**Subject Code and Course Number:** ENV 105

**Course Title:** Numbers, Responsibility, and the Environment

**Number of Credits:** 3

**Instructor Name:** Mr. Sean Reynolds, M.S.

**Email Address:** sreynolds@aua.am

**Telephone Number:** ex 2792

**Office Location:** PAB 308W

**Office Hours:**Mon/Wed/Fri 12:30-1:20

**Term/Year:** Spring 2017

**Class Schedule:** Mondays, Wednesdays, Fridays: 12:30 PM – 1:20 PM

**Prerequisites:** None

**Co-Requisites:** None

**Course Description:**

The course is a practical introduction to basic quantitative and statistical techniques that can be applied to environmental studies. Students will learn techniques to identify, organize, verify, and understand data, including analyzing trends and tendencies. The course will emphasize the importance of ethical and responsible use of data and information. Each topic will begin with an introduction to a numerical or statistical concept followed by the application of that concept on a real world environmental challenge or opportunity. Students will use basic data analysis tools such as Microsoft Excel or Google Sheets.

**Required Materials:**

Required: Huff, D., Geis, I. (1954). How to Lie With Statistics. New York, NY, USA: W. W. Norton & Company, Inc. (Free, Linked on Moodle)

Recommended:

Further readings and electronic course materials will be added on Moodle.

A tablet or laptop computer will be useful to have in class, but is not required.

The below books are excellent resources on Microsoft Excel. However, much of the information they contain can be found easily online. Both books offer ebook editions for less than ~$15:

* **Excel 2016 All-In-One for Dummies**(2016) Harvey, Greg, PhD. Hoboken, NJ: John Wiley & Sons, Inc.
* **Excel Data Analysis for Dummies,** 3rd ed. (2015) Nelson, S. L. & Nelson, E. C. Hoboken, NJ: John Wiley & Sons, Inc.

**Schedule & Topics*:***

***Course Syllabus is Subject to Change to address student needs.***

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Topic** | **Reading** | **Non-Reading Home Tasks** |
| 1 | What is Environmental Data? | [UN Brochure on Environmental Statistics](https://unstats.un.org/unsd/environment/envpdf/Brochures/BrochureEnvironment.pdf) | Moodle Non-Graded Quiz |
| 2 | Types of Environmental Data | None |  |
| 3 | Responsibility and Numbers | Introduction (Textbook) | Fact Checking the News (Assignment 1) – Feb 9 |
| 4 | Insights on Numbers | 10 Things You Ought to Know About Statistics (Moodle) |  |
| 5 | Samples and Data | Chapter 1 (Textbook) | Formatted Spreadsheet (Assignment 2) – Feb 23 |
| 6 | Averages and Formulas | Chapter 2 (Textbook) |  |
| 7 | Displaying Data for What It Is | Chapter 3 (Textbook) | Formulas (Assignment 3) – Mar 16 |
| 8 | When Different Is the Same | Chapter 4 (Textbook) | Project Proposals Due – Mar 25 |
| 9 | Graphs, Graphs, Graphs | Chapter 5 (Textbook) |  |
| 10 | Infographics, Maps, and Misrepresentation | Chapter 6 (Textbook) | Graphing (Assignment 3) – Apr 6 |
| 11 | Evaluating Data and Data Sources | Chapter 7 (Textbook) | Pivot Tables (Assignment 4) – Apr 13 |
| 12 | Relating Two Things | Chapter 8 (Textbook) | Project Check-In #1 – Apr 20 |
| 13 | How Easy It Is to Statistulate | Chapter 9 (Textbook) | Lying With Statistics (Assignment 5) – Apr 27 |
| 14 | Fighting Back | Chapter 10 (Textbook) |  |
| 15 | Team Presentations and Review | None | Project Presentation |

**Student Learning Outcomes:**

The following chart shows alignment between course-specific and program student learning outcomes and program goals.

|  |  |  |
| --- | --- | --- |
| ***Course-based***  ***Student Learning Outcomes***  In this course, students will be able to: | ***Program Student Learning Outcomes***  Students will be able to: | ***Program Goal*** |
| Evaluate stories and trends in the news for factuality.  Discuss the responsibility of journalists, governments, and the public on matters involving the environment and environmental data.  Demonstrate how research and data collection must be done carefully to avoid drawing false conclusions. | 4.1 Produce and deliver written and oral presentations, and communicate with specialists and non-specialists using appropriate media and technology.  4.2 Think critically and creatively, conceptualizing real-world problems from different perspectives.  4.3 Work productively in diverse teams and solve problems collaboratively. | **Gen Ed Goal 4:** Develop articulate, conscientious leaders and problem solvers who are committed to contributing to their fields and society. |
| Enhance quantitative analysis and writing skills.  Evaluate data sources for accuracy.  Use Microsoft Excel/Google Sheets to manipulate, display, and draw conclusions from common environmental datasets.  Describe human-environment relationships. | 5.1 Use common software and information technology to pursue inquiry relevant to their academic and professional fields, and personal interests.  5.2 Weigh evidence and arguments, and appreciate and engage in diverse modes of inquiry characteristic of historical, cultural, political, economic, and quantitative disciplines. | **Gen Ed Goal 5:** Provide students with a broad foundation of knowledge and skills and cultivate a commitment to life-long learning. |

**Course Structure** Instructor-led class will meet three times per week. Home tasks include readings, assignments, and progress made on final group presentation. All home tasks must be completed before the discussion starts.

**Method of Evaluation**

Student learning will be evaluated based on the following weighted components:

• Attendance and Participation (10%)

• Assignments (40%)

• Midterm (15%)

• Final Exam (15%)

• Semester Project (20%)

Notes on Grading:

* Standard +/- grading scale used (A+= 100-97, A= 96.9-93%, A-=92.9-90%, B+=89.9-87%, etc.).
* This course does not have extra credit opportunities to make up lost points.
* Grades are not curved at the end of the semester.
* Grades posted on Moodle may not accurately reflect the semester grade.

Class attendance and Participation (10%):

* Students are expected to attend each lecture on time and engage the topic by taking notes, asking questions, and participating in activities. Student participation also includes remaining quiet and attentive at appropriate times.
* The entirety of the attendance and participation grade consists of 10 points.
* 5 points will be earned through in class participation. Five in class assignments and or group work will be distributed during class and students will receive one point for being present and actively participating in these discussions.
* 5 points of this grade is given automatically to every student. These points are provisional. If you disrupt class and I ask you to leave, you will lose 1 point of this grade.
* If a student must miss a lecture for an excusable reason (i.e., funeral, religious observance, military service), inform the instructor prior to lecture or you will be marked as absent. Even students with a valid excuse for their absence will be marked as absent if they do not send a notifying email prior to lecture.
* In this course, many sessions will include activities that necessitate student participation including: peer review of documents, presentations, and group work.

Assignments (30%):

Throughout the semester there will be five assignments that students will complete on their own. These assignments will help students better understand both modern numerical analysis using spreadsheets and other software, but also give them a deeper understanding of the environment, environmental research, and responsibility in discussing environmental issues.

A schedule of assignments is provided in the schedule above

Exams (30%):

The course will include a mid-term exam covering topics from weeks 1 to 7 as well as a comprehensive final exam covering all course topics with an emphasis on topics covered in weeks 9-14. Please see attached rubric for essay criteria, which will be used to grade the essay section of the exam.

Mid-Term Exam:

The mid-term exam will cover topics from weeks 1 to 6 and will be administered on tablets in the classroom. It will be held on March 2nd to avoid issues with Spring Break.

1) Multiple choice and short answers on basic terminology and concepts

2) Short analytical essays based on provided data and graphs.

The purpose of the mid-term exam is to assess students’ progress in learning how to use terminology and apply appropriate course concepts to understand and analyze environmental concepts. Students will receive feedback through the in-class mid-term review as well as written feedback on their mid-term exams. Students are encouraged to attend office hours for more individualized guidance.

Final Exam:

The final exam will cover topics covered throughout the course with special emphasis on topics covered in weeks 8 to 15. The final exam will consist of the following:

1. Multiple choice and short answers on concepts and terminology
2. Short analytical essays based on provided data

The purpose of the final exam is to assess students’ mastery of concepts and terminology as well as their abilities to analyze environmental data and come to conclusions based on the data. Final exams and comments will be posted to Moodle. Students are welcome to confer with the instructor for more individualized feedback.

Semester Project (20%):

* The course will introduce basic concepts used to study the environment and the impact humans have on it. The goal of the semester project is to use the tools studied in class to study a student selected dataset using these methods.
* Students will work in groups of 3-5 on this project.
* Students can select any environmentally related topic they choose. Students can choose between a survey, an experiment, or a study based on available data.
* Class time will be used for students to explain the goals of the project and track ongoing progress of their semester project.

**Library and Media/Technology Use**

Students are encouraged to use supplemental online and reference materials available at the library to enhance their overall learning in the course. Students are encouraged to use audio-visual aids and presentation software as appropriate. If students have any questions or need additional support in using library resources or technology, they should confer with library staff, ICT, or the instructor.

**Late Policy**

Quizzes, exams, assignments, papers, projects, and presentations must be taken or submitted at the specified time. For quizzes, students must take the quiz during the time allotted on Moodle, failure to do so will result in a 0. Written papers/assignments will have 1% deducted from the total grade for every hour late. Example: 4 hours late, 4% points off.

**Make-up Procedures**

Make-up assignment, exam, and quiz will be given at the instructor’s discretion. Students must submit convincing evidence of a medical or other emergency that makes completing an assignment or taking an exam or quiz at the scheduled time impossible.

**Policy on Grade Appeal**

Students are entitled to appeal grades in line with the university’s *Grades Policies* policy which is available online at http://policies.aua.am/policy/11

**Standards for Academic Integrity**

Students are required to conduct themselves in an academically responsible and ethical manner in line with the Student Code of Ethics. Acts of academic dishonesty impair the academic integrity of AUA and create an unfair academic advantage for the student involved and other member(s) of the academic community. These acts are subject to disciplinary measures as prescribed in the AUA Code of Student Ethics <http://policies.aua.am/policy/10>

The Student Code of Conduct can be found at <http://policies.aua.am/policy/101>

**Special Needs:**

Students requiring special accommodations for learning should contact the Center for Student Success by the end of the Drop/Add period with such requests. [studentsuccess@aua.am](mailto:studentsuccess@aua.am), <http://studentsuccess.aua.am/disability-support-services/>

Presentation Rubric

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Excellent** | **Very Good** | **Good** | **Poor** |
|  | 5 points | 4 points | 3 points | 0-2 points |
| Preparation  Up to 5 Points | Clearly put exceptional effort into the preparation and design. | Demonstrated very good preparation and design. | Work showed some evidence of preparation. | Work appeared to have been done at the last minute. |
|  | 5 points | 4 points | 3 points | 0-2 points |
| Visual Aids/Examples  Up to 5 Points | Added greatly to the presentation. | Aids/Examples were clear and helpful. | Visual aids were used, but could have been more helpful or less wordy. | Visual aids were not particularly helpful or were not used. |
|  | 9-10 points | 8 points | 7 points | 0-6 points |
| Organization & Structure  Up to 10 Points | Presentation was exceptionally logical and superbly organized. | Work had a clear introduction, body, and conclusion. | Presentation was generally organized but lacked some clarity. | The work was poorly organized or ideas were presented randomly. |
|  | 5 points | 4 points | 3 points | 0-2 points |
| Articulation  Up to 5 Points | Excellent and clear verbal articulation of major and minor points. | Explained ideas well. | Ideas were stated but lacked some clarity. | Ideas were difficult to understand. |
|  | 9-10 points | 8 points | 7 points | 0-6 points |
| Subject Knowledge  Up to 10 Points | Thorough knowledge of subject throughout presentation. All information clear, appropriate, and accurate. | Evident knowledge of subject in most of presentation. Most information clear, appropriate, and accurate. | Some knowledge of subject. Not all information useful or sufficient. | Lacks knowledge of subject. Insufficient, confusing, and/or incorrect information. |
|  | 5 points | 4 points | 3 points | 0-2 points |
| Comprehension and Ability to Address Questions  Up to 5 Points | Thorough knowledge of subject throughout paper. All information clear, appropriate, and accurate. | Evident knowledge of subject in most of paper. Most information clear, appropriate, and accurate. | Some knowledge of subject. Not all information useful or sufficient. | Lacked knowledge of subject. Insufficient, confusing, and/or incorrect information. |
|  | 5 points | 4 points | 3 points | 0-2 points |
| Time Management  Up to 5 Points | Showed exceptional time management skills. | Finished within the allotted time. | Went over/too short. | Appeared unaware of time allotment. |
|  | 5 points | 4 points | 3 points | 0-2 points |
| Overall Quality  Up to 5 Points | Outstanding overall quality. A powerful and memorable presentation. | Covered all the main points and it was generally well-delivered. | Could have put more effort into the preparation and design stages to increase overall quality. | Generally sloppy. Weak presentation skills. You have the ability to do much better. |

Essay Rubric

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Criterion | Exemplary | Accomplished | Developing | Poor |
|  | 5 points | 4 points | 3 points | 0-2 points |
| Focus/Thesis  Up to 5 points | Identifies and demonstrates a sophisticated understanding of the main issues/problems in the assignment. | Conveys topic and key question(s). Clearly delineates subtopics to be reviewed. General thesis statement. | Identifies and demonstrates an acceptable understanding of most of the issues/problems. | Does not adequately convey topic. Does not describe subtopics to be reviewed. Lacks adequate thesis statement. Inadequate or no summary/conclusion. |
|  | 9-10 points | 8 points | 7 points | 0-6 points |
| Content/Subject Knowledge  Up to 10 points | Makes appropriate and powerful connections between identified issues/ problems and the strategic concepts studied in the course readings and lectures.  Fully responds to each part of the assignment, presenting both objective facts and subjective views as required. | Makes appropriate connections between most identified issues/ problems and the general concepts studied in the course readings and lectures.  Responds with 80% or more of required information, both objective and subjective. | Makes appropriate but somewhat vague connections between identified issues/problems and concepts studied in readings and lectures.  Responds with 70% or more of required information, both objective and subjective. | Makes inappropriate or little connection between issues identified and the concepts studied in the readings; supplements case study, if at all.  Responds with less than  70% of required information, both objective and subjective. |
|  | 9-10 points | 8 points | 7 points | 0-6 points |
| Required Research  Up to 10 points | Utilized three or more scholarly references, including at least one peer-reviewed journal. | Utilized three references, including at least two scholarly references, one of which was from a peer-reviewed journal. No wikis or unprofessional web resources used. | Utilized three non-textbook resources. No wikis or unprofessional web resources used. | Fewer than three resources used.  Wikis and unprofessional resources used. |
|  | 9-10 points | 8 points | 7 points | 0-6 points |
| Critical Thinking Skills  Up to 10 points | Accurately interprets evidence, statements, graphics, questions, etc.  Draws warranted, judicious, non-fallacious conclusions.  Fair-mindedly follows where evidence and reasons lead. | Accurately interprets evidence, statements, graphics, questions, etc.  Identifies relevant arguments (reasons and claims) pro and con.  Offers analyses and evaluations of obvious alternative points of view.  Justifies analyses and evaluations of obvious alternative points of view. Fairmindedly follows where evidence and reasons lead. | Accurately interprets evidence, statements, graphics, questions, etc. in most circumstances. Identifies some relevant arguments (reasons and claims) pro and con. Basic analyses and evaluations of obvious alternative points of view. Incomplete analyses and evaluations of obvious alternative points of view.  Bias and preconceptions evident that detract from a true critical review. | Misinterprets evidence, statements, graphics, questions, etc.  Fails to identify strong, relevant counter-arguments.  Ignores or superficially evaluates obvious alternative points of view.  Justifies few results or procedures, seldom explains reasons.  Regardless of the evidence or reasons maintains or defends views based on self-interest or preconceptions. |
|  | 9-10 points | 8 points | 7 points | 0-6 points |
| Organization  Up to 10 points | Paper clearly discusses topics and subtopics; it is strongly organized with transitions linking all topics. Excellent summary and conclusion. | Paper discusses topics and subtopics and is well organized with clear transitions. Summary/conclusion recaps the topic and key findings. | Paper discusses topics and subtopics but may be poorly organized; student attempts to provide transitions. Summary/conclusion recaps the topic and key findings. | Paper is not logically organized and lacks transitions between sentences and paragraphs. Inadequate or no summary/conclusion. |
|  | 5 points | 4 points | 3 points | 0-2 points |
| Writing Conventions  Up to 5 points | Demonstrates clarity, conciseness and correctness; formatting is appropriate and writing is free of grammar and spelling errors.  All sources are correctly written in the in-text citation and on the References page in APA style. | Grammatical, spelling, and punctuation errors occur rarely in the paper and do not interfere with reading the paper.  Few sources are incorrectly written in APA style in either the in-text citation or on the References page. | Occasional grammar or spelling errors, but still a clear presentation of ideas; lacks organization.  Most sources are incorrectly written in either the in-text citations or on the References page, but APA style is attempted. | Writing is unfocused, rambling, or contains serious errors; poorly organized and does not follow specified guidelines.  APA style is not used or poorly attempted |