

## **COURSE SYLLABUS**

### **Conservation Ecology 11:216:317 Fall 2024**

Tuesdays 8:30am - 11:30am, room 123 ENR building

3 credits; Fulfills requirement for Core Curriculum Contemporary Challenges: Our Common Future Courses (CCO), Discipline-Based Writing and Communication (WCd)

### **Instructor**

Professor Rachael Winfree, 128 ENR building, rachael.winfree@rutgers.edu

Office hours by appointment; please email me to schedule a time

### **Pre-requisites**

General biology (01:119:115 or 01:119:116), or equivalent, or permission of instructor

### **Course Objectives**

- Introduce students to the major environmental challenges of our time, including climate change, biodiversity loss, terrestrial and marine habitat destruction, invasive species, and the environmental consequences of our food and energy systems.
- Develop students' critical reasoning and writing skills.

### **Learning Outcomes**

- Appropriately, knowledgeably, and concisely contribute to class discussions, including leading class discussion on one occasion.
- Knowledgeably discuss and write about the world's greatest environmental problems and their potential solutions, including understanding and evaluating the often opposing opinions that each issue generates.
- Evaluate published articles for their scientific merit; evaluate and cite sources of information appropriately.
- Write an organized, informed, and well-argued paper on a current topic in conservation ecology and/or environmental science.

### **Format**

One 3 hour meeting per week. Class time will be largely devoted to discussion and small group problem-solving exercises.

### **Grading policy**

Grades will be assigned according to the following thresholds: 90% of possible points is an A, 80% B, 70% C, 60% D, <60% F. Total points for the course 500. Broken down as:

- 275 points for class meetings. Each class is worth 25 points, broken down as follows: 5 for the quiz, 10 for the weekly writing assignment, 5 for in-class verbal participation which includes asking and answering questions, and 5 for any in-class exercise that is handed in plus the 'reflection' that you submit after class. There are 11 graded classes (the first and the last class, which are an introduction and a review session, are not graded).
- 25 points for leading class discussion of a paper

- 100 points for midterm essay exam / paper
- 100 points for final exam

### Protocols for class assignments

- Readings will be available as pdfs in the Canvas / Files folder named by class date.
- You should come to class prepared to discuss the readings listed for that class.
- All assignments listed as due at a class meeting are due to Canvas by 8:30am, i.e., before the class starts.
- At the start of each class there is an open book quiz on the content that day's readings.
- You will need to bring a laptop to class in order to take the quiz, which is online, and to access the readings we discuss in class (unless you choose to print them). If bringing a laptop is a problem for you please let me know and we will find a solution.
- ***Use of cell phones and laptops (other than viewing pdfs of the readings being discussed) in class reduces your learning and that of those around you. In this course you have the option of opting in to being distraction-free in class, defined as (1) not taking your phone out of your backpack during class, and (2) closing all tabs on your laptop except for the course Canvas site / pdfs being discussed / note-taking for this class. Students who opt in to this policy will and adhere to it in every class will receive 15 points extra credit at the end of the course.***

## Class schedule and assignments

### Class 1, Sept 3: Introduction to course / critical thinking

due: nothing other than reading the two papers below prior to class

- Bergstrom, CT and JD West. 2020. Preface, pages xi to xvi in *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. Random House, New York
- Puruggan, M and J Hewitt. 2004. How to read a scientific article.

### Class 2, Sept 10: How to write well

due: 5 bullet points per reading indicating things you learned that you are going to implement in your own writing.

- Zinsser, W. 2006. *On Writing Well: The Classic Guide to Writing Non-fiction, 30th anniversary edition* (22 pages of excerpts from the book)
- Bullock, R. 2009. *The Norton Field Guide to Writing, 2nd edition* (40 pdf pages of excerpts from the book, plus another 84 pages for reference on grammar, usage, and punctuation)
- Pechenik J. 2010. Chapter 6, Revising. Pages 82-125 in *A Short Guide to Writing about Biology*, Pearson.
- Pechenik J. 2010. Chapter 8, Writing a review paper. Pages 137-147 in *A Short Guide to Writing about Biology*, Pearson.
- Winfree, Organizing a paper

### Class 3, Sept 17: Biodiversity and natural history

due: weekly writing assignment (WWA) with summary of each reading; see 'Class 3 assignment instructions' in folder with pdfs for additional instructions

due: post photos of 3 species to iNaturalist

- May RM. 1992. How many species inhabit the Earth? *Scientific American*, October 1992:18-24.
- Diaz, S and Y Malhi. 2022. Biodiversity: concepts, patterns, trends, and perspectives. *Annual Review of Environment and Resources* 47: 31-63

#### **Class 4, Sept 24: Habitat loss** (Taught by guest lecturer Morgan Mark)

due: weekly writing assignment with summary of each reading

- Robinson SK, Thompson FR, Donovan TM, Whitehead DR, and Faaborg J. 1995. Regional Forest Fragmentation and the Nesting Success of Migratory Birds. *Science* 267(5206):1987-1990.
- Terborgh J, Lopez L, Nunez P, Rao M, Shahabuddin G, Orihuela G, Riveros M, et al. 2001. Ecological Meltdown in Predator-Free Forest Fragments. *Science* 294(5548):1923-1926.
- Moore RP, Robinson WD, Lovette IJ, Robinson TR. 2008. Experimental Evidence for Extreme Dispersal Limitation in Tropical Forest Birds. *Ecology Letters* 11:960-968.
- Hoekstra, JM et al. 2005. Confronting a biome crisis: global disparities in habitat loss and protection. *Ecology Letters* 8: 23-29

#### **Class 5, Oct 1: Quantitative critical thinking**

due: weekly writing assignment with summary of each reading

note: there are three assigned readings here for your WWA (each reading is selected pages from a different chapter), even though they are in the same pdf and from the same book

- Bergstrom, C and J West. 2020. 'Causality.' Pages 55-58 and 68-76 in *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. Random House, New York.
- Bergstrom, C and J West. 2020. 'Numbers and nonsense.' Pages 83-92 and 96-103 in *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. Random House, New York.
- Bergstrom, C and J West. 2020. 'Spotting bullshit.' Pages 242-263 in *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. Random House, New York.

#### **Class 6, Oct 8: TBD** (Taught by guest lecturer Morgan Mark)

due: weekly writing assignment with summary of each reading

#### **Class 7, Oct 15: Overharvesting**

due: weekly writing assignment with summary of each reading

due: if you are leading a paper discussion, turn in 'LeadingDiscussion' for the paper you are leading, plus the usual weekly writing assignment for the other 4 papers

- Redford KH. 1992. The empty forest. *Bioscience* 42(6):412-422.
- Jackson JBC, et al. 2001. Historical overfishing and the recent collapse of coastal ecosystems. *Science* 293:629-638.
- Wright TF, et al. 2001. Nest poaching in neotropical parrots. *Conservation Biology* 15:710-720.

- Goettsch, B et al. 2015. High proportion of cactus species threatened with extinction. *Nature Plants*: article number 15142
- McCauley, DJ, et al. 2015. Marine defaunation: Animal loss in the global ocean. *Science* 347: 1255641-1 to -7

### **Class 8, Oct 22: Invasive species**

due: weekly writing assignment with summary of each reading

due: if you are leading a paper discussion, turn in 'LeadingDiscussion' for the paper you are leading, plus the usual weekly writing assignment for the other 4 papers

- Lowe, S et al. 2000. 100 of the world's worst invasive alien species: A selection from the global invasive species database. Published by the Invasive Species Specialist Group of the Species Survival Commission of the IUCN. 12 pages
- Gurevitch, J. 2004. Are invasive species a major cause of extinctions? *Trends in Ecology and Evolution* 19:470-474.
- Preston R. 2007. A death in the forest. *The New Yorker*, December 10:1-13.
- [The three news articles / letters to the editor below are in one pdf, and should be written about jointly] "2011-2013 Science\_Nature": Davis M, et al. 2011. Don't judge species on their origins. *Nature* 474:153-154; Simberloff, Alyokhin, Lockwood, Wickham. 2011. Correspondence. *Nature* 475:36-37; Nicholls H. 2013. The 18-km<sup>2</sup> rat trap. *Nature* 497:306-308
- Vellend M. 2017. The biodiversity conservation paradox. *American Scientist* 105:94-101.

**Oct 29: NO CLASS / MIDTERM PAPER DUE** - upload your midterm paper to Canvas by 11:59pm. Midterm is a 4-page review paper based on Hannah Ritchie's 2024 book Not the End of the World. See 'ConservationEcology\_Midterm Paper.docx' for detailed instructions.

### **Class 9 , Nov 5: Ecosystem services**

due: weekly writing assignment with summary of each reading

- Heal G. 2000. Basic economics, chapter 2: Pages 21-42 in Heal, G. *Nature and the Marketplace*. Island Press, Washington, D.C.
- Kleijn D, Winfree R, Bartomeus I, Carvalheiro LG, et al. 2015. Delivery of Crop Pollination Services is an Insufficient Argument for Wild Pollinator Conservation. *Nature Communications* 6:1-8.
- Max, D T. 2014. Green is good. *The New Yorker*, 12 May 2014 issue, 54-63 Tercek, M and J Adams. 2013. Maybe it's not Chinatown after all, pages 1-17 in *Nature's Fortune: How Business and Society Thrive by Investing in Nature*. Basic Books, New York.

### **Class 10, Nov 12: Human population growth and resource use**

due: weekly writing assignment with summary of each reading; see Read Me for instructions on how to write up the Our World in Data graphs

- Crist, E, Mora, C, Engelman R. 2017. The interaction of human population, food production, and biodiversity protection. *Science* 356: 260-264
- Load of Rubbish. 2018. *The Economist*: 29 Sept, 2018, pages 3-12

- Our World in Data 2020. Graphs excerpted from ourworldindata.org: M Roser, H Ritchie, and E Ortiz-Ospina 2019, World population growth, H Ritchie and M Roser 2020, Environmental impacts of food production; H Ritchie and M Roser 2018, Energy.

### **Class 11, Nov 19: Climate change**

due: one paragraph on each of the three readings below (three paragraphs total). In your paragraphs, summarize the most important things you learned from each reading, using quantitative information (numbers, percentages, etc) where possible.

- Our World in Data 2020. H Ritchie and M Roser 2020, CO2 and greenhouse gas emissions. This assigned reading is the series of web pages found at the following link: <https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>
- Climate Central. 2012. *Global Weirdness: Severe Storms, Deadly Heat Waves, Relentless Drought, Rising Seas, and the Weather of the Future*. Vintage Books: New York. This assigned reading is a pdf of excerpts (chapters 1, 2, 5, 6, 7, 9, 10, 15, 17, 18, 19, 21, epilogue) from the book.
- Ritchie, H. 21 March 2023. 'We need the right kind of climate optimism.' Vox. This assigned reading is an online article: <https://www.vox.com/the-highlight/23622511/climate-doomerism-optimism-progress-environmentalism>

**NO CLASS Nov 26**, Thanksgiving break

### **Class 12, Dec 3: Human culture & ideas**

due: weekly writing assignment with summary of each reading

- Battersby, S. 2017. Can humankind escape the tragedy of the commons? *PNAS* 114:7-10.
- Frank RH. 2020. 'Creating more supportive environments.' Pages 229-260 in *Under the Influence: Putting Peer Pressure to Work*. Princeton University Press, Princeton NJ.
- TBD additional reading

### **Class 13, Dec 10: Review for final exam**

due: Self-assessment of your writing. One page that summarizes (1) the comments you have received in the course thus far with respect to what aspects of your writing most need to be improved, and (2) the recommendations from the assigned readings on how to write well (see class 4) that would most improve your writing if you implemented them going forward.

- Review session: bring your questions about course content!
- We will also complete course evaluations during this class

**FINAL EXAM** Cumulative, based on the course readings and class discussions from throughout the course. Short answer and essay questions, open book / notes, in person. Format will be electronic i.e. on Canvas (so bring your laptop!), but AI assistance with writing (e.g., ChatGPT) cannot be used. Exam will be Friday, December 20, 12:00-3:00pm, in our usual classroom 123 ENR.

**COURSE SYLLABUS - details of evaluation and academic integrity**

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Fulfills requirement for Contemporary Challenges: Our Common Future Courses (CCO), Discipline-Based Writing and Communication (WCd)

**Instructor**





Professor Rachael Winfree, 128 ENR building, rachael.winfree@rutgers.edu

**Grading policy details**

**Grades will be assigned according to the following thresholds: 90% of possible points is an A, 80% B, 70% C, 60% D, <60% F. Total points for the course 500. Broken down as:**

- **275 points for class meetings. Each class is worth 25 points, broken down as follows: 5 for the quiz, 10 for the weekly writing assignment, 5 for in-class verbal participation which includes asking and answering questions, and 5 for any in-class exercise that is handed in plus the 'reflection' that you submit after class.** Occasionally there will be class meetings for which there is no in-class exercise handed in, and for those classes the reflection will be worth the full 5 points. There are 11 graded classes (the first and the last class, which are an introduction and a review session, are not graded).
- 25 points for leading class discussion of a paper
- 100 points for midterm research review paper
- 100 points for final exam

Individual assignments such as the midterm paper and final exam will be given letter grades as well as % points. The % points to letter grade conversion used for individual assignments is as follows:

 A+ 98
A 94
 A- 90
B+ 88
B 84
 B- 80
C+ 78
C 74
 C- 70

The letter grades assigned for the course as a whole has to use only the letter grades allowed by Rutgers University (no A+, A-, B-, or C- as marked with red above; and no I do not know why Rutgers doesn't allow the full letter grade range) and thus will use the following % points to letter grade conversion:

total %	letter
90-100	A
85-89	B+
80-84	B
75-79	C+
70-74	C
60-69	D
<60	F

**For all the work you do in this course the intellectual quality of your work, that is the factual accuracy, thoughtfulness, and critical thinking / reasoning demonstrated by what you write or say in class, is heavily weighted in evaluation.** The amount of writing or speaking per se counts for less. That is, the course emphasizes quality over quantity, because developing your critical thinking and writing skills is the purpose of the course.

**There are four types of assignments for each class meeting.**

- A weekly writing assignment based on the readings is due to Canvas before 8:30am when class starts (10 pts).
- Starting at 8:30am, there will be an online in-class quiz on the readings assigned for discussion in that day's class (5 pts).
- Student participation during class - that is, asking and answering questions during class discussion - will be worth 5 points.
- Lastly, at some class meetings we will do in-class activities for which brief written work is turned in. In addition, after each class you will submit a 'reflection' to Canvas about what you learned during that class. Both of these assignments will be evaluated on thoughtfulness in demonstrating that you have understood the content of the class, logical reasoning, higher-order thinking, and quality of the writing with respect to usage and grammar. These two together are worth 5 points, and on days when there is no in-class assignment the reflection is worth the entire 5 points.
- You must be present in person during class in order to submit work and earn credit for the in-class participation and in-class activities. If you have to miss class or choose not to attend you may still submit your weekly writing assignment and take the quiz for credit. Note that much of the material and the skills that are central to doing well on the midterm and final are covered during the in-person class discussions. If you miss class due to a personal emergency or illness

you should have a confirmatory email sent to Professor Winfree by the [Dean of Students - Student Support](#) (longer-term medical or family reasons which the Dean's office currently defines as more than 2 days duration; email is deanofstudents@echo.rutgers.edu) or from a doctor / [New Brunswick Health Services](#) (short-term illness); you will then be allowed to make up the in-class points the following week, by receiving double credit on the in-class assignments.

**Your midterm grade (100 pts) will be based on a 4-page written research review paper that is based on a book**, which you will purchase on your own at the start of the course and read on your own outside of class. The book is Hannah Ritchie, 2024, *Not the End of the World*, and it should be available for about \$14 from Amazon, eBay, etc. Either the hardback or the paperback version is fine. Late policy: Papers turned in late immediately lose half a letter grade, and will continue to lose half a letter grade per day thereafter. 'Late' is defined as after the Canvas Assignments site closes for that assignment, i.e., the time listed on the course syllabus. No extensions on this assignment unless requested by a [Dean of Students - Student Support](#) (longer-term medical or family reasons which the Dean's office currently defines as more than 2 days duration; email is deanofstudents@echo.rutgers.edu) or by a written note from a doctor / [New Brunswick Health Services](#) (short-term illness).

**The final exam (100 pts)** will be cumulative and open book/notes, meaning that you will have access to all the course materials on Canvas, including the pdfs of the readings, as well as any notes you have taken during the course. The format will be entirely written - short answer / essay. An important component of the exam will be citing your sources, i.e. the readings and class meetings that constituted the course. You will not be allowed to use sources outside the course, such as Google searches or Wikipedia, on the final exam. You will not be allowed to use generative AI assistance (Chat GPT etc.) to help with your writing on the exam. You will take the final exam in person during the final exams period. The exam will be taken on Canvas, i.e., on your laptop.

**Course policy: No use of generative AI assistance (ChatGPT, Claude, Bing, etc.)**

You are not allowed to use generative AI assistance for any of the written work you turn in for this course. AI assistance with reading and summarizing course materials (pdfs, book read for midterm, research conducted for midterm) is prohibited as is AI assistance with your writing. The reason for this policy is that a fundamental purpose of this course is to develop your own skills in critical reading, writing, and thinking. Outsourcing this work to an AI prevents you from developing your own skills, as well as being (in this context) dishonest and unfair to the other students in the course. Work handed in for this course may be run through plagiarism and ChatGPT detection software, and plagiarism will be reported to Rutgers University administration, with the attendant consequences.

**Course policy: You may opt in to being 'distraction-free' in class, which means no use of cell phones or internet tabs / apps other than the course Canvas site during class.** Students who opt in will sit together in the center section so that they do not have other students using social media, the internet etc around them as even being seated within sight of these distractions reduces student learning and lowers grades. Those who opt in by the second class meeting and adhere to the policy throughout the



course will receive 15 extra credit points.

### **Details of assessment of performance on assignments**

1. **Quizzes** (5 pts) will be assessed on:

- multiple choice, assessed as a percentage correct

2. **Weekly writing assignments** (10 pts), **in-class participation** (5 pts), and in-class assignments and reflection (5 points) will be assessed on:

- succinctness and clarity in summarizing the readings
- ability of the student to clearly evaluate the scientific merit of the paper
- ability to evaluate the paper's relevance to the scientific and public communities
- use of appropriate vocabulary and language
- spelling and grammar

3. **Leading paper discussion** (25 pts) will be assessed as follows:

- 10 points for thoughtful and concise answers in the 'leading paper discussion' document
- 10 points for the intellectual content of the points you raise as you lead class discussion
- 5 points for engaging effectively with the other students as you lead class discussion.

4. **Midterm research review paper** (100 pts) will be assessed on:

- succinctness and clarity in identifying the main points of the book
- choice of a topic and question to research as the focus of your paper
- use of 5-10 additional sources that you read and cite in your paper
- logical progression (i.e., intellectual organization) and originality of ideas
- implementing the intellectual organization practices described in the 'Organizing a paper' handout
- higher-order thinking: synthesis, analysis, insight, drawing connections among disparate sources
- spelling, grammar, vocabulary, and language

5. **Final Exam** (100 pts) will be assessed on:

- ability to answer the questions in a concise and factually correct way that accurately reflects the content of the course readings
- logical progression (i.e., intellectual organization) and originality of ideas
- higher-order thinking: synthesis, analysis, insight, drawing connections among disparate sources
- succinctness and clarity in identifying the main issues learned about in the course
- ability to evaluate scientific merit and credibility of sources
- the number and quality of references used
- spelling, grammar, vocabulary, and language

### **Required readings**

Students are required to purchase one book which will be read outside of class and used as the basis for the midterm paper: Hannah Ritchie 2024, Not the End of the World. Books can

be purchased for about \$15 from various online sources (e.g., Amazon, eBay). Either the hardback or the paperback version is suitable. All other required readings for the course will be made available as pdfs on the course Canvas site.

### Academic Integrity

All students are expected to follow University policies on academic integrity: <http://academicintegrity.rutgers.edu/>. Selections from this guide are copied and pasted below as a reminder. **For the purposes of this course, it is a violation of academic integrity to use generative AI assistance (e.g., ChatGPT) to help with the written work you turn in for this course.** A primary goal of this course is to develop and strengthen your own writing skills; thus, using AI assistance undermines the purpose of the course.

### Academic Integrity Violations

#### A. Types of Violations

This section describes various ways in which the principles of academic integrity can be violated. Examples of each type of violation are provided in this policy. However, neither the types of violations nor the lists of examples are exhaustive.

**Plagiarism:** Plagiarism is the use of another person's words, ideas, images, or results, no matter the form or media, without giving that person appropriate credit. To avoid plagiarism, a student must identify every direct quotation using quotation marks or appropriate indentation and cite both direct quotation and paraphrasing properly according to the accepted format for the particular discipline or as required by the instructor in a course. Some common examples of plagiarism are:

- Copying word for word (i.e. quoting directly) from an oral, printed, or electronic source without proper attribution.
- Paraphrasing without proper attribution, i.e., presenting in one's own words another person's written words or ideas as if they were one's own, regardless of the nature of the assignment.
- Incorporating into one's work graphs, drawings, photographs, diagrams, tables, spreadsheets, computer programs, or other non-textual material from other sources, regardless of format, without proper attribution.

**Cheating:** Cheating is the use or possession of inappropriate or prohibited materials, information, sources, or aids in any academic exercise. Cheating also includes submitting papers, research results or reports, analyses, and other textual or visual material and media as one's own work when others prepared them. Some common examples are:

- Prohibited collaboration: receiving research, programming, data collection, or analytical assistance from others or working with another student on an assignment where such help is not permitted.
- Copying another student's work or answers on a quiz or examination.
- Using or having access to books, notes, calculators, cell phones, technology, or other prohibited devices or materials during a quiz or examination.
- Submitting the same work or major portions thereof to satisfy the requirements of more than one course without permission from the instructors involved.
- Preprogramming a calculator or other device to contain answers, formulas, or other unauthorized information for use during a quiz or examination.
- Acquiring a copy of an examination from an unauthorized source before the examination.
- Having a substitute take an examination in one's place.
- Submitting a purchased or downloaded term paper or other materials to satisfy a course requirement.
- Submitting as one's own work a term paper or other assignment prepared, in whole or in part, by someone else.

**SEBS/SAS CORE CURRICULUM LEARNING GOALS****CONTEMPORARY CHALLENGES: OUR COMMON FUTURE COURSES (CCO)****c. Analyze the relationship that science and technology have to contemporary social issues.**

Global climate change, global food supply, consequences of overuse of agrochemicals / pharmaceuticals / antibiotics for the environment and human health, energy use, and genetic engineering, are among the many social issues dealt with in this course from a scientific and technological perspective.

**DISCIPLINE-BASED WRITING AND COMMUNICATION (WCD)****t. Communicate effectively in modes appropriate to a discipline or area of inquiry.**

In their weekly writing assignments, the research paper, and the essay-based final exam assigned in the course, I require that the students follow the standard style found in scientific journals. Students are expected to use the vocabulary appropriate to the field of Conservation Ecology and Ecology generally.

**u. Evaluate and critically assess sources and use the conventions of attribution and citation correctly.**

In their papers, I require that the students provide citations for all information, and that the citations follow the standard style used in the journal *Conservation Biology*. Students are told that journals cited and citation style are among the most important criteria used in the course for assessment.

**v. Analyze and synthesize information and ideas from multiple sources to generate new insights.**

The readings in this course will range from books to magazine articles to peer-reviewed journal articles from the world's top scientific journals such as *Science* and *Nature*. The readings will cover from the 1970's to the present, and will range in authorship from an opinion piece by the Dalai Lama to technical papers by leading scientists. This will provide the students with a wide range of source material from which they will learn to summarize and synthesize multiple viewpoints. All of the writing assignments in the course require analysis and synthesis.

## Evaluation for CONTEMPORARY CHALLENGES (CC0), Goal c

<b>GOAL c - Analyze the relationship that science and technology have to a contemporary social issue.</b>				
Relevant assignments	OUTSTANDING (A)	GOOD (B)	SATISFACTORY (C)	UNSATISFACTORY (D/F)
Weekly writing assignments  Research paper	Understands how advances in science and technology explain many of the causes of complex socio-technological issues such as global climate change and declines of global food supply.	Understands the advantages and limitations of science and technology in explaining specific environmental issues.	Is able to explain how the scientific and non-scientific readings in the course complement each other with respect to environmental issues.	Cannot understand how science and technology can clarify contemporary environmental issues.
Weekly writing assignments  Research paper	Has a comprehensive understanding of the limitations and advantages of ways currently suggested to cope with environmental issues.	Shows ability to deal realistically with the suggested "solutions" to particular environmental problems.	Shows creativity in proposing environmental solutions, and understands some of their potential shortfalls.	Fails to identify possible solutions or the need for possible solutions of current environmental problems..

## Evaluation for DISCIPLINE-BASED WRITING AND COMMUNICATION (WCD), Goals t, u, and v

<b>GOAL t – Student is able to communicate effectively in modes appropriate to a discipline or area of inquiry.</b>				
	<b>OUTSTANDING</b>	<b>GOOD</b>	<b>SATISFACTORY</b>	<b>UNSATISFACTORY (D/F)</b>
Weekly writing assignments	Clearly written, concise and eloquent, without excess verbiage using appropriate scientific language.	Well-argued and well-reasoned with minor errors in language usage. Few grammar and spelling errors.	Writing allows reader to follow the argument and relate it to the teachings but shows little use of appropriate language.	Writing is difficult to follow, lacking in coherent ideas. Padded.
Research paper				

<b>GOAL u – Evaluate and critically assess sources and use the conventions of attribution and citation correctly.</b>				
	OUTSTANDING (A)	GOOD (B)	SATISFACTORY (C)	UNSATISFACTORY (D/F)
Research paper	Can independently find necessary sources, including electronic sources, and evaluate their credibility, bias, and timeliness.	With some guidance, can find necessary sources and assess their reliability.	With guidance, can find and assess the reliability of most of the relevant sources.	Does not understand how to find the necessary sources, or how to assess their reliability.
Research paper	Cites a comprehensive range of relevant and appropriate sources, and applies appropriate conventions for attribution and citation accurately.	Cites some relevant sources, though not all clearly connected to the argument. Applies appropriate conventions for attribution and citation, with perhaps a few technical mistakes	Cites a limited number of sources, not all relevant. Notable errors in applying appropriate conventions for attribution and citation	Sources, if cited at all, are irrelevant to the topic or discipline, and/or inaccurately characterized. Fails to apply appropriate conventions for citation & attribution.*
<p>* Cases of suspected plagiarism should be reported to the department undergraduate chair and/or Judicial Affairs in the Office of the Dean of Students. <a href="http://judicialaffairs.rutgers.edu/">http://judicialaffairs.rutgers.edu/</a></p>				

<b>GOAL v – Student is able to: Analyze and synthesize information and ideas from multiple sources to generate new insights.</b>				
	OUTSTANDING	GOOD	SATISFACTORY	UNSATISFACTORY (D/F)
Weekly writing assignments  Research paper	Demonstrates both in the written reports and class discussion a sophisticated understanding of the evidence and arguments in the readings and other sources, and an ability to synthesize this information into cohesive analyses of complex issues.	Can understand the main thrusts of the readings, and can use the scientific and non-scientific materials of the course to put these arguments in a critical context.	Shows comprehension of most of the readings, with some gaps. Can reproduce the arguments advanced in these readings, but is not able to use other course materials to evaluate them, and does not put the	Lacks the reading comprehension skills to extract the main points of the scientific and non-scientific readings. Does not know how to criticize the many environmental hypotheses or how to fit them into a bigger picture.
All 12 weekly writing assignments.  Research paper	Explores larger implications and connections; demonstrating original/insightful thinking; and/or explicates limits of findings.	Makes some effort to explore larger implications and connections; demonstrating original/insightful thinking; and/or explicates limits of findings.	Demonstrates little awareness of larger implications and connections and/or limits of findings. Little evidence of original/insightful thinking.	Demonstrates scant to no awareness of larger implications and connections and/or limits of findings. Scant to no evidence of original/insightful thinking.