

HNRS 240—HISTORY OF SCIENCE SYLLABUS

James Trefil
 207 East Building
 (703) 993-2183
jtrefil@gmu.edu

- August 28 *** Introduction, Organization SWH Ch1,3
 The nature of science
 Numbers
- Sept 4 —NO CLASS—LABOR DAY
- Sept 11 archeoastronomy, phases of the moon, SWH Ch 2
 Greek and Alexandrian science SWH Ch 4
 QUIZ on numbers
- Sept. 18 *** Islamic science SWH Ch 5
 QUIZ on Rubaiyat Rubaiyat
- Sept 25 *** introduction to sInvestigator—bring computer
- Oct 2 *** Copernicus, Brahe, Kepler SWH Ch 6
 QUIZ on *Sidereal Messenger* Galileo, *Sidereal Messenger*
 Copernican system with sInvestigator—bring computer
- Oct 10 *** Newton, Maxwell SHW Ch 7
- OCT 9—FALL BREAK—CLASS MEETS ON TUESDAY, OCT 10
- Oct 16 MIDTERM I
 The science of life SWH Ch 8
- Oct 23 Rough draft presentations
- Oct 30 *** Class presentations
- Nov 6 Individual meetings with instructor
- Nov 13 *** Evolution *Origin of Species*
 QUIZ on *Origin of Species* (Ch 1-4)
 Evolution with sInvestigator—bring computer

Nov 20 cell theory, modern medicine, Preview of Modern Science

Nov 27 individual meeting with instructor to discuss term paper

Dec 4 *** term paper presentations
MIDTERM II

*** PLEASE BRING YOUR COMPUTER TO THESE CLASSES

Reading:

SWH – Science in World History, James Trefil

Sidereus Nuncis, or The Sidereal Messenger—Galileo Galilei

Origin of Species—Charles Darwin

Rubaiyat—find the poem on the web

GRADING

Exams/quizzes—40%

Presentation and class participation—35%

term paper—25%

HNRS 240 INFORMATION

James Trefil
207 East Building
(703) 993-2183
jtrefil@gmu.edu

GENERAL INFORMATION

This is a course that will cover the development of science from the earliest times to 1900. No previous knowledge of science will be assumed, and scientific concepts will be introduced when necessary. Attendance will not be taken, but each student is responsible for material presented and announcements made in class.

REQUIREMENTS

There will be weekly readings from the primary text, as outlined in the syllabus. In addition, as outlined in the syllabus, there will be reading assignments from two supplementary texts. A quiz on material from these texts will be given on the day the reading assignment is due, and may be included in other quizzes and exams. Additional reading assignments will be made from time to time.

At the instructor's discretion, there will be occasional short quizzes. These quizzes will always be announced a week in advance. There will be two midterm exams, which will consist of short answer essay questions. In lieu of a final exam, students will write a term paper due on the last day of class. Information on the term paper will be passed out later.

Finally, students will form small research groups of approximately five students each and prepare a PowerPoint presentation, choosing their topic from a list supplied by the instructor. Groups will give a 'rough draft' presentation for the instructor and, after incorporating his comments, a full scale presentation to the class. This will be followed by individual meetings with the instructor for comments.

The weight of each of the assignments will be as follows:

Midterm exams	40%
Presentation and class participation	35%
Quizzes	25%

A NEW METHOD OF TEACHING

HNRS 240

This semester you will be given a chance to participate in testing a new method of science instruction, based on artificial intelligence programs developed at the Volgenau School of Engineering. Two important advances in science – the adoption of the Copernican model of the solar system and Darwin’s theory of evolution — will be taught using a program called sInvestigator. You will be introduced to the system by people from the Volgenau School on Sept. 25-- the Copernican system will be the subject for the class on Oct 2, and the theory of evolution will be taught on Nov 13. For each of these two subjects you will be asked to take a pretest (whose grade will not count toward your class grade) and a post test (whose grade will be counted). The purpose of these tests is to see how well the system is working in teaching basic science. They will be administered by people from the School of Education.

PLEASE BRING YOUR COMPUTER TO CLASS ON ALL DAYS INDICATED BY *** IN THE SYLLABUS

In addition, from time to time other short online tests will be administered in order for members of the sInvestigator team to carry out their evaluation of the system

As I have told other students who participated in the development of this system, you may be in at the ground floor of a major change in science education, or you may be in at the ground floor of a major fizzle. In science, you never know how things will turn out in advance.

LIST OF POSSIBLE TOPICS FOR PRESENTATION

The rise of railroads

Canals

The Electrification of America

The internal combustion engine

Phlogiston/Caloric *

The Rise of Agricultural Technology

The development of the telescope or microscope

Chinese Astronomy*

Chinese Medicine

Indian Mathematics

Debate Over the Reality of Atoms*

Trial of Galileo

Newton's Alchemy or Theology *

Development of Energy Sources

*may be challenging

You may choose other topics with the consent of the instructor
Additional topics may be added with the consent of the instructor