GEG222 - INTRODUCTION TO ENGINEERING STATISTICS (3 UNITS)

- Introduction to statistics: fundamentals of probability theory; random variables and expectations, discrete and continuous distributions, probability and relative frequency, independent trials.

- The Laplace De-Moivre’s limit theorem, Poisson’s law.

- Concepts used in statistics: expectation of a sum, variance, covariance, correlations.

- Theory of errors, estimation of variance and correlation, linear regression, random events, frequency analysis, data reductin techniques.

- Distribution and density functions.

- Expectation and other moments.

LABORATORY:

- Introduction to R;

- Exploratiry data analysis: methods of visualisation and summary statistics sampling from standard discrete and continuous distributions (Bernoulli, Geometric, Poisson, Gaussian, Gamma) Generic methods for sampling from univariate distributions;

- The use of R to illustrate probabilistic notions such as conditioning, convolutions and the law of large numbers;

- Examples of modelling real data (but without formal statistical inference) and the use of visualizations to asses fit.

FUNDAMENTALS OF PROBABILITY

Sample space is a set of all possible outcomes of a random experiment