PS 325-201 2014 (5139) – Development of Scientific Thought

4 credits T_R 12:30 – 14:40 pre-requisites: 12 credits of Natural Science

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

office hours: M 9:30-12:30 , T 10:30-12 , W 11:30-12:30 , R 10:30-12 , F 9:30-12:30, and by app't.

Required textbook: Making Modern Science by Bowler & Morus (from Univ.Chicago Press, 2005)

We will do the first half of the book during the first half of semester – about 2 chapters/week.
Students will also read (and present on) selections from Science Education Organizations, or a Science Society, or other Science Interface – they'll mostly be online sources … for example:

WV State Curriculum Standards and Objectives
Natonal 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, Tech, Society (Gutenberg)

I'll try to keep links and schedule updated on-line at : www.science.marshall.edu/foltzc/ps32514.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* economic and technological channels). Examples from all areas of science will be used, and each student will do special work in their 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:

20% - Chapter Quizzes. Chapters are fairly self-contained, but there are a lot of them.
20% - Chapter Presentations. Each student will present one chapter during each half of the semester, and make the Quiz (and its scoring key) for those chapters. 2nd half chapter may be from on-line source.
15% - 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% - Midterm Exam. Anecdotes, attitudes, connections, hypothetical meetings … before break.
10% - Demo/Lab Projects. In the 2nd half of the class, each student will design, organize, and present some (age-appropriate) activites which the class will "field-test".
15% - Curriculum Paper due Finals week: "what's missing" in your classes, and an assessment design.

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