

First Year Seminar

Mind Meets Matter

Fall 2009

IMPORTANT INFORMATION

Instructor: Cindy Samet
Class Meetings: TTh 10:30 – 11:45 am - Bechtel Room of Waidner-Spahr Library
Lab Meetings: Rector Science Complex-Stuart Hall, Room 1113/1121 (dates tba)
Office: Rector Science Complex-Stuart Hall, Room 1107
Office Hours: Wed. 1:00 – 3:00 *and by appointment*
Phone: x 1295 (office)
e-mail: samet@dickinson.edu

***NOTE WELL – there is a Bb site for this course. You should check this site *daily* for important messages, announcements, and assignments.**

Texts (in reading order)

In Search of Schrodinger's Cat: Quantum Physics and Reality by John Gribbin
(Bantam Books, 1984)
Nanotechnology: A Gentle Introduction to the Next Big Idea by Ratner, Ratner
Prentice Hall/Pearson Education, 2003)
Cradle to Cradle: Remaking the Way We Make Things by McDonough and
Braungart (North Point Press, 2002)

Writing Guides

A Writer's Reference, 6th ed. by Hacker
On Writing by Stephen King (Scribner, 2000)

Note: shorter reading assignments will be made available on Bb.

COURSE OVERVIEW

Everywhere you go, you are surrounded by stuff! Scientists refer to stuff as “matter”, which is defined as anything that takes up space and has mass. Yet where does it come from? What *is* it? How can it be manipulated, shaped, transformed, represented? How do human beings understand and interact with matter? What are the broader impacts of manipulating matter - to the environment, to society?

In this seminar we will explore such questions, and in doing so, undertake an in-depth study of matter across the disciplines. The course will be divided into two parts. In the first part, we will focus on *understanding matter*. This will involve a trip “down the rabbit hole” into the rich world of quantum mechanics - the physical theory that describes the rules for how very small objects, such as electrons and protons, behave. We will read “*In Search of Schrodinger's Cat: Quantum Physics and Reality*” (John Gribbin) and study the 2004 film “What the Bleep Do We Know”, the drama-documentary that brings the metaphysical world into our everyday experiences. The focus of the second part of the course will be on *designing matter*. Topics will include nanoscience, which provides the ultimate example of how we can work at the molecular level and, atom by atom, create something new, and in doing so, change the way we live.

COURSE GOALS

- **Understand the basic tenets of the quantum theory or “quantum mechanics” and how it “provides the fundamental underpinning of all modern science” (Gribbin, 1)**
- **Understand the fundamental science behind nanotechnology (and thus see how an understanding of quantum mechanics is necessary for a complete understanding of nanotechnology).**
- **Apply concepts and ideas from quantum mechanics and nanotechnology to the manipulation and design of “matter”, including novel materials.**
- **Take a holistic look at matter across the disciplines, especially art.**

COURSE FORMAT

This is a *seminar* class. That means that I will not be simply standing up and lecturing to you. I expect that much of the “presentation” of the material will come from you, the student. Of course, I will regularly bring in some demonstrations and present material necessary for the facilitation of the class activities and of our learning in general. However, even in these instances, it is your questions and the resulting discussions that will really make this course successful.

In order for this format to work, it is absolutely essential that you do the readings before coming to class. And when you read, please do so actively. How do you actively read? You read with a pad of paper nearby and a pen in your hand. You make notes about the material and any questions you have. It is not necessary to outline everything you read. It is necessary to write down the things you find confusing or surprising or things you want to discuss more fully in class.

COURSE PHILOSOPHY

Note that format of this course requires you to be a *partner* in your education. As such, we will both have obligations to each other.

Here are some of the things I expect from you:

- That you will treat everyone in the class, including the professor, with respect
- That you will attend every class, fully prepared and ready to participate
- That you will visit me when you are struggling with the material
- That you will not plagiarize or otherwise steal the work of others
- That you acknowledge that your perception of effort, by itself, is not enough to justify a distinguished grade
- That you will not make excuses for your failure to do what you should have done

- That you will accept the consequences—good or bad—of your actions

For my part, here are some of the things you can expect from me:

- I will treat you as an individual and with respect at all times
- I will be accessible and approachable; I'm here to help you learn
- I will manage class in a professional manner; this may include educating you in appropriate behavior
- I will prepare carefully for every class and I will begin and end on time
- I will be honest with you and will admit when I do not know something
- I will return assignments quickly with detailed feedback
- Your grade will reflect the quality of your work and nothing else
- I will pursue the maximum punishment for plagiarism, cheating, or other violations of academic integrity

If there is something I can do to help you learn more effectively, I encourage you to come and visit me. Constructive criticism is always welcome.

GRADING

- **Writing Assignments----total of 65% of course grade**
 - Paper #1- short essay – 5%
 - Paper #2 – descriptive lab write-up – 15%
(WC visit)
 - Paper #3 – Cradle to Cradle essay - 20%
(WC visit + draft =5%/final paper 15%)
 - Paper #4 – Bibliography + Project paper (novel material prospectus) – 25%
(draft of bibliography = 10%/final biblio. and paper 15%)
- **Participation – total of 15% of course grade**
(Includes in-class discussions, debates, short writing assignments, lab work, etc.)
- **Project Podcast – 5% of course grade**
(This will be an announcement of the novel material you choose for your project)
- **Presentation – 15% of course grade**
(This will be a formal presentation of the novel material you choose for your project)

ATTENDANCE/DAILY/WEEKLY WORK

Attendance: Attendance is mandatory. One *unexcused* absence will be permitted. Additional unexcused absences will result in a lowering of the final grade by one letter grade per absence. Excused absences are medically related and do not include oversleeping, roommate problems, studying for another class or leaving early for Fall Pause or Thanksgiving. Excused absences may include documented illness or extreme circumstances such as hospitalization or a

documented death in the immediate family. These will be examined on a case-by-case basis. Note well: If you suspect you have the flu, please do not come to class or to my office. Please follow the instructions given in the all-college email messages and orientation information given. If possible, send me an email right away – the sooner I know you might be absent for an extended period of time, the better able I am to enable you to keep ahead in the class! There is always a way to work around an illness such as the flu, just so long as there is good communication.

NOVEL MATERIAL PROJECT

Each student will choose a novel material and study it in detail. This final project includes: the final paper (#4), the presentation, and the podcast/radio broadcast. Many more details to follow! Note well: the final paper is NOT a full, extended research paper but rather a summary or prospectus of your novel material. You will discuss your novel material in detail in your presentation.

THE LIBRARY AND WRITING CENTER

The library is a great place to find information on almost any topic. Because there is so much information available, however, it can be difficult to find exactly what you are looking for. Our library liaison for this course is Amelia Brunskill. She can be reached at 245-1601, via email at brunskia@dickinson.edu, or via our class Blackboard (Bb) site. Ms. Brunskill is available to help you locate anything you might need for this class. She will also be teaching a couple of information literacy sessions during the semester. The first of these will be on September 22 in the Information Commons Classroom (ICC) on the lower level of Waidner-Spahr library. The second will be on October 15th.

Dickinson College also has a Writing center that is available to assist you with writing assignments. This excellent service is available on the main floor of the Waidner-Spahr library. All first-year students are required to visit the Writing Center at least once during their seminars. It is always best to make an appointment when visiting the writing center as there is no guarantee that a tutor will be available if you arrive unannounced. We will discuss specific requirements for numbers of visits to the Writing Center as needed.

NOTE WELL: You are required to take paper assignments 3 and 4 to the Writing Center. Failure to carry out these requirements will result in a reduction in your course grade of one letter grade. You are also required to meet with our class librarian during the work on the project.

LATE WORK

All assignments and papers are due at the beginning of class. Late work is not accepted except under extreme circumstances (such as hospitalization from a car accident). “I overslept” or “I had a soccer game” or “I had two other papers due on the same day” are not acceptable reasons

for turning in late work. If you believe you deserve an exception to this policy, please come and see me outside of class.

Note well: *Computer and/or printer malfunctions are no excuse for late or missing assignments. Plan ahead and backup your files! Please allot ample time to complete your assignments in all classes.*

ACADEMIC HONESTY AND INTEGRITY

You are encouraged to discuss and debate the ideas in any of your assignments with your instructor and classmates. If you work on assignments cooperatively, rather than independently, please keep in mind that all of your work must be your own. Thus, while it is perfectly reasonable to discuss certain questions together, it is not acceptable to sit down together and write any paper side by side. In short, everything you write down must reflect your own thoughts and wording or be appropriately referenced. If there is reasonable evidence of cheating or plagiarism, college policy dictates that the matter must be turned over to the disciplinary system. If you are at all unsure about what constitutes cheating and plagiarism, I highly recommend you consult the college's Community Standards for a full explanation; it is available on the college's website at www.dickinson.edu/student/code.html.

*****Also, please note that you are *required* to attend the Academic Integrity Session on Wednesday, September 16 at 6:00 pm in the Information Commons Classroom (ICC) in the lower level of the Waidner-Spahr library.**

ACCOMODATIONS FOR STUDENTS WITH DISABILITIES

In compliance with the Dickinson College policy and equal access laws, I am available to discuss requests made by students with disabilities for academic accommodations. Such requests must be verified in advance by the Coordinator of Disability Services who will provide a signed copy of an accommodation letter, which must be presented to me prior to any accommodations being offered. Requests for academic accommodations should be made during the first three weeks of the semester (except for unusual circumstances) so that timely and appropriate arrangements can be made.

Students requesting accommodations are required to register with Disability Services, located in Academic Advising, first floor of Biddle House (contact ext. 1080 or waybranj@dickinson.edu) to verify their eligibility for reasonable and appropriate accommodations.

Note well: Additional Course Information can be found on Bb. This includes:

- 1. A course calendar**
- 2. Detailed reading assignments**
- 3. Detailed class preparation assignments**
- 4. Detailed handouts for paper assignments and project (these will be posted closer to the time of the assignment).**