Sustainable Development (Environmental Science and Public Policy 11)

Harvard College/GSAS: 109934

Meeting Times and Location: Spring 2020
Class: Monday and Wednesday, 10:30 AM - 11:45 AM
Mandatory section meeting: Wednesday 4:30—5:45pm | Thursday 9:00–10:15am | Thursday 6:00—7:15pm
Location: Museum of Comparative Zoology 440 (Harvard University Center for the Environment)

Instructors
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Contents (ver 1.2 200126)

1 Overview

This course explores contemporary understandings and practical implications of the idea of sustainable development. It investigates the meanings and measures that different groups have given to "sustainable

development;" the scientific understanding of the complex social-environmental systems we seek to develop sustainably; and lessons on how societies have avoided the "tragedy of the commons" while instituting practical action that advances sustainable development effectively and equitably.

The approach we take in this course is to analyze the earth and its human populations as a coupled social-environmental system, coevolving through time. Its goal is to help you understand how that coevolution can be guided toward sustainable development, which this course will define following international conventions as "development that improves the well-being of people here and now in ways that do not diminish the prospects of people – elsewhere or in future generations – to improve their own well-being." To this end, the course will equip you to serve as a "general practitioner" supporting the pursuit of sustainability. In particular, you will learn concepts and skills that have proven useful for helping citizens, corporations, governments, and other social actors to:

1. Articulate shared goals for sustainable development of their social-environmental system and assess progress (or lack thereof) toward achieving those goals;
2. Diagnose obstacles to further progress and identify opportunities for overcoming those obstacles;
3. Transform knowledge into action for pursuing sustainability.

You will have opportunities to hone these general concepts and skills by applying them to contemporary global crises ranging from climate change and biological extinctions to economic inequality and political disempowerment. Opportunities to explore the ways in which historical path dependence and local context matter in the pursuit of sustainability will be provided through teaching cases specially designed for this course: Alaska's salmon fishery as it evolves from a source of local livelihoods to a globally embedded market; London's development from a hamlet to a world mega-city; and the transformation of Appalachia through the discovery of coal and the impacts of its mineral wealth on both people and nature. In addition, you – together with a team of other students – will apply the *general* concepts and skills you are learning in class to the *particular* challenges of sustainable development encountered in a specific region of the world. For the 2020 offering of the course, these "application regions" are: one of the world's largest mega-cities (China's Pearl River Delta and its anchor city Hong Kong); one of the world's most dynamic remaining frontiers (Brazil's Acre province on the western edge of the Amazon); and one of the world's youngest and fastest growing populations (the East African nation of Uganda). You will be assigned to one of these regions by the teaching staff.

The course is multidisciplinary, drawing from the natural sciences, social sciences, and humanities. It employs quantitative and qualitative methods as needed to tackle different questions and challenges. The "general practitioner" orientation of the course emphasizes a broad perspective – a perspective increasingly in demand by business, government, NGOs, consulting, and academia – from which the big picture of sustainable development can be understood, and the specialist expertise needed in particular contexts can be identified, mobilized, and integrated. The course can thus serve as a stand-alone foundation for what Harvard's Amartya Sen has called "informed agitation" in the pursuit of sustainability, or as an introduction to more specialized training in particular challenges facing contemporary social-environmental systems (e.g. climate change, poverty traps or pesticide treadmills) or in particular approaches for addressing those challenges (e.g. biological conservation, clean energy, green manufacturing, organic agriculture).

Most classes in the course will involve a mix of lecture, small group deliberations, and plenary discussions. A weekly (mandatory) section meeting will provide an opportunity for students to collaborate in developing in-depth knowledge of sustainability challenges in their assigned "application region," together with the skills necessary for analyzing and reporting on those challenges. The course is capped at 40 students to allow ample opportunity for discussion in class and section. There are no prerequisites. Preference will be given to students enrolled in, or seriously contemplating enrollment in, the Environmental Science and Public Policy concentration.

Students will be evaluated on the basis of class and section participation, 10 short response papers (250 words max), one take-home exam on key sustainability terms and concepts, a group presentation on the most important obstacles to and opportunities for the pursuit of sustainability in the students' "application region", and a final individual paper (approx. 2000 words) evaluating the opportunities and barriers to sustainable development in

their “application region” and proposing a specific intervention within this context (e.g. in energy, or housing or food or governance) that could facilitate a transformation towards sustainable development.

2 Strategy

To develop the concepts and skills listed above the course will draw on knowledge and insights from ethics, the arts and humanities (to address item 1 above); from the natural and social sciences, history and public policy (to illuminate items 1 and 2); from science and technology studies (to illuminate item 3) as well as from news items and other materials as appropriate. No one, including your instructors, can be expert in all of these fields, which is why the three of us have teamed up to teach this course. All, however, should be able to learn from the particular expertise and experience that instructors and students in the course have to offer. One central intellectual challenge of the course will therefore be integration across individual perspectives, thus countering the retreat into the narrow disciplinary silos and professional specializations that increasingly cripple efforts to grapple with the big problems of our age. This is risky stuff: most of the time there will be someone in the classroom (as there will be in the organizations with which you later work on sustainability issues, or the communities you seek to help) who knows more about part of the topic being discussed than you do. It follows that our strategy for coming to terms with sustainable development – in the classroom as in front-line efforts –involves learning how to collaborate: to develop the habits of listening to what others have to say, asking one another for help, sharing what we each know best, and acknowledging our individual and collective limitations. To give us opportunities to hone these skills, the course syllabus is focused on a series of questions about “informed agitation” for sustainable development that we will explore collaboratively in class. The course will therefore involve teamwork and peer commentary in addition to more conventional individual assignments.

The second big strategic challenge for grappling with sustainable development is that context matters. For example, meeting energy needs in rural Africa requires different goals, knowledge, and action than does meeting housing needs in urban America. This is not to say that no generalizable knowledge about sustainable development exists – much of the course will be about such knowledge. But it does mean that we need to wean ourselves from the academic bias toward overvaluing generalizable knowledge, panaceas, and ostensibly “best” practices. The challenge is rather to learn how to shape understandings that are appropriate for particular places, times, and peoples by drawing on generalized knowledge and relevant experience from elsewhere, and then combining it with local knowledge and circumstances to produce useful guidance. To give us opportunities to hone such skills, during most of the course we will be organized into teams, each focused on one of the particular “application regions” noted above. In each case, the responsible team will focus on current efforts to advance sustainable development in its assigned region. Each team will draw on perspectives from the course to evaluate the region’s current pursuit of sustainability, and to explore how those efforts might be improved in the future. This is not an artificial classroom exercise. Rather, it reflects an increasing practice of many organizations (businesses, governments, civil society, foundations, etc.) to counter their own “inside the box” thinking by seeking outside perspectives of how they are doing, and how they could do better, in their pursuit of sustainability.

3 Tactics

3.1 Prerequisites and requirements

There are no prerequisites for the course. It is designed to be accessible to students whether they are focused on the humanities, social sciences, or natural sciences. The course is open to all undergraduates enrolled at Harvard College who are willing to meet the expectations outlined in Section 4 below. That said, the course is capped at 40 students to allow ample opportunity for discussion in class and section. Preference will be given to students enrolled in, or seriously contemplating enrollment in, the Environmental Science and Public Policy (ESPP) concentration. Should more than 40 students wish to enroll in the course, we will conduct a lottery with preference for ESPP concentrators and likely concentrators.

3.2 Meeting times and place

The class will meet MW from 10:30 – 11:45, in the Museum of Comparative Zoology 440 (Harvard University Center for the Environment). Attendance at weekly section meetings is also required of all students in the class.

Sections will be assigned using the online sectioning tool. Sections begin in the second week of the semester (the week of 2/3).

3.3 Class time

In keeping with the need for collaborative deliberation discussed above, most of the class time will involve discussion of the topic of the day. Students will be expected to have grappled with assigned readings, videos, and questions before class, and to contribute to class discussions through response postings to the Canvas site, oral responses in class (volunteered and cold-called) and occasional oral briefings based on discussions in sections. The instructors will spend some of the class time in lecture mode, but will serve primarily as a discussion leaders and summarizers rather than a lecturers. The teaching fellows will function the same way in the required section meetings.

3.4 Readings

The only required text book for this course is: Matson, Clark and Andersson. 2016. *Pursuing sustainability: A guide to the science and practice*. It is available through multiple online sellers where it can also be rented or bought as an e-textbook and on library reserve. We will use this book extensively in the course, so please obtain access to a copy. The first chapter, assigned for the first two classes, is available on the Canvas site.

Teaching Case Studies: We will draw extensively on three teaching case studies discussed in the course overview. These case studies referred to in class as "London," "Alaskan Salmon," and "Appalachia" will be provided to you on the Canvas site in the week they are assigned with other readings. Because we will refer back to these cases over the course of the semester, you may find it worthwhile to either print them out or save them in an accessible electronic place where you can keep track of your highlights and notes.

Additional Readings: Understanding of sustainable development is rapidly evolving. As a result, much of the most relevant reading material is available only in research papers or policy briefs published by specialty journals and organizations. We will therefore assign a number of such readings. Many of them will be hard going for some of you (as we assure you they were for us) unless you happen to have upper level training in the particular field in question. We can only recommend that you stick with it: developing an ability to read intelligently across disciplines is not only necessary for grappling with sustainable development, it is part of what makes the grappling so exciting. Well in advance of each class we will post to the Canvas course site a 1-2 page summary of the main issues to be addressed plus a list of the required readings and how they relate to those main issues. Note, however, that the price of working directly with a rapidly evolving field is that new and useful background materials will become available after the course begins. As these come to our attention (through our own reading, work of the teaching staff, or suggestions from you), we will post them in the Supplementary Readings listed at the end of our summary posting. We will also include the most up to date academic review papers on relevant topics in the Supplementary Readings section for each class. You don't need to digest this "breaking" material or the "academic review" papers, but may do so if you have the time and inclination. Copies of all the assigned and supplemental readings that are not taken from the course text book will be posted on the Canvas site. To honor the copyright on these materials, copies should NOT be distributed to others not enrolled in the course unless those materials are publicly available on the web (i.e. access not restricted to Harvard account holders).

Digging Deeper: In a field as vast and rapidly changing as sustainable development, no one can pretend to know all the relevant literature. Keeping up, like so much in the field, is thus a collaborative endeavor. Here are some places where you can find an evolving set of news items and research writings that are broader and deeper than those assigned for this course:

- *Reader in Sustainable Development*: Presidential Science Medalist and geographer Robert Kates has prepared an annotated "Reader" of the classic publications in the field. It's a delight to browse, both for the comments accompanying the recommended readings and his effort to "classify" the literature.

- *Reviews*: Good review articles are the only way to even approximately keep up with the pace of modern research. Here's a good short paper on why you should make a habit of monitoring the best review in your field. The *Annual Review of Environment and Resources* could readily be called the Annual Review of Sustainable Development. It publishes one volume of about 20 reviews each year. It is designed to cover

the whole field of sustainable development every 5 years. So, to a first approximation, the last 5 volumes are the equivalent of an up-to-date textbook on research in sustainable development. (Recent papers have covered everything from tipping points in the climate system to "literature and the environment" by Harvard's own Prof. Lawrence Buell).

- *Breaking research*: There are many of top journals publishing original research on sustainable development. Our favorites include *Ecology and Society, Ecological Economics, World Development, Journal of Cleaner Production, Global Environmental Change Human and Policy Dimensions* and the *Sustainability Science* section of the *Proceedings of the National Academy of Sciences of the US (PNAS*, of which Bill Clark is an [unpaid] editor). All are available through Hollis, and have RSS feeds you can send to your favorite reader.

- *Breaking news*: Sustainability is everywhere. Here are some of the news sites we use in our struggle to keep up: International Institute for Sustainable Development, Grist, Environmental Health News, SciDevNet, The Guardian's Global Development section.

- *Your suggestions*: On the Canvas site, we invite you to alert the rest of us in the class to material (texts, pictures, videos, podcasts, from the news, the web or the journals) that you find particularly interesting. There will be a dedicated Discussions thread for these sorts of postings.

3.5 Communication with the instructors and teaching fellows

Announcements regarding the class will be available on the Announcements page of the Canvas site. For questions or concerns about the class, start with the teaching fellows via the email addresses given on the course site. The teaching fellows (TFs) will also be available for regular consultations at times to be announced early in the course. These will be listed on the Canvas course site.

The course instructors are also excited to meet with you to discuss the academic content of the course as well as more general discussions on sustainable development and navigating life and work at Harvard and beyond. We will hold regular office hours.

Bill Clark's Office Hours: After class on many Mondays and Wednesdays in an office adjoining the lecture room (HUCE 425b), and at other times by appointment in my office at Harvard Kennedy School (see directions below). The normal procedure for office hours is to sign up for times that suit your schedule using the scheduling link provided on the Canvas site. If you cannot make the normal office hours, please schedule time by email directly with my assistant Leah Knowles (leah_knowles@hks.harvard.edu). Let her know in the email when you can meet, how urgently you need to meet, and a couple of sentences about what you want to discuss with me. It will help to keep your email from getting lost in the flood if you put 'ESPP11' at the front of the subject line. For substantive issues that can be dealt with by email, or for personal issues or emergencies, you can also reach me via email at William_Clark@harvard.edu . Again, you are more likely to get a quick response if you put 'ESPP_11' at the front of the subject line. In emergencies, the surest way to reach me is through Ms. Knowles. Make sure she knows that you are an ESPP11 student, and that you need to see me soon. She will find a way.

You can find my office at the Kennedy School by: 1. Enter HKS through the main courtyard entrance on Eliot Street; 2. Proceed straight through the main doors; 3.Take the elevator on your left to the 3rd floor; 4. Upon exiting the elevator, turn left and walk up the stairs; 5. Make a slight left when you come to the Forum; 6. Turn left at the end of the Forum, where you'll see the reception area for the Belfer Center; 7. Bill's office is located in the corner to your right (L-360) I know that seems difficult, but once you visit me once, it will be easy to find again!

Alicia Harley's Office Hours: I will hold drop-in office hours most Mondays directly after class in the HUCE Lounge right outside the classroom. I will hold additional sign-up office hours on Wednesday's from 3:30-5pm in my office at Harvard Kennedy School. You can find my office on the first floor of Rubenstein Building in room 123. To get there: 1. Enter HKS through the main courtyard entrance on Eliot Street; 2. Proceed straight through the main doors; 3. Walk into the forum room slightly to your left; 4. Turn right down a hallway in Littauer building; 5. After you get to the end of the hall you will have to take another right at which point you will be in Rubenstein Building;

6. My office is past the elevator on the right with a group of other offices—you have to enter this group area before you will find my office. Please ask around if you get lost as students and staff at the Kennedy School should be able to point you in the right direction for the Rubenstein building. If you get REALLY lost, shoot me an email (Alicia_harley@hks.harvard.edu) and I will be checking it regularly during office hours and can come find you! I am also happy to set up office hours at additional times on an as needed bases. Please email me to set something up.

Michaela Thompson's Office Hours: I will hold office hours on Wednesdays from 2-5pm. My office is HUCE 449, which is just down the hall from the classroom. You are also welcome to contact me via email to set up additional office hours on an as-needed basis.

4 Expectations of faculty and students

You should expect the course faculty and the teaching fellows to provide a framework, information, course environment and feedback that will help you to learn the concepts and skills needed to think critically and act effectively in the realm of sustainable development. We will be prepared, by the end of the course, to write you recommendations for internships, jobs and fellowships reflecting the commitment and contribution to the course that you demonstrate through your work. We will also provide multiple opportunities for you to give us feedback on how we are doing: we want to learn from you how to do it better.

What we expect of you is a commitment to do the learning. In particular, you need to be willing to participate fully in the identification and synthesis of relevant knowledge, the classroom and section discussions, written assignments, and feedback on others' work. These commitments are what will make or break the course as a participatory learning environment. This means coming prepared to all classes and section meetings so that others can benefit from your research and insights. It means not just saying your own piece, but also listening and building on what others have to say. It means getting assignments in on time so that others have time to read them before building on them in their own work. It means giving and taking feedback on how the class can work better. It means having enough interest in what is going on in the class, and what the instructors and your classmates are saying, to forego engagement with the electronic world during class hours except as requested by the teaching staff[*]. We are prepared to help you do the learning: if you have questions or are having difficulties, come to us. If you are willing to work hard to meet the expectations outlined above, we would like to have you join the class. If not, not.

5 Assignments, Evaluation and Grading

The course is designed to encourage participation, teamwork, accountability for learning the material, and practice in critically applying that material to inform action in the real world. To facilitate the learning process, you will be evaluated based on your participation, quality of written and oral communication, and on a final team oral presentation and individual paper that will draw on your group's semester-long critical assessment of the prospects for sustainable development in your application region. There is one short take-home, open-book exam. On average, you should expect to be turning in one assignment on most weeks throughout the semester. This is, however, less of a workload than it might at first appear. In general, the weekly response papers are short (<250w), and many of them cumulatively build toward and will be incorporated in your final briefing and paper. A summary of the individual assignments is provided at the end of this section. A schedule of assignments and due dates will be posted on the Canvas course site.

5.1 Participation

Your responsibilities in the course are grounded on your engaged and informed participation in our mutual exploration of sustainable development. Our concern here is not that you be 'right,' or agree with us or the readings or your classmates. Rather, it is that you take contributions from all of these sources seriously, strive to understand what they are getting at, and probe them critically but respectfully. Grading will reflect both the substance and the timeliness of your participation in the course. In particular, responsible participation includes:

[*] Students with special needs for electronic equipment in class should contact the instructors. We will work something out.

- Showing up on time for all class and section meetings, or explaining to the TFs *in advance and in writing* on the rare occasions when you can't.
- Being prepared to discuss critically, and with *specific* examples, the application of assigned material or insights from the broader literature to questions posed and cases discussed in class.
- Contributing your share to the group activities in section, including mutual critique of one another's work.

5.2 Academic Integrity and rules for collaboration

In general, this course follows the guidance on "Academic Integrity and Academic Dishonesty" presented in the Harvard College Handbook for students (link here). In particular, this course is grounded in the idea that open discussion and the exchange of ideas are essential to good academic work. But the price of getting people to be open with their ideas is to give them credit when you use those ideas. In a collaborative work environment, however, the rules for giving "fair credit" can become murky. Here on the ones we will use in this course:

- All assignments in this course will be clearly labeled either "single author" or "collaborative."
- "Single author" assignments include the weekly response papers and final paper. For these, you are encouraged to consult with your classmates and to share sources and ideas. However, you should ensure that the written work you submit for evaluation is contains substantial elements of your own research and that it reflects your own approach to the topic. Given that we will have been discussing in class and section many of the issues you write about, professional practice suggests that you provide a general credit to your colleagues in your final paper (e.g. "Acknowledgments: The work reported here has benefited substantially from my discussions with members of the ESPP11 course at Harvard College.") For the weekly response papers you can skip this general acknowledgment. That said, any major ideas and any form of direct text that you get from your classmates must always be treated with a full citation just as you would treat a journal article or book (e.g. "I thank my colleague Jane Doe for first suggesting this idea to me" or a standard citation to published work).
- "Collaborative work" in this course means the oral briefing that you and your section-mates will present at the end of the semester. Again, it is expected that your oral presentation will draw from ideas discussed in class, which you can cover with a general acknowledgement of the sort noted above. Any ideas or text included in your final briefing that come from members of your section do not need to be cited. Why? Because you are authoring the oral briefing as a team. You can discuss your oral presentation with others not on your team (indeed with others not in the course). But any ideas and text you get from them must be credited with a full citation, as must material drawn from published sources. Citations to support an oral briefing may be provided in the notes of accompanying slides or in a separate bibliographic memo submitted in support of the presentation.
- The take-home exam is (technically) a "single author" assignment. It must be your own individual work. It is an "open book" exam, meaning that you can consult any written materials. You may NOT discuss the questions or your answers with anyone, in person or electronically. Technical or logistics issues should be raised with the teaching staff. Citations are not required for these exams.
- In all cases, if in doubt, consult the teaching fellows or instructors.

5.3 Assignments

Each of the assignments in the course will be evaluated as part of your course grade. Detailed assignment descriptions will be provided with ample time before each assignment is due. It is important to note that your weekly response papers will help you prepare for the take-home exam, final presentation and final paper. Working diligently on the response papers will thus ensure that you are prepared for the larger assignments. They also provide an opportunity for repeated practice with feedback on the skills of memo writing and revision that are central to the course.

Assignment 1: *Take-Home Exam (individual assignment):* This exam will cover the Introduction and Part I of the course. The exam will include multiple short answer questions (200-word limit) and one essay question (500-word limit). The exam will begin (accessed through Canvas) at 3pm on March 23rd and is due on Tuesday March the 24th by 9pm (30 hours later).

Assignment 2: *Final Symposium Presentation (group assignment)*: Each regional team will prepare and present an oral briefing on the most important obstacles to and opportunities for the pursuit of sustainability in the

team's "application region." The final presentations will take place during reading period on Sunday May 3 from 10:30am to 12:30pm at the Harvard Kennedy School. After the presentations, we will have a celebratory lunch. Each presentation should last 15-20 minutes, with an additional 10 minutes for questions and answers. No written product is required for this assignment, though you may want to use a modest number of projected slides or handouts to accompany your oral presentation.

Assignment 3: *Final paper (individual assignment)*: Individually, you will write a paper evaluating the opportunities and barriers to sustainable development in your "application region," using the frameworks used in the course and proposing an intervention within this context that will move the needle for a transition towards sustainable development. The final paper should be approximately 2000 words (plus or minus 300 words). The word count does not include tables, figures, footnotes, endnotes or the bibliography. This assignment is due on the last day of reading period by 5pm on Wednesday May 6th to the Canvas site.

Response Papers**:** In addition to the three major assignments described above, you will have 10 response papers due over the course of the semester. **Response papers should be posted to the course website prior to 9pm the day before class**. Response papers should be no more than 250 words. Response papers are graded on a scale of 0 – 3 (0=not submitted, 1=not quite there, 2= fine, 3= exceptional).

The response paper schedule is as follows: Response papers will start in the 2nd week of class (week of February 3). For the second week of class students must submit two response papers (one for Monday's and one for Wednesday's class). Starting the 3rd week of class and for the remainder of the semester, you are only required to submit 1 response paper per week (either for Monday's class or Wednesday's class, usually for a class of your choosing, sometimes for one specified by us). Note that we will not have response papers due during the week when you have the take-home exam. *Careful readers will note that this totals 12 response papers. You, however, are only required to submit 10: you may skip two of the scheduled response papers on days of your choosing (perhaps you are having a particularly busy week). However, if you wish to submit up to 12 response papers, we will only count your top-10 response paper grades, allowing you to make up for poor scores on up to two response papers.*

5.4 Grade Weights

We urge you to use the course as an opportunity to explore, challenge and learn. That said, grades must be given. Here is the distribution of weights that we will apply to reach the final grade:

Engaged Participation in class and section …… 15%
Response Papers …… 20%
Exam…… 20%
Group Final Symposium Presentation …… 20%
Final Paper …… 25%

For the Final Symposium Presentation, all members of the Group will receive the same grade. For all Assignments, the teaching staff is committed to helping you improve your performance through comments on your work and, if requested, office hour meetings with you. We urge you to make use of this feedback.

Penalties:

Participation and attendance: Because this class is based on participation and sharing of ideas, missing a class or section penalizes all of us. Because life is complicated, however, absences will sometimes be necessary (e.g. job interviews). If you have to miss a session or be late, write to your TF before the class, explaining why, and take the initiative with your group members to assure that you take on your share of any group work emerging from the session. Unexcused absence from class or section without a prior written excuse from your TF means that you will receive a participation grade of 0 (scale 1-100) for that session. Multiple unexcused absences or late arrivals will result in a participation grade of 0 for the course as a whole.

Written assignments: Because the written assignments contribute directly to class and section discussion, a late assignment incurs a penalty of 20% per day or partial day unless an exemption has been granted in advance, in writing, by your TF. Any fraction of a day counts as a day. The same penalties apply to the final paper unless an exemption has been granted in advance, in writing, by the instructors.

5.5 Grade definitions

As noted above, you will be graded based on how diligently, critically and creatively you take advantage of each of these opportunities. We will make a serious effort to have the grade awarded on each contribution and on the course as a whole correspond to the literal definitions of grades provided in the official Harvard Student Handbook, i.e.:

A, A- Earned by work whose excellent quality indicates a *full mastery* of the subject and, in the case of the grade of A, is of *extraordinary distinction*.

B+, B, B- Earned by work that indicates a *good comprehension* of the course material, a *good command of the skills* needed to work with the course material, and the student's *full engagement* with the course requirements and activities.

C+, C, C- Earned by work that indicates an *adequate and satisfactory comprehension* of the course material and the skills needed to work with the course material and that indicates the student has met the *basic requirements for completing assigned work and participating* in class activities.

D+, D, D- Earned by work that is *unsatisfactory* but that indicates some *minimal command* of the course materials and some *minimal participation* in class activities that is worthy of course credit toward the degree.

E Earned by work which is *unsatisfactory and unworthy* of course credit towards the degree.

6 The (important) fine print about how you can use this course to destroy your life

Of the many ways to mess up the glorious opportunities that being at Harvard offers you, only a couple have much to do with the classroom. Getting a bad grade is way down the list. Plagiarism is right at the top. The only part of Professor Clark's job that he has hated through the years is chairing the disciplinary committee at the Kennedy School, where he periodically has to pass a sentence on a case of plagiarism that seriously messes up a student's life. It makes all of us very sensitive to the issue. Too many people – from political leaders to professors to students – do plagiarize, mostly by accident. But "by accident" at best turns the case from the academic equivalent of murder to manslaughter, with the result that the perpetrator is forever known as a former academic convict, with a record, and all that this entails. Plagiarism is not only wrong (if we steal ideas that others share with us, soon no one will be willing to share ideas), it's dumb (whatever the risk is of being caught, the punishments are so horrible that anyone stupid enough to plagiarize on purpose doesn't deserve a college degree anyway). You should therefore think hard about how not to have anyone even suspect that you've plagiarized anything, ever. What the Harvard College Handbook for Students has to say on the topic is worth reading. We reproduce some of the key text here:

It is expected that all homework assignments, projects, lab reports, papers, theses, and examinations and any other work submitted for academic credit will be the student's own. Students should always take great care to distinguish their own ideas and knowledge from information derived from sources. The term "sources" includes not only primary and secondary material published in print or online, but also information and opinions gained directly from other people. Quotations must be placed properly within quotation marks and must be cited fully. In addition, all paraphrased material must be acknowledged completely. Whenever ideas or facts are derived from a student's reading and research or from a student's own writings, the sources must be indicated (see also Submission of the Same Work to More Than One Course …) The responsibility for learning the proper forms of citation lies with the individual student. Students are expected to be familiar with the Harvard Guide to Using Sources. Students who are in any doubt about the preparation of academic work should consult their instructor and Allston Burr Assistant Dean or Resident Dean of Freshmen before the work is prepared or submitted.

Students who, for whatever reason, submit work either not their own or without clear attribution to its sources will be subject to disciplinary action, up to and including requirement to withdraw from the College.

In short, don't plagiarize. If in doubt, talk to us.

7 Version History

Ver 1.0 (200121) Original posted to course site.
Ver 1.1 (200124) Updates to text in Overview (Section 1), section times, take home exam instructions, and to how individual classes (section 8) are labeled.
Ver 1.2 (200126) updates section times (now finalized).

Ver 1.3 (200207) updated section activities.

8 List of classes

COURSE INTRODUCTION		
Monday	Jan 27	**1. Pursuing Sustainability**: What is this course all about?
Wednesday	Jan 29	**2. The Anthropocene**: What are the major trends shaping the Anthropocene?
Wed/Thur		*No Sections – First Week of Class*
PART I: SUSTAINABLE DEVELOPMENT AS A CONCEPTUAL CHALLENGE		
Monday	Feb 3	**3. Goals for Sustainable Development**: What do we want for people and nature?
Wednesday	Feb 5	**4. Determinants of Sustainable Development**: What must be sustained to achieve sustainability goals?
Wed/Thur		Section 1: Overview of application region: Assignment logistics and reading guide.
Monday	Feb 10	**5. So Why is This So Hard?** The How can we collectively manage shared resources (aka the Fishbanks Experiment)?
Wednesday	Feb 12	**6. A Framework for Integrating Research in Sustainability Science**: Which fields contribute what to sustainability science?
Wed/Thur		Section 2: Best practices for library research with environmental librarian George Clark.
Monday	Feb 17	***HOLIDAY – No Class***
Wednesday	Feb 19	**7. Natural Assets**: What are the roles of ecosystems, environment, and minerals in sustainable development?
Wed/Thur		Section 3: Strategy session for group work: Assigning responsibilities, streamlining workflow with the right tools.
Monday	Feb 24	**8. Anthropogenic Assets**: What are the roles of human capital, manufactured capital, social capital and knowledge capital in sustainable development?
Wednesday	Feb 26	**9. Integrated assessment of Trends in Assets**: Are we consuming too much?
Wed/Thur		Section 4: Synthesize trends in natural and anthropogenic resources in application regions. Prepare brief presentation for lecture 3/2.
Monday	March 2	**10. Analyzing the dynamics of social-environmental systems I**: How do basic system properties of feedback, stocks, flows and non-linearity affect the pursuit of sustainability?
Wednesday	March 4	**11: Analyzing the dynamics of social-environmental systems II:** How do basic properties of the Anthropocene System including heterogeneity and inequality affect the pursuit of sustainability?
Wed/Thur		Section 5: Skill: Conducting qualitative interviews. Group work on application regions.
Monday	March 9	**12. Horizontal Connections:** How do horizontal connections including pollution externalities, trade and migration affect the pursuit of sustainable development?
Wednesday	March 11	**13. Vertical Connectivity:** How do vertical connections including innovation and cross-level governance interactions affect the pursuit of sustainable development?
Wed/Thur		Section 6: Synthesize dynamics of social-environmental systems in application regions. Prepare brief presentations for lecture 3/23.

		Exam: Brief discussion of what you can expect on the midterm.
SPRING BREAK – March 14 - 22		
Monday	March 23	**14. Overview of the Course Thus Far:** Goals, Metrics & Complexity
Wednesday	March 25	**15. Modeling Complexity a Worked Example:** You too can do this at home!
Wed/Thur		Section 7: Skill: Complex systems modeling in your application region.
PART II: WHAT CAPACITIES ARE NEEDED TO PURSUE SUSTAINABILITY ?		
Monday	March 30	**16. Capacity to Evaluate Options:** How can we measure whether or not our current development pathways are sustainable and evaluate the chances that new policies will lead to more sustainable development pathways?
Wednesday	April 1	**17. Capacity to Promote Equity:** How can we promote equitable distribution of the fruits of the earth's resources within and between generations?
Wed/Thur		Section 8: Group work on application regions: What else needs to be done for assignments #2 and #3?
Monday	April 6	**18. Capacity to Promote Adaptation:** How can our incomplete understanding of the dynamics of the Anthropocene System be harnessed to cope with disturbances and reconfigure our use of resources to function under changing conditions?
Wednesday	April 8	**19. Capacity to Promote Transformations:** How can we move beyond isolated actions to move whole sectors or regions to more sustainable development pathways?
Wed/Thur		Section 9: Synthesize what you know about various capacities in your application region. Prepare brief presentations for lecture 4/13.
Monday	April 13	**20. Capacity to Link Knowledge with Action:** How can we ensure knowledge to support informed agitation for sustainability is utilized in practice?
PART III: GOVERNANCE FOR SUSTAINABILITY		
Wednesday	April 15	**21. Governance for Sustainability:** What are the special challenges of governance for sustainability?
Wed/Thur		SECTION 10: Skill: Presentation best practices. Brainstorm outline for assignments #2 (symposium presentation). Group work on application regions
Monday	April 20	**22. Nurturing Shared Resources:** How can efforts to avoid the "tragedy of the commons" deal with challenges of free-riding and collective action?
Wednesday	April 22	**23. Promoting Equity:** How can actors with seemingly little or no power promote transformations toward sustainability in the face of powerful incumbent interests?
Wed/Thur		Section 11: Group work on application regions and assignment #2.
Monday	April 27	**24. Confronting Uncertainty:** How do we design reflexive governance systems that foster sustainability when we are almost certain to be wrong as often as we are right?
Wednesday	April 29	**25. Wrap-Up: What has this course been about? (**Brief review and time for group project work)
Wed/Thur		*No Sections – Reading Period*
Sunday	May 3	*Final Symposium Presentation @ Harvard Kennedy School in Bell Hall: 10:30am - 12:30pm with celebratory lunch from 12:30pm-1:30pm*