

HONORS PS1500 - PHYSICS IN THE PLAYS OF TOM STOPPARD

Course Outline - Spring Semester 2009

INSTRUCTOR: Dr. Bradley W. Carroll
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COURSE
HOME PAGE: <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

- 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 MWF

1:00 – 2:00 TTh

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. A Kwik-Kwiz™ will be each day the plays are discussed. 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 will be a short essay paper (3 - 5 pages) on an assigned topic from the plays. 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 quiz and 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 quiz and midterm average of at least 80% *and* a satisfactory effort in group discussion
- "C": An overall quiz and midterm average of at least 70% *and* a satisfactory effort in group discussion
- "D": An overall quiz and midterm average below 70% *or* an unsatisfactory effort in group discussion
- "E": An overall quiz and 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 6 Course introduction
8 *Seven Ideas*, p. 1 - 13

Week 2

Jan 13 *Seven Ideas*, p. 14 - 35
15 *Seven Ideas*, p. 35 - 49

Week 3

Jan 20 *Hamlet* Act 1
22 *Hamlet* Act 2 through Act 3, Scene 2

Week 4

Jan 27 *Hamlet* Act 3, Scene 3 through Act 4, Scene 7
29 *Hamlet* Act 5

Week 5

Feb 3 *Seven Ideas*, p. 50 - 65
5 *Seven Ideas*, p. 65 - 73

Week 6

Feb 10 *Seven Ideas*, p. 73 - 83
12 *Rosencrantz & Guildenstern*, Act 1
Exam #1 (Physics) - SC 269
13 **Exam #1 (Physics) - SC 269**

Week 7

Feb 17 *Rosencrantz & Guildenstern*, Act 2
19 *Rosencrantz & Guildenstern*, Act 3
20 **Movie: Rosencrantz & Guildenstern are Dead**

Week 8

Feb 24 *Seven Ideas*, p. 84 - 105
26 *Seven Ideas*, p. 106 - 124
Exam #2 essay paper due at beginning of class

Week 9

March 3 *Seven Ideas*, p. 125 - 138
5 *Exploring Chaos* (to be handed out in class)

March 10 **Spring**

12 **Break**

Week 10

March 17 *Arcadia*, Act 1, Scenes 1 and 2, p. 7 - 52
19 *Arcadia*, Act 1, Scenes 3 and 4, p. 52 - 75
Exam #3 (Physics) - SC 269
20 **Exam #3 (Physics) - SC 269**

Week 11

March 24 *Arcadia*, Act 2, Scenes 5 and 6, p. 76 - 102
26 *Arcadia*, Act 2, Scene 7, p. 102 - 137

Week 12

March 31 *Seven Ideas*, p. 139 - 183
April 2 *Seven Ideas*, p. 184 - 198
Exam #4 essay paper due at beginning of class

Week 13

April 7 *Seven Ideas*, p. 199 - 220
9 *Seven Ideas*, p. 220 - 224
The Character of Physical Law, Ch. 6
(to be handed out in class)

Week 14

April 14 *Hapgood*, Act 1, Scenes 1 - 3, p. 489 - 516
16 *Hapgood*, Act 1, Scenes 4 and 5, p. 516 - 547
Exam #5 (Physics) - SC 269
17 **Exam #5 (Physics) - SC 269**

Week 15

April 21 *Hapgood*, Act 2, Scenes 1 - 3, p. 548 - 575
23 *Hapgood*, Act 2, Scenes 4 - 7, p. 575 - 593
**Exam #6 essay paper due Tuesday, April 28,
at the presentation of course projects**

FINAL EXAM

Tuesday, April 28, 12:00 - 2:00 pm

Presentation of course projects