

The Well-Trained Mind Academy
**Philosophy & History of Science:
A Survey of Scientific Thought**

Course Blackboard site: wtma.blackboard.com

Required Texts:

- Bauer, Susan Wise. *The Story of Science: From the Writings of Aristotle to the Big Bang Theory*. New York: W. W. Norton, 2015.
- Alvarez, Walter. *Trex and the Crater of Doom*.
- Weinberg, Steven. *The First Three Minutes: A Modern View of the Origin of the Universe*.
- Gleick, James. *Chaos: Making a New Science*.

Primary Source Readings:

Most of the excerpts from primary sources can be found at <http://www.susanwisebauer.com/story-of-science/>. Excerpts from 20th century authors that are not available online will be posted to the course page.

Course Description:

A historical journey through the development of scientific thinking, beginning with the Greeks and continuing through modern chaos theory. Also covers the content of major scientific theories such as continental drift, Darwinian evolution, the “Big Bang”, and quantum physics. The instructor will assign primary source readings in addition to the required text.

Grading:

*Participation	10%	Theoretical Papers (2)	20%
Weekly Quizzes	15%	Biographical Paper	10%
Discussion Board Posts	10%	Primary Source Paper	10%
*Unit Tests (5)	25%		

***Class Participation:**

The Class Participation grade is broken down into the following 2 components:

1. **Attendance:** students will earn 50% of their class participation by being in class ON TIME! Students who are either absent (without prior approval) or tardy will not receive this credit (Note: if a student has a class that ends at the same time our class begins, he/she should notify the instructor during the first week of class and a grace period may be permitted).
2. **In-Class Participation:** students will earn 50% of their class participation when they actively engage with any class activities during each class meeting. This may include responding to/asking questions, contributing to brainstorming activities, groupwork, or any other classroom activities. Students who speak or write any disrespectful statements during class will lose their In-Class participation credit for the week.

***Unit Tests:**

Five exams (25%): There will be five out-of-class exams, each covering one of the five units specified in the class schedule above. Each exam will include identifications, short responses, and a brief essay. The exams will be closed book and timed.

Example Schedule:

<u>Class</u>	<u>Topic</u>	<u>Readings to be completed before class</u> "SoS" = Bauer's "Story of Science" Text
1	Introduction: What is Science?	Print Syllabus & Calendar; Read SoS Preface
Unit 1: The Beginnings		
2	The Hippocratic Corpus	SoS Ch. 1 & excerpts from <i>On Airs, Waters, Places</i>
3	Platonic Science	SoS Ch. 2 & excerpts from <i>Timaeus</i>
4	Aristotelian Science	SoS Ch. 3 & excerpts from <i>Physics</i> & <i>The History of Animals</i>
5	Pythagorean Mathematics	SoS Ch. 4 & excerpts from "The Sand-Reckoner"
6	Atomism	SoS Ch. 5 & excerpts from <i>De rerum natura</i>
7	Geocentricism	SoS Ch. 6 & excerpts from <i>The Almagest</i>
8	Heliocentricism	SoS Ch. 7 & excerpts from <i>Commentariolus</i>
Unit 2: The Birth of the Method		
9	The Scientific Method	SoS Ch. 8 & excerpts from <i>Novum organum</i>
10	Observation & Experimentation	SoS Ch. 9 & excerpts from <i>De mortu cordis</i>
11	Galileo	SoS Ch. 10 & excerpts from <i>Dialogue concerning the Two Chief World Systems</i>
12	Microscopic Proof	SoS Ch. 11 & excerpts from <i>Micrographia</i>
13	Rules of Reasoning	SoS Ch. 12 & excerpts from the <i>Principia</i>
14	Review	Review SoS Ch. 1-12
Unit 3: Reading the Earth		
15	Genesis of Geology	SoS Ch. 13 & excerpts from <i>Natural History: General and Particular</i>
16	Uniformitarianism & Catastrophism	SoS Ch. 14 & excerpts from <i>Theory of the Earth; Preliminary Discourse</i>
17	Age of the Earth	SoS Ch. 15 & excerpts from <i>Principles of Geology</i>
18	Age of the Earth	SoS Ch. 16 & excerpts from <i>The Age of the Earth</i>
19	Continental Drift	SoS Ch. 17 & excerpts from <i>The Origin of Continents and Oceans</i>
20	Asteroid Impacts	SoS Ch. 18 & excerpts from <i>T. rex and the Crator of Doom</i>

Unit 4: Reading Life			
21		Theories of Transformation	SoS Ch. 19 & excerpts from <i>Zoological Philosophy</i>
22		Natural Selection	SoS Ch. 20 & excerpts from <i>The Origin of Species</i>
23		Inheritance	SoS Ch. 21 & excerpts from <i>Experiments in Plant Hybridization</i>
24		The Modern Synthesis	SoS Ch. 22 & excerpts from <i>Evolution: the Modern Synthesis</i>
25		DNA	SoS Ch. 23 & excerpts from <i>The Double Helix</i>
26		Reductionism	SoS Ch. 24 & excerpts from <i>The Selfish Gene</i>
Unit 5: Reading the Cosmos			
27		Relativity	SoS Ch. 25 & excerpts from <i>Relativity: The Special and General Theory</i>
28		Quantum Physics	SoS Ch. 26 & excerpts from <i>The Origin and Development of the Quantum Theory; What is Life?</i>
29		The Big Bang	SoS Ch. 27 & excerpts from <i>The Nature of the Universe; The First Three Minutes</i>
30		Chaos Theory	SoS Ch. 28 & excerpts from <i>Chaos</i>
31		Review	Review SoS Ch.25-28
32		Review	Review SoS Ch. 1-28