

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 Gorchoy 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 Hertzsprung-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