

CURRICULUM CHANGE PROPOSAL

APPROVAL PAGE

Proposal Title: Add PSYC 6305 and PSYC 5305, Multilevel Modeling, to Graduate Catalog

College: Liberal Arts

Department: Psychology

DEPARTMENT CHAIR

I have read the enclosed proposal and approve this proposal on behalf of the department.



2-19-2019

Signature

Date

COLLEGE CURRICULUM COMMITTEE CHAIR

I have read the enclosed documents and approve the proposal on behalf of the college curriculum committee.

Signature

Date

COLLEGE DEAN

I have read the enclosed documents and approve the proposal on behalf of the college. I certify that the necessary funds will be allocated by the college in support of this proposal.

Signature

Date

GRADUATE CURRICULUM CHANGE MEMO

Date: 2/15/2019

From: James M. Wood, Ph.D., Graduate Program Director, Department of Psychology

Through: Edward Castaneda, Ph.D., Chair, Department of Psychology

Through: Denis O'Hearn, Ph.D., Dean, College of Liberal Arts

To: Amy Wagler, Ph.D., Chair, Graduate Council

Proposal Title: Add PSYC 6305 and PSYC 5305, Multilevel Modeling, to Graduate Catalog

The Psychology Department has successfully offered Multilevel Modeling (MLM) as a Special Topics course twice in the past (see attached syllabus). We would now like to list it as a regularly offered course. MLM has become a widely used statistical technique in the social sciences, health sciences, and education. This course enables students in these areas to become proficient in MLM and to acquire skills they can use in their research and applied work. We anticipate that the course will be offered every other year, usually during a regular semester, but occasionally during Wintermester. Based on past experience, we expect it will consistently attract advanced graduate students from Psychology, Health Sciences and Education. We are requesting that the course be listed as a Doctoral level course, PSYC 6305, so our PhD students can enrol in it. We are also requesting that the course be listed as a Graduate level course, PSYC 5305, so our MA students in Clinical Psychology and Experimental Psychology can enrol in it.

COURSE ADD

All fields below are required

College : Liberal Arts

Department : Psychology

Rationale for adding the course:

The Psychology Department has successfully offered Multilevel Modeling (MLM) as a Special Topics course twice in the past. We would now like to list it as a regularly offered course. MLM has become a widely used statistical technique in the social and health sciences and education. This course enables students in these areas to become proficient in MLM and acquire skills they can use in their research and applied work. The Department anticipates that the course will be offered every other year and will consistently attract advanced graduate students from Psychology and other fields.

All fields below are required

Subject Prefix and # PSYC 6305

Title (29 characters or fewer): Multilevel Modeling

Dept. Administrative Code : 2380

[CIP Code](#) 42.0101.00

Departmental Approval Required Yes No

Course Level UG GR DR SP

Course will be taught: Face-to-Face Online Hybrid

How many times may the course be taken for credit? (Please indicate 1-9 times): 1

Should the course be exempt from the "Three Repeat Rule?" Yes No

Grading Mode: Standard Pass/Fail Audit

Description (600 characters maximum):

Data in the social and applied sciences are often "nested" or "clustered," with a multilevel structure. For example, jurors are nested within juries, students are nested within classrooms, and repeated measures are nested within persons. This course provides an introduction to the use of multilevel models that take into account such nesting or clustering among observations. Students will learn the basic concepts of multilevel modeling and have the opportunity to apply appropriate analytic techniques to multilevel data in a class project and homework assignments.

Contact Hours (per week): 3 Lecture Hours Lab Hours Other

Types of Instruction (Schedule Type): Select all that apply

- | | | | |
|---------------------------------------|------------|----------------------------|----------------------|
| <input checked="" type="checkbox"/> A | Lecture | <input type="checkbox"/> H | Thesis |
| <input type="checkbox"/> B | Laboratory | <input type="checkbox"/> I | Dissertation |
| <input type="checkbox"/> C | Practicum | <input type="checkbox"/> K | Lecture/Lab Combined |

- D Seminar
- E Independent Study
- F Private Lesson

- O Discussion or Review (Study Skills)
- P Specialized Instruction
- Q Student Teaching

Fields below if applicable

If course is taught during a part of term in addition to a full 16-week term please indicate the length of the course (ex., 8 weeks): Will typically be taught during full 16-week term, but maybe be offered during Wintermester (2 wks)

TCCN (Use for lower division courses) :

Prerequisite(s):		
Course Number/ Placement Test	Minimum Grade Required/ Test Scores	Concurrent Enrollment Permitted? (Y/N)
PSYC 6307 or 5307	B	No
PSYC 6308 or 5308	B	No

Corequisite Course(s):
N/A

Equivalent Course(s):

Restrictions:	
Classification	DR
Major	No

COURSE ADD

All fields below are required

College : Liberal Arts

Department : Psychology

Rationale for adding the course:

The Psychology Department has successfully offered Multilevel Modeling (MLM) as a Special Topics course twice in the past. We would now like to list it as a regularly offered course. In a separate Course Add proposal that is being submitted along with this proposal, we have provided a rationale for this course and requested that it be listed as a Doctoral level course, PSYC 6305. In this Course Add proposal, we ask that the same course be listed as a Graduate level course, PSYC 5305, so that the students in our MA Clinical and Experimental Psychology programs can enrol in it.

All fields below are required

Subject Prefix and # PSYC 5305

Title (29 characters or fewer): Multilevel Modeling

Dept. Administrative Code : 2380

[CIP Code](#) 42.0101.00

Departmental Approval Required Yes No

Course Level UG GR DR SP

Course will be taught: Face-to-Face Online Hybrid

How many times may the course be taken for credit? (Please indicate 1-9 times): 1

Should the course be exempt from the "Three Repeat Rule?" Yes No

Grading Mode: Standard Pass/Fail Audit

Description (600 characters maximum):

Data in the social and applied sciences are often "nested" or "clustered," with a multilevel structure. For example, jurors are nested within juries, students are nested within classrooms, and repeated measures are nested within persons. This course provides an introduction to the use of multilevel models that take into account such nesting or clustering among observations. Students will learn the basic concepts of multilevel modeling and have the opportunity to apply appropriate analytic techniques to multilevel data in a class project and homework assignments.

Contact Hours (per week): 3 Lecture Hours Lab Hours Other

Types of Instruction (Schedule Type): Select all that apply

- | | | | |
|---------------------------------------|------------|----------------------------|----------------------|
| <input checked="" type="checkbox"/> A | Lecture | <input type="checkbox"/> H | Thesis |
| <input type="checkbox"/> B | Laboratory | <input type="checkbox"/> I | Dissertation |
| <input type="checkbox"/> C | Practicum | <input type="checkbox"/> K | Lecture/Lab Combined |

- D Seminar
- E Independent Study
- F Private Lesson

- O Discussion or Review (Study Skills)
- P Specialized Instruction
- Q Student Teaching

Fields below if applicable

If course is taught during a part of term in addition to a full 16-week term please indicate the length of the course (ex., 8 weeks): Will typically be taught during full 16-week term, but maybe be offered during Wintermester (2 wks)

TCCN (Use for lower division courses) :

Prerequisite(s):		
Course Number/ Placement Test	Minimum Grade Required/ Test Scores	Concurrent Enrollment Permitted? (Y/N)
PSYC 6307 or 5307	B	No
PSYC 6308 or 5308	B	No

Corequisite Course(s):
N/A

Equivalent Course(s):

Restrictions:	
Classification	GR
Major	No

Instructor: Osvaldo F. Morera, PhD
Email: omorera@utep.edu
Lectures: 10:30 pm – 11:50 pm, UGLC 336
Texts:

Snijders, T. & Bosker, R. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*, 2nd Edition. Thousand Oaks, CA: Sage.

Heck, R. H., Thomas, S.L. & Tabata, L.N. (2014). *Multilevel and Longitudinal Modeling with IBM SPSS (2nd edition)*. New York: Routledge.

Selected chapters from Neter, Wasserman & Kutner on fixed effects ANOVA (Model I), Random effects ANOVA (Model II), and mixed effects ANOVA (Model III).

Other Readings (for now)

Centering in MLM

Enders, C.K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods*, 12, 121-138.

Lüdtke, O., Marsh, H.W., Robitzsch, A., Trautwein, U., Asparouhov, T., & Muthén, B. (2008). The multilevel latent covariate model: A new more reliable approach to group level effects in contextual studies. *Psychological Methods*, 13, 203-229.

Repeated Measures as MLM Models

Gueorguieva, R. & Krystal, J.H. (2004). Move Over ANOVA: Progress in Analyzing Repeated Measures Data and its Reflection in Papers Published in the Archives of General Psychiatry. *Archives of General Psychiatry*, 61, 310-217.

Hoffman, L., & Rovine, M.J. (2007). Multilevel models for the experimental psychologist: Foundations and illustrative examples. *Behavior Research Methods*, 39, 101-117.

Locker Jr., L., Hoffman, L., & Bovaird, J. A. (2007). On the use of multilevel modeling in the analysis of psycholinguistic data. *Behavior Research Methods*, 39, 723-730.

Multilevel Mediation

Preacher, K.J., Zyphur, M.J., Zhang, Z. (2010). A general multilevel model SEM framework for assessing multilevel mediation. *Psychological Methods*, 15, 209-223.

Prerequisites:

I assume that you have knowledge of Psychology 6307 and Psychology 6308 prior to taking this course. I may talk about multilevel mediation and that may require some knowledge of latent variable modeling, but Psych 6302 or 6323 is not a prerequisite for the class.

Course objectives/Learning Objectives:

Data in the social and applied sciences are often “nested” or “clustered” or have a multilevel structure. For example, jurors are nested within juries; patients are nested within doctors; students are nested within classroom (which are then nested in schools, that are nested in school districts, that are nested in counties that are nested in states). Measurements of attributes or characteristics of juries (time to deliberate) and jurors (age, sex, individual difference measures like legal authoritarianism) may also be available. Repeated measures data and longitudinal data are also multilevel data, as they are nested within person.

Most standard statistical models assume the independence observations (or independence of errors). When data have a multilevel structure, observations are typically correlated. In other words, the standard independence assumption is violated and the statistical testing procedure becomes very liberal. For example, jurors make decisions after lengthy deliberations. Undoubtedly, their verdicts are influenced by other jurors.

This course provides an introduction to the use of multilevel models that take into account dependencies between observations. You will learn the basic ideas of multilevel modeling and you have a chance to apply these techniques to data that your group has for a class project (as well as data that I will ask you to analyze on homework assignments).

Topics that will be covered include knowing the difference between fixed effects and random effects ANOVA models. An introduction to multilevel analyses, random intercept and slope models, 2 level models, centering, hypothesis testing, model assessment, power analysis for designing multilevel studies, probing interactions and longitudinal (repeated measures) data and 3 level models. Time permitting, I will talk about cross-classified data, models for dichotomous responses, and the assessment of mediation in multilevel modeling and power analysis. At the minimum, you will have a solid understanding of multilevel modeling and we should get through what Snijders & Bosker (2012) would consider sufficient for an introductory course (Chapters 1-6 and 7.1).

Computing:

We will primarily be using SPSS and *MPlus*. I will also talk about PRELIS/LISREL in the early portion of the class. Due to the recent upgrade in LISREL to Version 9.1, I may spend more time using SPSS or I will bring my laptop to class and use LISREL 8.8. The following machines in Room 105 have LISREL 8.8 and MPlus on them: dbvlab18, dbvlab20, dbvlab21 and dbvlab23.

Evaluation:

Students will be evaluated on the basis of a small number of group project homework assignments (40% of the grade), at least one in class quizzes (10% of grade), group presentation (15% of the grade) and a group class paper written in APA format (35% of the grade).

Policy on Auditors

Student and faculty auditors are welcome in the class, as long as they complete the required university audit form. However, my first priority is to the students who are registered for the class. Students in the class get first dibs on seats in the class. In addition, if we were to ever wind up in the Room 105 and seating in the room becomes a problem, registered students get first dibs on the 4 machines with MPlus/LISREL. I also ask that auditors not submit any homework assignments or take any exams, as it is extra work on my part and the TA's part. If your attendance becomes sporadic, I expect that you will not slow down the class questions that were covered in prior lectures.

In short, your completion of the university audit form allows you the privilege of listening to the course material (and that is all). If your attendance requires additional time of my TA, additional time of myself or takes away from the learning experience from the registered students in the class, you should not audit this class.

Course structure and requirements:

1. Students will be responsible for all material covered in lectures, class handouts and assigned readings. With regard to lectures, there is no such thing a stupid question (in most cases). If you have a question, someone else probably has that same question. Feel free to ask any questions.
2. A calculator is still highly recommended. It should perform all basic mathematical operations and should have several memories.
3. There will be between 4 - 8 homework assignments (probably 6, we'll see). Many of the homework assignments will require the use of statistical software. We will use SPSS and MPlus in this class. As stated above, we may also use LISREL.
4. Please turn off all pagers, beepers and other electronic devices before entering class. They are a distraction to other students in the class and to the professor.

5. Office Hours and Appointments: If you have questions concerning the topics of this course, you can stop by to see me during my office hours or please do not hesitate to make an appointment to see me. If you stop by my office and you do not have an appointment to see me, I will ask you to schedule an appointment to see me and I will answer your question during that appointed time. This policy also applies to “questions that will only take a minute to answer.”

6. Conduct of Graduate Students: Students enrolled in this course are graduate students and I have certain expectations of graduate students. As you are pursuing an advanced professional degree, I expect that you will act in a professional manner. Asking for extensions on assignments because you are busy with other courses/projects/papers is not professional. In addition, I also expect that you will show respect to everyone in the class.

7. Academic Misconduct: The Department of Psychology follows the university policy on academic honesty that is published in the Undergraduate College-Academic Regulations and is available to all members of the University community. Additional information on academic misconduct can also be found at the following links:

<http://studentaffairs.utep.edu/Default.aspx?tabid=4386>

<http://admin.utep.edu/Default.aspx?PageContentID=2084&tabid=30292>

This policy represents a core value of the University and all members of the university community are responsible for abiding by its tenets. Lack of knowledge of this policy is not an acceptable defense to any charge of academic dishonesty. The University has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their own work, for the appropriate citation of sources and for respect of others' academic endeavors.

In other words, plagiarism, cheating and academic dishonesty will not be tolerated in this class. Plagiarism consists of using another person's ideas, words, or assistance, while failing to acknowledge this person. If you must submit someone else's work as if it were your own, you must acknowledge the original author/original source. If I suspect any incidence of academic dishonesty, plagiarism, collusion, cheating, etc. on any class assignment or exam, I will be more than happy to forward suspected material to the Office of the Dean of Students.

8. Accommodations for Students with Disabilities: If you have an identified disability that may affect your performance in this class, please see the instructor (no later than the end of the first class) or contact the Disabled Student Services Office in Room 106 of the Student Union (phone 747-5148) such that provisions can be made to ensure that you have an equal opportunity to meet all the requirements of this course.

Important Dates to Remember

Wednesday, February 1	Census Day; Last day to drop course without "W" appearing on transcript
Tuesday, February 7	Fixed effects/random effects ANOVA quiz
Friday, February 12	Pass/Fail Grade Option Selection Deadline
March 13 – March 17	Spring break
Friday, March 30	Course drop deadline
Thursday, May 4	Last Day of our class
Friday, March 5	Class projects due
Wednesday, May 17	Grades due to Records Office

Tentative Course Schedule

PSYC 6305/5305 Multilevel Modeling

Tentative Course Schedule

Date	Topic	Reading
1/17, 1/19	Fixed and random effects ANOVA, matrix algebra	NWK chptrs.
1/24	Review of OLS regression	Class notes
1/26, 1/31	Intro to multilevel modeling and empty model	Chapters 1-3
2/2 – 2/9	Random intercept model, random slope model Exploring variability	Chapter 4, 7
2/7	Fixed and random effects ANOVA in class quiz	
2/14 - 2/16	Centering in MLM	Chapter 5
INITIAL PROJECT PROPOSAL, DUE 2/16		
2/16	Estimation methods	Chp. 4, 5, 10
2/21 – 2/28	Inference for fixed effects, random effects, model evaluation and testing model assumptions Probing interactions in multilevel models	Chapters 6,9
3/7 – 3/23	Longitudinal models	Chapter 15
3/14 - 3/16	SPRING BREAK	
3/23 – 3/30	Repeated measures	Chapter 15 and Hoffman papers
4/4 - 4/11	Power analysis, 3 level models	Chapter 5, 11
4/13 - 4/20	Cross-classified models, multivariate multilevel models and multilevel logistic regression	Chp 16, 17
4/25 – 4/27	Group presentations	
5/2 - 5/4	Multilevel mediation, multilevel SEM	Preacher papers
FINAL PROJECT DUE, MAY 5		

Group Project Description: Initial Assignment

Due Date: Thursday February 16

For this assignment, you can work on all parts of the assignment as a GROUP.

For this assignment, I need to know something about the data that your group will work on for the class project. As stated in the syllabus, this class involves the analysis of nested data (or clustered data). If you do not have data, you can come to me and we can find a multilevel data set for your group to work on.

For example, jurors are nested within juries. In this case, jurors would be what is called “level 1” and characteristics of the jury (time to deliberate) would be called a “level 2” variable. Repeated measures and longitudinal data are also nested, as the repeated assessments make up “level 1” and the characteristic of the person makes up “level 2.”

I need to know something about your data set to help you for next week. So, describe your data set to me in no more than 1 page. Be sure to indicate the following

- i) Hypothesis of interest that is motivated by a brief review:
- ii) What is your dependent variable(s). If there is more than one dependent variable, which is the primary dependent variable.
- iii) What are the variables that are at “Level 1.” How are they derived (the summation of several items on a Likert scale, single value denoting group membership, etc)
- iv) What are the variables of interest at “Level 2.” How are they derived (the summation of several items on a Likert scale, single value denoting group membership, etc)
- v) Are there any hypothesized interactions that need to be considered? In some cases, MLM will lend itself naturally to a “cross-level” interaction, where the relationship between X and Y at Level 1 depends on a Level 2 characteristic.

Group Project Presentations

Group Members: _____

Group Topic:

Tentative Scoring Structure for Psych 6335 Class Presentations

I. Introduction (5 points total)

- _____ (1 point) Provide an outline/roadmap of what you will talk about
- _____ (1.5 points) Provide general background into research area
- _____ (2.5 points) Description of the past research area and how it relates to your hypothesis.

II. Hypothesis (4 points total)

- _____ (4 points) Based on prior research, what are your hypotheses? Are there competing hypotheses that should be tested (if this makes sense)

III. Methods (8 points total)

- _____ (2 points) Who were the subjects and how many participants? Describe the participants
- _____ (2 points) How did you determine how many participants that you needed? Do a power analysis, even if the data was already collected.
- _____ (2 points) Why did you choose the measures that you used in the study (i.e., were the other measures reliable and valid)? If the measures were already chosen for you, justify why they were chosen.
- _____ (2 points) How was the study carried out? You are describing how you (or someone else) went about testing your hypothesis (obtaining consent, ordering of measures, debriefing, etc)

IV. Results (6 points)

_____ (4points) What did you find in your model? This is worth the most points, but it will depend on what you did (what coefficients were fixed and random; estimation method used, did you have to revise your model in a way that does not seem that you were “fishing”, etc). In other words, tell me what you think we need to know about your approach.

_____ (2 points) Were the reported analyses presented logically? Did you analyze everything you could think of or is there a reasoning? If you need to do other analyses to test your hypothesis, did you do them?

V. Discussion (5 points)

_____ (2 point) How do your findings relate to prior research

_____ (2 point) What are the limitations/future directions for this type of research

_____ (1 point) What is the take-home point of your class project

VI. Attendance Points/Participation Points (5 points)

_____ (2 point) Were you in class during your classmates' talks?

_____ (1 point) Did you ask a question?

_____ (2 points) Did you ask at least one meaningful question

Final Paper for Multilevel Modeling

The final paper is due by *12 p.m. May 5*. The final paper will be graded on a 75 point scale. Fifteen (15) points will be deducted from the final project grade a group receives for each day the project is late. You should turn in *two copies, type-written and formatted in APA publication style* (see Publication Manual of the American Psychological Association). Also, you should submit an electronic version of the paper. The paper should include the following sections:

- (a) ABSTRACT (5 points). Please do not forget to include an abstract, it will cost you points.
- (b) INTRODUCTION --- indicating the nature and scope of the problem investigated and citing other pertinent research; statement of hypotheses, if any. (20 points)
- (c) METHOD --- descriptions of (a) subject sample; (b) instrument, scales, etc.; (c) administration procedures. Also include an Analysis subsection describing statistical measures used. (20 points)
- (d) RESULTS / DISCUSSION (may be combined) --- presentation of the results of the study; use tables and figures where possible. The discussion section should go into the meaning and significance of major results and relate these to pertinent work; discussion of implications.

Where appropriate, effect size estimates and/or confidence intervals should be reported and interpreted. Failure to report confidence intervals or effect size estimates will result in the loss of project points. (20 points)

- (e) REFERENCES / APPENDICES. (10 points)

Again, if other members in the group indicate that your effort to the project has not been sufficient (or if I sense that you have not been doing your fair share of the work), I reserve the right to deduct points from your class project.
