Comparison between Version 18.0 (2023) and Version 18.1 (2024) of "Fundamentals of Physics" Volume II

Chapter	Comments
Part A – Forces	
1. Mass and gravitational force	Clarified the difference between physical and conceptual models. Somewhat long (21 pages)
2. Charge and electric force	* I added a note specifying how this chapter is focused on identifying a model that explains the attract, not why particles would be transferred by rubbing. Readers are referred to the next chapter for that explanation. The two FAQ's on that were moved to the next chapter. * The FAQ on why electrons don't fall into the nucleus is moved to the next chapter. * Two FAQ's on torque vs. force were combined. * Revised the explanation for two dipoles and the resulting orientation. Combined the two figures illustrating the second case. * Minor rewording. Long (25 pages)
3. Nucleons and nuclear force	* Added information in first section for why electrons are more likely to transfer than protons, and also why electrons would transfer by rubbing. * Added a note that charge is conserved during decay. Added FAQ from previous chapter about why electrons don't fall into the nucleus. * Added a FAQ addressing our model is insufficient for explaining why a neutron by itself is unstable. (17 pages)
4. Magnets and magnetic force	No changes. Short (12 pages)
Part B – Fields and Energy	
5. Describing Fields	* Modified the note about what happens if the Sun suddenly disappeared to clarify how changes to the gravitational field travel at the speed of light. * Modified the figures with combined fields so that there is a dot where the two fields cancel. * Minor rewording (15 pages)
6. Quantifying Fields	No changes. Short (9 pages)
7. Conservation of energy	* Clarified the difference between kinetic energy and potential energy in section 7.2, explicitly pointing out that we don't refer to the kinetic energy type by the force responsible for the change (like "gravitational kinetic energy"). I also added a checkpoint for this. * Minor rewording (19 pages)
8. Chemical reactions	* Moved the section on exothermic and endothermic reactions to the end as the section on units focuses on individual bonds breaking or forming rather than reactions. I also renamed it "Language" as it discusses more than just endothermic vs. exothermic. The switch also allowed for examples using numbers when discussing exothermic

	and endothermic reactions. (15 pages)
9. Nuclear reactions	* Clarified problem 9.2. (16 pages)
Part C – Current	
10. The flow of charge	No changes except for minor rewording for footnotes ii and vi. Long (21 pages)
11. Electric Current	No changes Long (21 pages)
12. Electromagnets	No changes (17 pages)
13. Fluids	* Adding comments in section 13.2 (moving liquids) explicitly stating why a pressure difference results in fluid flow rather than fluid *acceleration* (due to dissipative effects). * Moved the figure associated with checkpoint 13.5 from a separate figure to being “inside” the checkpoint. (13 pages)
Part D – Circuits	
14. Voltage	No changes Long (22 pages)
15. Resistance	No changes Long (22 pages)
16. Describing AC circuits	No changes Short (13 pages)
17. Impedance	No changes Long (22 pages)
18. Induction	No changes (15 pages)
Part E – Waves	
19. Sound	No changes Long (23 pages)
20. Doppler	* Expanded the first footnote to clarify that the change in pitch isn’t instantaneous unless the car runs over the observer. *Minor rewording (11 pages)
21. Interference	* I clarified the note on page 382 about combining two waves with a 120 degree phase difference (by adding in a reference to adding two vectors 120 degrees apart). * Section 21.4 (beats) was modified to emphasize how loud and soft correspond to where the amplitude is large vs.

	soft rather than where there is a peak vs. a valley. Long (21 pages)
22. Standing Waves	Major rewrite, with the organization of the chapter essentially reversed. Rather than discussing normal modes first, with applications to string and wind instruments coming at the end, the revised chapter starts by focusing only on the fundamental, first with string instruments and then with wind instruments (open and closed pipes). Normal modes and resonance is then introduced at the end to explain why instruments sound differently and how wind instruments can get different notes without changing the length of the tube. (19 pages)
Part F – Optics	
23. Light as a Wave	No changes (19 pages)
24. Bending of Light	No changes (20 pages)
25. Lenses and Mirrors	* Minor changes to beginning of “focal length” section to clarify when rays converge and also to introduce the use of f to represent the focal length (so that it can be used later to indicate what is meant by the inverse of the focal length). Long (21 pages)
26. Objects and Images	* Modified the discussion in section 26.2 (explaining magnification) to clarify how the eye observes the image as being where the rays appear to diverge from, not where the rays are going. (20 pages)