International Pollution Issues
Spring 2021
Tuesdays/Fridays, 11:10 AM to 12:25 PM – HN 1022
Undergraduate GEOG 33500-01
Graduate GEOG 71500-01

Instructor: Enrique Lanz Oca
Office: Virtual
E-mail: enriquelanzoca@gmail.com
Office Hours: Tuesdays, 11:15am – 12:15pm (via Zoom)
(Make an appointment to talk with the instructor through Zoom; however, you can e-mail the instructor whenever you wish.).

Course Description:
This course explores the international trans-boundary pollution and contamination. The continuous technological advances such as transportation or genetic manipulation, the globalization of industrial processes, the rise of emergent countries known as B.R.I.C.S., and the massive human migrations around the world have made pollutants and contaminants can be transmitted through the borders in an unprecedented scale. From the COVID-19 Virus to Chinese mercury found in the Olympic-Mountain lakes through stagnant plastics in the Pacific Ocean, any pollutant and contaminant can reach any point in a planetary scale. We examine therefore the main international trans-boundary pollution sources with especial emphasis in the main industrial and urban centers, transport pathways such as oil/gas pipelines, maritime-shipping and aerial routes, and contamination events such as oil spills or nuclear-power plant accidents that impact beyond a country’s borders. Finally, this course will discuss the current national and international legal instruments of cooperation such as the London Treaty about ocean dump or possible future international treaties such as a definite international Climate Change Pact to counteract degradation of the environment.

Modus Operandi for the Class:
Type of Class: Virtual Class
-The class will be synchronous (via Zoom). If there is a technical problem with Zoom, I will send you another invitation or another digital platform to initiate the communication.
-It is a requirement to attend to the class. If you cannot attend due to an extreme difference in Time Zone (e. g. in countries such as China, South Korea, Taiwan, Indonesia, Australia or New Zealand or other type of reason (e. g. technical), please let me know it as soon as possible.
-The class will be recorded. If there are technical problems, I will not able to send you the copy.
-Protocol of Zoom communication Class: Although not a total requirement, the camera should be “ON” during the class (please, tell me if there is any issue with the camera ON)

-Zoom Join Code Information:
  a. Friday, January 29: https://pratt.zoom.us/j/96651574905?pwd=aU83MWdHTVJnYjRsWnZxLINCcnAzdz09
  b. Tuesday, Feb. 2 https://pratt.zoom.us/j/94656844150?pwd=V1dxdDI3Qnd4T0xXRzNqOUhsL2w3QT09
  c. Friday, Feb. 5 https://pratt.zoom.us/j/97958762807?pwd=c2FDUENnalJNd254SEhDTFJDQTRHQT09
  d. Tuesday, Feb. 9 https://pratt.zoom.us/j/99254366510?pwd=MTJqSFkwcnBELVlkvR3h5TldQWdlddz09
  e. Friday, Feb. 12 https://pratt.zoom.us/j/96038665052?pwd=K1R1WlZkR1RxcWtROR1WVFqKzFwQT09
  f. Tuesday, Feb. 16 https://pratt.zoom.us/j/92516381416?pwd=WErGeUN3VGxyN2VBZXYWUGlTURxUT09
  g. Friday, Feb. 19 https://pratt.zoom.us/j/96099723878?pwd=MnR3MXpwSzRwV3dtOXkxaFVNRYz1QT09
  h. Tuesday, Feb. 23 https://pratt.zoom.us/j/92543538918?pwd=TGZucFFtOWl5S3VkJGluM3pPYitvdz09
  i. Friday, Feb. 26 https://pratt.zoom.us/j/98918714686?pwd=MEVZSmk0d0NaWmVha3Y3a3BSY2MxQT09
  j. Tuesday, March 2 https://pratt.zoom.us/j/93598723780?pwd=VGt3M0k2L0o2UE9KRHNUN0VSYzMzUT09
  k. Friday, March 5 https://pratt.zoom.us/j/91465614847?pwd=djRuZ2VOY3BCaUVzQWNBR0Q1MGZrUT09

I will send you the rest of Zoom Join Codes every week (check your email).

Required Materials:
There will be no textbook. The course will include assigned materials that are available through articles, texts, chapters, films, and audios. These materials are available in the section “Course Materials” on Blackboard. Where indicated on the syllabus, materials will be found online.

Schedule of Topics and Assignments*
*Except for changes that substantially affect implementation of the evaluation statement, this syllabus is a guide for the course and is subject to revision by the instructor. Any changes will be announced in advance.
**Course Objectives:**

<table>
<thead>
<tr>
<th>This course has been designed to…</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduce students to global implications of anthropogenic activities that lead to production of critical substances (e.g. smog) resulting in detrimental changes to our environment and encourage the students to think critically about human’s responsibility towards a sustainable future.</td>
</tr>
<tr>
<td>2. Study the actions taken by the international community and by international organizations to find appropriate ways for conciliating divergent interests of the major industrialized countries and the developing world.</td>
</tr>
<tr>
<td>3. Understand what science is and how the scientific method works.</td>
</tr>
<tr>
<td>4. Learn to write coherently, grammatically, and critically through diverse assignments such as a Proposal and a Final Research Paper.</td>
</tr>
<tr>
<td>5. Access, evaluate, interpret, and cite scientific information from peer-reviewed journal articles and other relevant sources.</td>
</tr>
</tbody>
</table>

**Student Learning Outcomes:**

<table>
<thead>
<tr>
<th>Upon completion of this course, students will be able to…</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have a basic understanding of how Earth works as a planetary structure.</td>
</tr>
<tr>
<td>2. Comprehend the most prevalent environmental impacts caused by our civilization and think about those possible measures capable of promoting a more sustainable society environmentally speaking.</td>
</tr>
<tr>
<td>3. Your attainment of these learning outcomes will be assessed especially through your writing assignments, exams, scientific/artistic projects (e.g. Poster), and class participation.</td>
</tr>
</tbody>
</table>
**Course Assignments.** This course will be based upon:

*Undergraduate and Graduate*

<table>
<thead>
<tr>
<th>ASSIGNMENTS</th>
<th>% for the Final Grade</th>
<th>CHARACTERISTICS/REQUIREMENTS</th>
</tr>
</thead>
</table>
| Proposal for the (Final Paper)   | 15% 15%               | -At least 2 pages (double space) and 4 References  
-At least 3 pages (double space) and 6 References |
| Final Research Paper             | 30% 30%               | -At least 8 pages (double space) and 6 References  
-At least 10 pages (double space) and 10 Ref. |
| Abstract (Final Paper)           | Not Required 5%       | 250 words plus keywords      |
| EXAMS                            | -Mid-Term: 15% 15%    | Multiple Choice Questions    |
| POSTER                           | 10% 5%                |                              |
| PRESENTATIONS                    | 5% 5%                 | ~ 5 minutes (e. g. using PowerPoint)  
~ 10 minutes (e. g. using PowerPoint) |
| PARTICIPATION                    | 5% 5%                 |                              |
| Discussion Board Event           | 5% and 5%             | Discussion of an international pollution event (e. g. Keystone XL Pipeline) |
| Meetings outside the class       | -Not required         | -Required at least ONCE      |

Final letter grades will be assigned based on the CUNY grading policy that can be found in the online undergraduate catalog available at: [http://catalog.hunter.cuny.edu/](http://catalog.hunter.cuny.edu/).

**Key points about these assignments:**

1. You will receive feedback for the Proposal, Final Paper, Sustainability Project, and Poster (Science Exploratory Project).
2. You will have the opportunity to re-write the Proposal of Final Research Paper.
3. A complete description of the assignments is located in Appendix 1 at the end of the Syllabus.
4. You can find the due dates for all of the assignments in the Course Content and Calendar section of the syllabus (see below).
Course Contents and Calendar:
Part I: Course Introduction

Week 1: January 29th (Friday): Introduction, Science/Traditional Knowledge, and Pollution
1. Introduction to the Course and Description of the Syllabus
2. Science and the Traditional Knowledge
3. What is Pollution?
4. Transboundary Pollution and Environmental Justice

Required Materials:

PART II: Atmosphere and Pollution

Week 2: Earth’s Atmosphere:
February 2nd (Tuesday):
1. Structure and Composition
2. Solar Energy and the Earth
3. Atmospheric Pressure Systems
4. Air Masses and the Atmospheric Circulation

Required Materials:
- McKnight, Tom L. Chapter 3: “Introduction to the Atmosphere” (pages 59-65) in Physical Geography

February 5th (Friday): Atmospheric Pollution 1
2. Acid Deposition (rain and snow)
3. The Ozone Layer and Its Depletion
Required Materials:

**Week 3: Atmosphere and Pollution 2:**

**February 9th (Tuesday):**
1. Wildfires
2. Volcanic Eruptions
3. Aerosols
4. Thinking about the Proposal of the Final Research Paper
5. Organizing Discussion Board Event: 1st Trial (Making the Groups)

**Required Materials:**
-Casazza, Marco; Lega, Massimo; Liu, Gengyuan; Ulgiati, Sergio; and Endreny, Theodore (2018). “Aerosol pollution, including eroded soils, intensifies cloud growth, precipitation, and soil erosion: A review.” Journal of Cleaner Production, Volume 189, 10 July 2018, Pages 135-144.
-Chapter 16, “Wild Fires” pages 488-492)

**February 12th (Friday): NO CLASS**

**PART III: Hydrosphere and Pollution**

**Week 4:**

**February 16th (Tuesday): The Hydrosphere:**
1. The Water or Hydrological Cycle
2. Planetary Water Distribution
3. Surface Waters: Oceans, Rivers, Lakes, and Ice
4. Underground Water (aquifers)

Required Materials:

February 19th (Friday): Oceans and Pollution 1:
1. Plastics, Microplastics, and the Ocean
2. Sargassum and Algae Invasion
3. The Law of the Sea (UNCLOS) and International Dumping

Required Materials:
-Hu, Chuanmin, Brock Murch, Brian B. Barnes, Mengqiu Wang, Jean-Philippe Maréchal, James Franks, Donald Johnson, Brian Lapointe, Deborah S. Goodwin, Jeffrey M. Schell, and Amy N. S. Siuda (2016). “Sargassum watch warns of incoming seaweed.” Earth and Space Science news (Eos) (Sept. 6)

Further Materials:

Week 5:
February 23rd (Friday): Oceans and Pollution 2:
1. The New Arctic Exploitation and Pollution
2. Oil Spills

Required Materials:

Further Materials:
February 26th (Friday): Oceans and Pollution 3:
- RESEARCH PAPER PROPOSAL DUE
  1. Submarine Mining
  2. Acidification
  3. Coral Bleaching

Required Materials:


Week 6:
March 2nd (Tuesday): Rivers and Lakes Pollution
  1. Transboundary Watersheds
  3. Water Transfers

Required Materials:

March 5th (Friday):
  1. Transboundary Conflicts
  2. Transboundary River Pollution
    Cases: a. The Colorado River
b. The Tijuana River

3. The Aral Sea Disaster

Required Materials:
-Phys.org (2016). “Managing an endangered river across the US-Mexico border” (July 18th)

Part IV: Energy Sources and Pollution

Week 7:

March 9th (Tuesday): Nuclear Energy and Pollution
1. What is Nuclear Energy?
2. Fission and Fusion
3. Nuclear landscape: uranium mining/enriching, reactor, and deposit

Required Materials
-“Nuclear Reactor - Understanding how it works” (video). Available at https://www.youtube.com/watch?v=1U6NzcV9Vws

March 12th (Friday): Nuclear Pollution
1. Radioactivity
2. Nuclear Residual Materials
3. Ocean Dumping Events and Transportation
4. Nuclear Reactor/Facility Accidents
   -Case: Chernobyl (former USSR) (1986)

Required Materials:

Week 8:

March 16th (Tuesday): Coal and Pollution 1
1. Geological Formation
2. Types of Coal
3. Mining, Transportation, Production, and Consumption

**Required materials:**

**March 19th (Friday): Coal and Pollution 2**
1. Coal and Pollution
2. Coal and the Trans-border Pollution
3. Coal Mining Fire and Pollution: Centralia (US)

**Required Materials:**

**Week 9:**
**March 23rd (Tuesday): MID-TERM Exam**

**March 26th (Friday):**
1. Checking the progress of the Final Research Paper
2. Organizing Discussion Board Event: 2nd Trial (Making the Groups)

**Week 10:**
**March 30th (Tuesday): NO CLASS; SPRING BREAK**

**April 2nd (Friday): NO CLASS; SPRING BREAK**

**Week 11:**
**April 6th (Tuesday): Petroleum and Pollution 1:**
1. Geological Formation
2. The Petroleum Landscape
3. The Canadian Oil-Tar Sand
4. Hydraulic Fracturing (Fracking)
5. Trans-Border Oil Transportation: pipelines and trains

**Required Materials:**

**Further Materials:**

**April 9th (Friday): Biosphere, Planetary Cycles and Ecosystems**
1. What is the Biosphere?
2. Planetary Biochemical Cycles:
   a. Flow of Energy and Matter
   b. Water, Carbon, Oxygen, and Nitrogen
3. Ecosystems and Biomes

**Required Materials:**
- Chapter 10, “Cycles and Patters in the Biosphere”
- Chapter 11, “Terrestrial Flora and Fauna” in Physical Geography by Tom L. McKnight

**Week 12:**
**April 13th (Tuesday): Ecosystems, Genetics, Invasive Species, and Pandemics**
1. Genetic Modified Organisms (GMOs)
2. Invasive Species
3. Pandemics: From Antonine Plague to COVID-19

**Required Materials:**
news/speaking-of-science/wp/2017/08/04/gmo-salmon-caught-in-u-s-regulatory-net-but-canadians-have-eaten-5-tons/?utm_term=.1695ac7c0ebe


**Further Materials:**


**April 16th (Friday):**
1. Airplane Traffic
2. Shipping Transportation
3. Organizing Discussion Board Event: 3rd Trial (Making the Groups)

**4. FINAL RESEARCH PAPER DUE**

**Required Materials:**


**Week 13: Garbage and Pollution and Earth’s Day Week Celebration**

**April 20th (Tuesday):**
1. What is Garbage?
2. Treatment Methods: Landfills, Incineration, and Recycling
3. The Freshkills Landfill Project/Park

**Required Materials:**

April 22 (Thursday): The Earth’s Day: Mini-Conference (via Zoom)

April 23rd (Friday): DISCUSSION BOARD EVENT
Case: the Keystone XL Pipeline Project (See Appendix 1)

Week 14:
April 27th (Tuesday): Trans-Border Garbage
1. Trans-Border Garbage
3. Ship Breakers: Bangladesh
4. Importing Trash and Electricity: Sweden

Required Materials:
- Clark, Liat (2012). “Sweden to import 800,000 tonnes of trash to burn for energy.” Available at http://www.wired.co.uk/article/sweden-imports-garbage-for-energy

April 30th (Friday):
1. Plastic, Recycling and third world countries
2. E-Waste
3. Cloud garbage: Virus, Spams, and Trojans
4. Space: satellite junk and the Nemo Point’s garbage

Required Materials:

Further Materials:


Part VII: Understanding the Current Ecological Crisis

Week 15

May 4 (Tuesday): Climate Change: Facing the Unknown
1. What is that so-called Climate Change and Global Warming?
2. Past Climates
3. Causes of Climate Change

4. POSTER DUE

Required Materials:
-Chapter 11: “Climate Change.”

May 7 (Friday): Some Consequences of Climate Change:
1. Sea Level Rise Impact in:
   a. Coastal landfills
   b. Nuclear residual sites
   c. Salinization
2. Ocean Heat waves (“Hot Blob”): Guest Speaker: Natalie Monterrosa
3. Living Relics: Permafrost and Microorganisms

Required Materials:


Week 16

May 11 (Tuesday): Final Ecological Meditations about the Current Ecological Crisis
1. The Five Extinctions, and now the Sixth?
2. Bunkers, Seeds, and the Doomsday
3. Climate Change Refugees/Migrants
4. Final Ecological Meditations: From Trump’s to Biden’s Administration and Beyond

Required Materials:
- Duggan, Jennifer (n. d.). “Inside the Doomsday ‘Vault.’”

Further Materials:

May 14 (Friday)
- PRESENTATIONS 1

Week 16:

May 18th (Tuesday): NO CLASS; Reading Day
Possibilities to have the second Round of PRESENTATIONS 2

Week 17

May 24th (Friday):
- FINAL EXAM
- PRESENTATIONS 3
**Course Policies:**

**Attendance:**
I will take attendance at every class meeting. You should arrive in class on time and stay for the entire session. If you will miss class for any reason, you should discuss this with me ahead of time. You are responsible for any material you may miss. You are allowed five hours of absence, not five days. A low attendance could determine the distinction between an “F” or “WU” grade. Finally, the tardiness generates constant interruptions of the class. The continuous tardiness could generate a reduction of points for the final grade. **DO NOT BE LATE IN CLASS.**

**Incompletes:**
I do not give incompletes (IN) except under the most extraordinary and documented medical emergencies. No late assignments will be accepted. Without a valid medical excuse, you will receive a grade of zero (0) on any assignment missed. If, for a valid medical emergency, you do miss an assignment, you must contact me within 48 hours of the missed assignment and present acceptable documentary evidence for your absence. At the time of the request, you must also complete a Contract to Resolve an Incomplete Grade in consultation with me. We will agree on what needs to be completed and when it will be due and, if you meet the mutually agreed upon conditions, your course grade will be recomputed and a new grade, if appropriate, will be submitted. I will allow only one semester in which you can resolve the IN/FIN. After that time no request will be considered. The contract form is available in the Department of Geography office, HN 1006, during normal business hours or in OneStop on the 2nd floor of the North Building.

To receive a CR/NC you must have completed all course requirements and have requested the CR/NC option no later than the last scheduled lecture. That means all written assignments, quizzes, exams (including the final exam) must have been completed. If you choose this option, then all grades above 70% will be assigned CR and 69.9% and below will be assigned NC unless you choose the assign D option for grades between 60 and 69.9. Finally, CR/CN is only available to undergraduate students. More information is available at http://www.hunter.cuny.edu/advising/how-to/file-credit-no-credit-cr-nc

**Classroom Electronics Use:**
I permit the use of laptops and tablets **ONLY** for the purpose of taking notes during lecture and discussion. All other personal electronics should be turned off or set to silent before entering the classroom. Absolutely no texting is allowed during class. Any use of electronics beyond their permitted use is a disruption to the class and will be treated accordingly.

**Hunter College Policy on Academic Integrity:**
Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished to the full extent allowed according
to Hunter College. Being in college requires discipline, collegiality, and overall honesty. Although knowledge is an accumulation of ideas from different people and epochs that you can use, you have to do so under certain conditions. If you are going to use another’s ideas you have to identify their names and works. If you don’t, it is called ‘plagiarism,’ and that is illegal. Plagiarism is the presentation of someone else’s ideas, words or artistic, scientific, or technical work as one’s own. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations of the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors.

**ADA Policy:**
In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1124, to secure necessary academic accommodations. For further information and assistance, please call: (212-772-4857)TTY or (212-650-3230).

Students requiring special consideration during the exams must make arrangements with the Office of Accessibility and tell your instructor of the arrangements.

**Hunter College Policy on Sexual Misconduct:**
“In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College’s Public Safety Office (212-772-4444).

b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College’s Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

CUNY Policy on Sexual Misconduct Link: http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links-pdf
Appendix 1: A Detailed Description of the Assignments

1. Proposal of the Research Paper:
   It is a document where the student (or researcher) exposes the principal topic of the investigation, what type of research questions she/he will use to explore the topic, the main objectives of the investigation, what methods will be managed to collect data, and the significance of the investigation. The paper proposal is a type of reference that the teacher (or reader) uses to evaluate a priori the plan proposed by the student, and decide any type of necessary change. Any proposal should mainly have the following parts:

   **Structure of the Proposal:**
   1. Introduction
   2. Literature Review
   3. Research Questions and Objectives
   4. Methodology and Materials
   5. Intellectual Contribution
   6. Conclusion
   7. Bibliography

1. **Introduction:** section of the proposal that illustrates the principal theme of the investigation through a short background of the topic. For instance, “Since the 1990s renewable energy projects have become visible features of our landscapes. Countries such as Denmark, Germany or Spain have regions possess an extraordinary density of renewable projects in their territories.”

2. **Literature review:** part of the proposal where the student demonstrates her/his knowledge about some of the main scholars’ works and arguments analyzing this topic. Examples: “Whereas Peter Smith and Lucas Felman (2014) have analyzed the impact of the new wind farm projects in Europe, Leonardo Sanprocio and his research team (2013) have analyzed the environmental consequences of solar and wind projects in the Southwest of United States.”

3. **Research questions and objectives:** section that exposes the main research objectives and question/s used by the student to investigate the topic. For example, “I will explore in this work those environmental impacts caused by wind farm facilities in North Dakota, putting especial attention on the visual integration of wind turbines in the landscape. To study this relation, I will try to answer the following questions: what type of sociopolitical and environmental impacts do renewable energy project generate? How have local communities accepted this type of energy plants?”

4. **Methodology and Materials:** the student displays in this section all of those methods that will be managed for data collection. These methods can be classified in two categories:
   a. Primary sources: information obtained directly by the student: experiments, interviews, direct observation, etc.
b. Secondary sources: articles, books, websites, films, or audios.

5. Intellectual contribution: In this section the student demonstrates the importance or significance of her/his work. For instance, “This work is crucial because it will contribute to the understanding of those environmental and cultural impacts caused by the renewable projects.”

6. Conclusion: Summary of the paper proposal.

7. Bibliography, Works Cited, or References section

Citation Styles: A completed description of the different citation styles can be found at The University of Pittsburgh (2020). “Citation Styles: APA, MLA, Chicago, Turabian, IEEE: Home” Available on https://pitt.libguides.com/citationhelp

2. Final Research Paper:
The students should choose a topic that is related to Planet Earth. The main component to evaluate the paper will be the solidity and clarity of the argument (or thesis), and the examples and information that you provide to corroborate it; that is the evidence. Moreover, the paragraphs should be built around textual evidence in the form of quotes or paraphrases. Although any writing style (MLA, APA, Chicago, Harvard, etc.) for all of the in-text quotations can be used, the students must be coherent. For this paper, the undergraduate students should use 6 references (for Graduate students at least 10 references) (books, chapters, journal articles, interviews, audios, etc.) to support their thesis in this paper. In addition, the paper must be double spaced, with heading and title.

Structure of a Research Paper

-Introduction
  a. Brief description of the main topic of the paper
  b. Research question/s and objectives
  c. Argument (or thesis)

-The Main Core of the paper: This is the central section of the paper where you provide enough information, cases, examples from other scholars to defend your argument.

-Conclusion: This is the part of the work where you summary your paper.

-Bibliography (or References, Works Cited): Section where you show all of those scholars’ works that you have used in your work.

An example of a research question and argument could be:
“In this paper I will analyze the question how did Eratosthenes know the Earth’s size more than 2,000 years ago? I argue Eratosthenes possessed privileged information that he collected in the Alexandria library.”
Other alternative structure could be,
1. Introduction
2. Literature Review
3. Methodology
4. Results
5. Discussion
6. Conclusion
7. Citations

For a completed description of this type of scientific paper structure, see Nature (2014). “Scientific Papers.” Available at https://www.nature.com/scitable/topicpage/scientific-papers-13815490/#:~:text=To%20reach%20their%20goal%2C%20papers,aim%20to%20inform%20not%20impress.&text=Papers%20that%20report%20experimental%20work,body)%3B%20and%20finally%20Conclusion.

Citation Styles: A completed description of the different citation styles can be found at The University of Pittsburgh (2020). “Citation Styles: APA, MLA, Chicago, Turabian, IEEE: Home” Available on https://pitt.libguides.com/citationhelp

3. Abstract (for Graduates):
Section that described shortly, precisely, and efficiently the main components of a paper: background of the topic, research focus, thesis, and methods. Most of the abstracts have around 250 words and are composed by three sections:
- Title
- Main Text
- Key words: between three and four words that reflect precisely the main key points of the investigation.

You can find some guidelines in this link https://writingcenter.gmu.edu/guides/writing-anabstract.

A Sample of an Abstract for the American Association of Geographers Conference (AAG):
“Climate Change Denial and the Tragedy of North America's Dams”

With approximately 90,000 big dams, the United States has more dams than nearly any other country. It is commonly recognized that these dams, largely built between the 1930s and the 1960s, are in a state of disrepair; in fact, 80 percent of U.S. dams will reach their life span by 2020. This condition is exasperated by unprecedented changes in climatic patterns. Climate change is accelerating dam vulnerability and boosting the risk of collapse. In California, the Oroville dam, the tallest dam in the United States, nearly collapsed due to the unusual amount of winter precipitation in 2017. In Puerto Rico, the Guajataca Dam, hit hard by hurricane Maria, also nearly collapsed in 2018. And in March 14, 2019, the Spencer Dam did collapse, making it the first dam ever to be destroyed by ice chunks. Despite the undeniable influence of the weather,
some entities still reject climate change as a factor threatening dam infrastructure, asserting that the managerial negligence of public institutions and the aging status of dams are the only causes of this decay. This paper exposes how two main ideologies have contributed to the current rejection of climate as a factor in dams’ vulnerability. First, the engineering profession still produces engineers who are taught to observe nature mechanically, without recognizing the changing ecological scenario. Second, some conservative agencies, in an effort to convince the public that public institutions and infrastructures do not and cannot function, erase climatic influence from their descriptions.

**Keywords**: Dams, climate change, engineering, and conservatism

**Note**: The students will receive feedback for the proposal, final paper, and the poster. They will have possibilities to re-write some of the reviews for the proposal.

4. **Two Exams: Mid-Term and Final Exams**: These exams will be completed in class. The exams will be composed of a set of multiple-choice questions. These questions will be divided in two categories:
   1. The question has “just” one correct answer
   2. The choice could be either “All of them” or “None of them”

Sample of a Multiple-Choice question:
1. Choose the correct answer about the Earth’s shape:
   
   a. The Earth is a sphere with flattened poles
   b. The Earth is a perfect sphere
   c. It is a flat planet moving around the sun
   d. The Earth is not planet, but a moon

5. **Elaboration of a Poster**: You will elaborate a poster in order to present your Final Research. This type of posters are very typical in conferences such as the American Association of Geographers. This poster works like the structure of a research paper; that is, you need to show the Background (Introduction), Research Objective, Argument, Methods, Evidence. Although you can use texts, the main mechanism is visual.

6. **Oral Presentation of the Final Research Paper**: You can use programs such as PowerPoint or others to present your research paper
   - Undergraduate students: around 5 minutes
   - Graduate students: around 10 minutes

7. **Class Participation**: Participation is fundamental for your success in this class and includes all of the following: class discussion, LMS posts, group activities, data-collection quizzes, environmental fieldtrips, data collection excursions, and attendance. You need to study the “Materials” every week (check each class in the syllabus) in order to prepare the class.
8. Discussion Board Event (Group Project):
1. Focus: We will discuss the KeystoneXL Pipeline case.
2. The students will be divided in various groups that would represent some of the main public and private agencies and individuals involved in the process. For example,
   - TransCanada Energy: the owner of the pipeline
   - US Federal Government (Trump’s and Biden’s administration)
   - Canadian Government
   - State and Province governments (Canada and US)
   - Oil companies extracting oil tar sand (province of Alberta)
   - Native American and First Nations communities
   - Environmental groups
   - Local communities
   - Banks connected to the companies
   - Workers participating in this project
   - Unions
3. The students would prepare the defense of these groups studying some reports and documents focused on each of these agencies.
4. Modus Operandi: It would take place on Friday, April 23 (via Zoom) and would be broadcast through the Greenbelt Society link to anyone. This event will be connected to the celebration of the Earth’s Day on Thursday, April 22.