

Environmental Justice

Fall 2018

BIOS 50544 / PHIL 43308 (ALSO STV 43396 & IIPPS 50901)

Dr. Kristin Shrader-Frechette

O'Neill Family Professor, Philosophy Department
and Biological Sciences Department

Office hours: Mon/Tues 2-3:15; other
times are by appointment,
per sign-up sheet on office door).

Office: 211 Malloy, email: kshrader@nd.edu

Website: www.nd.edu/~kshrader

Class Time: Mon 3:30-6:15

Classroom: Malloy 220

Course goals: to understand problems of environmental injustice (EIJ) throughout the world
to understand how discriminators use poor science/ethics/logic against minorities and the poor
to understand the many conflicts of interest that face scientists doing environmental research
to teach people to avoid suspect inferences, default rules, and subjectivity in science/ethics
to use classical ethical techniques for resolving ethical dilemmas of EIJ
to rethink the various ways that unethical science can compromise both ethics and science

Course Overview

- I. **EJP Severity:** How Serious Are Environmental-Justice Problems (EJP)?
- II. **EJP Causes:** Why Do Good People Do So Little About EJP?
- III. **EJP Solutions:** How Does Scientific, Logical, & Ethical Analysis Help Resolve EJP?

Questions:

At beginning of each class, the professor asks for questions. At this time, be sure to ask questions about assignments, research, procedures, or prior lectures. For government-research, scientific-journal, journal-database questions for your paper assignments, see professional ND (research or government-document) librarians. Please do not email the professor with a question until after (1) you have read the syllabus clearly and (2) you have asked the question at the beginning of class.

Contact Information:

Please see Dr. Shrader-Frechette during her office hours or after class. For appointments, please sign the sheet on her office door. If none of these appointment times will work, please follow directions on the office door and email Dr. S-F to let her know when you are available (give 4 options) Monday-Tuesday, 6:15 or 6:30. Dr. Shrader-Frechette receives about 200 emails daily, many handled by her assistant. Unfortunately, this high email volume means she cannot quickly answer student emails, so do not wait until the last minute, if you need a meeting. She wants to see everyone, so please do not hesitate to see her. For emergency/sickness contact, use email. Be sure to sign up for appointment or contact Dr. Shrader-Frechette about a week ahead of time, as she often is out of town weekly (doing science or pro-bono EJ work in US/abroad). Typically, she cannot quickly see those who do not make appointments in advance.

Course Format:

The course is an interactive seminar, with prof's 60-minute interactive lecture, followed by 90 minutes of student-based interaction. Note that **weekly assignments are like those for 3 class days**. Hence you need to balance time, to do work.

DEADLINES

Paper P1A ----- ----- -----	Copies for prof & 2 reviewers due, per syllabus, 9-1-18 (+5 points) or 9-8-18 , 48 hrs, before next class begins. Put hard copy in 211 Malloy box before 8 am on Mon before class. Bring hard+ R copies for entire class to class. +5 points for early turn-in: see lecture outlines at syllabus end.
Corrected P1A + P1B	Copies for prof & 2 reviewers due, per syllabus, 9-15-18 (+5 points) or 9-22-18 , 48 hrs before next class begins. Put hard copy in 211 Malloy box before 8 am on Mon before class. Bring hard P1B + R copies for entire class to class. +5 points for early turn-in" se lecture outlines at end of syllabus.
Corrected P1B + P2	Copies for prof/reviewers due, per syllabus, 9-30-18 (+10 points), 10-8-18 (+5 points), or 10-20-18 , 48 hrs before next class begins. Put hard copy in 211 Malloy box by 8 am, Mon before class. To class, bring hard P1B+R copies for whole class. Extra points for early turn-in: see details at syllabus end.
Paper E	Email copies for prof & 2 reviewers 10-27-18 , 48 hrs before next class begins. Put hard copy in 211 Malloy box by 8 am Mon before class. To class, bring hard copies of E +R for class.
Corrected P1B,P2+P3+Pwrpt	Copies for prof due, per syllabus, 11-10-18 (+5 points) or 11-17-18 , 48 hrs before next class begins. Put hard copy in 211 Malloy box before 8 am on Mon before class. Bring hard copies of P1B for entire class to class. +5 points for early turn-in: see lecture outlines at syllabus end.

Note that all required papers must (1) have **line-numbering and page numbering** (so prof. can always refer to specific line numbers in making comments on paper). P1B, P2, and P3 papers must (2) include **explanations of why student did not correct any earlier comment by prof**. Prof will evaluate papers in order in which they were turned in & take off many points for earlier problems that student later failed to correct,

Students who do not bring copies of P, E, & R papers for class members---or email copies of P & E papers to professor's box (2 days early), on time, will automatically lose 5 points each time. R papers are due on dates listed above, at class.

Requirements: For all papers, grammar must be without errors, or students will lose points. For all papers except NYT, be sure that you use (as many as possible) up-to-date scholarly books and articles (especially, from refereed scientific and medical journals). Although professor is one of the top scholars globally in the field covered by the course, do not cite her work in these papers. Also, use no mere website material, no popular sources, no sources likely to have bias (e.g., from industry or citizen-advocacy groups). You may use government documents and journals, even if they are online. Top journal articles and National Academy of Sciences documents are needed. Other requirements are below:

1. **2 one-page assigned papers: 1 P1A, 1 ethics (E);** bring hard copies for entire class, and put hard copy in professor's box, 211 Malloy (and send professor e-mail copy), 48 hours before class beginning at which paper is due (see explanation on pp. 1-2 of syllabus).
2. **6 one-page review papers (R):** of original P1B, P2, E papers of persons on your right and left. Be ready to present R paper in class, and bring copies to class for prof and students.
3. a **P1B** (copies for class); a longer project paper/letter **P2**; a **final P3** (including power-point presentation of P3 for class); a xerox copy of what you send out (corrected P2 = P3) to community/group/officials. Send reviewer and professor an e copy, and put hard copy of paper in professor's box (211 Malloy) at least 48 hours before class when paper is due.
4. **in-class analysis/attendance** at every class (C). Excellent presentations (not reading them!) of P1A, P1B, P2, P3, E, & R papers help count for this grade. If you forget class/prof copies, you lose 5 points.
5. **quizzes (Q) on reading for the week;** watching 1 video (V)+ turning in V sheets for "Trade Secrets."
6. **NY Times summaries (S)** on weekly EJ problems; turn it in at beginning of class; NYT articles must be from previous 6 days and must use flawless grammar.

Basis for Course Grade: There will be no tests, but course grade will be determined by weighting each of the following 5 items as 20 percent: (P1A, E) + (6 Rs) + (P1B + P2 + P3) + (S, C) + (Q, V).

Students are encouraged to develop their own arguments and, especially, to develop arguments that differ from those of the professor. Students will be graded only on the logic they employ, the quality of their argument methods, and the factual correctness of factual claims, not on the content of their opinions/positions. Be sure to use the 5 criteria and to avoid logical fallacies.

Prof accepts no late papers/assignments, except in the case of a family death or a student illness. (Doctor's note is required.) All assignments are due at the beginning of class, and prof won't accept them later. Athletes who must be out of town should turn in papers early and do quizzes early.

Main Course Work: Students will choose the same project (for papers P1A, P1B, P2, and P3) on which to work independently. In the past, many ND students have analyzed draft environmental-impact statements (2500 are done each year in the US), particularly for poor/minority communities. Others have assessed ethical issues underlying current/proposed scientific or environmental legislation or policies.

Videos for Extra Credit (1) Coverup at Ground Zero (ABC "Turning Point"), (2) "Declassified: Human Experimentation," (3) NOVA: "A Plague on Our Children," or (4) "Save the Males." All are on second floor of library.

Background Reading on Risk-Assessment Methods

- (1) US National Academy of Sciences, 1994, Science and Judgment (SJ); available at <http://books.nap.edu/books/030904894X/html/R11.html>.
- (2) US National Academy of Sciences, 1996, Understanding Risk (UR); available at <http://books.nap.edu/books/030905396X/html/R1.html>.
- (3) US National Academy of Sciences, 1983, Risk Assessment in the Federal Government (RA); available at <http://www.nap.edu/books/0309033497/html/>.

Texts

- (1) parts of US National Academy of Sciences, RA, UR, to be read online (**optional**).
- (2) Shrader-Frechette, Taking Action, Saving Lives (NY: Oxford University Press, 2007); available from Amazon & bookstore at about \$ 23 (from Oxford U Press for about \$20 if you use coupon on professor's website); and Environmental Justice, \$ 19, by using promotion code 24842, ordering at www.oup.com/us (\$33 Amazon).
- (3) Peter Singer, 2002, One World: The Ethics of Globalization; \$ 6 on Amazon.
- (4) New York Times subscription, M-F for 15 weeks = \$ 30. Paper copy required. Follow directions at <http://homedelivery.nytimes.com/HDS/CollegeSearch.do?mode=SearchCollege&who=stud&SELECTED MENU=24&SELECTED MENU PARENT=22>

Format for 1-Page (Only) Assignment, Weekly NYT Summaries:

1. Use only articles from the previous 6 days. Use Oxford University Press formatting-style for New York Times summaries each week, and put this NYT citation at the top of the summary page, e.g., **Gardiner Harris, "Congressional Investigators Are Critical of F.D.A.'s Efforts to Detect Drug Dangers," *The New York Times* CLV, no. 53559 (April 24, 2006): A12.** (Remember that newspaper style and grammar are not the same as standard style/grammar.)
2. One-page NYT summaries should have 3 paragraphs. First paragraph should be the longest and **summarize** main points of the article. Second paragraph should explain **why** the issue is an EJ problem. Third paragraph should summarize **what you can do** to help alleviate this problem.
3. Cut out the NYT article from newspaper; **staple** it to back side of your summary; use only articles from the last 6 days.

Format for 1-page-max Ethics Paper E (on Singer, chs. 1, 2, 3, or 5): make copies for professor, entire class

- (1) Give one-sentence quotation + one-sentence argument, + one sentence explaining why flaw is supportive of/damaging to the author's position. Repeat (1) 4 times, so that you have 15 sentences – each a complete argument in the single sentence after the quotation. Use the 5 criteria and avoid fallacies. Always check the grammar paper given by professor, before you turn in your paper. (2) below explains an example of the paper.
- (2) Employ same format as given in KS-F sample critique of Lewis later in syllabus, or use same format for E as given in E paper later in syllabus.

E's content should be partly ethical, not purely scientific-logical. Use the 5 criteria. To help in your analyses, there is much ethics material in the Singer and Shrader-Frechette course readings. From Singer volume, choose which 3 E-paper topics (priority ranked) you would like, pro or con (8 options; see p. 13). Before Fri noon of the first week of class, put 3 priority-ranked E topics (first come, first served) in box by prof's door at 211 Malloy.

E assignments are "first come, first served"! Note that "con" papers are easier to do than "pro" papers because, if you support a person/position, you must find reasons that are not already used by the person to support his/her position – i.e., you must provide original, new, complete arguments for agreeing with the person. If you are "con," you need only use an argument to show why a claim is doubtful. Keep key claims in E papers of the form: "A is B because C." Be sure to have all 3 parts of paper, and avoid any redundancy. Do not make claims that you cannot back up with citations, and give reasons for your claims. Have a smart person read your paper, ahead of time, to look for logical/conceptual/grammar problems. Rewrite paper several times to be sure it is logical/clear/well argued/grammatical. Use correct citation format, as in model paper. At least 48 hours before beginning of class, email prof/reviewers copies, and before 8 am on Monday before, put hard copy in prof's box (211 Malloy). Students who forget extra copies, for prof. or for class, lose 5 points

Format for 1-Page (Only) Assignment, Paper R (Review):

6 one-page review papers (R), of P1B, P2, E papers of persons on your immediate right and left are due at class on same day as the person's papers are due. Have a very smart person read your paper, ahead of time, to look for logical, conceptual, and grammar problems. Bring copies for professor/class members, and keep a copy for yourself to use when you present your paper in class, or you will lose 5 points. Be as detailed and precise as possible; make no general points; and use the 5 criteria. Each of these R papers must have at least 6 numbered points/sentences (3 positive, 3 constructive criticism), with blank lines between points, assessing the paper. Each sentence must be of the form: "A is B because C." Sample positive sentence: "Mary Smith's argument two is more convincing because she uses arguments and citations from the very top scientific journals, Science, Nature, and Environmental Health Perspectives." Sample constructive-criticism sentence: "Joe Brown's second argument is weak because, although Joe seems possibly correct to argue that increased local breast cancers occurred because of dioxins released from a nearby Monsanto plant, Joe does not systematically eliminate other likely causes of the cancers, such as family history or genetics." Avoid hasty generalizations, such as "Joe's paper is good because. . . ." Make very specific positive and negative comments about specific good/bad aspects of one argument or claim of author, and make no general statements about the paper or about any argument. Each point must be very precise and very clear. At least 48 hours before beginning of class (at which paper is due) authors of P1, P2, & E papers should email prof/reviewers copies. Before 8 am on Monday before, authors should put hard copy in professor's box (211 Malloy). In email subject line put: "E paper for EJ" and "R paper for EJ" and so on. If authors do not send paper to professor and evaluators in time, authors of P1, P2, E papers will lose 20 points. Reviewers' Format: at center top of paper R, put: "Review of Joe Smith Paper A." Skip 2 lines, and at far left, put your own name, followed by the name of the class: "EJ class. Always check the grammar paper given by professor, before you turn in your paper. Students who forget extra copies, for prof. or for class, lose 5 points.

Format, Paper P1A: (1) Support your thesis with 5 one-sentence arguments, each of the form "A is B because C."
(2) Back up every claim you make in arguments with parenthetical citations---- and list citations at end.
(3) Give a one-sentence (5-line max) thesis that outlines your 5 one-sentence arguments.
(4) Use format, style, structure, and length---as given in sample paper on next page.

Format, Paper P1B: (1) Give 5 three-sentence (argument-objection-response) chunks, each AOR of the form "A is B bc C."
(2) Back up each claim with citations; list citations at end; give (5-line max) thesis outlining your 5 arguments.
(3) Correct every problem noted on P1A paper or you will lose many points.
(4) Use format, style, structure, and length---as given in sample P1B paper given in following pages.

Sample Paper P1A (Be sure that you include line numbers & current references; they do not appear here.)

(We haven't updated references since undergrad Antoinette and I used her classwork P1A to write/publish paper below:
Antoinette Pusateri and Kristin Shrader-Frechette, "Flawed Scientific-Evidence Standards and Diesel Regulations,
Accountability in Research, 22, no. 3 (2015):162-191.)

One-Sentence Thesis: US EPA's decision not to name diesel particulate matter (DPM) a hazardous air pollutant (HAP), thus subject to Clean Air Act regulations, is questionable on grounds of science---because DPM (1) is a carcinogen, (2) causes reproductive dysfunction, and (3) is a teratogen---and questionable on grounds of environmental justice (EJ) because (4) DPM cancers mostly affect poor people and minorities disproportionately living near freeways, and (5) DPM's teratogenic and reproductive effects harm innocent children, typically irreversibly.

5 One-Sentence Arguments:

(1) EPA's decision not to name DPM a HAP is scientifically questionable because (1.1) DPM is a known human carcinogen (IARC, 2012, 1), and (1.2) the Clean Air Act requires that any pollutant "reasonably anticipated to be carcinogenic" be named a HAP (CFR Title 42, 2012).

(2) EPA's decision not to name DPM a HAP is scientifically questionable because (2.1) current DPM levels cause reproductive dysfunction such as endocrine disruption (e.g., Dadvand et al., 2013), and (2.2) the Clean Air Act requires any pollutant "reasonably anticipated" to cause reproductive dysfunction to be named a HAP (CFR Title 42, 2012).

(3) EPA's decision not to name DPM a HAP is scientifically questionable because (3.1) current DPM levels cause birth defects (e.g., Ren et al., 2011), and (3.2) the Clean Air Act requires any pollutant "reasonably anticipated" to be teratogenic to be named a HAP (CFR Title 42, 2012).

(4) EPA's not naming DPM a HAP is questionable regarding EJ as (4.1) near-freeway dwellers---e.g., the majority-African-American, 80%-renters of West Oakland, CA (3 square miles bounded by I-580, I-880, and I-980) have a DPM-caused cancer risk that is 500-700 times greater than EPA's acceptable cancer level of 1 in a million (City of Oakland, 2014, 6-24), and (4.2) near-freeway dwellers are disproportionately poor people and minorities (e.g., Tian et al, 2013).

(5) EPA's decision not to name DPM a HAP is questionable regarding EJ because (5.1) children are vulnerable and cannot protect themselves from DPM (e.g., Goodin 1985), and (5.2) most teratogenic/reproductive-dysfunction harm to innocent children is irreversible, as they have "only one chance" to develop functional bodily organ systems (e.g., Grandjean 2013).

Citations

City of Oakland. 2014. Final Environmental Impact Report, West Oakland Specific Plan, Oakland: Department of Planning and Building. Available at <http://www2.oaklandnet.com/oakca1/groups/ceda/documents/report/oak047557.pdf>; see draft EIR, 4.2-2, available at <http://www2.oaklandnet.com/oakca1/groups/ceda/documents/report/oak045229.pdf>

Code of Federal Regulations, Title 42 (CFR 42). 2012. Hazardous Air Pollutants, 42 Ch. 85, Subch I, Part A, Sec. 7412, (b), (2). Ithaca, New York: Legal Information Institute. Available at <http://www.law.cornell.edu/uscode/text/42/7412>. Last accessed June 21, 2014.

Dadvand, P., Parker, J., Bell, M. L., Bonzini, M., Brauer, M., Darrow, L. A., Gehring, U., Glinianaia, S. V., Gouveia, N., Ha, E. H., Leem, J. H., van den Hooven, E.H., Jalaludin, B., Jesdale, B. M., Lepeule, J., Morello-Frosch, R., Morgan, G. G., Pesatori, A. C., Pierik, F. H., Pless-Mulloli, T., Rich, D. Q., Sathyanarayana, S., Seo, J., Slama, R., Strickland, M., Tamburic, L., Wartenberg, D., Nieuwenhuijsen, M. J., and Woodruff, T. J. 2013. Maternal exposure to particulate air pollution and term birth weight. *Environmental Health Perspectives*, 121(3): 367-373.

International Agency for Research on Cancer (IARC). 2012. *Diesel and Gasoline Engine Exhaust and Some Nitroarenes*. Lyons: France: World Health Organization. Available at <http://monographs.iarc.fr/ENG/Monographs/vol105/mono105.pdf>. Last accessed June 21, 2014.

Goodin, Robert. 1985. *Protecting the Vulnerable*. Chicago: University of Chicago Press.

Grandjean, Philippe. 2013. *Only One Chance*. New York: Oxford University Press.

Ren, A., Qiu, X., Jin, L., Ma, J., Li, Z., Zhang, L., Zhu, H., Finnell, R. H., and Zhu, T. 2011. Association of selected persistent organic pollutants in the placenta with the risk of neural tube defects. *Proceedings of the National Academy of Sciences* 108(31): 12770-12775.

Tian, Nancy, Xue, Jianping, and Barzyk, Timothy. 2013. Evaluating socioeconomic and racial differences in traffic-related metrics in the United States using a GIS approach, *Journal of Exposure Science and Environmental Epidemiology* 23: 215-222; doi:10.1038/jes.2012.8

Sample Paper P1B (Be sure that you include current references & line numbers; they do not appear here.)

(We haven't updated references since undergrad Antoinette and I used this classwork P1B to write/publish paper below:
Antoinette Pusateri and Kristin Shrader-Frechette, "Flawed Scientific-Evidence Standards and Diesel Regulations,
Accountability in Research, 22, no. 3 (2015):162-191.)

One-Sentence Thesis: US EPA's decision not to name diesel particulate matter (DPM) a hazardous air pollutant (HAP), thus subject to Clean Air Act regulations, is questionable on grounds of science---because DPM (1) is a carcinogen, (2) causes reproductive dysfunction, and (3) is a teratogen---and questionable on grounds of environmental justice (EJ) because (4) DPM cancers mostly affect poor people and minorities disproportionately living near freeways, and (5) DPM's teratogenic and reproductive effects harm innocent children, typically irreversibly.

5 Three-Sentence Argument-Objection-Response Outlines (earlier one-sentence A's are now 1A, 2A, etc)

(1A) US EPA's decision not to name DPM a HAP is scientifically questionable because (1.1) DPM is a known human carcinogen (IARC, 2012, 1), and (1.2) the Clean Air Act requires that any pollutant "reasonably anticipated to be carcinogenic" be named a HAP (CFR Title 42, 2012).

(1O) US EPA says the available data are not sufficient to develop a "confident estimate" of the unit risk estimate or URE for cancer, something needed for regulation (EPA, 2010).

(1R) Because (1R.1) California EPA has demonstrated a DPM URE for more than 20 years (CARB, 1998), and (1R.2) US EPA says the DPM URE range is between 1/1000 and 1/100,000 (EPA, 2010)---both of which are 10-1,000 times higher than US EPA's "acceptable risk" level of 1/1,000,000 cancer risk for those exposed (CFR Title 42, 2012)---US EPA could lower DPM risks by a factor of 10, yet remain within the range (at least 1/1,000,000) of required Clean Air Act regulation.

(2A) EPA's decision not to name DPM a HAP is scientifically questionable because (2.1) current DPM levels cause reproductive dysfunction such as endocrine disruption (e.g., Dadvand et al., 2013), and (2.2) the Clean Air Act requires any pollutant "reasonably anticipated" to cause reproductive dysfunction to be named a HAP (CFR Title 42, 2012).

(2O) Some scientists note that because endocrine-disrupting compounds (EDCs), synthetic hormones, (2O.1) are ubiquitous in the environment and (2O.2) often induce either no damaging (or positive) effects (e.g., Nohynek et al, 2013), it is premature to claim that DPM, not something else, causes observed endocrine disruption.

(2R) Both because (2R.1) DPM is comprised of nanoparticles, known to be EDCs (e.g., Iavicoli et al, 2013), and because (2R.2) many EDC results of both animal and human experiments use mechanistic, case-crossover, time-series, nested case-control, or cohort studies to control for whether DPM, versus another factor, is an EDC (e.g., Li et al, 2014), the predominance of evidence shows DPM has long been known to be an EDC (e.g., Takeda et al, 2004).

(3A) EPA's decision not to name DPM a HAP is scientifically questionable because (3.1) current DPM levels cause birth defects (e.g., Ren et al., 2011), and (3.2) the Clean Air Act requires that any pollutant "reasonably anticipated" to be teratogenic, be named a HAP (CFR Title 42, 2012).

(3O) Some scientists say because elemental carbon usually is used as a proxy for DPM measures, it's unclear whether DPM itself actually causes supposed harm, and they exclude it from HAP consideration (e.g., Loh et al., 2007, 1166).

(3R) Because DPM is the solid carbon core to which many polyaromatic hydrocarbons and carcinogens adhere (e.g., Monforton, 2006), using elemental carbon as a proxy for DPM underestimates---but does not misplace---DPM hazards, because this proxy ignores DPM's carcinogens and PAHs that are very harmful.

(4A) (4) EPA's not naming DPM a HAP is questionable regarding EJ as (4.1) near-freeway dwellers---e.g., the majority-African-American, 80%-renters of West Oakland, CA (3 square miles bounded by I-580, I-880, and I-980) have a DPM-caused cancer risk that is 500–700 times greater than EPA's acceptable cancer level of 1 in a million (City of Oakland, 2014, 6-24), and (4.2) near-freeway dwellers are disproportionately poor people and minorities (e.g., Tian et al, 2013).

(4O) Those who live near freeways have reduced travel times that help compensate for related health harm (e.g., Carey, 2001).

(4R) Although those who live near freeways enjoy reduced travel times, it is unlikely that they give free informed consent to live where their (and especially their children's) cancer risk increases by 500-700 times; instead, poverty and racism likely force them to live in such deadly environments (e.g., Faden and Beauchamp, 1986).

(5A) EPA's decision not to name DPM a HAP is questionable regarding EJ because (5.1) children are vulnerable and cannot protect themselves from DPM (e.g., Goodin 1985), and (5.2) most teratogenic/reproductive-dysfunction harm to innocent children is irreversible, as they have "only one chance" to develop functional bodily organ systems (e.g., Grandjean 2013).

(5O) While everyone wants to protect children, some scientists say that because DPM's nano status makes its exposure difficult to quantify in measurement studies, they exclude it from HAP consideration (Loh et al., 2007, 1166),

(5R) While DPM measurement is difficult---scientists know that (5R.1) PM harm is proportional to particle number, not mass and mass measures underestimate PM harm by a factor up to 65 (Sager and Castranova, 2009), and that (5R.2) because long-standing and robust data show PM has no safe dose and exhibits a linear concentration-response relationship (Pope and Dockery, 2006)---DPM should be reduced as much as possible to protect more sensitive groups such as children.

Citations

California Air Resources Board (CARB). 1998. *The Report on Diesel Exhaust*. Sacramento, CA: California Environmental Protection Agency CARB; available at <https://www.arb.ca.gov/toxics/dieseltac/de-fnds.htm> and last accessed June 21, 2014.

Carey, J. 2001. *Impact of Highways on Property Values*. Phoenix: Arizona Department of Transportation; available at <https://repository.asu.edu/attachments/74139/content/HighwaysPropertyValues.pdf> and last accessed June 21, 2014.

City of Oakland. 2014. Final Environmental Impact Report, West Oakland Specific Plan, Oakland: Department of Planning and Building. Available at <http://www2.oaklandnet.com/oakca1/groups/ceda/documents/report/oak047557.pdf>; see draft EIR, 4.2-2, available at <http://www2.oaklandnet.com/oakca1/groups/ceda/documents/report/oak045229.pdf>

Code of Federal Regulations, Title 42 (CFR 42). Hazardous Air Pollutants, 42 Ch. 85, Subch I, Part A, Sec. 7412, (b), (2). Ithaca, New York: Legal Information Institute. Available at <http://www.law.cornell.edu/uscode/text/42/7412>. Last accessed June 21, 2014.

Dadvand, P., Parker, J., Bell, M. L., Bonzini, M., Brauer, M., Darrow, L. A., Gehring, U., Glinianaia, S. V., Gouveia, N., Ha, E. H., Leem, J. H., van den Hooven, E.H., Jalaludin, B., Jesdale, B. M., Lepeule, J., Morello-Frosch, R., Morgan, G. G., Pesatori, A. C., Pierik, F. H., Pless-Mulloli, T., Rich, D. Q., Sathyanarayana, S., Seo, J., Slama, R., Strickland, M., Tamburic,

L., Wartenberg, D., Nieuwenhuijsen, M. J., and Woodruff, T. J. 2013. Maternal exposure to particulate air pollution and term birth weight. *Environmental Health Perspectives* 121(3): 367–373.

- Environmental Protection Agency (EPA). 2010. *National-Scale Air-Toxics Assessment*. Washington, DC: US EPA Technology Transfer Network. Available at <http://www.epa.gov/ttn/atw/nata/natsafaq.html#B7>. Last accessed June 21, 2014.
- Faden, Ruth, and Beauchamp, Tom. 1986. *A History and Theory of Free Informed Consent*. New York: Oxford University Press.
- Iavicoli, I., Fontana, L., Leso, V., and Bergamaschi, A. 2013. Review: The effects of danomaterials as Endocrine Disruptors. *International Journal of Molecular Sciences* 14: 16732-16801; doi:10.3390/ijms140816732 ISSN 1422-0067 www.mdpi.com/journal/ijms
- International Agency for Research on Cancer (IARC). 2012. *Diesel and Gasoline Engine Exhaust and Some Nitroarenes*. Lyons: France: World Health Organization. Available at <http://monographs.iarc.fr/ENG/Monographs/vol105/mono105.pdf>. Last accessed June 21, 2014.
- Goodin, Robert. 1985. *Protecting the Vulnerable*. Chicago: University of Chicago Press.
- Grandjean, Philippe. 2013. *Only One Chance* New York: Oxford University Press.
- Li, C., Fang, C., Xu, D., Wang, B., Zhao, S., Yan, S., Wang, Y. 2014. Mechanisms in Endocrinology, *European J of Endocrinology* 171: R183-R190; doi: 10.1530/EJE-14-0287
- Loh, M. M., Levy, J. I., Spengler, J. D., Houseman, E. A., Bennett, D. H. 2007. Ranking cancer risks of organic hazardous air pollutants in the United States. *Environmental Health Perspectives* 115(8): 1160–1168.
- Monforton, Celeste. 2006. Weight of the evidence or wait for the evidence? Protecting underground miners from diesel particulate matter. *American J of Public Health* 96(2): 271–276; doi: 10.2105/AJPH.2005.064410
- Nohynek, G.J., Borgert, C. J. Dietrich, D. Rozman, K.Z. 2013. Endocrine disruption. *Toxicology Letters* 223 (3): 295-305.
- Pope, A., and Dockery, D. 2006. Health effects of fine particulate air pollution. *Journal of Air and Waste Management Association* 56: 709–742.
- Ren, A., Qiu, X., Jin, L., Ma, J., Li, Z., Zhang, L., Zhu, H., Finnell, R. H., and Zhu, T. 2011. Association of selected persistent organic pollutants in the placenta with the risk of neural tube defects. *Proceedings of the National Academy of Sciences* 108(31): 12770–12775.
- Sager, T. M., and Castranova, V. 2009. Surface area of particle administered versus mass in determining the pulmonary toxicity of ultrafine and fine carbon black. *Particle and Fibre Toxicology* 6(15): 1–11.
- Takeda K., Tsukue N., Yoshida S. 2004. Endocrine-disrupting activity of chemicals in diesel exhaust and diesel exhaust particles. *Environmental Sciences* 11(1):33-45.
- Tian, Nancy, Xue, Jianping, and Timothy Barzyk. 2013. Evaluating socioeconomic and racial differences in traffic-related metrics in the United States using a GIS approach. *Journal of Exposure Science and Environmental Epidemiology* 23: 215–222; doi:10.1038/jes.2012.8

Format for Project Paper P2: Correct all problems prof noted on P1A/P1B papers. Explain/develop each A, O, and R into a paragraph, and use 5 criteria in developing. Have a separate header/section for each AOR three-paragraph chunk. At least 48 hours before beginning of next class, P2 authors should email prof/reviewers copies. Before 8 am on Monday before class, put P2 hard copy in prof's box (211 Malloy). Students who forget extra copies, for prof/class, lose 5 points. Use sample P1A, P1B, BioScience format, for doing (argument-objection-response) items in (8) below. Be sure to number & use header for each (1)-(9) item and for each of 5 parts (8.1, 8.2, 8.3, etc) under part 8.on your P2 paper. Have a smart person read your paper to look for logical/conceptual/grammar problems.

[last name, first name]

[date]

- (1) Your department and your year in school.
- (2) Title of draft EIS/TA/QRA/law/regulation (document being assessed) + website address and full bibliographical information, in correct citation formation (in-text citation; references at end).
- (3) 1 succinct, clear, complete, precise sentence on what the EIJ problem is.
- (4) 1 succinct, clear, complete sentence on what the document says about the problem.
- (5) 1 succinct, clear, complete sentence on your thesis (what you think about what document says).
- (6) Relevant deadline, if any, and names/addresses of those to whom responses should be sent.
- (7) 1-3 sentences on why the EIJ problem is important.
- (8) Complete development/analysis into one paragraph for each sentence in each three-sentence AOR (argument-objection-response) chunk---so that paper has 5 AOR sections/chunks, each on a different problem, and 15 sentences total that need development, analysis, and clarification.
- (9) minimum 20 current scientific references; be sure bibliography citations are complete & in correct format.

Format for Project Paper P3: This is merely a xeroxed copy of the letter and attachments, after original P2 has been corrected on the basis of professor's markings. Use the 5 criteria, and staple old P2, with professor's comments, to xerox copy of new P3, plus xeroxes of addressed envelopes, all in a large brown envelope. Always check the grammar paper, given by professor, before you turn in your paper. P3 = proof of the quality of the paper/arguments/letter you mail out. At least 48 hours before beginning of class (at which paper is due) authors of P3 papers should email prof/reviewers copies. Before 8 am on Monday before, authors should put hard copy in professor's box (211 Malloy). Students who forget extra copies, for prof. or for class, lose 5 points. In your new paper, be sure to fix all the problems, noted by the professor, on your old paper. You will lose many additional points for any problems that are noted on old papers, but not fixed on new papers. If it is impossible to fix some problem, noted by the professor, give her a note that explains, in detail, why it is impossible. Have a very smart person read your paper, ahead of time, to look for logical, conceptual, and grammar problems.

About the Professor: Kristin Shrader-Frechette has degrees in mathematics and in philosophy of science and has done 3 post-docs: one in hydrogeology, one in economics, and one in population biology/community ecology. Author of 400 professional papers and 17 books, her work has been translated into 17 languages and has appeared in science journals such as Science, BioScience, Health Physics and Quarterly Review of Biology, as well as in philosophy journals such as Ethics, Philosophy of Science, and Journal of Philosophy. Her latest books are Taking Action, Saving Lives, and What Will Work: Preventing Climate Change with Renewable Energy and Tainted [about how polluters misrepresent science to continue polluting]. Shrader-Frechette has done environmental-justice (EJ) work in the Americas, Europe, Africa, the Arctic, and throughout the US – and is the leading philosopher in the world on EJ issues. She has addressed the national academies of science in 3 nations and advised various foreign and US governments, the UN, and the WHO on issues of quantitative risk assessment, EJ, and nuclear waste disposal. Shrader-Frechette has been a member of the US EPA Science Advisory Board and Chair of the US Bioethics Committee of the US EPA. She also has served on many committees and boards of the US National Academy of Sciences, the UN, the WHO, and the International Commission on Radiological Protection. Her research has been funded continuously by NSF for 28 years, and she is Past President of the Risk Assessment and Policy Association and the International Society for Environmental Ethics. Shrader-Frechette has won the top ethics award in the world – given by the World Technology Network – for her work on environmental justice and ethical issues in science. Her husband has a math PhD and is a software engineer. Their children recently graduated from Princeton and just finished MD/PhDs or law degrees. All are avid scuba divers, runners, and kayakers. See her website at www.nd.edu/~kshrader.

Lewis HW. 1990. Technological Risk. New York: Norton.

1. "Ionizing radiation....may or may not be bad in small doses—no one knows" (Lewis, ch. 15, p. 218).

Lewis' claim is incomplete because he admits, on p. 222, that the National Research Council (National Academy of Sciences) says that the probability of radiation-induced cancer is a function of the amount of radiation received.

Lewis' incompleteness is damaging to his argument because the incompleteness suggests he may be biased in underestimating the dangers associated with radiation.

Alternative to two previous sentences:

Lewis' claim could lead to the consequence that people were careless about unnecessary radiation risk because he says "no one knows" if small doses are dangerous.

This consequence is damaging to Lewis' argument because people ought not ignore even potential risks if they are easily avoidable, e.g., by wearing a lead apron for x-rays.

2. Medical x-rays are examples of voluntary exposure to radiation" (Lewis, ch. 15, p. 219).

Lewis assumes that when people receive x-rays, their exposure to radiation is voluntary.

This assumption is doubtful because doctors, insurers, or employers often require people to receive x-rays, and patients often do not understand the risks involved and hence cannot consent to them.

3. "Nuclear waste must be disposed of carefully" (Lewis, ch. 15, p. 220).

Lewis' claim above is inconsistent because he also claims (on pp. 245-246) that "high-level waste....risk....turns out to be ridiculously low....High-level nuclear waste disposal is a non-risk."

Lewis' inconsistency is damaging to his argument because one need not be "careful" about a risk that is "ridiculously low" or a "non-risk"-- emotive language that suggests Lewis' bias.

4. "The vast majority of all these radiation sources deliver[s] extremely small doses, with minimal if any heal the effects, even though fear of even trivial doses of radiation is common"(Lewis,ch.15,p.220).

Lewis assumes that it is not reasonable to fear trivial doses of radiation.

This assumption is doubtful because Lewis admits ionizing radiation "may be bad in small doses—no one knows" (Lewis, ch. 15, p. 218), and it is reasonable to fear small/unneeded doses of things with cumulative effects.

5. "The maximum permitted exposure for workers in nuclear facilities is 5,000 mr per year, and for the general public 500. We don't know if this much radiation does any harm at all"(Lewis,ch.15,p. 220).

Lewis' claim is incoherent because (1) the referent of "this much radiation" could be 5,000 or 500 mr and (2) he says (p. 222) "the most authoritative estimates" of radiation risk show that the risk is a function of dose.

Lewis' incoherence is damaging to his argument both because (1) his language makes his argument unclear and (2) he appears to be biased in underestimating radiation risks.

Thesis: Chapter 9 of *How Are We to Live?* discusses the nature of ethics, dismisses several theories of ethics, and supports some ethical principles that (Singer says) lead to universal concern for others. There are at least 5 reasons to suggest Singer's positive account lacks sufficient evidence and that his dismissal of other theories is unwarranted.

1. Singer discusses the possibility that ethics is gendered and hypothesizes that "the predominance of women in environmental and animal movements therefore suggests a greater readiness to work for larger goals and not just to help oneself or one's own kind" (179) because they have adopted more of an ethics of universal concern, or "care-ethic." However, one study suggests the care-ethic was not significantly higher in female participants who volunteered than in those who did not (Karniol et al 2003). Partly because Singer may erroneously identify behavior and concern, he insufficiently documents the claim that the nature of ethics has a gender component.

2. Singer claims, as R.M. Hare does, that ethics must be "universalizable," that we should be "prepared to prescribe them independently of the role that we occupy" (174), taking the needs and desires of all other beings into account. However, Olson and Svensson (2003) show Hare used the term "universalizable" in only one sense: situations with identical properties merit identical moral judgments. Singer may misinterpret Hare and thus have little Hare support that moral judgments must take into account desires and needs of other beings.

3. On page 172, Singer claims that Christianity creates overwhelming guilt and causes the abandonment of ethics in some people because of unnecessary tension between self-interest and ethics when Christians emphasize "the denial of harmless bodily pleasures, especially sexual pleasures." Yet the philosopher, St. Augustine, argues in his *Confessions* that sexual pleasures can often be harmful, in that they "overcast [one's] heart so that [one] is unable to discern pure affection from unholy desires" (Second Book, ch.2). Singer does not address the possibility that moral rules of sexual purity protect people from some harm, such as blinding one's reason, and he may therefore be unwarranted in dismissing the Christian emphasis on moral rules concerning sexuality.

4. Singer claims the Buddhist tradition is "a failure in social terms" (190) because in Japan, the 'first precept' of Buddhism is not upheld: sentient beings are used as food. However, when Singer judges Buddhism, he is assessing Japanese adherence to Theravada Buddhism, though the Buddhism that was introduced into Japan was a less-strict, less-purification-oriented Mahayana Buddhism (Burt 1982). In applying the standards of one form of Buddhism to another, Singer may unfairly reject Buddhist ethics.

5. Singer refutes the Kantian concept of morality by showing that horrific Nazi acts (e.g. acts of Adolph Eichmann) were merely a consequence of blindly adhering to duties for their own sake (184). However, Claudia Koonz studied the Nazi motivation for genocide and concluded in her book, *The Nazi Conscience*, that the Holocaust was a result of extreme racism that developed into violence, as German society saw the ethnic majority as morally righteous and denounced corrupting outsiders (Koonz 2005). Given other explanations for the Holocaust, it may be unfair for Singer to dismiss Kantian duty, based on Eichmann's claim of duty.

Burt, E.A. 1982. **The Teachings of the Compassionate Buddha**. New York, New York: New American Library.

Karniol, R., Grosz, E., Schorr, I. 2003. Caring, Gender Role Orientation, Volunteering. **Sex Roles** 49 (1-2): 11-19.

Koonz, C. 2005. **The Nazi Conscience**. Cambridge, Massachusetts: Harvard University Press.

Olson, J., Svensson, F. 2003. A Particular Consequentialism: Why Moral Particularism And Consequentialism Need Not Conflict. **Utilitas** (15) 2:194-207.

Pilkington, J.G. 1876. **The Confessions of St. Augustine, Bishop of Hippo**. Edinburg: T. & T. Clark. Digitized Oct 3, 2007.

Singer, P. 1995. **How Are We to Live? Ethics in an Age of Self-Interest**. Amherst, New York: Prometheus Books.

SAMPLE, PART OF A 2002, P.1, P1 PAPER (*BioScience* citation format), REFERENCES NOT YET INSERTED

[Citations below need updating, as do others examples on prof's website. Though she is prominent, do not cite prof's work.]

Thesis: The US should not allow proposed, more lenient workplace-pollution (than public) standards, because often workers (1) are not informed about risks; (2) impose risks on the innocent, e.g., future people (3) get no compensating wage differential (CWD); (4) have faulty risk preferences; and (5) should not trade health for money.

Argument 1: The US should not allow more lenient workplace standards, (1) because workers often are not fully informed about higher risks, and industry often covers up the risks (GAO 1999).

Objection 1: Argument 1 is questionable because unions and government regulators can inform workers of the risks, as Congress recently did, in the case of nuclear workers (Congress 1999).

Response 1: Objection 1 is questionable because US union membership is only 14-16 percent (Miller 1999, pp. 57-59), and government often fails in its regulatory capacity (GAO 1999).

A2: The US should not allow more lenient workplace standards, (2) because often worker mutagenic risk is imposed on innocent people, such as future generations (Shrader-Frechette 2002, ch. 5).

O2: A2 is questionable because someone needs to do the risky work, or else the economy would suffer (Dorman 1996, pp. 26-28).

R2: O2 is questionable because human rights take precedence to economics, and because European nations also do risky work, but with very stringent workplace standards (Newton 1996, pp. 135-149).

A3: The US should not allow more lenient workplace standards, (3) because often there is no CWD for workers in environmentally risky occupations (Leigh 1995, pp. 3-7, 215).

O3: A3 is questionable because many economists say there is a compensating wage differential, although it varies from occupation to occupation (Viscusi et al. 2000).

R3: O3 is questionable because although there is an average CWD, disaggregating CWD data shows it exists only for unionized, college-educated, or male workers (Shrader-Frechette 2002, Ch. 7).

A4: The US should not allow more lenient workplace standards, (4) because workers often have faulty or irrational preferences for riskier work (Broome 1999, pp. 192-198).

O4: A4 is questionable because workers have the right to determine what jobs they want, and the market promotes efficient job-risk matchups (Viscusi et al. 2000, pp. 768-769).

R4: O4 is questionable because workers often are forced into jobs, not because of real preferences but because of economic hardship and low skill levels (Levenstein and Wooding 1997).

A5: The US should not allow more lenient workplace standards, (5) because workers ought not be able to trade health for money, since only vulnerable people tend to do so (Leigh 1995, pp. 3-7, 215).

O5: A5 is questionable because such trades promote worker freedom (Viscusi et al. 2000, p. 766).

R5: O5 is questionable because even the courts recognize that paternalism and worker protection sometimes ought to take precedence over complete worker autonomy (Sellars 1997, p. 47).

FALL 2018, OUTLINE OF LECTURES AND ASSIGNMENTS

Monday Date	Section of Course	Lecture	Assignment Due Today
Monday 8-27-18	What Are EJP?	(1) Course Overview; EJ Overview (2) Tools of Analysis: Fallacies & 5 Criteria (3) Suggestions for Paper P1A	(1) Read ch. 1 EJ; get NYT subscription. (2) Work on Paper P1A, the first version of your main project paper; eg: DOE 2016 on Yucca (9 slides) (3) By noon Friday, put priority list of 3 E (Singer) topics in prof's box, 211 Malloy; choose S topic ASAP. (4) get name/email address of person on your right/left
8-28-18	LAST DAY FOR CLASS CHANGES		
9-3-18	Pro/Con: EJ Problems	(1) Analysis of Bullard, Friedman (2) Analysis of ch. 1, TASL	(1) <u>For 5 extra points, email prof "early" P1A paper 48 hours before class starts, on 9-1-18</u> (2) Read-analyze ch. 1, TASL + Bullard & Friedman on website; (3) Prof/class will go over early P1A papers at class; bring to class copies of paper for all class members.
9-10-18	Why People Do Not See EJ Problems	(1) Manipulating Govt., Media, Science (2) Scientific Tools of Analysis	(1) Read/analyze S-F, TASL, chs. 2-3 (2) <u>48 hours before class begins, on 9-8-18, email paper P1A to to prof; bring hard copies to class for entire class; present P1A papers. Also give professor a hard copy (in her box, 211 Malloy, as explained earlier) and an email copy—both at least 48 hours before class begins.</u>
Sun 9-16-18	TIME TBD MAKE-UP CLASS	GO OVER P1A PAPERS; CLASS VOTE ON WHEN TO MEET	GOAL IS LUNCH-TIME OR SUPPER-TIME RESERVATION: MAKE-UP CLASS, WITH FOOD: COUNTS FOR 1/2 MISSED CLASS WHEN PROF MUST LECTURE IN CALIF. IN OCT
Monday 9-17-18	"	(1) Flawed Property Rights: Appalachia (2) Do analysis of all P1 papers	(1) Email paper P1B to prof/reviewers 9-15-18, 48 hrs before class begins. To class, bring hard COPIES for entire class + R copies. Give prof <u>a hard copy</u> in 211 Malloy box, as explained earlier. 5 extra points for turning in P1B early. (2) Read EJ, ch. 3. (3) Early P1B and R authors, be ready to present to class, with hard copies for all.
9-24-18	"	(1) Ignoring Consent: Louisiana (2) Ignoring Vulnerability, Native People	(1) Read chs. 4, 6, EJ. <u>Email P1B to prof/reviewers 48 hrs before class begins (on 9-22-18)</u> To class, bring hard COPIES for entire class + R copies. Give prof <u>a hard copy</u> in 211 Malloy box, as explained earlier. (2) P1B and R authors, be ready to present to class, with hard copies for all.
Sun 9-30-18	TIME TBD MAKE-UP CLASS	GO OVER P1B PAPERS; CLASS VOTE ON WHEN TO MEET	GOAL IS LUNCH-TIME OR SUPPER-TIME RESERVATION: MAKE-UP CLASS, WITH FOOD: COUNTS FOR 1/2 MISSED CLASS WHEN PROF MUST LECTURE IN CALIF. IN OCT
Mon 10-1-18	Why People Do Not See EJP	(1) Ignoring Equity: Yucca Mountain (2) Ignoring Compensation: Workers	(1) Read chs. 5, 7 EJ; Email early P2 & corrected P1B on 9-30-18, for 10 extra points (48 hours before class begins) to prof/reviewers and bring hard copies to class for entire class Present P2 & R papers. <u>Be sure to give professor a hard copy (in her box, 211 Malloy, as explained earlier)</u> .

- (2) Do analysis of P2 papers, and R Papers that are presented at class.

10-8-18		NO CLASS: Prof lecturing out of town.	<p>Email prof/reviewers early P2 and revised/corrected P1B (for 5 extra points) by 3:30 on 10-8-18. Be prepared to present these papers and R papers at next class meeting---and to bring copies to that class for all members of class</p> <p>Work on upcoming papers that are due.</p> <p>We made up this class on 9-16-18 and 9-30-18.</p>
10-15-18		FALL BREAK	WORK ON PAPER due 10-29-18. WATCH "TRADE SECRETS" VIDEO & FILL OUT WEBSITE QUESTIONNAIRE.
10-22-18	Ethical Solutions	(1) Guaranteeing Human Rights	<p>(1) Read S-F, TA, ch. 4; EJ, ch. 2.</p> <p>(2) Turn in "Trade Secrets" video sheet at class.</p> <p>(3) Email prof/reviewers P2 and revised/corrected P1B by 3:30 on 10-20-18. Be prepared to present these papers and R papers at next class meeting---and to bring copies to that class for all members of class</p> <p>At class, reviewers turn in R papers.</p>
10-26-18		LAST DAY TO DROP CLASS	
10-28-18 (Sun)		LUNCH/SUPPER CLASS TO FINISH P2 PAPERS	CLASS MAKES UP FOR LAST CLASS, WHEN PROF MUST LECTURE OUT OF TOWN.
10-29-18	"	(1) Stopping Warming; Correcting WTO	(1) Read Singer, chs. 1-3: do not critique Singer out of context; make sure you know other arguments of his in book. <u>Turn in all Singer (E and R) papers for all topics, for all future dates on 10-27-18; send to reviewers/prof 48 hours earlier.</u> Give prof these <u>hard copies</u> (in box, 211 Malloy, as explained earlier) & email copy. Bring paper copies for all class members.
		(2) Pro Singer 1_____	Con Singer 1_____
		(3) Pro Singer 2_____	Con Singer 2_____
		(4) Pro Singer 3_____	Con Singer 3_____
11-5-18	Ethical Solutions	(1) Using Law; Global Duties	(1) Read Singer, chs. 4-5.
		(2) Pro Singer 4_____	(2) Be ready to present Singer and R papers. Have E & R and extra credit copies for entire class.
		Con Singer 4_____	
		(3) Pro Singer 5_____	Con Singer 5_____
11-12-18	"	(1) Taking Personal Action	(1) Read EJ, chs. 8-9.
		(2) Power point presentation, P3 papers	(2) Turn in CORRECTED P1B + P3 + power point early (to get 5 extra points), by emailing them to prof/reviewers by 3:30 on 11-10-18. Be prepared to present these papers and R papers at class meeting---and to bring copies to class for all members of class

11-19-18	"	Power point presentation of P3 papers,	Turn in CORRECTED P1B + P3 + power point by emailing them to prof/reviewers by 3:30 on 11-17-18. Be prepared to present these papers and R papers at class meeting---and to bring copies to class for all class members.
11-26-18	"	Power point presentation of P3 papers,	Be ready to give remaining power point presentations.
12-5-18	"	NO CLASS; PROF MUST LECTURE IN CA.	We made up class on 10-28-17