FOR 6934
Mixed Models for Biologists

Summer 2015

PREREQUISITE	STA 6166 or equivalent
LECTURE TIME	Monday – Period 2-3 (9:30 – 12:15 am) – NZH 219 Wednesday – Period 2-3 (9:30 – 12:15 am) – NZH 219
INSTRUCTOR	Dr. Salvador A. Gezan Office: 363 Newins-Ziegler Hall Phone: (352) 846-0133 E-mail: sgezan@ufl.edu Office hours: Wednesday 1:00 pm – 2:30 pm
TEACHING ASSISTANT	Dr. Melissa Carvalho Office: 358 Newins-Ziegler Hall E-mail: melissapisaroglo@ufl.edu Office hours: TBA Mr. Lazarus Mramba Office: 358 Newins-Ziegler Hall E-mail: lmramba@ufl.edu Office hours: TBA
CLASS WEBSITE	https://elearning.courses.ufl.edu/webct/
COURSE DESCRIPTION	Application of linear mixed models for biological sciences including: random effects models, hierarchical models, and repeated measures. The course will focus on biological applications for fileds such as agriculture, forestry, ecology, wildlife and environmental sciences, with the use of the R statistical package.
COURSE OBJECTIVES	Train graduate students in linear mixed model (LMMs) with the aim of promoting sound scientific research based on good statistical thinking and practice that requires proper use and critical interpretation of the outcomes and coding of these techniques. In this class we will review/clarify/explain LMMs, where theoretical details will be kept to a minimum but several examples will be presented and fully discussed.
REQUIRED BOOK	**None**
SUGGESTED BOOK	Littell, R.C., Milliken, G.A., Stroup, W.W., Wolfinger, R.D. and Schabenberger, O. 2006. SAS for Mixed Models, 2nd ed., SAS Institute Inc, Cary NC.

HOMEWORK

There will be 4 assignments. Each will be worth 25 points. Homework assignments can be worked and presented on pairs (no trios). Following is the schedule for the assignments:

Homework 1 – Posted: May 11th – Due: May 20th
Homework 2 – Posted: May 20st – Due: May 27th
Homework 3 – Posted: May 27th – Due: June 03th
Homework 4 – Posted: June 03th – Due: June 15th

GRADING

Grades will be based on a total of 100 points, with 88 points from the homework and 12 points from class participation. The following are the letter grades considered and their corresponding ranges

A (96-100)	A- (90-95)	
B+ (86-89)	B (83-85)	B- (80-82)
C+ (76-79)	C (73-75)	C- (70-72)
D+ (66-69)	D (63-65)	D- (60-62)
E (0-59)		

SOFTWARE

You will need a computer for ALL classes and form homework assignments. Hence, it is recommended that you bring your laptop to each class in order to follow the class examples and to do the practicals during class. The only software used will be R (The R project for Statistical Computing). This statistical package is free and it can be downloaded from: www.r-project.org. We strongly recommend that you also install RStudio (www.rstudio.com), which makes interaction with R much easier.

OUTLINE OF TOPICS (Tentative)

Session	Topics	Date
1	Linear Models and R	May 11
2	Introduction to Linear Mixed Models	May 13
3	Exploratory Data Analysis in R	May 18
4	Hierarchical Models: Experimental Structure	May 20
5	** HOLIDAY **	May 25
6	Complex Hierarchical Models	May 27
7	Model Estimation and Prediction	June 1
8	Unbalance Data and Non-orthogonality	June 3
9	Variance and Covariance Structures	June 8
10	Repeated Measures: Multiple Measurements	June 10
11	Repeated Measures: Random Regression	June 15
12	Dealing with Non-normal data	June 17

UNIVERSITY POLICIES

Academic Dishonesty: All members of the University Community share the responsibility to challenge and make known acts of apparent academic dishonesty. Acts of academic dishonesty will not be tolerated and will be referred to the Student Honor Council.

Software use: All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against the University policies and rules, disciplinary action will be taken as appropriate.

University support services: Resources are available on-campus for students having personal problems or lacking clear career and academic goals which interfere with their academic performance. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling
3. Sexual Assault Recovery Services, Student Health Care Center, 392-1161, sexual counseling
4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling

Accommodations for students with disabilities: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. If you have a documented disability and wish to discuss academic accommodations, please CONTACT ME as soon as possible.