**Advanced Seminar in Educational Psychology**

**EPSY 590, In-person Section TL (CRN 54859) and**

**Online full-semester Section TLO (CRN 53554)—Synchronous (preferred) or asynchronous options**

## Tu Th 1:00 – 1:50 p.m. US Central Time

**Spring, 2022**

Instructor: Dr. Cromley

Office: Rm. 188U Education Building

E-mail: jcromley@illinois.edu (by far the best way to reach me)

Telephone: (217) 300-1092

Zoom: <https://illinois.zoom.us/my/jcromley>

Office hours: Wed 3:00 pm – 5:00 pm on Zoom. First come, first served (no appointments possible). Other times available by appointment.

**Course Description (from Academic Catalogue):**

Seminar in educational psychology; topics relate to the areas of specialization represented by the various divisions within the department. 0 to 4 graduate hours. No professional credit. Approved for Letter and S/U grading. May be repeated to a maximum of 8 hours in the same or separate semesters, if topics vary. Prerequisite: Consent of instructor required.

**Course Overview**

This seminar covers the ‘life cycle’ of research that gathers data about the learning process or problem solving during learning. A wide variety of data collection measures are used, but there are commonalities in research design, writing IRB protocols, data collection procedures, measurement issues, data analysis, and writing for publication when these types of learning/performance process research methods are used. Examples will be read and discussed across a wide range of learning-related outcomes (post-test factual or inference scores, motivation, emotion, performance with a device, etc.) in multiple domains (reading, mathematics, history, science, health, etc.) You will also gain experience writing a proposed research study; this could take the form of a manuscript (from Introduction through Method) or a grant proposal narrative. A secondary goal is to better understand the intertwined measurement and data analysis issues that tend to arise with these sorts of data.

**Course objectives:**

At the end of this course, students will be able to:

* Define process data and name at least 10 process data types
* Design stimuli and tasks that are do-able by a sample(s) from the population of interest in a study that collects process data
* Design data collection procedures that will meet expectations of consenting participants and IRB, and yield complete, usable data
* Develop their own coding scheme to categorize language or behavior
* Develop their own scoring rubric to score for accuracy
* Effectively train 2nd coders/scorers to a high level of inter-rater reliability
* Transform raw data into scores that can be analyzed, appropriate to different types of process data
* Screen transformed data to choose appropriate data analysis technique(s)
* Apply appropriate theory-driven data analysis technique(s) to process data

**Readings:**

All required readings will be available on the Canvas site in the weekly folders, and are listed below.

**Course Requirements:**

Readings: All teaching materials assume you have completed the readings before class. Students are expected to complete assigned readings before class and come prepared to discuss the material.

Class Discussion: Each student must participate in class discussions, whether you are in person or on the synchronous Zoom session, or watch the video recordings which will be posted to Canvas a few hours after class. Discussion of course material will be facilitated by in-class reading of relevant sections of journal articles reporting on the collection, coding/scoring, and analysis of process data.

Writing assignments: There are 13 medium-length writing assignments, one due almost every week (see the long Word document in Canvas for details). These will be submitted via Canvas and will be checked with the Turnitin software. Most assignments involve writing short sections of your final paper, and will be graded. All written assignments must be carefully thought through, polished, proofread, and as free of grammar errors as possible—turning in a first draft is not acceptable. All written assignments are individual assignments; you may work with the UIUC Writers Workshop (<http://www.cws.illinois.edu/workshop/UsingOurAppontmentSystem.aspx>), but you may not collaborate with other student(s) or tutor(s) on the ideas, writing, etc. You will receive extensive written comments on every assignment within 1 week of submitting it.

Research Proposal (final presentation and final paper): The final paper will be a research proposal for a study that uses during-learning process data to address a question of personal interest about some learning-related (or performance-related) variable. As mentioned above, you will write and receive extensive feedback on each section as you write it. In addition to incorporating my comments on earlier drafts, your thinking will evolve as you work on the paper, and this will require some re-writing of sections that you may have thought were complete.

We will discuss mechanics and strategies for developing research proposals in class, but expect to write a 13- to 28-page double-spaced paper. This could be formatted in APS style like an ERP or dissertation proposal OR it could be formatted like a grant proposal (single-spaced 10 to 14 pages). Rubrics for the final paper will be posted to Canvas later in the semester.

The week 15 presentations are a chance to pull together all of the different parts of your project and to get feedback on each of the choices you have made in research design.

**Evaluation:**

Student grades will be earned by students’ achievement on the following assignments. Please see the weekly schedule for due dates:

Percent

Short weekly writing assignments ([12-1 dropped] x 4% each) 48%

Individual class participation 2%

Final project written submission 50%

TOTAL 100%

*There will be no extra-credit opportunities. Please do not ask.*

**Course Policies:**

Attendance: Regular attendance or watching must be a priority because the course covers complex and sometimes technical material. If you choose to miss class because of (personal or professional) travel or because of a significant life event, you are responsible for getting all notes and making up assignments. If you are ill, please watch online synchronously or asynchronously.

Late assignments: Late assignments will be penalized 5% of the assignment score per day, must be emailed to me (the Canvas submission link will disappear past the due date), and feedback may be delayed beyond 1 week from submission. The final paper must be submitted on time or it will receive a score of 0 (zero).

**Students with Disabilities:**

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign (during COVID-19 restrictions, be sure to wear a face covering and show your app/boarding pass), call 333-4603 (V/TDD), or e-mail a message to disability@uiuc.edu.

To insure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class are asked to see the instructor as soon as possible.

**Academic Integrity:**

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: <http://education.illinois.edu/edpsy/about/academic-integrity>. All written asignments will be screened for plagiarism using the Turnitin function in Canvas. Please note that you are responsible for reading this policy. Ignorance is not an excuse for any academic dishonesty. Plagiarism or fair use violations will be dealt with without exceptions. <http://education.illinois.edu/edpsy/about/academicintegrity.>

The Illinois Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: <http://studentcode.illinois.edu/>

If you have not used Canvas before for your courses, helpful information will be found at <http://online.illinois.edu/getting-started/learning-management-systems/canvas>

**Important Regulations**

Students are responsible for all information transmitted at class meetings, which will always be captured on video for asynchronous viewing and posted to Canvas a few hours after class. This includes material that may or may not be included in the readings, announcements about deadlines or changes of deadlines, meeting course requirements, etc.

Please notify me in advance if any assignment deadlines conflict with a religious observance.

Please notify me in advance by email if you are an in-person student but you will not be in class.

**Emergencies**

Please review relevant information at: <https://police.illinois.edu/emergency-preparedness/run-hide-fight/> if you sign up for emergency messages at <https://police.illinois.edu/services/stay-informed/illini-alerts/>, you’ll receive information from the police and administration during these types of situations. If you have any questions, go to <http://police.illinois.edu>, or call 217-333-1216.

**Grades will be earned according to the following system**

97-100 = A+ 93-96.9 = A 90-92.9 = A-

87-89.9 = B+ 83-86.9 = B 80-82.9 = B-

77-79.9 = C+ 73-76.9 = C 70-72.9 = C-

67-69.9 = D+ 63-66.9 = D 60-62.9 = D-

Below 59.9 = F

**Weekly Schedule**

| Date/  Week | Topic (Note: coverage may be accelerated until we get to coding; assignment dates will not change as a result) | Readings (on Canvas) | Assignments due via Canvas **on Tuesdays** before the beginning of that class meeting |
| --- | --- | --- | --- |
| 1/18/2022  1/20/2022  Week 1 | Introductions of us and the syllabus  Definition of process data and of various types  Overview of relating during-learning processes to learning/performance outcomes, the “flight recorder” analogy | None—first class | None—first class |
| 1/25/2022  1/27/2022  Week 2 | Choice of type(s) of process data—detailed descriptions and what different types can reveal | Azevedo & Taub, 2020 | #1 Draft learning/ performance outcome(s) measures section for study you are proposing |
| 2/1/2022  2/3/2022  Week 3 | Design of stimuli and tasks, logistical and IRB issues | Articles | #2 Draft description of process data you are proposing, with a rationale for each type |
| 2/8/2022  2/10/2022  Week 4 | Gathering data 1—Think-aloud, emote-aloud, and cognitive interview procedures | Articles | #3 Draft description of stimuli and during-learning tasks |
| 2/15/2022  2/17/2022  Week 5 | Gathering data 2—Procedures for eye tracking, drawings, gesture, psycho-physiological and other measures | Articles | None |
| 2/22/2022  2/24/2022  Week 6 | Overview of processing the data—Examples (coding schemes, rubrics, transcription, automated processing/data mining) and linking to theory and prior research | *Articles* | #4 Draft data collection procedures for process data you are proposing |
| 3/1/2022  3/3/2022  Week 7 | Coding process data—Creating and applying codebooks to think-aloud, cognitive interview, and open-ended response; training coders | Articles | #5 Methodological literature examples writeup for the coding, scoring, and other data processing approaches you are proposing |
| 3/8/2022  3/10/2022  Week 8 | Scoring process data—Creating and applying rubrics, training scorers | Articles | #6 final project prospectus AND #7 Draft coding scheme and draft coding procedures you are proposing (see Note if Not Applicable) |
| 3/15/2022  3/17/2022 | Spring Break No Classes |  | None |
| 3/22/2022  3/24/2022  Week 9 | Processing eye tracking and logfile data—Approaches and composites unique to eye tracking and log files | Articles | #8 Human subjects narrative for the process data study you are proposing |
| 3/29/2022  3/31/2022  Week 10 | Measurement quality how-to with process data—reliability and validity, inter-rater reliability statistics | Articles | #9 Draft scoring rubric and draft scoring procedures you are proposing (see Note if Not Applicable) |
| 4/5/2022  4/7/2022  Week 11 | Data analysis—Variable-centered approaches: reminders of parametric test assumptions, demonstrations of alternative non-parametric tests, multilevel data structures | Articles | #10 Draft measurement quality approaches you are proposing (see Note if Not Applicable) |
| 4/12/2022  4/14/2022  Week 12  Note: Drop deadline 4/15/2022 | Data analysis—Person-centered approaches: cluster analysis and its modern cousins | Articles | #11 Draft final paper lit review |
| 4/19/2022  4/21/2022  Week 13  NB Possibly online only | Data analysis-- information-centered approaches: Multidimensional scaling, network analysis, and transition analysis | Articles | #12 Draft final paper measures and procedure, including lit review relevant to these |
| 4/26/2022  4/28/2022  Week 14  NB Possibly online only | Data analysis--Linking results from process data to learning outcome(s) | Articles | #13 Draft final paper introduction including rationale, (revised) lit review, theory, and research questions |
| 5/3/2022  Week 15 | Brief final student presentations | None | None—Pre-record presentation and visit Zoom breakout rooms |
| 5/10/2022  Week 16 | Final paper due | None—final paper due | Final paper due via Canvas by 5:00 pm |

Note: For any assignment that covers a technique you are not proposing to use, full credit will be given. If you make changes to your proposed project—as I expect you will—the final paper will need to include all sections relevant to your project, including any one(s) you did not initially submit.

Readings (all on Canvas)

Week 2

Kareklas,

Week 3

???Tim Shipley (eye track), Kim Kastens (tabletop), Martha Alibali (gesture)

Week 4

???Braten (TA), Craig et al. (2008emote-aloud), Karabenick et. al, 2007 (cognitive interview)

Week 5

Scharinger (psychophys), Tsai & HSu (log file), Alibali et al (gesture), Strobel (eye tracking)

Week 6

Catrysse, Gijbels, & Donche, 2020 (HSSP); Bråten, Magliano, & Salmerón, 2020 (HSSP); Newton, K. J. (2008). An extensive analysis of preservice elementary teachers’ knowledge of fractions. *American Educational Research Journal, 45*(4), 1080–1110.

Week 7

Azevedo & Cromley 2004; Latini et al, 2021; Cromley, Dai, Fechter et al., 2021;

Week 8

Dornisch & Sperling, 2006; Barzilai et al 2020; Gil et al, 2010; Mason et al 2013 scoring drawings; sample human subjects narrative

Week 9

Schoor et al., 2021; Moreno et al., 2021; Kastens et al, 2016; Bernacki???; Chen Huang Liu 2020

Paquette, L., & Bosch, N. (2020).

Week 10

Baars et al., 2018;

Revelle & Condon, 2018;

Week 11

Huck (non-parametrics), Huang (Multilevel),

Cromley, J. G., Kunze, A., & Dane, A. (2021). Multi-text multi-modal reading processes and comprehension. *Learning and Instruction*. <https://doi.org/10.1018/j.learninstruc.2020.101413>

Week 12

Zahner, W., Dai, T., Cromley, J., Wills, T., Booth, J., Shipley, T., & Stepnowski, W. (2017). Coordinating multiple representations of polynomials: What do patterns in students’ solution strategies reveal? *Learning and Instruction*, 49, 131-141. <https://doi.org/10.1016/j.learninstruc.2017.01.007>

Cromley, J., & Wills, T. W. (2016). Flexible strategy use by readers who learn much versus learn little: Transitions within think-aloud protocols. *Journal of Research in Reading, 39*(1),50–71.doi:10.1111/1467-9817.12026

Week 13

D’Mello & Graesser, 2014; Paans et al., 2019 (PROM—transition analysis), Lombardi & Ryu (SNA)

Week 14

Cromley et al, 2013; Scheiter mediation;