



## READING LIST

### PIL102, Teaching and Learning in Higher Education 2 at the Faculty of Science

#### Textbook:

Scientific Teaching, Handelsman, et al. 2007 ISBN: 1429201886, 9781429201889 Available to buy:  
<https://www.adlibris.com/se/bok/scientific-teaching-9781429201889>

*Note:* this book may be difficult to get, so please order early. Also, I will contact the previous class to see if anyone wants to sell a used copy. You will hear about this by Feb 25th. There are also two copies in the GU libraries and a copy at the pedagogen library as a reference.

#### Resources:

##### ***Learning Outcomes and Course Plans***

Kennedy Declan, Hyland Áine, Ryan Norma: “Writing and using learning outcomes: a practical guide”, article C 3.4-1 in Eric Froment, Jürgen Kohler, Lewis Purser and Lesley Wilson (eds.): EUA Bologna Handbook – Making Bologna Work (Berlin 2006: Raabe Verlag)  
<https://cora.ucc.ie/bitstream/handle/10468/1613/A%20Learning%20Outcomes%20Book%20D%20Kennedy.pdf?sequence=1&isAllowed=y>

GU course plan templates (English and Swedish): Available on Canvas

Hussey, Trevor & Smith, Patrick (2002). “The trouble with learning outcomes.” Active learning in Higher Education 3, 220-233. <http://alh.sagepub.com/content/3/3/220.abstract>

What is the Value of Course-Specific Learning Goals? Journal of College Science Teaching November/December 2009 p52.  
[http://www.cwsei.ubc.ca/SEI\\_research/files/LifeSci/Simon\\_Taylor\\_ValueOfCourseSpecificLG.pdf](http://www.cwsei.ubc.ca/SEI_research/files/LifeSci/Simon_Taylor_ValueOfCourseSpecificLG.pdf)

General Instructional Design Principles Teach Beyond your Reach by R. Neidorf (2006)  
<http://samarnhpang.files.wordpress.com/2011/06/teaching-c.pdf>

##### ***Science Education: Why we need a change***

Why we are teaching science wrong and how to make it right. Waldrop, Nature (2015) 523  
<http://www.nature.com/news/why-we-are-teaching-science-wrong-and-how-to-make-it-right-1.17963>

Innovations in teaching undergraduate biology and why we need them. W. Wood. Annual Review Cell and Developmental Biology 2009 25:93. <http://www.ncbi.nlm.nih.gov/pubmed/19575638>

A wakeup call for science faculty. Alberts Cell 2005 123:739-741.  
[http://www.cell.com/abstract/S0092-8674\(05\)01182-7](http://www.cell.com/abstract/S0092-8674(05)01182-7)

### ***Learning Theory in Science Education***

How People Learn: Bridging Research and Practice (1999) National Research Council, National Academy Press [http://www.nap.edu/catalog.php?record\\_id=9457](http://www.nap.edu/catalog.php?record_id=9457)

How People Learn: Brain, Mind, Experience, and School: Expanded Edition (2000) National Research Council, National Academy Press [http://www.nap.edu/catalog.php?record\\_id=9853](http://www.nap.edu/catalog.php?record_id=9853)

Improved Learning in a Large Enrollment Physics Class. *Science* (2011) 332:862. <http://science.sciencemag.org/content/332/6031/862.long>

AMEE Medical Education Guide, 20. The good teacher is more than a lecturer-the 12 roles of the teacher. [http://wikieducator.org/images/e/e3/Twelev\\_Roles\\_of\\_a\\_Lecturer.pdf](http://wikieducator.org/images/e/e3/Twelev_Roles_of_a_Lecturer.pdf)

### ***Classroom Formats***

Refreshing your Lecturing, Chapter 3 of *The Lecturer's Toolkit*, Race and Brown 2007. (online at [gu.se](http://www.gu.se))

### ***Concept Tests and Clickers***

Science Simulations: <http://phet.colorado.edu/en/simulations/category/new>

Lecture: Confessions of a Converted Lecturer: Eric Mazur <https://www.youtube.com/watch?v=WwslBPj8GgI>

### ***Small groups***

Small-Group Instruction: An Annotated Bibliography of Science, Mathematics, Engineering, and Technology Resources in Higher Education [http://www.wcer.wisc.edu/archive/nise/publications/Occasional\\_Papers/COOPER/CooperALL.pdf](http://www.wcer.wisc.edu/archive/nise/publications/Occasional_Papers/COOPER/CooperALL.pdf)

### ***Laboratories***

Offering more than 'Here is the textbook': Teaching assistants' perspectives on introductory science courses by S. Dotger *J. College Science Teaching* Jan/Feb 2010, 71-76.

Easy ways to promote inquiry in the laboratory course KM Polacek *J. College Science Teaching*, Sept 2005, 52-55.

### ***Assessment***

Developing Assessment Items: a how-to guide. Henriques, et al., 2006. In *Assessment in Science: practical experiences and education research*, chapter 2. National Science Teachers Association

### ***General References***

Reaching Students: what research says about effective instruction in undergraduate science and engineering (2015) National Academies Press (selected chapters). Available online at: <http://www.nap.edu/catalog/18687/reaching-students-what-research-says-about-effective-instruction-in-undergraduate>

The Lecturer's Toolkit, Race and Brown 2007 Available online at [gu.se](http://gu.se)

Biggs, John & Tang, Catherine (2007). *Teaching for quality learning at the university: What the Student Does*. New York, NY: Maidenhead. (I första hand kapitel 4 (Using constructive alignment in outcomes-based teaching and learning) Available through GU library.