HIST 373
The Rise of Modern Science

Fall 2024	Instructor: Dr. K.W. Schweizer
Office Hours:	Federated Dept. of History, NJIT/Rutgers
Mondays: Noon – 12:30 pm	Office: Cull. 308
Wednesdays Noon – 12:30 pm or	email: karl.schweizer@njit.edu
By appointment	
Monday and Wednesday 1 pm – 2:20 pm	
Faculty Memorial 403	

Course Description: This course consists of **four** components:

The first component examines the historical dimension of science, specifically, how history illuminates the wider role of science in human cultural development.

The second component explores the nature of Scientific Revolutions, the stages by which they occur, their time scale, the criteria for determining whether there has been a revolution and the creative factors in producing revolutionary new ideas. It traces the nuances that differentiate both scientific revolutions and human perceptions of them. It will also examine the material factors that played a key role in the production of new knowledge.

The third component looks at the achievements of major scientists in relation to the visionary displacements underpinning their creative enterprise and the societies in which they lived.

The fourth component focuses on the nature of scientific inquiry: its genesis, defining characteristics, varieties, and place in the modern world. It also examines the conditioning factors outside science itself that played a pivotal role in the production of new knowledge and reasoning processes.

Course Goals: By the end of the course, students will be able to:

- Understand that science is not self-germinating but intrinsically related to the overall historical process: the history of civilization.
- Better comprehend the complexity behind scientific creativity and formulation.
- Have a greater ability to think, write, and read in a critical, analytical fashion—the defining measure of a university education.
- Appreciate the impact of Science on other modes of Modern Thought.
- See how the religious concerns of leading thinkers influenced and shaped the substance of their scientific theories.
- How social, cultural and intellectual factors shaped the development of Science in its formative stage.

Assignments and Marks:

Written Assignments:	40%
Midterm Quiz	20%
Final Quiz:	30%
Class Attendance and Participation:	10%

Grading Scale for Assignments and Participation:

A = 85 – 100
B = 75 – 79.5
C = 65 – 69.5
B+ = 80 – 84.5
C+ = 69.5 – 74.5
D = 50 – 64.9
F = 49.9 - 0

Course Requirements:

- There will be 4 in-class written assignments throughout the course and each will be 3 to 4 pages in length.
- These assignments will be based on class lectures, assigned readings and occasional online links.
- No computers, phones, or other electronic devices as well as written or printed material will be permitted.
- Absence and makeup arrangements will only be permitted with an official notification from the Dean of Students.
- The assignments will equal 40% of the final class grade.

Course Assignments:

1. Monday, September 30: First in-class written assignment.
2. Monday, October 21: Second in-class written assignment.
3. Monday, November 18: Third in-class written assignment.
4. Monday, December 2: Fourth in-class written assignment.

Texts: (required readings)

J. Henry, The Scientific Revolution and the Origins of Modern Science (NY, 2002).

John Marks, Science and the Making of the Modern World (1991).

Herbert Butterfield, The Origins of Modern Science (NY, Free Press, 1997).

Semester Schedule:

Wed., Sept. 4: Introduction

Mon., Sept. 9 and Wed. Sept. 11:
The History of Science: Contexts and Key Issues.
Readings: Butterfield, intro., ch. 10.

Mon. Sept. 16 and Wed. Sept. 18:
Early Modern Science: External and Internal Factors.
Readings: Butterfield, ch. 4; Henry, ch. 1.

Mon. Sept. 23 and Wed. Sept. 25:
Paradigms, Anomalies and Scientific Discovery and Progress
Readings: Marks, pp. 32-44; Butterfield, ch. 5.

Mon. Sept. 30 and Wed. Oct. 2:
Science, Humanism and the Christian Church.
Readings: Butterfield, ch. 4; Henry, ch. 5; Marks, pp. 36-45.

Mon. Oct. 7 and Wed. Oct. 9:
Scientific Revolutions as Changes in World Views.
Readings: Butterfield, ch. 7; Butterfield, "The Scientific Revolution, Handout; K. Schweizer, "Visions and Discoveries." Handout.

Mon. Oct. 14: ***Midterm Quiz***

Wed., Oct. 16:
The 17th Century: Experimental Method and Mechanical Philosophy.
Readings: Henry, ch. 2; Butterfield, ch. 5; Marks, pp. 32-78.

Mon., Oct. 21 and Wed., Oct. 23 and Mon., Oct. 28:
The Newtonian Revolution.
Readings: Henry, ch. 5; Marks, ch. 3; Butterfield, ch. 8.

Wed., Oct. 30 and Mon. Nov. 4:
Science, Technology and Society: The 18th Century.
Readings: Henry, ch. 4; Butterfield, ch. 9; Marks, part 4; K. Schweizer, "Science, Technology and Society: 18th and 19th Century," handout.

Wed., Nov. 6 and Mon., Nov. 11 and Wed., Nov. 13:
Evolution and the Great Chain of Being.
Readings: Butterfield, ch. 12; K. Schweizer: "Social Darwinism and its Social/Political Implications" handout; Marks, section 4:8.

Mon., Nov. 18 and Wed. Nov. 20:
Social Darwinism.
Readings: Handouts; Marks, part 4.

Mon., Nov. 25:
Science, Industrialization and Global Ramifications
Readings: Marks, ch. 4; Henry, ch. 6; K. Schweizer, "Science and its Discontents" handout.

Mon. Dec. 2 and Wed. Dec. 4:
Einstein, Relativity and Quantum Theory.
Readings: Marks, ch. 6; K.W. Schweizer, "Einstein and Relativity," (handout)

Monday, Dec. 9: Review

Wednesday, Dec. 11: ***Wrap up Quiz.***

Policies:

- This is an **intellectually demanding course** and all students will be expected to do all the readings listed in the syllabus.
- Attendance will be taken during each class. Absences will be excused only with documentation from the Dean of Students.
- Plagiarism in any written assignment will result in an automatic failure and will be reported to the Dean of Students.
- There will be no "make-up" quiz. If you miss the final quiz, documentation from the Dean of Students must be provided in order to make up the quiz.
- All submitted work must comply with the NJIT Honor Code. You can view NJIT Honor Code at: NJIT website, just Google: "academic integrity."