

CHEM 720/7200: Introduction to Experimental Design and Chemometrics

Winter 2012

Schedule: Wednesdays, 7:00-9:20PM, Main Link (EIT-2053/MACN-101)

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Outline:

- Probability, parameters and statistics
- Precision and accuracy
- Evaluation of sources of variation in data (analysis of variance)
- Calibration
- Reliability and drift
- Sensitivity and limit of detection
- Experimental design
 - o The origins of experimental design
 - o Factorial designs
 - o Fractional factorial designs
 - o Placket-Burman design
- Least squares
- Multivariate approaches
- Optimization of analytical methods

Evaluation: Assignments (15%), midterm exam (25%), presentation (20%), final exam (40%)

Midterm exam: February 15 during regularly scheduled hours.

Required Text: No textbook is required for the course. Lecture slides will be available as electronic reserve through the library.

Suggested Texts: G.E.P. Box, J.S. Hunter, W.G. Hunter, "Statistics for Experimenters", 2nd Ed., Wiley Interscience, 2005
D.L. Massart, B.G.M. Vandeginste, S.M. Deming, Y. Michotte, L. Kaufman, "Chemometrics: a textbook", Elsevier, 2003
R.G. Brereton, "Applied Chemometrics for Scientists". J. Wiley & Sons, 2007

Attendance: Attendance is not mandatory, but is highly recommended because of the lack of a required text and reliance on lectures.

Notes: There will be no classes on Feb. 1.