BIBLIOGRAPHY

I will point out references throughout the course. Here are some brief comments on general sources.

General Relativity

For a first graduate course, I like Carroll's *Spacetime and Geometry.* The appendices are important.

After mastering Carroll, move on to Poisson's *A Relativist's Toolkit*, simultaneously with Wald's classic *General Relativity.* Wald is more formal, while Poisson is more hands-on. Read Wald for the insight, and Poisson to learn how to calculate.

Quantum field theory

I have not found a *great* introduction to QFT. Any of the standard introductory books (Peskin and Schröder, Schwartz, Zee, etc.) will suffice for this course. Eventually you should aim to master the first two volumes of Weinberg's *Quantum Theory of Fields*, but that is not necessary for this course.

2d conformal field theory is covered nicely, but encyclopedically, in the eponymous book by Di Francesco *et. al.* For a shorter introduction to 2d CFT, which covers 60% of the same material at 10x the information density, see Chapter 2 of Polchinski's *String Theory*, volume 1.

For an introduction conformal field theory in >2 dimensions, see Simmons-Duffin's *TASI Lectures on the Conformal Bootstrap,* and AGMOO (below).

We will also use some QFT in curved space. Classic books on this topic (which are out of date, but still useful) are Birrell and Davies, Wald, and Fulling.

Holographic duality

A wonderful introduction to holographic duality is still Witten's original paper, *Anti de Sitter Space and Holography.* This can be followed with the relevant sections of Kiritsis's *String Theory in a Nutshell*.

A general overview of the AdS/CFT correspondence, as well as practical reference material like the various coordinate systems used in AdS, can be found in the AGMOO review (Aharony, Gubser, Maldacena, Ooguri and Oz), *Large N Field Theories, String Theory, and Gravity*.

Quantum information

I recommend high-energy-oriented students start by reading Preskill's lecture notes on quantum computation. Other good sources are Nielsen and Chuang, and Wilde's textbook or online notes.

Black holes and quantum info

I taught a similar course in 2015; the typed lecture notes are on my website at www.hartmanhep.net/topics2015. The course this year will be about 50% different; some of the lectures will be indistinguishable.

I also recommend Harlow's *Jerusalem Lectures on Black Holes and Quantum Information*, which covers many similar topics.