

56:295

Sec. 001

Multivariate Statistics and Advanced Quality Control
(M/W 5:00 - 6:15pm, Room: ALF classroom—3231 SC)

Fall 2005

Instructor: Prof. Yong Chen

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Hours: W 1:30 – 2:30

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Text: Johnson, R. A., and Wichern, D. W., *Applied Multivariate Statistical Analysis*, 5th ed., Prentice-Hall, 2002.

Reference Text: Montgomery, D. C., *Introduction to Statistical Quality Control*, 5th ed., Wiley, 2005.

Course Web Site: <http://www.engineering.uiowa.edu/~yongchen>

Main topics to be covered (estimated # of lectures):

1. Random vectors and random sampling (2)
2. Multivariate normal distribution (2)
3. Inferences about a mean vector and quality control (QC) applications – T^2 chart, multivariate EWMA, and multivariate CUSUM (4)
4. Inferences about a covariance matrix and QC applications – control charts for monitoring variability (2)
5. Multivariate linear regression models and QC applications – Regression adjustment, linear profile monitoring, partial least squares (4)
6. Principal components and QC applications (3)
7. Factor analysis and QC applications (2)
8. Robust multivariate analysis (2)
9. Variance components analysis (2)
10. Classification (2)
11. Student presentation (2)

Grading:

Exam 1	(October 17, Monday)	30%
Exam 2	(December 7, Wednesday)	30%
Homework		25%
Group presentation&report on a research paper		15%

Note: This course is given by the College of Engineering. This means that class policies on matters such as requirements, grading, and sanctions for academic dishonesty are governed by the College of Engineering. Students wishing to add or drop this course after the official deadline must receive the approval of the Dean of the College of Engineering. Details of the University policy of cross enrollments may be found at: <http://www.uiowa.edu/~provost/deos/crossenroll.doc>. Please refer to <http://www.engineering.uiowa.edu/current-students/academic-misconduct.html> for information about academic misconducts. Please make sure to be aware of the university regulations on academic misconducts.