Some Useful References

The following are some books that you might find useful. The first three have been placed on the two-hour reserve list at the mathematics library (as has Wald).

C.W. Misner, K.S. Thorne, and J.A. Wheeler, *Gravitation*, (W.H. Freeman and Company, New York, 1973) [QC178.M67]. Although 35 years old, this is still a standard textbook for graduate courses due to its comprehensiveness (over 1000 pages!). It is particularly strong on how general relativity meshes with the rest of physics, on physical intuition, and on applications to astrophysics. It is packed with examples and problems and historical notes, and contains here and there details not found any other book, although some of the applications like cosmology are out of date. We will be using this book occasionally as a complement to Wald.

S. Weinberg, *Gravitation and Cosmology* (New York, Wiley, 1972) [Qc6.W42]. This book adopts a field-theoretic, non-geometric approach to general relativity, which is very different from the approach we will be following. However, it is a detailed and comprehensive book covering many advanced topics. It is strong on astrophysics, cosmology, and experimental tests; it will be most useful for P6554 in the spring semester.

S. Carroll, *Spacetime and Geometry: An Introduction to General Relativity*, (Pearson Addison Wesley, 2003) [QC173.6.C377 2004]. This book gives a more introductory and less detailed treatment than the two books listed above, but has the advantages of being clear, readable and pedagogical, and also being very up-to-date. It makes connections to modern research topics in cosmology and string theory. I recommend consulting this book as a supplement to Wald if you have not had any previous exposure to general relativity.

J.B. Hartle, *Gravity: An Introduction to Einstein’s General Relativity*, (Addison Wesley, San Francisco, 2003) [QC173.6 .H38 2003]. This is an introductory, undergraduate level textbook which pioneers a new approach to teaching the subject, in which the key physical predictions (Schwarzschild solution etc.) are covered before the field equations. It was written by one of the masters of the field of relativity and is probably the best introductory book on the subject.


Mathematical texts on differential geometry include
