

Instructors:

Thomas E Martin
Natural Sciences 205; phone 243-4393; email: tom.martin@umontana.edu
Office Hours: MF 9 – 10:00; 1-3:00

Objectives:

The purpose of this course is to teach graduate students in natural resources and biological sciences to:

1. Understand strong inference and hypothetico-deductive approaches to science.
2. Induction vs deduction; statistical vs research hypotheses
3. How to construct/develop alternative hypotheses and the predictions for falsifying them.
4. Elucidate and make explicit assumptions and how to treat them.
5. Learn how to identify and espouse major gaps in knowledge.
6. Give presentations that incorporate these principles.
7. Learn to evaluate and provide feedback on these principles for presentations.

References:

Platt, J.R. 1964. Strong inference. *Science*. 146:347-353.

Popper, K. R. (1982), *Realism and the Aim of Science*, Hutchinson, London.

Course Grades will be based on the following proportions:

Active participation in discussion	0.50
Presentations	0.50

Class schedule

<i>DATE</i>	<i>SCHEDULED TOPIC</i>
31 August	Introduction to basic ideas and structure of the course
14 September – 7 October	2 min presentation, followed by 5 min critique of each student outlining their overarching question, their specific research question, and why this is an important topic area and what the gap in knowledge is that will be filled to advance understanding – no mention of study organism and non-taxa specific – learning how to critique/interact
12 October – 4 November	5 min presentations of each student: integrating all principles above and critiques by other students and adding: the study system and why it is a good basis for tests, description of alternative alternative hypotheses, and how the hypotheses address the gap in knowledge
9 November – 9 December	10 min presentations of each student: integrating all principles above and critiques by other students and adding: explicit delineation of assumptions, and methods for testing hypotheses and assumptions while controlling for the alternatives