

Math/Stat 370: Engineering Statistics

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Week 4

Random Vectors

- A vector of continuous random variables (X, Y) is described by the **JOINT PDF** $f(x, y)$

$$\mathbb{P}(a \leq X \leq b, c \leq Y \leq d) = \int_a^b \int_c^d f(x, y) dy dx.$$

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- A vector of discrete random variables (X, Y) is described by the **JOINT PMF** $f(x_i, y_j)$

$$\mathbb{P}(a \leq X \leq b, c \leq Y \leq d) = \sum_{a \leq x_i \leq b} \sum_{c \leq y_j \leq d} f(x_i, y_j).$$