

Required reading list. When a chapter is indicated, it refers to a chapter in the class textbook “Black holes and time warps: Einstein’s outrageous legacy” by Kip Thorne. For a given date (e.g., Feb 1), you are to have read the material before that class; an exception is for the Jan 25 class, where no report on that reading is needed as it was the first class.

1. Jan 25: Introduction, and ancient conceptions  
[http://en.wikipedia.org/wiki/Aristotelian\\_physics](http://en.wikipedia.org/wiki/Aristotelian_physics)
2. Feb 1: The Renaissance and the scientific revolution  
<http://www.answers.com/topic/scientific-revolution>
3. Feb 8: Galileo and Kepler: breaking away from the ancients  
[http://en.wikipedia.org/wiki/Galileo\\_Galilei](http://en.wikipedia.org/wiki/Galileo_Galilei) and  
[http://en.wikipedia.org/wiki/Johannes\\_Kepler](http://en.wikipedia.org/wiki/Johannes_Kepler) and  
[http://en.wikipedia.org/wiki/Scientific\\_method](http://en.wikipedia.org/wiki/Scientific_method)
4. Feb 15: Newton and the concept of mathematical modeling of physics  
[http://en.wikipedia.org/wiki/Isaac\\_Newton](http://en.wikipedia.org/wiki/Isaac_Newton) and  
[http://en.wikipedia.org/wiki/Mathematical\\_model](http://en.wikipedia.org/wiki/Mathematical_model)
5. Feb 22: Between Newton and Einstein  
[http://en.wikipedia.org/wiki/John\\_Michell](http://en.wikipedia.org/wiki/John_Michell) and  
[http://en.wikipedia.org/wiki/Discovery\\_of\\_Neptune](http://en.wikipedia.org/wiki/Discovery_of_Neptune) and  
[http://en.wikipedia.org/wiki/James\\_Clerk\\_Maxwell](http://en.wikipedia.org/wiki/James_Clerk_Maxwell)
6. Mar 1: Special relativity: the union of space and time  
[http://en.wikipedia.org/wiki/Special\\_relativity](http://en.wikipedia.org/wiki/Special_relativity) and  
[http://en.wikipedia.org/wiki/Thought\\_experiment](http://en.wikipedia.org/wiki/Thought_experiment) and  
Chapter 1
7. Mar 8: Midterm; no extra reading
8. Mar 22: General relativity and its tests  
[http://en.wikipedia.org/wiki/General\\_relativity](http://en.wikipedia.org/wiki/General_relativity) and  
Chapter 2
9. Mar 29: Implications and rejection: black holes and the expanding universe  
<http://skyserver.sdss.org/dr1/en/astro/universe/universe.asp> and  
<http://cosmology.berkeley.edu/Education/BHfaq.html> and  
Chapter 3

10. Apr 5: Do black holes exist? Observations of black holes; how can we rule out alternatives?  
[http://en.wikipedia.org/wiki/White\\_dwarf](http://en.wikipedia.org/wiki/White_dwarf) and  
<http://www.astro.umd.edu/~miller/nstar.html> and  
Chapters 4, 5, and 6
11. Apr 12: The mathematical golden age: acceptance, proofs, and evaporation  
[http://en.allexperts.com/e/n/no/no\\_hair\\_theorem.htm](http://en.allexperts.com/e/n/no/no_hair_theorem.htm) and  
[http://en.wikipedia.org/wiki/Hawking\\_radiation](http://en.wikipedia.org/wiki/Hawking_radiation) and  
Chapters 7 and 12
12. Apr 19: The influence of black holes on their surroundings  
<http://mcdonaldobservatory.org/news/releases/2009/0202.html> and  
Chapters 8 and 9
13. Apr 26: Gravitational waves  
[http://en.wikipedia.org/wiki/Gravitational\\_wave](http://en.wikipedia.org/wiki/Gravitational_wave) and  
Chapter 10
14. May 3: The far-out future: wormholes and time machines  
<http://en.wikipedia.org/wiki/Wormhole> and  
[http://en.wikipedia.org/wiki/Time\\_travel](http://en.wikipedia.org/wiki/Time_travel) and  
Chapters 13 and 14
15. May 10: Presentation of term projects; no extra reading
16. May 17, 1:30-3:30 PM: final exam; no extra reading