28.</b> <i>Shannon Entropy, cont.</i> <b>Citation methods; hw3 due</b>
7	<b>3/4.</b> <i>Information and Maxwell's Demon</i> [EN99] pp. 1-20. <b>Research topic due</b>	<b>3/6.</b> <i>Info and Maxwell's Demon, cont.</i> [Bub01]; [Ben87]. <b>Midterm handed out</b>
8	<b>3/11.</b> <i>Quantum Mechanics: Basics</i> [RP11] pp. 1-16. <b>Midterm due</b>	<b>3/13.</b> <i>Quantum Mechanics: Basics, cont.</i> <b>hw4 due</b>
9	<b>3/18. Spring Break</b>	<b>3/20. Spring Break</b>
10	<b>3/25.</b> <i>Density Operators and Mixed States</i> [RP11] pp. 205-214.	<b>3/27.</b> <i>Quantum Entanglement</i> [RP11] pp. 31-41.
11	<b>4/1.</b> <i>Entanglement Correlations</i>	<b>4/3.</b> <i>Von Neumann Entropy</i> [RP11] p. 216-217. <b>First draft due; hw5 due</b>
12	<b>4/8.</b> <i>Von Neumann Entropy as TD Entropy.</i> [Pru20]	<b>4/10.</b> <i>Black Hole Thermodynamics</i> [Wal18].
13	<b>4/15.</b> <i>Black Hole Thermodynamics, cont.</i>	<b>4/17.</b> <i>Black Hole Entropy as TD Entropy</i> [PT19]. <b>hw6 due</b>
14	<b>4/22.</b> <i>Black Hole Entropy as TD Entropy, cont.</i>	<b>4/24.</b> <i>Black Hole Entropy as Entanglement Entropy.</i> [An22].
15	<b>4/29.</b> <i>The Black Hole Information Loss Paradox.</i> [Wal20].	<b>5/1.</b> <i>The Black Hole Info Loss Paradox, cont.</i> <b>Revision due</b>
15	<b>5/6.</b> <i>Overflow/Review</i> <b>hw7 due; Final handed out (due 5/10)</b>	