



## Statistics for Analytical Scientists

- 09:00** *Registration and coffee*
- 09:30** Introduction to course
- 09:40** **Introduction to statistics: Description of data**
- normal distribution
  - population vs sample statistics
  - degrees of freedom
  - calculating mean, standard deviation, relative standard deviation, standard deviation of the mean
- 10:00** **Workshop A1:** Calculation of statistical parameters
- 10:40** **Introduction to significance testing**
- introduction to significance testing
  - probability: level of confidence and significance
  - one-tailed vs two-tailed tests
  - hypotheses
  - interpreting results from significance tests
- 11:00** *Break*
- 11:20** **Significance testing: t-tests**
- different t-tests (one-sample, two-sample, paired)
- 11:40** **Workshop A2:** Significance testing: t-tests
- 12:10** *Lunch*
- 13:10** **Significance testing: F-test**
- calculating the F statistic
  - obtaining critical F-values
  - assessing the significance of F
- 13:25** **Workshop A3:** Significance testing: F-test
- 13:55** **Analysis of Variance: ANOVA**
- what is ANOVA?
  - uses of ANOVA
  - key terms in ANOVA (sum of squares, mean square)
  - ANOVA calculations
  - interpreting the results from ANOVA

- 14:25**    **Workshop A4: ANOVA**
- 14:55**    *Break*
- 15:15**    **Linear regression: interpretation and pitfalls**
- uses of regression
  - principles of least squares linear regression
  - assumptions in linear regression
  - interpreting residual plots
  - interpreting regression statistics (correlation coefficient, residual standard deviation, etc)
  - estimating the uncertainty in predicted values obtained from a linear calibration plot
- 15:45**    **Workshop A5: Linear regression**
- 16:25**    **Control charts**
- setting up and interpreting Shewhart charts
- 16:40**    **Workshop A6: Control charts**
- 17:00**    Review of course
- 17:15**    Close of course

***Individual times approximate***