EDUC09:
INDIVIDUAL DIFFERENCES AND ASSESSMENTS

Fall Term, 2013	David J.M. Kraemer, PhD
Monday, Wednesday, Friday	*david.kraemer@dartmouth.edu*
MWF 10:00-11:05, X-hr: Th 12:00-12:50	Office: Raven 212
Raven 104	*Office hours: M,W 3:00-4:30*

COURSE OVERVIEW

This course is focused on practical and theoretical issues regarding how we evaluate academic performance and how individual differences impact that performance. The term is divided into two major sections:

1. The first section focuses on the test and the information it provides. What kinds of tests occur in schools? How do teachers, administrators, policy developers, and students use these tests? What are the key concepts in understanding what a test measures and how it should be interpreted? What can (and can't) a test tell us about the achievement of a student, of a teacher, of a district, and of a nation?
2. The second section of the course focuses on the individual student. What makes one student different from another? What factors determine a student's academic aptitude? Which aspects of one's cognition, personality, and family background are relevant to educational performance? How should we deal with these individual differences in an academic environment?

From this course, students will gain a broad understanding of the lay of the educational assessment landscape, a deep understanding of the promises and perils of academic testing, and a more comprehensive view of individual differences in cognition. Developing the skills of reading research and opinion articles, discussing and understanding different interpretations of data, and writing for a scientific audience are central to these goals and therefore are critical components of the course.

GRADING OVERVIEW

10% Pop Quizzes (4)
10% Short Opinion Paper
15% Class Presentations (2) & Participation
20% Midterm Examination
20% Final Examination
25% Final Research Paper & Annotated Bibliography

GENERAL POLICIES

1. **Read all materials and prepare for class.** You are expected to read the materials posted on Blackboard *before* each class. Be prepared to discuss that material *in class*. Everyone is expected to come to every class and to arrive on time. You are also expected to contribute to class discussion. You will learn the material better and others will learn from you. The success of this course depends on everyone coming to class prepared and ready to discuss the material. Both attendance (on-time) and preparation for class will determine a portion of your grade (see "Assignments and Assessments" below).
2. **Tell me sooner rather than later.** If you know ahead of time that you will be missing a class, e.g., for sports, please let me know in advance in order to avoid losing participation credit. Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me before the end of the second week of the term to discuss appropriate accommodations.
3. ***ASSUME THAT I WILL NOT ACCEPT LATE ASSIGNMENTS.***
4. **Cell phones are not to be used in class.** If an emergency arises that requires the use of a phone, please quietly excuse yourself from the room to respond.
5. **Accommodations.** Students with learning, physical, or psychiatric disabilities enrolled in this course who may need disability-related classroom accommodations are encouraged to make an office appointment to see me early in the semester (i.e., within the first two weeks). If you have not done so already, students requiring disability-related accommodations should register with the Student Accessibility Services office (301 Collis Student Center).
   Dartmouth's policies and resources: **http://www.dartmouth.edu/~accessibility**
   Contact info: 646-9900, **Student.Accessibility.Services@Dartmouth.edu**
6. **Plagiarism is unacceptable.** All work submitted as your own must be written by you and not previously submitted for any other class. It is important to attribute material that is the work of others to the original source. If you are unsure how to properly cite a source, please consult with me prior to handing in an assignment (and see: **http://www.dartmouth.edu/~writing/sources/**). You should be familiar with Dartmouth's Honor Principle, which applies to all courses at Dartmouth (available here: **www.dartmouth.edu/~uja/honor/**). I do not expect any violations of this code, but if any concerns do arise I will forward all related materials to Dartmouth's Committee on Standards.
7. **Before you turn in your papers…** make sure that you use 12-point Times New Roman font, that you double-space the whole document, that your print margins are 1-inch on all sides (not the default in *Word)*, that all your pages are numbered, and that your document is stapled together (if printed). For citations in all papers, you must use APA Style formatting (refer to the APA Style Manual or online guides, such as: **http://owl.english.purdue.edu/owl/resource/560/01/**)

ASSIGNMENTS and ASSESSMENTS

Pop Quizzes (10%) – *Four quizzes throughout the term*

- Will consist of short answer and fill-in-the-blank questions
- Covers recently assigned class readings
- These are intended to be low-stakes opportunities to gauge your understanding of the material.
- Your quiz grade will be the average of your highest 3 quiz scores

Short Opinion Paper (10%) – ***Due MONDAY, OCTOBER 14TH***

- A well-researched, well-reasoned, 3-page paper focused on using tests to measure trends in school/group performance – see assignment on Blackboard for more details.
- Paper must cite at least 2 new sources: articles, book chapters, or news reports
- This is another low-stakes opportunity to gauge your understanding of the material, as well as a chance for me to provide feedback on writing for a scientific audience (which will be useful when it comes time to write your final paper).
- Of critical importance: cite all of your sources

Class Presentations & Participation (15%) – *See class schedule for topics*

- During several class periods, a selected student will present a summary and critical analysis of that day's assigned articles:
    - Everyone will present twice during the term
    - Each 10-minute presentation will include:
        - A summary of the article including, e.g., the goal of the study, an overview of the methods, and a description of the main findings, or, if the article is an opinion paper, an analysis of their argument
        - A discussion of whether the authors' interpretations are well-founded and what are the broader implications of the article
- In addition, everyone is always expected to:
    - Arrive on time for each class
    - Prepare for class discussions that you are *not* leading and be attentive (e.g., read the assigned materials, stay awake during class, stay off internet, etc.)

Mid-term examination (20%) – ***WEDNESDAY, OCTOBER 16TH***

- Mix of short answer and fill-in-the-blank questions
- Covers all material from Section I

Final examination (20%) – ***FRIDAY, NOVEMBER 22ND @ 8am***

- Mix of short answer and fill-in-the-blank questions
- Covers all material from Section II

Final Research Paper & Annotated Bibliography (25%) – ***Due FRIDAY, NOVEMBER 22ND***

- There is a great deal that we still do not know for sure about what individual differences between students are important for classroom learning. In this research paper, you will choose a topic discussed in class (or closely related), identify a specific question about that topic that we don't yet know the answer to, and propose a study to investigate that question.
- *I need to approve your chosen topic no later than: – MONDAY, NOVEMBER 4TH*
- Your final paper will consist of: 1) a background information section that details your question and describes the progression of relevant past research that logically leads to your proposal; 2) a proposed study (or studies) – e.g., classroom experiment, analysis of test trends, lab experiment – that will answer the question at hand, including roughly the target number participants, and enough about the methods and procedure that it is clear what you propose to do; 3) hypotheses, and implications of predicted (and possible alternative) results.
- Perform a literature search for at least 10 relevant articles not assigned in this class.
- Annotated bibliography: a detailed list of references (formatted in APA style) cited in the paper, in which you describe in about two sentences the research or argument presented in each article and its relevance to your thesis.
  (for examples, see: http://owl.english.purdue.edu/owl/resource/614/03/)
- Of critical importance: cite all of your assertions (if you want your readers to believe your facts, cite your sources).

CLASS SCHEDULE and ASSIGNED READINGS

1. Monday, September 16

INTRODUCTION and COURSE OVERVIEW

- We will discuss the structure and schedule of the course, the course goals and assignments, and preview an article that highlights upcoming topics.

SECTION I: THE TEST

2. Wednesday, September 18

Reading: The Evolution of American Testing (pp. 46-73), *in* Koretz, D. M. (2009). *Measuring up: What educational testing really tells us*. Harvard University Press.

Lecture: HISTORY OF TESTING IN PSYCHOLOGY AND THE U.S. EDUCATION SYSTEM

- We will cover roughly 100 years of testing that has focused on evaluating achievement and predicting aptitude. Here we begin to explore fundamental concepts that we will expand upon in subsequent classes.

3. Friday, September 20

Reading: What *Is* a Test?; and What We Measure (pp. 16-45), *in* Koretz, D. M. (2009). *Measuring up: What educational testing really tells us*. Harvard University Press.

Lecture: TEST CONCEPTS: NORM-REFERENCING and CRITERION-REFERENCING

- A fundamental issue in standardized testing is what standard to use as a basis of comparison for each student's performance – should achievement be measured against other students or against an independent threshold of acceptable performance?

4. Monday, September 23

Reading: Measures of Central Tendency, *excerpt* (pp. 39-64), *in* Thorndike, R. M. (2010). *Measurement and evaluation in psychology and education (8th ed.).* Boston: Prentice Hall.

Lecture: TEST CONCEPTS: VARIABILITY AND CENTRAL TENDENCY

- This week's classes will focus on key statistical and psychometric concepts that are critical to understanding how tests can and cannot be validly interpreted. We will discuss each of these concepts in the context of educationally relevant examples.

5. Wednesday, September 25

Reading: Giving Meaning to Scores, *excerpt* (pp. 66-108), *in* Thorndike, R. M. (2010). *Measurement and evaluation in psychology and education (8th ed.).* Boston: Prentice Hall.

Lecture: TEST CONCEPTS: STANDARDIZATION AND SCALING

6. Friday, September 27

Reading: Error and Reliability (pp. 143-179), *in* Koretz, D. M. (2009). *Measuring up: What educational testing really tells us*. Harvard University Press.

Lecture: TEST CONCEPTS: VALIDITY, RELIABILITY, AND ERROR

7. Monday, September 30

Reading: Freedman, S. W. (1993). Linking Large-Scale Testing and Classroom Portfolio Assessments of Student Writing. *Educational Assessment*, *1*(1), 27-52.

Lecture: ACHIEVEMENT TESTING: MEASURING STUDENT PERFORMANCE

- This week's classes will focus on specific tests and specific inferences that are made based on reported scores on these tests. Included in this discussion are alternative explanations for perceived interpretations (e.g., test biases, grade inflation) and how to deal with these issues.
- Today's class focuses on the interpretation of test scores at the level of the individual student.

8. Wednesday, October 2

Reading: Carey, T., & Carifio, J. (2012). The Minimum Grading Controversy: Results of a Quantitative Study of Seven Years of Grading Data From an Urban High School. *Educational Researcher*, *41*(6), 201–208.

Lecture: ACHIEVEMENT TESTING: MEASURING SCHOOL PERFORMANCE

- Today's class focuses on the interpretation of test scores as a measure of how a particular school or district is performing, and the related issue of using student test performance to evaluate teachers and administrators.

9. Friday, October 4

Reading: Wiliam, D. (2010). Standardized Testing and School Accountability. *Educational Psychologist*, *45*(2), 107–122.

Lecture: ACHIEVEMENT TESTING: MEASURING GROUP PERFORMANCE

- Today's class focuses on using test scores to compare across groups of students, such as different SES groups, races/ethnicities, states, and countries.

10. Monday, October 7

Reading: Lee, J. (2008). Is Test-Driven External Accountability Effective? Synthesizing the Evidence From Cross-State Causal-Comparative and Correlational Studies. *Review of Educational Research*, *78*(3), 608–644.

Discussion: ACHIEVEMENT TESTING: WRAP-UP

- Today we will wrap up our discussion of standardized testing with the broad evaluation of the testing landscape as provided by the assigned readings. We will also summarize the unresolved issues and discuss how new initiatives such as the Common Core State Standards would address these issues.
- (Plug: EDUC29 – "Policy and Politics in American Education", W14)

11. Wednesday, October 9

Readings:

1. Gamoran, A. (1992). The Variable Effects of High School Tracking. *American Sociological Review*, *57*(6), 812–828.
2. Figlio, D. N., & Page, M. E. (2002). School Choice and the Distributional Effects of Ability Tracking: Does Separation Increase Inequality? *Journal of Urban Economics*, *51*(3), 497–514.

Lecture: TESTING FOR PLACEMENT: TRACKING IN HIGH SCHOOL

- This class and the next class focus on using tests to predict future performance. First we discuss issues relating to tracking (e.g., placing into advanced math) in high school.

12. Friday, October 11

Readings:

1. Maruyama, G. (2012). Assessing College Readiness: Should We Be Satisfied With ACT or Other Threshold Scores? *Educational Researcher*, *41*(7), 252–261.
2. Sackett, P. R., Kuncel, N. R., Beatty, A. S., Rigdon, J. L., Shen, W., & Kiger, T. B. (2012). The Role of Socioeconomic Status in SAT-Grade Relationships and in College Admissions Decisions. *Psychological Science*, *23*(9), 1000–1007.

Lecture: TESTING FOR PLACEMENT: COLLEGE ADMISSIONS

- In this class we'll discuss using the SAT and related tests as measures of college preparedness.

13. Monday, October 14 – **_SHORT PAPER 1 DUE_**

Discussion: Today we will discuss the papers that you wrote, and spend a short time reviewing topics in advance of the midterm exam.

14. Wednesday, October 16

****MIDTERM EXAM****

SECTION II: THE INDIVIDUAL STUDENT

15. Friday, October 18

Discussion: Midterm review

Lecture: MEMORY and EXECUTIVE FUNCTIONS: KEY CONCEPTS and MODELS

- We will spend the next several classes covering different aspects of memory, as well as cognitive processes related to complex thought that are collectively termed "executive functions". Today we will start with a broad overview of the concept of working memory and some basic concepts and early experiments.

16. Monday, October 21

Readings:

1. Baddeley, A. (2003). Working memory: Looking back and looking forward. *Nature Reviews Neuroscience*, *4*(10), 829–839.
2. D'Esposito, M. (2007). From cognitive to neural models of working memory. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *362*(1481), 761.

Lecture: MEMORY and EXEC. FUNCTIONS: BEHAVIORAL and NEURAL EVIDENCE

- Today we will continue to compare models of working memory and discuss convergent evidence from experiments using behavioral, computational, and neuroscience data. We will also discuss the relationship of working memory to other constructs, such as "executive functioning" and "cognitive control".

17. Wednesday, October 23

Readings:

1. Gathercole, S. E., & Alloway, T. P. (2008). Working memory and classroom learning. *Applied cognitive research in K-3 classrooms*, 17–40.
2. Case Studies, Reporting Results and Recommendations (pp. 307-327)*, in* Dehn, M. J. (2011). *Working memory and academic learning: Assessment and intervention*. John Wiley & Sons.

Lecture: WORKING MEMORY: DEVELOPMENT and VARIATION

- Today's class will focus on experiments that have examined the role of working memory in the classroom. Studies include those that investigate how impaired development of working memory can adversely affect academic achievement.

18. Friday, October 25

Readings:

1. Miyake, A. (2000). The Unity and Diversity of Executive Functions and Their Contributions to Complex "Frontal Lobe" Tasks: A Latent Variable Analysis. *Cognitive Psychology*, *41*(1), 49–100.
2. Posner, M. I. (1994). Attention: The mechanisms of consciousness. *Proceedings of the National Academy of Sciences*, *91*(16), 7398.

Lecture: EXECUTIVE FUNCTIONS: DEVELOPMENT and VARIATION

- In this class we will continue to discuss the role of executive functions, such as attention and cognitive control in students' learning experiences.

19. Monday, October 28

Readings:

1. McDaniel, M. A., Anderson, J. L., Derbish, M. H., & Morrisette, N. (2007). Testing the testing effect in the classroom. *European Journal of Cognitive Psychology*, *19*(4-5), 494–513.
2. Memory Impairments: Risk Factors, and Case Studies (pp. 91-93; pp. 315-334), *in* Dehn, M. J. (2010). *Long-term memory problems in children and adolescents: assessment, intervention, and effective instruction*. Hoboken, N.J: Wiley.

Lecture: LONG-TERM MEMORY: DEVELOPMENT and VARIATION

- Today's class will focus on the role of long-term memory in the classroom. Studies include those that investigate how impaired development of long-term memory can adversely affect academic achievement, and those that look at how to promote effective long-term encoding
- (Plug: EDUC09 – "Cognition Applied Toward Education", S14).

20. Wednesday, October 30

Readings:

1. Horn, J. L., & Cattell, R. B. (1966). Refinement and test of the theory of fluid and crystallized general intelligences. *Journal of Educational Psychology*, *57*(5), 253–270.
2. Conway, A. R., Cowan, N., Bunting, M. F., Therriault, D. J., & Minkoff, S. R. (2002). A latent variable analysis of working memory capacity, short-term memory capacity, processing speed, and general fluid intelligence. *Intelligence*, *30*(2), 163–183.

Lecture: INTELLIGENCE: KEY CONCEPTS and MODELS

- The next several classes focus on the construct of intelligence. Specifically, we will explore various definitions of intelligence and several sub-components of the unified concept we think of as *g*, or "general intelligence", and look at studies that demonstrate the role of intelligence in academic achievement.

21. Friday, November 1

Readings:

1. Gray, J. R., Chabris, C. F., & Braver, T. S. (2003). Neural mechanisms of general fluid intelligence. *Nature Neuroscience*, *6*(3), 316–322.
2. Rohde, T. E., & Thompson, L. A. (2007). Predicting academic achievement with cognitive ability. *Intelligence*, *35*(1), 83–92.

Lecture: INTELLIGENCE: BEHAVIORAL and NEURAL EVIDENCE

- Today's class picks up on the discussion of models of intelligence and focuses on key experiments that elucidate the cognitive and neural underpinnings of various aspects of higher-order thought.

22. Monday, November 4

Readings:

1. Nisbett, R. E., Aronson, J., Blair, C., Dickens, W., Flynn, J., Halpern, D. F., & Turkheimer, E. (2012). Intelligence: New findings and theoretical developments. *American Psychologist*, 130–159.
2. Deary, I. J., Strand, S., Smith, P., & Fernandes, C. (2007). Intelligence and educational achievement. *Intelligence*, *35*(1), 13–21.

Lecture: INTELLIGENCE: DEVELOPMENT and VARIATION

- In today's class we'll continue to discuss issues regarding how intelligence relates to classroom performance and we'll dive into the debate on the sources of intelligence (i.e., nature vs. nurture) and how malleable an individual's intelligence is through the stages of childhood, adolescence, and adulthood.

23. Wednesday, November 6

Reading:

1. Sternberg, R. J. (1999). Successful intelligence: finding a balance. *Trends in Cognitive Sciences*, *3*(11), 436–442.
2. Visser, B. A., Ashton, M. C., & Vernon, P. A. (2006). Beyond g: Putting multiple intelligences theory to the test. *Intelligence*, *34*(5), 487–502.

Lecture: INTELLIGENCE: ALTERNATIVE DEFINITIONS

- Many alternative theories of how to conceptualize intelligence have been proposed that do not conform to the general framework discussed so far. Examples include Gardner's Multiple Intelligences, and Sternberg's Triarchic Theory of Intelligence. Today we will discuss how to interpret these theories in light of (and apart from) the theories and evidence covered thus far.

24. Friday, November 8

Readings:

1. Rohrer, D., & Pashler, H. (2012). Learning styles: where's the evidence?: commentaries. *Medical Education*, *46*(7), 634–635.
2. Shah, P., & Miyake, A. (1996). The separability of working memory resources for spatial thinking and language processing: An individual differences approach. *Journal of Experimental Psychology: General*, *125*(1), 4-26.

Lecture: VISUAL AND VERBAL LEARNING STYLES

- An idea that has captured the imagination of many in education and psychology is that of learning styles – ways in which individuals differ in terms of improved learning outcomes on the basis of, for example, having information presented in words versus images. Today we will discuss the evidentiary basis and validity for such claims (or lack thereof), and how these theories should or shouldn't be incorporated into education.

25. Monday, November 11

Readings:

1. Laidra, K., Pullmann, H., & Allik, J. (2007). Personality and intelligence as predictors of academic achievement: A cross-sectional study from elementary to secondary school. *Personality and Individual Differences*, *42*(3), 441–451.
2. Kanai, R., & Rees, G. (2011). The structural basis of inter-individual differences in human behaviour and cognition. *Nature Reviews Neuroscience*, *12*(4), 231–242.

Lecture: PERSONALITY: KEY CONCEPTS and MODELS

- A fruitful area of research on individual differences has been that of personality psychology. But just what is "personality"? Today we will begin to explore models and theories about different factors of personality and how they relate to learning and education.

26. Wednesday, November 13

Reading: Pittenger, D. J. (1993). The utility of the Myers-Briggs type indicator. *Review of Educational Research*, *63*(4), 467–488.

Lecture: PERSONALITY: TYPES and STYLES

- Today we will continue to investigate trends and measures pertaining to personality that are being used in educational contexts (e.g., MMPI, Locus of Control), and discuss their evidentiary basis, psychometric validity, and possible value in a school setting.

27. Friday, November 15

Readings:

1. Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, *92*(6), 1087–1101.
2. Duckworth, A. L., & Seligman, M. E. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science*, *16*(12), 939–944.

Lecture: PERSONALITY and EXECUTIVE FUNCTIONS

- Several currently popular topics in educational/personality psychology relate directly to concepts of executive functions that we have discussed in this course. In this light, we will examine the constructs of "grit", and "self-control" and how they resemble (and differ from) EF constructs like cognitive control, as well as how they can be useful concepts for education.

28. Monday, November 18

Discussion: Today we will discuss your final papers and spend a little time reviewing topics in advance of the final exam and discussing course reflections and feedback.

Friday, November 22 – **_FINAL PAPERS DUE_**

****FINAL EXAM @ 8am****