

**Syllabus for
Meta-Analysis - EDP 381C
Unique Number: 10905
Spring, 2017**

Course Description:

This course is designed to help students master the statistical techniques used to conduct *quantitative meta-analyses*. This class will focus on helping students learn how to calculate various kinds of effect sizes and to use them to conduct meta-analyses including both pooling of effect size estimates and estimate and interpret results from meta-regression models, to describe and discuss quantitative meta-analytic methods and associated results, to handle various methodological dilemmas encountered when conducting a quantitative meta-analysis and to understand the statistics used in a broad array of meta-analytic scenarios.

Pre-requisites:

Meta-analysis is a complex analytic technique. This is a Quantitative Methods class and is designed to focus on the statistics and does not cover the steps and procedures involved in searching for, gathering and coding the relevant primary studies' data.

Mathematical/Statistical skills: This course requires the use of several intermediate graduate-level mathematical/statistical skills. Students are required to have mastered (actually, aced) correlation and regression techniques as well as experimental design (ANOVA) and the fundamentals of matrix algebra. In this class, you will not be provided with an in-depth review of the concepts involved in these pre-requisite skills.

Computer programs: While some of the analyses conducted will be greatly facilitated by the use of a computer program such as Excel, SPSS syntax, SAS, etc., this course is not designed to teach students how to use these programs either in and of themselves or for meta-analytic purposes. Students should come into the class feeling comfortable with the use of Excel and SPSS (or SAS, R or STATA) syntax. Some examples using Excel, SPSS or R will be provided during class time but students will be responsible for mastering the software that best fits their needs. Note also that no commercial meta-analysis software is taught in this class because such products are typically behind in terms of the most recent statistical innovations. In addition, use of conventional statistical software for conducting meta-analysis can help you build a deeper understanding of what the software is doing for you.

Calculator: Students must have access to a calculator that can be used to perform the relevant mathematical functions (such as taking the natural log, the exponent, square root, etc.) during class time. Therefore, please be sure to bring a calculator to class! However, a calculator will likely not suffice for the calculated required in all take-home assignments.

Class-time distractions: Do **not** text, surf the internet, check Facebook, email, etc. during class time as this distracts both you and students seated around you. Turn off phones unless you need to be contacted for dependents' care.

Meeting time and location:

Days: Tuesday and Thursday

Time: 9:30 – 11am*

Place: SZB 268

Instructor:

Name: Dr. Tasha Beretvas

Office: SZB 538E

Office hours: Wednesdays, 2:30-4pm^{*}, and by appointment.

E-mail: tberetvas@austin.utexas.edu

Note: Do not call me. I don't answer my office phone. Use email for correspondence.

^{*}Due to prior professional commitments, there are a few class and formal office hour times when I will be out of town and thus unavailable. For missed formal office hours, do contact me in advance to set up an additional appointment. For missed class times, I will do my best to post a video of the missed lecture and any activities for you to observe and engage in during my absence.

Missed office hours will include: 2/1, 3/15

Missed face-to-face classes will include: 2/2, 3/14, 3/16, 4/27

Last, my sincerest apologies but, as is likely for each of you, my schedule is very full. As soon as you know that you might need to meet with me outside of my regularly scheduled office hours, please be sure me to find a date/time for an appointment.

Note that if you have questions about course material or assignments then you need to email to set up an appointment to discuss your questions. You will not learn the relevant material by my giving you an *answer over email*. So when you have a question, please come to my office hours. If you cannot make those times, email me and suggest dates/times that you can meet and I'm VERY happy to work with you to help you answer your questions!

Course Materials

Required: The course closely follows sections of the material covered in the **second edition** of the *The Handbook of Research Synthesis* (Cooper & Hedges, 2009) textbook. Note that the text provides additional topics not covered in class that should prove to be a useful resource for applied meta-analysts. While this book is available as an electronic resource in our library, it is a great resource and well worth owning! (I have listed some additional meta-analysis textbook resources at the end of the syllabus).

Optional: Class handouts matching the overheads used by the instructor will be made available on CANVAS (<http://canvas.utexas.edu>) to students by 6a.m. on the day of the relevant class meeting. I update overheads to match class progress and cannot guarantee to offer them any earlier. **Please do not ask me to do so.** Reading the handouts does not provide the student with the learning experiences or materials equivalent to those obtained by attending class. The handouts provide a skeleton of what is being covered each day and will thus be an incomplete version of the material actually covered. They are designed so that the students can pay attention without scribbling down everything that's being said. The handouts contain spaces for the student to fill in the additional material and to practice working through examples that are provided in class.

Assessments:

Readings from the textbook have been assigned for almost every topic covered (see Topics handout). Occasionally additional readings will be distributed. Students may choose to read the selections either before or after the class sessions, whichever better helps to solidify their learning.

There will be four types of assessments during the semester (performance on which will contribute to students' final grade) including:

- In-class group quizzes (Ungraded)
- Homeworks (**50%**)
- Mini-meta-analysis (**25%**)
- Methodological Meta-Meta-Analysis Project (**25%**)

The only way to master meta-analytic techniques (as is the case with most mathematical topics or techniques) is to practice using them. Thus, the assignments are designed to provide students with the opportunity to apply meta-analytic techniques. However, because this is a Quantitative Methods course, there will also be an opportunity to explore meta-analysis methodology a little bit more deeply through the Methodological Project.

Homeworks

Practice using the concepts and formulas we will cover in class will be provided in the form of homeworks. These homeworks will typically be facilitated by students' use of some statistical software program for the computation of results. While students are encouraged to seek the help of the instructor with necessary concepts, homework ***must*** be the work of the individual student.

Students should assume that homeworks will be assigned every few weeks and will be due a week after they are assigned.

(The homeworks will be worth a total of **50%** of the final grade).

Note: Students should - on their own time - also construct and do their own homework by ***conducting all analyses*** demonstrated in class. Students will not learn by simply watching the instructor conduct analyses!

Mini-meta-analysis

A mini-meta-analysis project will be assigned to answer an applied meta-analytic research question that can be assessed by synthesizing studies' estimates of one of the standardized mean differences, δ . Each student will choose a substantive meta-analytic research question of "interest". Each student will then gather a minimum number* of applied studies (offering at least a minimum number of δ estimates) that employ quantitative methods to investigate the relationship between the relevant variables and that have sufficient information that can be used to estimate effect sizes.

Students will be required to submit a proposal for the mini-meta-analysis for review by the instructor. The proposal* will list the research question [and relevant variable(s)] and provide abstracts for the studies that will provide the data to be meta-analyzed.

The student will then calculate the relevant effect size estimate for each study and summarize the effect size across studies. A summary* of these results along with a description of

the search for the articles, etc. will be provided to the instructor for assessment. The student will also code a study characteristic that distinguishes the studies and that the student hypothesizes might be related to the relevant effect size and investigate this relationship statistically. Additional analyses typically expected in a meta-analysis will also be required and detailed at a later time. These will be summarized and provided to the instructor as part of the final version* of each mini-meta-analysis project.

Note: The data being gathered must not be part of data previously gathered by the student.

The proposal will be due at the start of class at the start of class on **March 23rd**. The final project will be due at the start of class on **April 6th**.

(The proposal and final project are together worth **25%** of the final grade).

Review Quizzes

It is important that students keep up with the material that is being covered. I have found that (unfortunately) one of the best ways to “strongly encourage” students to master material is through the use of quizzes. However, to minimize anxiety, these quizzes will not contribute directly to your final grade. Students will not be required to memorize formulas and can use class notes. In addition, these will be completed in small groups. However, only a certain amount of class time will be dedicated to completing the quizzes and therefore it will help to have reviewed material before taking each quiz. Students will not necessarily be forewarned of upcoming quizzes at the end of the prior class – this should help motivate students to make the time to stay up to date on class material. Note that while the review quizzes will not be graded per se, preparation for them and completion of them will hopefully help you better master the material!

(The reviews will be worth **0%** of the final grade although the benefits resulting from studying for and working on them are priceless).

Methodological Meta-Analysis Project

This is a graduate level *Quantitative Methods* course, thus there is one final requirement that involves students’ focusing on meta-analytic methodology. Each student must choose a methodological dilemma in meta-analysis [e.g., how to synthesize correlations (using Fisher’s Z_r or not?), or how to synthesize multivariate effects (done correctly, or is univariate synthesis conducted, etc.?), or how researchers handle results from the test of homogeneity, how researchers handle missingness, how publication bias is addressed, etc]. There will then be two options.

For both options, each student will have to select a meta-analytic methodological dilemma. The student will then find a minimum* number of recent methodological (simulation or derivation) articles (one of which may be a textbook chapter) that discuss or investigate this or a facet of the selected meta-analytic dilemma. The student will compose a summary* of the dilemma – what is the dilemma?, what are the possible approaches to address the dilemma?, what is the impact of using one approach over another?, what has been found in previous methodological research?. For the more applied project option, students will need to find a minimum* number of applied meta-analyses in a field of substantive interest that have had to confront this dilemma. The student will then summarize how the methodological dilemma was addressed in each of the applied meta-analyses that are being summarized. The student will then use data from an applied meta-analysis – or from data they had already gathered – to demonstrate the different results that can occur based on the approaches chosen. The project should include a

discussion about the results that were found (maybe expected differences were not found, or they were – why?). Last, the student will offer guidelines for applied meta-analytic researchers who might encounter this dilemma.

For the more methodological option, in addition to describing the dilemma, summarizing how the dilemma is handled in a number of applied meta-analyses and what previous research has found, the student will have to emphasize what has *not* been resolved about the methodological dilemma (i.e., make the case for their proposed methodological study). The student will then have to propose a methodological study including a real (meta-analytic) data study and a small-scale simulation study intended to address the methodological issue that is as yet unresolved, and note expected findings with associated guidelines for applied researchers.

As with the mini-meta-analysis projects, a proposal* will be due (on **April 20th**) to the instructor several weeks before this final project is due. (The final project will be due at the end of semester on the last class day, **May 4th**).

(The project is worth **25%** of the final grade).

*Fuller details will be provided about this assignment later in the semester.

Makeup Assignments:

By UT Austin policy, students must notify the instructor of their pending absence at least fourteen days prior to the date of observance of a religious holy day. If a student must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, then the student will be given an opportunity to complete the missed work within a reasonable time after the absence.

Only in exceptional circumstances (including a verifiable medical excuse) and only with **prior** permission from the instructor will a student be able to hand in an assignment late. Without this permission, the student will be penalized for late work. For each 24-hour period that the assignment is delayed, **10%** will be deducted from the assignment's score. Because assignments are due at the beginning of class, each 24-hour period will start coincident with the class's beginning at 9:30am. There will be no exceptions to this penalty.

If a student becomes ill on the day that an assignment is due, it is the student's responsibility to contact the instructor and to arrange delivery of the assignment by the time it is due. In this case, if the assignment is not complete, then the student will receive credit only for what was attempted. It is important to complete the homework **before** the day on which it is due.

I do **not accept emailed** assignments unless agreed to in advance.

Grading System:

Grades are assigned based on percentage of accumulated points:

A : 93-100;	B+ : 86-89;	C+ : 76-79;	D : 60-69;	F : 0-<60
A- : 90-92;	B : 83-86;	C : 73-76;		
	B- : 80-82;	C- : 70-72;		

Graduate students must receive a minimum overall grade of a **C** (i.e. 73%) to be awarded credit (**CR**) for the course.

Attendance:

Students are responsible for all material presented in lectures. It is expected that students will attend lectures, however attendance will not be taken. If a student **misses a class**, then the

student is responsible for obtaining both the course material that was missed as well as any class announcements from his/her classmates.

Students are expected to arrive **on time** for the beginning of class. Students anticipating late arrival should notify the instructor before class. A pattern of tardiness can **negatively affect** your grade.

Assignments are due at the **beginning** of class on the due date indicated either in the syllabus or during class (for homeworks). If a student cannot attend on the days when an assignment is due, then the student is responsible for notifying the instructor **in advance** and arranging timely delivery of the assignment.

Scholastic Dishonesty Policy:

Each graded assignment **must** be the work of the individual student. Practice in class and review quizzes provide opportunities for collaboration; graded assignments do not.

The University defines academic dishonesty as cheating, plagiarism, unauthorized collaboration, falsifying academic records, and any act designed to avoid participating honestly in the learning process. Scholastic dishonesty also includes, but is not limited to, providing false or misleading information to receive a postponement or an extension on a test or other class assignment, and submission of essentially the same written assignment for two courses without the prior permission of faculty members.

By accepting this syllabus and participating in this course, you have agreed to these guidelines and **must** adhere to them. Students who violate University rules on scholastic dishonesty will receive an F for the course grade, be referred to the appropriate university officials, and may receive a maximum penalty of suspension from the University. For more information on scholastic dishonesty, students may review the Student Judicial Services website: <http://www.utexas.edu/depts/dos/sjs/>.

Disability Accommodation

Students who have a documented disability that may impair their ability to complete assignments or otherwise satisfy course criteria are encouraged to meet with the course instructor to identify, discuss and document any feasible instructional modifications or accommodations. They must notify the instructor no later than the end of the second week of the semester/term in which the course is offered. Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259, <http://www.utexas.edu/diversity/ddce/ssd/>

Emergency Evacuation Policy

Occupants of buildings on the UT Austin campus are required to evacuate and assemble outside when a fire alarm is activated or an announcement is made. Please be aware of the following policies regarding evacuation:

- Familiarize yourself with all exit doors of the classroom and the building. Remember that the nearest exit door may not be the one you used when you entered the building.
- If you require assistance to evacuate, inform me in writing during the first week of class.
- In the event of an evacuation, follow my instructions or those of the TA.

Do not re-enter a building unless you're given instructions by the Austin Fire Department, the UT Austin Police Department, or the Fire Prevention Services office.

Carrying of Handguns

Students in this class should be aware of the following university policies:

- Individuals who hold a license to carry are eligible to carry a concealed handgun on campus, including in most outdoor areas, buildings and spaces that are accessible to the public, and in classrooms.
- It is the responsibility of concealed-carry license holders to carry their handguns on or about their person at all times while on campus. Open carry is NOT permitted, meaning that a license holder may not carry a partially or wholly visible handgun on campus premises or on any university driveway, street, sidewalk or walkway, parking lot, parking garage, or other parking area.

Please also review the following:

- Students in this class who hold a license to carry are asked to review the university policies regarding campus carry:
 - [Overview](#)
 - [Fully Policy](#)
- ***I request that students inform me if they intend to carry a handgun during course meetings.*** I make this request because knowing which, if any, students are carrying handguns will help me to effectively coordinate response to emergencies or threats to student safety. Disclosing this information is voluntary and at the discretion of the student.
- ***Per my right, I prohibit carrying of handguns in my personal office (i.e., SZB 538E).*** Note that this information will also be conveyed to all students verbally during the first week of class. This written notice is intended to reinforce the verbal notification, and is not a “legally effective” means of notification in its own right.

Additional Meta-Analysis Texts

- Borenstein, M., Hedges, L. V., Higgins, J. P. T. and Rothstein, H. R. (2009). *Introduction to meta-analysis*. John Wiley & Sons, Chichester.
- Card, N. A. (2012). *Applied meta-analysis for social science research*. New York: Guilford.
- Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Academic Press, San Diego, CA.
- Lipsey M. W. & Wilson D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage Publications, Inc.
- Sutton, A. J., Abrams, K. R., Jones, D. R., Sheldon, T. A, & Song, F. (2000). *Methods for meta-analysis in medical research*. John Wiley & Sons, Chichester.