



Arab Academy for Science and Technology and Maritime Transport College of Engineering and Technology  
Electronics & Communications Engineering Department

**Course Name: Random Signal and Noise**  
**Term: 7<sup>th</sup>**  
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## Sheet #1 MATLAB Tutorial

### Write a Matlab program that solve the following problems

1- An experiment of tossing a coin and the observed face of each coin of interest. Compute the probability of head and tail occurrences for  $N \in [10, 20, \dots, 100]$ , where  $N$  is the number of repeating the experiment.

2- Generate random number from  $[-1, 1]$ .

3- An experiment of throwing a dice and the observed number at each face of interest. Compute the probability of occurrence for each number appears during the experiment.

4- A number  $x$  is selected at random in the interval  $[-1, 1]$ , let the events  $A = \{x < 0\}$ ,  $B = \{|x - 0.5| < 1\}$ ,  $C = \{x > 0.75\}$   
Find  $P[B]$ ,  $P[A]$ ,  $P[C]$ ,  $P[A \cap B]$ ,  $P[A \cap C]$ ,  $P[A \cup C]$ ,  $P[A \cup B \cup C]$ ,  $P[A/B]$

5- A block of 100 bits is transmitted over a binary communication channel with probability of bit error  $P = 10^{-3}$ . Find the probability that a block contains 3 or more errors.