

COURSE APPROVAL ROUTING CHECK LIST

091027

1. Course Number: ACM
PSM 641

1st Bulletin 11-5-09
2nd Bulletin 11-19-09

2. Course Title: Design and Analysis of Experiments
(no more than 70 characters)

Title Abbreviation: Des & Anal Exper
For use in Master Schedule (no more than 19 characters)

3. Action: New Course Revision IF Designation WAC

Requested Designation(s): _____

Course Proposal/Revision Check List

This checklist will help departments avoid some of the most common mistakes made on course proposals. Your use of the checklist will allow the College Senate Curriculum Committee to focus its review on more substantive issues and expedite the approval process.

- Proposal format conforms to the Directory of Policy Statements, Section IV:02.00 (2002).
- Proposal has been proofread for spelling, punctuation, grammar, style and gender-neutral language.
- If the course is a new course, reasons for the additions are included; if the course is a revision of an existing course, reasons for revision and a copy of the old course are included as well as the IF Narrative when appropriate.
- Catalog description follows the guidelines in the Curriculum Handbook, Appendix C.
- Student learning outcomes are coherent with course content and assessment.
- Outcomes are referenced with course content.
- All resource entries are alphabetized and conform to a specific style manual.
- Cross listed courses have been checked with all chairs and deans included in development of the course.

DEPARTMENT ACTION

[Signature]
Chair, Department Curriculum Committee

10/16/09
Date

4. Approved with confirmation that all necessary laboratories, studios, resources, facilities and personnel for support of this course are available.

[Signature]
Signature of Department Chairperson

MATH 10/16/09
Department Date

Prefix, Number and Name of Course: PSM 641 Design and Analysis of Experiments

Credit Hours: 1

In Class Instructional Hours: 1 **Labs:** 0 **Studio:** 0 **Field Work:** 0

Catalogue Description:

Prerequisite: Admission to program or instructor permission

Design of experiments (one, two and three factors), multiple comparisons, randomized complete block designs, Latin square design.

Reasons for addition:

To create a one-semester-hour module for the graduate Professional Applied and Computational Mathematics program where students will identify factors which affect a given process or phenomenon, both individually and in combination, with minimum cost and maximum efficiency while maintaining the validity of results.

Student Learning Outcomes: Students will	Course Content References:	Assessment:
1. implement a variety of experimental design techniques to compare population means together with diagnostics and interaction in the higher order experiments.	I-II	Individual homework assignments, group work, examinations and computer projects
2. design appropriate experimental models for existing real-life data and assess the appropriateness of the designs.	I-II	Individual homework assignments, group work, examinations and computer projects
3. use appropriate statistical software to analyze real world problems.	I-II	Individual homework assignments, group work, and computer projects.
<p>Course Content:</p> <p>I. One-factor experiments</p> <ul style="list-style-type: none"> A. One-way analysis of variance: completely randomized design B. Tests for the equality of several variances C. Multiple comparisons D. Comparing treatments with a control E. Randomized complete block designs F. Diagnostics-residual analysis, model checking G. Latin square design <p>II. Factorial experiments (two or more factors)</p>		

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| <ul style="list-style-type: none"> A. Interaction in two-factor experiments B. Two-factor analysis of variance C. Three-factor experiments |
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Resources

Scholarship:

Atkinson, A. C., Donev, A. N., and Tobias, R. D., *Optimum Experimental Designs with SAS*, Oxford University Press, 2007.

Box, G. E. P., Hunter, J. S., and Hunter, W. G., *Statistics for Experimenters: Design, Innovation and Discovery*, 2nd ed., Wiley-Interscience, 2005.

Brook, R. L., and Arnold, G. C., *Applied Regression Analysis and Experimental Design*, Dekker, 1985.

Cortina, J. M., and Nouri, H., *Effect Size for ANOVA Designs*, Sage, 2000.

Draper, N. R., and Smith, H., *Applied Regression Analysis*, 3rd ed., Wiley, 1998.

Gonzalez, R., *Data Analysis for Experimental Design*, Guilford Press, 2009.

Hinkelmann, K., and Kempthorne, O., *Design and Analysis of Experiments*, Vol. 1, 2nd ed., Wiley, 2008.

Kleinbaum, D. G., Kupper, L. L., and Muller, K. E., *Applied Regression Analysis and Other Multivariable Methods*, 3rd ed., Duxbury Press, 1998.

Mason, R. L., Gunst, R. F., and Hess, J. L., *Statistical Design and Analysis of Experiments: With Applications to Engineering and Science*, 2nd ed., Wiley, 2003.

Mickey, R. M., *Applied Statistics: Analysis of Variance and Regression*, 3rd ed., Wiley-Interscience, 2004.

Miller, R., *Beyond ANOVA: The Basics of Applied Statistics*, Wiley, 1996.

Montgomery, D. C., *Design and Analysis of Experiments*, 6th ed., Wiley, 2005.

Neter, J., Wasserman, W., and Kutner, M. H., *Applied Linear Statistical Models*, 2nd ed., Richard D. Irwin, Inc., 1985.

Normand, L.F., and Mathews, D., *Practical Guide to Experimental Design*, Wiley, 1997.

Ott, R. L., and Longnecker, M., *An Introduction to Statistical Methods and Data Analysis*, 5th ed., Duxbury Press, 2001.

Rao, C. R., *Linear Statistical Inference and its Applications*, 2nd ed., Wiley Eastern 1973.

Ryan, T. P., *Modern Experimental Design*, Wiley, 2007.

Seber, G. A. F., *Linear Regression Analysis*, Wiley, 1977.

Winer, B. J., *Statistical Principles in Experimental Designs*, 3rd ed., McGraw-Hill, 1991.

Periodicals:

Annals of Applied Statistics

Annals of Mathematical Statistics

Annals of Statistics

Biometrics

Biometrika

Communications in Statistics

Demography

International Statistical Review

Journal of the American Statistical Association

Journal of Applied Statistics

Journal of Applied Statistical Science

Journal of Statistical Computation and Simulation

Journal of the Royal Statistical Society

Scandinavian Journal of Statistics

Statistics in Medicine

Statistical Methods in Medical Research

Technometrics

The American Statistician

Electronic and/or Audiovisual Resources:

Bower, K, "Design and Analysis of Experiments," www.keithbower.com/DOE.htm.

Knovel Corp., "Statistical Design and Analysis of Experiments,"
www.knovel.com/web/portal/browse/display?EXT_KNOVEL_DISPLAY_bookid=1406

Weibull.com, "Experiment Design and Analysis Reference,"
www.weibull.com/doewebcontents.htm.