**Science and Society: Industry Funding & Scientific Research**

**Course Format**: This class is designed to be a discussion based course. The goals is to create a dynamic class discussion in which students engage with each other and learn to engage in productive discussion. The central theme of the course will be ways in which private industry distort scientific research and the extent to which industry-funded science can be relied upon. There will be NO EXAMS. Instead, students are expected to come to class each week prepared to engage in discussion. Grading will be based on in-class discussion and on three small papers that require students to demonstrate an understanding of the material. Students must keep pace with the weekly readings to do well in this course. Students who typically do not keep up with course readings or typically only read them as they “cram” for an exam, should understand that such strategies will likely lead to a failing grade.

**Course Topic**: Industry funding has become the major source of income for scientific research. In addition to economic forces causing this trend, a number of non-profit and government agencies (e.g. the Gates Foundation, the Wellcome trust, the President’s Council of Advisors on Science and Technology, the Food and Drug Administration, etc.) are recommending more collaboration between industry and academia. The entire field of biomedicine is undergoing a massive shift along these lines as pharmaceutical companies shift their R&D work into universities under the rubric of translational medicine. Similarly, most of the work assessing the safety of industrial chemicals is conducted by the companies that produce them. Yet concurrent with this shift towards industry funding, there has been growing concern with the ways in which industry “bends science”. This course examines the significant changes to scientific organization that have occurred since WWII, how privatization of scientific research changes the nature of the scientific endeavor, and what is at stake if this trend continues.

1. **Policies:**

**‡ Grading:** There are 100 available points. The class is based on a relative grading scale

according to Yonsei University grading policy. That means that classes with an enrollment of >20 can have at most 35% in the A-range and 35% in the B-range, and classes with an enrollment of ≤20 can have at most 40% in the A-range and 50% in the B-range. Since the Yonsei online grade-submission system will not accept (or even allow) submission of grades that violate these restrictions, I am required to follow these guidelines. Hence, I have refrained from giving letter grades on assignments and exams.

The default floor for the grading percentages will be:

|  |  |  |  |
| --- | --- | --- | --- |
|  | + | 0 | - |
| A | 96 | 92.5 | 90 |
| B | 87.5 | 82.5 | 80 |
| C | 77.5 | 72.5 | 65 |
| F |  | Below 65 |  |

**‡ Attendance & Participation:**

Attendance will be taken in accordance with Yonsei Policy: missing 1/3 of all classes, regardless of having legitimate, official excuses, is to result in an F grade. Being more than twenty minutes late will be counted as an absence. You will be allowed six absences (excused/unexcused). Long days count as two classes. (Hence, you`re allowed two weeks of absences).

Students are expected to come to class prepared and ready to engage in an informed discussion of the material. Students are expected to actively participate in classroom discussions. Participation includes asking questions, raising objections, offering defenses, commenting on the significance of a point, clarifying an argument or a claim, and drawing out the connections between an issue from our current discussion and issues raised in our other readings.

**‡ Extensions or alternative test times:** All assignments are due at the beginning of class.

Students will have a ten minute grace period after which point the assignment will be considered late. Generally, no changes will be made to the dates listed. Exceptions will be handled on a case by case basis and will not, in any circumstances, be altered without supporting documentation. The penalty for turning in an assignment late will be a third of a grade deduction per day (or any portion thereof). It is the students responsibility to ensure that the paper they submit is the correct paper. If the wrong paper is uploaded to the drop box it will be treated as if no paper had been turned in and late penalties will accrue accordingly.

**‡ Academic Integrity:** All students are expected to be familiar with and abide by the

universities policies on academic integrity. Any failure to abide by this policy will result in a failing grade for the course and letter to the dean reporting the incident. For more information, please visit http://uic.yonsei.ac.kr/

and navigate to Home>Academics>Academic Regulations.

**‡ Disabilities and Special Needs:** I am happy to make any accommodations to facilitate

students learning. Please see me at the beginning of the semester to discuss such issues.

**‡ Preferred names and Gender Pronouns:** I would like to make every effort to create a safe

space. If you have a preferred name or gender pronoun that is not reflected in the roster, please let me know.

**‡ This syllabus may be updated as the semester proceeds. Any such changes will be announced in class as well as by email.**

**2. Participation (25%)**

Active and informed participation: Students are expected to come to class prepared and ready to engage in an informed discussion of the material. Students are expected to actively participate in classroom discussions. Participation includes asking questions, raising objections, offering defenses, commenting on the significance of a point, clarifying an argument or a claim, and drawing out the connections between an issue from our current discussion and issues raised in our other readings. Substantial contributions can raise your grade.

**3. Topic papers (75%):** Over the course of the class students will write 3 papers (950-1450 words—roughly 3-4 pages), papers will lose 5 points for every 100 words (or any portion thereof) outside the limit). The papers will be spread out over the class. The prompts are focused on clarifying the topic and understanding the arguments covered in the reading. Students should make reference to (**and cite!**) the material, but should express the ideas in their own words (i.e. no long block quotes). Citations should be MLA style. The purpose of these papers is to learn to digest and understand philosophic arguments (i.e. these are not research papers). Accordingly, students **should not** use outside resources to answer questions. Evidence of outside research will be considered cause to reduce a grade, or in extreme cases lose all credit. Students may confer with each other, but all writing should be done independently. Significant overlap in student papers is academic dishonesty (see below).

Because students may be new to philosophy, two accommodations have been made. The first is that papers will be of increasing impact on the final grade (The first paper is only 15%, the second 25% and the third 35%). This is intended to help students gain experience in writing such papers and incorporate feedback on early papers in hopes that future papers will be of higher quality. The second accommodation is a “get out of jail free card.” If after lecture, you wish to rewrite or amend your paper you may get a 3-day period to do so. However, this is not intended to be an extension. You may only exercise this option if you had already submitted an honest attempt at writing the paper in the first place. A rushed or incomplete paper will not qualify for this exception and will be graded as is. Refusals to allow you to use this option will be at my discretion. Each student may use this option only once per quarter. To do so, simply send me an email after the lecture. Please send it the same day so that I can begin grading and turn back papers to students in a timely manner. There will be **no penalty** for exercising this option.

**Week 1 (Sept 4/6): Speaking Truth to Power (chapter 1 of *Tainted* (16 pages))**

**Week 2 (Sept 11/13): The Argument for Pollution**

**(Chapter 2 & 3 of *Tainted* (27 pages))**

In this week we examine the arguments that we can safely store high-level radioactive waste underground in perpetuity and that low doses of carcinogens are harmless.

**Week 3 (Sept 18/20): Are medicines safe?**

**(Chapter 5, 7 & 8 of *Tainted* (34 pages))**

In this week we examine the ways in which drugs are tested for safety including animal testing, the threshold for drugs causing “serious harm” and the statistical methods used to establish causality.

**Week 4 (Sept 25/27): Is Pollution being safely contained?**

**(Chapter , 9 & 12 of *Tainted* (39 pages))**

In this week we examine “Superfund” sites that have been heavily contaminated and the three-mile island nuclear accident to examine the extent to which pollution is effectively contained once it exists.

**Week 5 (Oct 2): No Reading, Paper due beginning of week**

**Classes reflect on weeks 1-4**

**NO CLASS WEDNESDAY OCT 4 or MONDAY OCT 9**

**Week 6 (Oct 11): Bending science**

**(Chapter 1 & 2 of *Bending Science* (43 pages))**

In this week we begin a new book which explores range of sophisticated legal and financial tactics that are used to suppress or discredit research on chemical safety that threatens corporate profits.

**Week 7 (Oct 16) Does the scientific community regulate itself?**

**(Chapter 3 of Bending Science (16 pages)**

In this week we examine the extent to which peer-review, competitive grant and the tenure process effectively regulates scientific inquiry and the pursuit of scientific truth.

**(Oct 18/23): Midterm week, no class, no exam**

**Week 8 (Oct 25): Who’s in charge here?**

**(Chapter 4 of *Bending Science* (37 pages))**

In this week we examine the extent to which Industry is able to set the research agenda for scientific inquiry and the pursuit of scientific truth.

**Week 9 (Oct 30/Nov. 1): Inconvenient truths**

**(Chapter 5 & 6 of *Bending Science* (59 pages))**

In this week we examine two strategies industry takes in dealing with evidence that its products are harmful: obscuring evidence from public view and discrediting the studies

**Week 10 (Nov. 6/8): No Reading, Paper due beginning of week.**

**Classes reflect on weeks 6-9**

**Week 11 (Nov. 13/15): Enemies and Allies**

**(Chapter 7 & 8 of *Bending Science* (47 pages))**

In this week we examine two strategies industry takes in creating a scientific consensus: personally attacking scientists that produce work that threatens its interests and assembling panels of friendly experts to establish a pro-industry consensus

**Week 12 (Nov. 20/22): Spin and Counter-spin**

**(Chapter 9 & 10 of *Bending Science* (55 pages))**

In this week we examine how industry manipulates the public discourse about scientific findings and what we, as citizens can do about it.

**Week 13 (Nov. 27/29): The Politics of Science**

**(Chapter 11 & 12 of *Bending Science* (40 pages))**

In this week we examine zoom out to consider what sort of political reforms could be taken to reform industry-funded science.

**Week 14: (Dec. 4/6) No Reading, Paper due beginning of week**

**Classes reflect on weeks 11-13. Class ends NO FINAL EXAM**