

Important issues – Exam in FRM 5510/9510

- Simple designs - Screening
 - Why
 - How to generate and randomization
 - Full factor / Reduced designs
 - Number of variables/experiments
 - Confounding
 - Center points
 - Replicates
 - Categorical variables
- Advanced designs
 - Number of variables/experiments
 - Mixed level designs
 - Optimization
 - 3-level full factorial
 - Central Composite
 - Box Behnken
 - Mixture designs
 - D-optimal
- Design evaluation
 - Yates
 - Regression coefficients for all designs
 - ANOVA – MS and DF
 - Response surface
- Modelling
 - MLR
 - Requirements
 - Least square
 - PCA
 - Basic understanding of principles
 - PLS
 - Basic understanding of principles
 - Requirements
 - Comparison to MLR
 - PLS1 vs PLS2
 - Model evaluation / Important Plots (PCA/PLS)
 - Predicted vs Measured
 - Variance vs #PC (Explained/Residual Calibrated/Validated)
 - Loading
 - Scores
 - Bi-plot
 - Influence plot
 - Regression coefficients
 - Modelling process
 - Iteration:
 - Leave out one variable at a time
 - Evaluate model
- Validation
 - Leverage correction
 - Cross validation
 - Full / Replicate blocking
 - Test set validation
 - Advantages / disadvantages / limitations of the three methods
 - Significance
 - R^2 vs RMSEC/RMSEP
 - SEE
 - Jack-knife
 - Outliers
- NIR
 - Pre-processing