PS 325-201 2018 Spring (4621) – Development of Scientific Thought

4 credits T_R 17:00 – 19:15 pre-requisites: 12 credits of Natural Science

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

office hours: M_W_F 9:30-11:30pm ; _T_R_ 11:30-12:30 & 1:30-2:30pm ; and by app't or chance.

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

We'll "uncover"about 2 chapters/week. Ancient and non-Western aspects will be found elsewhere.
We'll also read (and present on) materials 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/ps325_18.htm

Course Description:

Through discussion of readings, 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 explored, and each student will do special work in their area of particular interest. Intended for Science Education majors.

Objectives:

Students will describe how specific scientific discoveries and theories came to be accepted and/or rejected; explain specific interplay of these with technology and engineering, and society's subcultures. They'll describe impacts that science developments had on the rest of science, 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 (self-selected) chapters from Bowler's book, and write the Quiz (and its scoring key) for those chapters.
20% - Chapter Quizzes. Intended to be fairly short, but there will be a lot of them.
15% - Laboratory Project (age-appropriate) which the class will "field-test" (role-playing grade-level plan).
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%