

PS 325-201 2017 Spring (4857) - Development of Scientific Thought

4 credits M_W 5:00-7:15pm pre-requisites: 12 credits of Natural Science

Instructor: Dr.Curt Foltz , Science 159 ; foltzc@marshall.edu (304 696-2519)

Office hours in Sci.159: T_R 12⁰⁰-13⁰⁰; W 12³⁰-14³⁰; M 14³⁰-15³⁰ ; T_R 17³⁰-18³⁰; and by chance

Required textbook: A Short History of Scientific Thought by John Henry (Palgrave MacMillan, 2012)

We will go thru the entire book during the semester – about 2 chapters/week.

We will also read (and discuss) selections from Science Ed Organizations, or a Science Society, or other Science Interface – they'll mostly be online sources ... for example:

WV State Curriculum Standards and Objectives

National Science Teachers' Association (/NCATE/NSES) or nextgenscience.org

American Physical Society/Am.Chemical Society/Nat.Assoc.Biology Teachers, etc

Classic articles on Philosophy of Science - or Science, Technology & Society (Gutenberg)

I'll try to keep links and schedule updated on-line at : www.science.marshall.edu/foltzc/p32517s.htm

Course Description:

Through discussion of readings as well and experiments and simulations, we will investigate the history, methods and nature of science, and how “science” has interacted with politics and society and culture (often *via* economy or technology channels). Examples from all areas of science will be used, and each student will do special work in an area of particular interest. Intended for Science Education majors.

Objectives:

Students will see how some specific scientific discoveries and theories came to be accepted and/or rejected; and some of the impacts they have had on the rest of science (as a discipline) and on the lives of humans.

Students will understand the evidence and arguments used for and against various theories.

Students will gain an appreciation of the nature of science as a way of knowing, in contrast to other intellectual pursuits such as history and religion.

Assignments:

In addition to assigned readings, and discussion of the larger historical scenarios, students might:

Role-play historical debates over competing theories using past evidence and arguments

Develop classroom activities (demos or experiments, or discussion guides) in some science discipline

Show and discuss the media's portrayal of a science discipline and/or its proponents/detractors

Evaluation & Grading:

10% - Participation. Discussion of historical connections, critique of Presentations, critique of Quizzes.

(In class, perhaps some can be done on-line.) Much of the success or failure of this course will depend on everyone's cooperation to discuss deep (controversial) ideas in a candid but civil manner.

20% - Chapter Presentations. Each student will present two chapters from the textbook, and write the Quiz (and its scoring key) for those chapters.

15% - Chapter Quizzes. Chapters are fairly self-contained, but there are a lot of them.

15% - Lab Project (school-age-appropriate) which the class will “field-test”.

15% - Midterm Exam. Essays on anecdotes, attitudes, connections, hypothetical meetings ... around break.

10% - Term Paper, due Finals week ... (assess “what's missing” in your curriculum, other science theme)

15% - Final Exam. Essays on anecdotes, attitudes, connections, hypothetical meetings ... Tue.finals week.

Letter grade boundaries will be: 100% > A > 85% > B > 75% > C > 65% > D > 55% > F > 0%