

COURSE IMPLEMENTATION DATE:	September 1994
COURSE REVISED IMPLEMENTATION DATE:	
COURSE TO BE REVIEWED:	September 1998
(Four years after implementation date)	(MONTH YEAR format)

**OFFICIAL COURSE OUTLINE INFORMATION**

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT:	<b>MATHEMATICS</b>	
<b>MATH 330</b>		<b>3</b>
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS
	<b>DESIGN OF EXPERIMENTS</b>	
COURSE DESCRIPTIVE TITLE		

**CALENDAR DESCRIPTION:**

The construction and analysis of standard experimental designs. Emphasis will be on the conduct, assumptions, implications and the rationale of particular designs; not on the finite geometry nor the combinatorics of the designs. Students will use suitable software, e.g. MINTAB, BMDP, when necessary. Students will be expected to design, conduct, analyse and report an experiment illustrating at least one of the major designs discussed during the course.

PREREQUISITES: **MATH 302**  
COREQUISITES:

SYNONYMOUS COURSE(S)	<b>SERVICE COURSE TO:</b>
(a) Replaces: _____ (Course #)	_____
(b) Cannot take: _____ for further credit. (Course #)	_____
	(Department/Program)

TOTAL HOURS PER TERM: <b>75</b>	TRAINING DAY-BASED INSTRUCTION
<b>STRUCTURE OF HOURS:</b>	LENGTH OF COURSE: _____
Lectures: <b>45</b> Hrs	HOURS PER DAY: _____
Seminar: _____ Hrs	
Laboratory: <b>30</b> Hrs	
Field Experience: _____ Hrs	
Student Directed Learning: _____ Hrs	
Other (Specify): _____ Hrs	

MAXIMUM ENROLLMENT: \_\_\_\_\_

EXPECTED FREQUENCY OF COURSE OFFERINGS: \_\_\_\_\_

**WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)**
 Yes
 No

**WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)**
 Yes
 No

**TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:**
 Yes
 No

**AUTHORIZATION SIGNATURES:**

Course Designer(s): _____ Math Curriculum Committee	Chairperson: _____ (Curriculum Committee)
Department Head: _____ Barry Garner	Dean: _____ J.D. Tunstall
PAC Approval in Principle Date: _____	PAC Final Approval Date: November 2, 1994

**COURSE NAME/NUMBER****LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:**

The course is designed to enable the students to:

1. Be familiar with the basic statistical designs commonly met in practice and in the literature;
2. Understand the reasoning and importance of the basic experimental maneuvers of randomization, blocking, stratification, and replication;
3. Meet the notion of random effects models for the first time;
4. Consider the effects of measurement errors in the independent variables and the notions of replicability and reliability.

**METHODS:****PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):**

Credit can be awarded for this course through PLAR (Please check :)  Yes  No

**METHODS OF OBTAINING PLAR:****TEXTBOOKS, REFERENCES, MATERIALS:**

[Textbook selection varies by instructor. An example of texts for this course might be:]

**TEXT:** TBA

Basic References:

- Statistics for experimenters. G.E.P. Box, W.G. Hunter, J.S. Hunter (John Wiley & Son 1978)
- The design and analysis of clinical experiments. Joseph L. Fleiss (John Wiley & Son 1986)
- Analysis of repeated measures. M.J. Crowder & D.J. Hand (Chapman and Hall 1990).
- The design of experiments. D.R. Cox. (John Wiley & Sons 1957).

**SUPPLIES / MATERIALS:****STUDENT EVALUATION:**

[An example of student evaluation for this course might be:]

Project	10%
Assignments	20%
In-class tests	30%
Final Examination	40%

**COURSE CONTENT:**

[Course content varies by instructor. An example of course content might be:]

*Linearity:* the assumptions of a linear model, linear effects and a linear error. Randomization.

*Blocking designs:* matched pairs; randomized blocks; Latin Squares; block design, Youden squares.  
Blocking versus covariate analysis – discussion.

*Factorial designs:* 2<sup>M</sup> designs. Yates' plussing and minussing; Daniels' method of normal plotting to select contrasts of interest in saturated designs. Fractional factorial (f.f.) designs, confounding and aliasing. How to select a f.f. design; implications of the selection; replication.  
Designs of Resolution R.

Plackett & Burman designs.

Response surface methods: use and estimation of local quadratic approximations, search for optimum.

Variance components: variance component models in balanced designs, construction of appropriate models, interpretation of tests, confidence intervals for fixed effects.

Cross-over designs: conditions under which they are appropriate, analysis and interpretation.

Split-plot designs: common repeated measure designs, and corresponding univariate models and analysis.

Error-in-measurement problems: replication and reliability; Cronbach's alpha; the attenuation of slope estimates.