

MLS 704 THE NATURAL SCIENCES SYLLABUS

Wednesday 6:00-8:40 pm

Welcome!

This course aims to strengthen students' understandings of "scientific literacy" by sharing knowledge of both classic and contemporary works, while highlighting great figures of science – known and not so well known, yet equally significant in both past and current history. Simulations, and when possible, hands-on laboratory experiences, will be undertaken affording students a realistic sense of the difficulties and limitations of experiment and observation in gathering, ascertaining and utilizing knowledge about nature. General philosophical and methodological issues that scientists and non-scientist should and do confront are also underscored. (3 hours, 3 credits.)

*Many thanks to Dr. Heather Sloan for sharing her insights, lesson ideas and more in creating this course.

Instructor

Prof. Gillian Bayne Office Hours: Wednesdays, 5 – 6pm; other times by appointment
email: gillian.bayne@lehman.cuny.edu

All of our classes will be held on Zoom, unless told otherwise. The Zoom link will be the same, and you can enter our class by using the one listed below:

This is a recurring meeting that meets 6:00pm – 8:40pm

Join Zoom Meeting

<https://lehman-cuny-edu.zoom.us/j/87856127355?pwd=VGVRk8xQzBWOHh3ZWc3YmJEL0p3QT09>

Meeting ID: 878 5612 7355

Passcode: 300729

Academic Objectives

The primary academic objective this course is to develop scientific literacy for a range of natural science disciplines through exploration of the following questions:

- What is the "Nature of Science"? Whose science? and, What kind of science?
- What are the basic tenets, unifying theories, and methods for Biology, Chemistry, Physics, Astronomy, and Earth Science?
- What are some common "misconceptions" about science? What are the common foundations of these "misconceptions"? How do culture and exposure factor into the (mis)understandings, (mis)interpretations and (accurate, inaccurate or false) applications of science?
- What are some questions that throughout history continue to need answering?
- What role does your knowledge of Biology, Chemistry, Physics, Astronomy and Earth Science play in your everyday life? How do the complexities of your background exposures in science, experiences and identities factor into this knowledge base?

Upon successful completion of this course students will demonstrate verbally and in writing:

- A more nuanced understanding of the nature of science
- A deeper understanding of the basic tenets, unifying theories, methods, and unanswered questions in Biology, Physics, Astronomy, Earth and Environmental Science
- The ability to reflect upon the role that a student's own scientific knowledge, thinking and skills play in their everyday life.

Course Requirements and Grading

Course Requirements

- Questions: post on the BB discussion board at least one question based on reading for each class – 10% of course grade
- New York Times, *Science Times*, weekly assignment- 15%
- Annotated bibliography – 25% of course grade
- Brochure on a topic of your choice – 20% of course grade
- Paper and Presentation: Science literate approach to everyday topics – 30% of course grade
Details and a grading rubric will be provided for assignments, unless told otherwise.

Required Texts

Science Matters – Achieving Scientific Literacy

Robert M. Hazen & James Trefil, Anchor Books (Random House, Inc.), 2009

ISBN 978-0-307-45458-4; \$13.39 new from Amazon, as little as \$4.99 used. Order immediately.

A free .pdf of the book here:

https://www.researchgate.net/publication/241283381_Science_Matters_Achieving_Scientific_Literacy

Also see:

The Meaning of Scientific Literacy

Jack Holbrook and Miia Rannikmaa

International Journal of Environmental & Science Education Vol. 4, No. 3, July 2009, 275-288

<https://files.eric.ed.gov/fulltext/EJ884397.pdf>

Additional reading material will be provided. You may also find interesting: (to be shared later in the course)

Jegede, O. (1999). Science education in nonwestern cultures: Towards a theory of collateral learning.

In Semali, L. & Kincheloe, J,(Eds.). *What is indigenous knowledge? Voices from the academy* (pp. 119-142). New York: Falmer Press.

Additional required reading and viewing listed in the course schedule will be available on Blackboard.

Reading assignments should be completed before they are to be discussed in class. Completing the reading ahead of time will prepare you to participate in robust and meaningful discussions, and in-group exercises during class.

Power Point Presentations

The Power Point presentation will be made available to you as needed.

The Mechanics of This Course

The primary objective of this course is to enhance your science literacy. One aspect of science literacy is asking questions - about everything - and assessing information. So, please ask questions in class and in Blackboard discussion posts. Not every question in science has an answer yet, but we will work together to find out as much as we can.

Our online course will use Zoom meetings for the first few weeks and then alternate Zoom meetings with independent work sessions. Zoom meetings will usually include a short presentation followed by either class

discussion or small group activities. Zoom meetings will last 1 to 2 hours. Please do the assigned reading/viewing before class so that you are prepared to participate. Anticipate spending 4 to 5 hours each week to prepare and attend Zoom meetings. Independent work sessions will require approximately the same amount of work time. Each of our independent work sessions will focus on a topic in one of four disciplines: physics, chemistry, earth science and biology.

Many of the sources in this course are videos, mostly short ones and two or three longer ones. Science concepts are very often best communicated visually. Graphics are good and animations or actual images are even better. So take video viewing seriously. Watch carefully, take notes, and review.

There are three required assignments in addition to the reading/viewing and discussion: an annotated bibliography, a brochure, and a research paper. Two class sessions are devoted to the assignments. The first to make sure you understand and get a start on the work. The second will be an individual session to answer questions and review your progress. Your brochure will be shared with the class in a "gallery" and your research will be shared as a short presentation at the end of the semester.

Course Policies

- Please help to maintain an atmosphere of acceptance, respect, and engagement in the classroom.
- Your constructive engagement is essential to our work together and your success in this course.
- Please arrive on time and be ready to participate at the start of class. If you cannot avoid being a few minutes late, please enter quietly, causing as little disturbance as possible.
- Please keep your cameras on throughout the duration of each class, if you can.
- Feel free to ask questions during class.

Accommodating Disabilities

Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall Room 238 and Telephone 718-960-8441.

The Academic Center for Excellence (ACE) and the Science Learning Center (SLC)

The Academic Center for Excellence (ACE) and the Science Learning Center (SLC) are two of the tutoring centers on campus. The ACE provides appointment-based and drop-in tutoring in the humanities, social sciences, and writing, as well as general writing and academic skills workshops. The SLC provides drop-in tutoring for natural science courses. To obtain more information about the ACE and the SLC, please visit their website at <http://www.lehman.edu/issp>, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707.

Academic Integrity

It is your responsibility to read and understand the Academic Integrity Policy that can be found in full in the Graduate Bulletin. Violations of the Academic Integrity Policy will not be tolerated. Violations typically take the form of cheating or plagiarism. Plagiarism is the presentation of another person's ideas, research, or writing as your own. At the very least confirmed violations of academic integrity will result in a grade of F or no credit for the assignment or exam in question and may result in more serious consequences.

Below is the schedule of topics and assignment due dates. You will find a detailed description and reading/viewing assignments for each week in the Week-by-Week Folder on Blackboard.

MLS 704 The Natural Sciences: Spring 2023 Schedule

Tentative, and subject to change according to class needs

*Note: We will have opportunities to hear from guest speakers, and may result in slight changes to the schedule

Date	Topic
Science Literacy and The Nature of Science	
25 Jan Week 1	Course Overview and Introductions - Zoom Meeting What is scientific literacy and what does it have to do with me?
1 Feb Week 2	The Nature of Science and Scientists - Zoom Meeting
22 Feb Week 3	Assignments Explained - Zoom Meeting Details of Assignments and Topic Selection
Science in Our Everyday Lives	
15 Feb Week 4	Physics/Astronomy - Zoom Meeting
22 Feb Week 5	Physics and Astronomy – Focus Topic TBD - Independent Work
1 Mar Week 6	Chemistry – Zoom Meeting + Independent Work
8 Mar Week 7	Guest Speaker
15 Mar Week 8	Assignment Progress Report Check- In
22 Mar Week 9	Earth Science - Zoom Meeting
29 Mar Week 10	Earth System Science Focus Topic: Earth from Space Nova - Independent Work Annotated Bibliography Due
5 - 12 Apr	Spring Break
19 Apr Week 11	Brochure Work; Peer Review
26 Apr Week 12	Biology - Zoom Meeting Focus Topic: Human Evolution + Independent Work Brochure Due
3 May Week 13	Presentation Scientific Literacy Papers
10 May Week 14	Presentation Scientific Literacy Papers
17 May Week 15	Science Literacy Paper Due Today

*modified from H. Sloan's MLS 704 syllabus