HONORS PS1500 - PHYSICS IN THE PLAYS OF TOM STOPPARD

Course Outline - Spring Semester 2007

INSTRUCTOR: Dr. Bradley W. Carroll
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COURSE HOMEPAGE: http://physics.weber.edu/carroll/honors/
TEXTS: *Hamlet*, William Shakespeare;
Rosencrantz & Guildenstern are Dead, Tom Stoppard;
Tom Stoppard: Plays Five, Tom Stoppard;
Seven Ideas that Shook the Universe, Nathan Spielberg and Bryon D. Anderson

Science and math background assumed: none!

OUTLINE

In several of his plays, Tom Stoppard examines the paradox of free will in a deterministic Newtonian world. To what extent can individuals control their lives in a clockwork universe? We will examine the rise and fall of the Newtonian worldview in this course, and see how this provides the philosophical themes of three of Tom Stoppard's plays, *Rosencrantz & Guildenstern are Dead*, *Arcadia*, and *Hapgood*. Classroom activities will include

- small-group discussions of the ideas of the plays
- performing selected readings from the plays
- investigations that explore the physics content of the plays

There will be a two-part midterm for each of Stoppard's plays (covering the storyline of each play and the physics in it), and an optional course project of your choice (with the instructor's approval).

OFFICE HOURS

11:00 – 12:00 Daily
and
any other time I am in my office

The topics for the small-group discussions will be distributed during the previous class. **Come prepared** to discuss any of the topics. The midterms on the physics content of the plays will consist of multiple-choice and short answer questions, and will be given in the Student Service Testing Center (SC 269) over a two-day period; remember to bring a picture ID and a #2 pencil for the multiple-choice. The other exams will be take-home and open book. Each person is responsible for his or her own work. Academic dishonesty on any exam will result in a grade of zero being given for that examination. A second violation will constitute failure of the course.

Physics provides the fundamental description of physical reality, an exciting and sometimes startling view of the world that most people never get to see. Above all, ***Ask Questions at Any Time!*** If you have questions that can't be cleared up in class, drop by my office to discuss the meaning and implications of the material. Relax and enjoy this exploration of how nature really works, and remember the words of British scientist J. B. S. Haldane: "Not only is the universe stranger than we imagine, it is stranger than we *can* imagine!"

GRADING

"A": An overall midterm average of at least 80% *and* an acceptable approved project for a total of at least 90% (midterms + project) *and* a satisfactory effort in group discussion

"B": An overall midterm average of at least 80% *and* a satisfactory effort in group discussion

"C": An overall midterm average of at least 70% *and* a satisfactory effort in group discussion

"D": An overall midterm average below 70% *or* an unsatisfactory effort in group discussion

"E": An overall midterm average below 70% *and* an unsatisfactory effort in group discussion

The course project is worth up to 10%. It should be something original and creative, and must be at least peripherally related to the subject matter of the course. With your project you must hand in a short written paper that describes what you did and how it is connected to the course. No last-minute projects will be approved. Your project should be something we can both be proud to share with the rest of the class!

SCHEDULE AND READING ASSIGNMENTS

Week 1
Jan 9 Course introduction
11 *Seven Ideas*, p. 1 - 13

Week 2
Jan 16 *Seven Ideas*, p. 14 - 35
18 *Seven Ideas*, p. 35 - 49

Week 3
Jan 23 *Hamlet* Act 1, Scene 1 through Act 2, Scene 1
25 *Hamlet* Act 2, Scene 2 through Act 3, Scene 2

Week 4
Jan 30 *Hamlet* Act 3, Scene 3 through Act 4, Scene 7
Feb 1 *Hamlet* Act 5

Week 5
Feb 6 *Seven Ideas*, p. 50 - 65
8 *Seven Ideas*, p. 65 - 73

Week 6
Feb 13 *Seven Ideas*, p. 73 - 83
15 *Rosencrantz & Guildenstern*, Act 1
Exam #1 (Physics) - SC 269
16 **Exam #1 (Physics) - SC 269**

Week 7
Feb 20 *Rosencrantz & Guildenstern*, Act 2
22 *Rosencrantz & Guildenstern*, Act 3
23 **Movie: Rosencrantz & Guildenstern are Dead**

Week 8
Feb 27 *Seven Ideas*, p. 84 - 105
Exam #2 (*Hamlet, Rosencrantz and Guilderstern are Dead*)
Take-home due Thursday, March 1, at the beginning of class
March 1 *Seven Ideas*, p. 106 - 124

Week 9
March 6 *Seven Ideas*, p. 125 - 138
8 *Exploring Chaos* (to be handed out in class)

March 13 **Spring**
15 **Break**

Week 10
March 20 *Arcadia*, Act 1, Scenes 1 and 2, p. 7 - 52
Exam #3 (Physics) - SC 269
21 **Exam #3 (Physics) - SC 269**
22 *Arcadia*, Act 1, Scenes 3 and 4, p. 52 - 75

Week 11

March 27 *Arcadia*, Act 2, Scenes 5 and 6, p. 76 - 102
29 *Arcadia*, Act 2, Scene 7, p. 102 - 137

Week 12

April 3 *Seven Ideas*, p. 139 - 183
Exam #4 (*Arcadia*) Take-home due Thursday, April 5, at the beginning of class
5 *Seven Ideas*, p. 184 - 198

Week 13

April 10 *Seven Ideas*, p. 199 - 220
12 *Seven Ideas*, p. 220 - 224
The Character of Physical Law, Ch. 6
(to be handed out in class)

Week 14

April 17 *Hapgood*, Act 1, Scenes 1 - 3, p. 489 - 516
Exam #5 (Physics) - SC 269
18 **Exam #5 (Physics) - SC 269**
19 *Hapgood*, Act 1, Scenes 4 and 5, p. 516 - 547

Week 15

April 24 *Hapgood*, Act 2, Scenes 1 - 3, p. 548 - 575
26 Hapgood, Act 2, Scenes 4 - 7, p. 575 - 593
Exam #6 (*Hapgood*) Take-home due Tuesday, May 1, at 5:00 pm in my office

FINAL EXAM

TBA

Presentation of course projects