PHY 675 - Radiological Mathematics

Course Code & Number	Course Name	C.H.	Lec.	Lab.	Tut.
PHY 675	Radiological Mathematics	4	4	0	0

Syllabus

Units of measurement related to Radiation Physics, Nature of Counting Distributions, Binomial Distribution, Poisson Distribution, Normal Distribution, Mean and Standard Deviation of a Set of Measurements.
Uncertainty in the Activity of a Radioactive Source, Uncertainty in a Single Measurement, Propagation of Error.
Statistical Subtraction of a Background Count or Count Rate, Error Propagation of Several Uncertain Parameters, Comparison of Data Sets, Are Two Measurements Different, Statistics for the Counting Laboratory, Uncertainty of a Radioactivity Measurement, Determining a Count Time, Efficient Distribution of Counting Time.
Detection and Uncertainty for Gamma Spectroscopy, Testing the Distribution of a Series of Counts, the Chi-square Statistic, Weighted Sample Mean, Rejection of Data.
Levels of Detection, Critical Level, Detection Limit (Ld) or Lower Level of Detection (LLD), Minimum Detectable Concentration or Contamination, Minimum Detectable Concentration (MDConc.), Minimum Detectable Contamination (MDCont.), Less-than Level (Lt), Interpretations and Restrictions, Log Normal Data Distributions, Particle Size Analysis.

References

- J.E. Martin, Physics for Radiation Protection, 2nd Edition, Wiely-VCH, 2006.
- J.E. Turner, Atoms, Radiation, and Radiation Protection, 3rd Edition, Wiley-VCH Verlag GmbH & Co., KGaA, Weinheim, 2007.
- G.F. Knoll. Radiation Detection and Measurement, 4th edition, John Wiley & Sons, 2012.