

# Research Methods for the Learning Sciences

## 85-748

Spring 2008 Syllabus Carnegie Mellon University

### General Information

Class times: 4:30 to 5:50 Tuesday & Thursday  
in Baker Hall 336B

Instructors: Professor Kenneth R. Koedinger  
Office hours by appointment  
Location: 3601 Newell-Simon Hall  
Phone: 8-7667  
Email: Koedinger@cmu.edu

Dr. Ryan S.J.d. Baker  
Office hours by appointment  
Location: 2602L Newell-Simon Hall  
Phone: 8-9690  
Email: rsbaker@cmu.edu

### Teaching Assistant:

Erin Walker  
Office hours by appointment  
Phone: 8-9184  
Location: 206 S. Craig  
Email: erinwalk@andrew.cmu.edu

Class URL: TBD

Class Discussion Group URL: TBD

The goals of this course are to learn data collection, design, and analysis methodologies that are particularly useful for scientific research in education. The course will be organized in modules addressing particular topics including overview of methods, cognitive task analysis, qualitative methods, protocol and discourse analysis, and educational data mining and log analysis. A key goal is to help students think about and learn how to apply these methods to their own research programs.

### Course Prerequisites

To enroll you must have taken 85-738, "Educational Goals, Instruction, and Assessment" or get the permission of the instructors.

### Readings

Textbook: "The Research Methods Knowledge Base: 3<sup>rd</sup> edition" by William M.K. Trochim and James P. Donnelly  
Other readings will be assigned in class.

### Reading Reports

For each class session, students are required to submit at least one post to the course discussion group by 9am the morning of the class. These posts can be about

- 1) a question you had about the reading, something important you did not understand
- 2) an idea inspired by the reading
- 3) an interesting connection with something you learned or did previously in this or another course, or in other professional work or research
- 4) an on-topic, relevant response, clarification, or further comment on another student's post

Assignments Homework assignments will give you practice in using educational research methods. Generally, each course topic will have one assignment, though some assignments will have multiple parts, with different parts due on different days. A final project will also be given, where you will apply a research method, in depth, to a topic of your choosing.

Grading The weight given to each assignment is as follows:

Assignment 1	10%
Assignment 2	10%
Assignment 3	10%
Assignment 4	10%
Assignment 5	10%
Assignment 6	10%
Final Project	20%
Reading Reports & Class Participation	20%

Partial credit will be given for assignments which are turned in late, before we start grading – but it is recommended to turn in all assignments on time (or discuss lateness with us beforehand)

## Class Schedule for Research Methods for the Learning Sciences Spring 2008 (Topics continue into blanks!)

Deleted: -----Page Break-----

1-15 Basic Research & Experimental Methods (Koedinger, Baker)  
1-17  
1-22  
1-24  
1-29 Cognitive Task Analysis (Koedinger, Walker, Baker)  
1-31  
2-5  
2-7 Video and Verbal Protocol Analysis (Lovett, Rosé, Walker)  
2-12  
2-14  
2-19  
2-21  
2-26  
2-28 Ethnography & Design Experiments?  
3-4 Surveys, Questionnaires, Interviews (Kiesler)  
3-6  
3-11 NO CLASS - Spring break  
3-13 NO CLASS - Spring break  
3-18 Psychometrics, reliability, Item Response Theory (Junker, Koedinger)  
3-20  
3-25  
3-27 Educational data mining (Scheines, Baker)  
4-1  
4-3  
4-8

4-10  
4-15  
4-17 NO CLASS - Spring Carnival  
4-22 Cognitive Task Analysis - Revisited (Koedinger,  
Baker)  
4-24  
4-29 Wrap-up  
5-1 Wrap-up