

Reading List

These papers will be available in one of the following ways: pdfs on the class web site, web refs to sites where you can download the text, or as hard copies handed out in class. As an exception to this, we will read most chapters of the text: "Teaching Physics", by E.F. (Joe) Reddish, published by Wiley, 2003. You should have your own copy of this book. It is available at the UCSD bookstore. Some valuable resources are included at the end of this list. We will use a few pages from these so you can get familiar with their content. I will hand out copies as needed.

You will be expected to have prepared for class by reading the articles BEFORE class. You will frequently be asked to write a summary or comment on some aspect of the reading to hand in at the start of class.

These references are listed in the approximate order for the class.

Hake, Richard, "Interactive-engagement vs traditional methods: A six-thousand student survey of mechanics test data for introductory physics courses" AJP, **66**(1), 64 (1998)

National Research Council (2000). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academy Press. Ch 2, 5, 8, but it is all worth reading <http://books.nap.edu/html/howpeople1/index.html> takes you to the toc on line, from which you can access individual chapters

McDermott, Lillian, "How We Teach and How Students Learn – A Mismatch?" AJP, **61**(4), 295, (1993)

Halloun, I., & Hestenes, D. "Common-sense concepts about motion", AJP, **53**, 1056-1065. (1985).

DiSessa, A, "Toward an Epistemology of Physics", Cognition & Instruction vol 10, p 105 (1993), just a few selected pages

Smith, diSessa, Roschelle, "Misconceptions Reconceived: A Constructivist Analysis of Knowledge in Transition", Journal of Learning Sciences, **3**(2), 115, (1993)

McComas, W.F., "Ten Myths of Science: Reexamining what we think we know about the nature of science", School Science and Mathematics, **96**(1), 10-16

Elby, A, "Helping physics students learn how to learn" AJP supp, **69**(7), S54

Elby & Hammer, "On the substance of a sophisticated epistemology", Science Education, (2001)

Chi, M., et al., "Categorization and representation of physics problems by experts and novices", Cognitive Science vol 5, 121, (1982)

Perkins, K., et al "Correlating Student Attitudes With Student Learning Using The Colorado Learning Attitudes about Science Survey" submitted to Phys Rev special topics PER, 2005

Heller, K., et al., "Teaching Problem Solving...." Am J Phys vol 60, 627, and other refs

Minstrell, J, "Explaining the 'at rest' condition of an object", Physics Teacher, Jan 1982, 10

McDermott, L.C. and Shaffer, P. (1992). *Research as a guide for curriculum development: An example from introductory electricity. Part I: Investigation of student understanding*. American Journal of Physics. 60 (11), 994-1003.

Bao, L., et al., "Understanding probabilistic interpretations of physical systems: A prerequisite to learning quantum physics" Am. J. Phys, **70**, 210, 2002

Mestre, et al, "Promoting Active Learning in Large Classes Using a Classroom Communication System", CP399, Proc ICUPE, p1019

Sokoloff, D. R., Thornton, R. K. "Using Interacting Lecture Demonstrations to Create an Active Learning Environment", The Physics Teacher, Vol 35, p 340, 1997.

Potter, De Leone, "Physics 7 at UC Davis, and Physics 205 at CSUSM" and misc refs

Meltzer, D., Manivannan, K., "Transforming the lecture-hall environment: The fully interactive physics lecture", Am J Phys, 70, 639 (2002)

Resources:

Mazur, E, "Peer Instruction: Getting Students to Think in Class", CP399, Proc ICUPE, (1997)

Knight, R. D., "Five Easy Lessons: Strategies for Successful Physics Teaching" published by Addison Wesley, 2002

Arons, A.B., "Teaching Introductory Physics" pub Wiley, 1997

Davidson & Ambrose, "The New Professor's Handbook", Anker pub, (1994)

Knight, R.D., calculus physics textbook "Physics for Scientists and Engineers" and associated workbook, Pearson, 2003 (sample of PER sensitive standard text)

McDermott, Lillian, "Tutorials in Introductory Physics" pub Prentice Hall 2 vols 1998