Conditional Expectation

In this course we probably do not need much about conditional expectation. However, conditional expectation plays a central role in estimation theory. The conditional expectation is the minimum mean squared error estimator, which is the optimal estimator under the mean square error criteria. We will not touch this in ECE 302. But for those of you who like to know more, you can read textbook chapter 6.5. You may also check my course website on ECE 645 Lecture 24.

Back to our business, I require you to understand the concept of conditional expectation at the level of textbook Chapter 5.7. An equivalent section can be found in Bertsekas and Tsitsiklis chapter 4.3. Read the entire chapter if you can.

Joint Gaussian

Since we are discuss joint distributions, I think it is the perfect time to introduce the joint Gaussian distribution. My approach is different from the textbook chapter 5.9, which I think it is making easy things complicated. So rather than following chapter 5.9 I like to use the vector notation. This is taken from textbook chapter 6.4. Read it and see if you can understand. Also, project 2 involves multivariate Gaussian. Read the instruction and do some MATLAB coding. This is the best way to understand.