Natural Systems 1- Participatory Research in Environmental Science

Final Exam Topics & Review Sheet

Module 1-The Nature of Science
- Basic Statistics: Mean, standard deviation, mode, median, range, cheesy science
- Statistical Tests: T-test, null hypothesis and alternative hypothesis, p-values
  - Be able to explain and interpret the results of a t-test, i.e. clover lab or another experimental scenario

Module 2-Investigating the Environment
- Readings
  - Coral reefs
  - Threats to Biodiversity
  - Planets of Weeds
  - Mass Extinctions
    - The Big Five and Big Six
    - Causes of Extinctions
  - Recent Mass Invasions
  - Biotic Homogenization
- Professor Negron-Ortiz, Nicholson and Gorchov Lectures
- Charles Darwin, Evolution and Natural Selection

Module 3-From the Big Bang to Today
- Readings
  - Revisit Raup’s Bad Genes or Bad Luck
  - Darwin
- Astronomy Readings
  - Ned Wright’s Cosmology Tutorial
  - The Big Bang
  - The Fate of the Universe
  - Life Cycle of Stars (H-R Diagrams and the reading “Star Clusters”)
    - See a Hertzprung-Russel Diagram Movie at http://jrscience.wcp.muohio.edu/Movies/hr1.mov
  - Star Clusters
  - The Birth and Death of Stars
  - The Winds of Starbirth
  - The Coolest Stars
- Astronomy problems
  - Doppler-red shift and blue shift, Kepler’s Laws, Moon phases and Scale Model Stuff-Earth, moon and sun, Hubble’s Law, the solar spectrum, age of universe
- The Solar System
- Famous star gazers
  - Penzias and Wilson
• Hubble

• Professor Nicholson and Cummins Lectures
  • See Lecture Note Links on Syllabus

Student Generated Labs

• Be able to develop a scenario for an experiment that contains: Solid Experimental Design, hypotheses, no cheesy science and statistical analysis
  • Controls, repetitive samples