



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	<i>Break</i>
15:15	Linear regression: interpretation and pitfalls <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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