**Signal Detection Theory and ROC Analysis**

**(Psych 272)**

Tuesdays: 1:00 – 3:50

Text: Macmillan & Creelman (2005)

1. Discriminability vs. response bias (Chapter 1)

 a. What is this distinction and why does it matter?

 b. When do these concepts apply?

2. d' vs. other sensible measures of accuracy (Chapter 1)

a. explicit theoretical assumptions vs. implicit theoretical assumptions

b. as a linear measure (needed for testing statistical interactions)

c. it is a surrogate for the ROC (not the other way around)

3. Measures of response bias (Chapter 2)

 a. Strength-based measures (c)

 b. Likelihood ratio measures (β)

4. ROC analysis (Chapter 3)

 a. The relationship between confidence ratings and response bias manipulations

 b. Area under the curve as the fundamental dependent measure (diagnostic medicine)

 c. Analyzing the z-ROC

 d. Competing theoretical accounts of the shape of the ROC

 e. Individual vs group ROC analysis

5. Base rates

 a. Positive predictive value (PPV); Negative predictive value (NPV)

 b. Optimal bias

6. Applications and errors (the core of this class)

 a. Eyewitness memory (social/applied psychology)

 b. Belief bias effect (cognitive psychology)

 c. Perceptual and decisional effects (sensation & perception)

d. Verbal overshadowing effect (cognitive psychology)

e. Memory consolidation in rats (neuroscience)

7. Other experimental designs that call for detection-based analyses

 a. 2AFC (Chapter 5 in 1991 text, Chapter 7 in 2005 text)

b. Same/Different design (Chapter 9 in 1991 text, Chapter 9 in 2005 text)