

# Elmhurst College

## HONORS 204

### Honors Seminar: Critical and Creative Inquiry

( <http://www.elmhurst.edu/~earls/hon204> )

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Earl C. Swallow

*Let us endeavor to see things as they are, and then enquire whether we ought to complain. Whether to see life as it is will give us much consolation, I know not; but the consolation which is drawn from truth, if any there be, is solid and durable; that which may be derived from error, must be, like its original, fallacious and fugitive.*

--Samuel Johnson

*It is a recurring experience of scientific progress that what was yesterday an object of study, of interest in its own right, becomes today something to be taken for granted, something understood and reliable, something known and familiar – a tool for further research and discovery.*

--J. Robert Oppenheimer

*If there turn out to be any practical applications, that's fine and dandy. But we think it's important that the human race understand where sunlight comes from.*

--William A. ("Willie") Fowler  
1983 Nobel Prize in Physics

Honors 204 is designed to allow students to explore the construction of meaningful work from the discovery of a passion, through the disciplining of that passion, to the turning of that passion into a profession. Students will be introduced to skills of critical and creative inquiry by working with faculty members who demonstrate the passions inherent in and underlying their disciplined professional lives.

# GENERAL EDUCATION PROGRAM

This particular version of **Honors 204** is derived from Physics 101, a course specifically intended for non-science students seeking to fulfill the **Inquiry and Issues in Science and Technology** requirement in the Elmhurst College General Education Program. Courses in this category develop knowledge of process and content in the natural sciences while emphasizing the impact of science on our world. They seek to raise students' awareness of the role played by science in the development of technology and of issues related to science and technology. By doing this they also foster responsible citizenship in an increasingly technological society. The four major objectives for this category are the following.

**(1) Development of critical thinking and problem solving skills through active exploration of natural science concepts and methods within a scientific discipline.**

This objective is directly addressed by the course project in combination with the concepts and principles developed in the readings and in class. The historical emphasis of the class development and text materials also demonstrates the kinds of thinking and analysis which have given us these elegant ideas.

**(2) Explicit identification and consideration of social, philosophical, and ethical questions associated with scientific and technological topics.**

This objective is addressed in the readings, classroom, and videotape presentations as well as the course project. These considerations are woven throughout the course.

**(3) Recognition of the strength and power of scientific and technological knowledge as well as its limitations.**

A major theme of the readings and course is the impact of scientific knowledge on how we view the world and our relationship to it. This is paralleled by discussion of the growth of scientific technology and its impacts on the daily realities of life. Discussion of measurement uncertainties ("errors") as a limiting aspect of experimental science is an important element of the course.

**(4) Internalization of scientific values such as intellectual integrity, curiosity, skepticism, tolerance for ambiguity, and openness to new ideas.**

These scientific values are variously addressed in three aspects of the course. First, they play a major role in the "story lines" dealing with the historical development of the physical ideas and theories examined in the course. Second, they are stressed in some of the videotapes used in the course. Third, scientific values are reinforced by the course project.

## MAJOR COURSE “THREADS”

The central theme of this course is the nature and impact of modern science and scientific knowledge coming from it, with primary emphasis on the science of physics. We pursue this theme through several course ‘threads.’

1. Examine the historical development of some major physics insights to see in concrete terms how science has actually worked and the contexts in which it developed.
2. Attend to the intellectual passions which characterize great scientists.
3. Attend to the issues and objectives of the **Inquiry and Issues in Science and Technology** General Education category as given above.
4. Develop a broader context for your General Education experience by **attending at least two campus intellectual events** during the term. To receive credit for your attendance, you must turn in a brief (one to three paragraphs) report discussing the role of "reliable evidence" or “intellectual/artistic passion” in the event.
5. Consider at ways to distinguish real scientific knowledge from bogus knowledge claims (pseudoscience or “voodoo science”).
6. Define, elaborate, execute, and present a significant group project in which you **critically examine** some example of pseudoscience.

## CONTACT INFORMATION

This course is (or should be) a cooperative undertaking involving you, your fellow students, and me. I am available for consultation outside the classroom when needed. As you may know, my office is Room 012 in the Schaible Science Center (SC 012). Please stop by and visit. Information about my office hours is posted on my office door. My office phone, (630)-617-3577, has 24-hour voice mail service. When leaving a voice mail message, it is best to make it more informative than a simple "call me." My fax number on campus is (630)-617-3735. My email address is [earls@elmhurst.edu](mailto:earls@elmhurst.edu), and my web page is at <http://www.elmhurst.edu/~earls>. Normally, I read my email quite frequently, even when I'm not on campus. At home my telephone number is (630)-920-9570. When I am working on research at Fermilab or elsewhere, I may also have appropriate telephone numbers posted on my office door.

## ATTENDANCE

In accord with general College policy as stated in the Elmhurst College Bulletin (*a.k.a.* the College Catalog), regular class attendance is expected and is a requirement for receiving a satisfactory grade in this course. Class participation is an essential part of the course and contributes to your grade. If you must miss a course meeting, you must also take the responsibility for completing any assigned work for that day. Students who miss more than an occasional class invariably find it **very difficult** to earn a satisfactory grade.

## WARNING

**Academic Honesty is Essential!** Academic honesty is a requirement for receiving a passing grade in this course. In your academic work, **do not** represent the work of someone else as your own. Any form of cheating is a serious offense, and the **normal penalty** is a **failing grade in the course for all involved**. This includes the student(s) who actually did the work! More severe action can and will be taken in extreme cases. In any case your reputation will be substantially damaged. I am obligated to report any instances of academic dishonesty to both the Vice President for Academic Affairs and the Dean of Student Affairs.

You are expected to become familiar with the general College policy on Academic Integrity as stated in the E-Book. Copies may be obtained from the Office of the Dean of Student Affairs, Room 240 in the Frick Center. The content of the E-Book applies to this course. I will also provide you with a copy of the [Natural Sciences Division policy statement](#) on this subject. If you have questions about this matter, please discuss them with me.

## ACCOMMODATIONS

The College will make reasonable accommodations for persons with documented disabilities. If you have a disability that may have some impact on your work in this course, please contact the Office of Advising at Goebel Hall Room 103 [(630)-617-3450].

## COURSE EVALUATION

Near the end of the semester, you will be given the opportunity to provide a confidential evaluation of various aspects of this course, including my performance as an instructor. If you have *suggestions for improvements*, they will be of even more use if they are made earlier than the formal evaluation. So please talk to me about them, send me an email note, or if you wish anonymity, slip a note under my office door or put it in my campus mailbox (Campus Box #3). The course you save could be your own!