

# Engineering Statistics Lecture XII

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## Abstract

HW #2 is due October 15, 2019:

- Section 2.3 #23-37 odd
- Section 2.4 #49-65 odd
- Section 2.5 #73-93 odd

NO CLASS THURSDAY, OCTOBER 10, 2019

## 1 Mathematical Expectation

Written as  $E[\text{argument}]$ , expected values give us an idea of what to "expect" of the argument involving a random variable. It is not any of the modes, usually. It is the average value given a PDF.

Suppose  $E[g(x)]$  is the expectation of  $g(X)$  for some random variable  $X$  with a PDF  $f(x)$ :

$$E[g(x)] = \sum_{all\ x} g(x)f(x) = \int_{all\ x} g(x)f(x)dx$$

with use of the discrete or continuous sum depending upon the set upon which  $X$  operates.

### 1.1 Mode

Local maxima in PDFs are called "modes"