

# Biology 823 Environmental Science

## Dr. Marc Albrecht Fall 2018

### Contact Information

2401 11<sup>th</sup> Ave, Bruner Hall Room 323, Kearney NE 68849

Office Phone: 308 865-8713

Email: [albrechtm@unk.edu](mailto:albrechtm@unk.edu)

Skype ID: Dr.AatUNK

Office hours: WF 1:00 – 3:00, T 10:00 – 11:00 or by appointment

### Introduction

This class is about life on Earth. Life is tenacious and ubiquitous on the planet. Ironically, as humans continue to succeed at living and using resources we have become a significant force of change on the planet. Today, humans determine the course of many other species and existence of entire ecosystems by our actions. That being said scientific rigor must be adhered to when discussing what may or may not happen to the biosphere on Earth. This class explores functioning of the biosphere on Earth and how humans are altering some of these functions.

Environmental science is, to me, derived from ecology and other scientific disciplines. Even ecology is a relatively new field in biology, so environmental science certainly is. People have not been working in this field very long. And the Earth and ecosystems are complex systems so there is lots to learn yet. Environmental science is sometimes connected to certain political views and this is called environmentalism. Some textbooks make a clear distinction between the two and I think this is a good thing to do. I am old enough now to remember when people concerned about the environment were most concerned about a possible ice age and human overpopulation causing a lack of food worldwide. Both of these concerns are now considered not important ones and there are new ones people focus on. Does this mean that the world has avoided an ice age and humans running out of food by our own planning and action? Or does it mean that people should not have been concerned about these things?

This is the type of conversation I would like to have in this class. There are many facts that need to be examined about how the Earth works. However, beyond this people tend to pull together a view of the world and people and what is going on with our shared planet Earth. I do not intend to push a particular view but rather provide information and proposals that allow people to discuss many viewpoints. Many issues in environmental science are complex and beyond simple facts I think it is difficult to determine what correct answers are to the larger questions. Life has taught me to agree with Aleksandr Solzhenitsyn: “An ill-educated person behaves with arrogant impatience, whereas the truly profound education breeds humility”.

## **Course Objectives**

Students in the course will achieve these goals by the end of the course:

- Define the field of Environmental Biology
- Explain the basic geological, meteorological, and biogeochemical cycles on Earth
- Be able to assess the impact of humans on environmental systems of Earth
- Discuss challenges and issues facing natural ecosystems such as
  - Climate change
  - Land use by people for food, water, and energy
  - Effect on land use of economic growth and stability
- Introduction of important current issues in environmental science from a scientific viewpoint
- Practice of scientific writing emphasizing paper structure and technical writing style

## **Required Textbook**

This book is required: Environment: The Science Behind the Stories, a la carte version, by Jay H. Withgott and Matthew Laposata 5<sup>th</sup> or 6<sup>th</sup> Edition. This may be purchased or rented from any vendor you wish.

## **Assignments and Grading**

### **Grading**

The graded work in this class is summarized below. Please note the quizzes and final exam are worth many points. The discussion boards are worth many points as well, but over many weeks.

Item	Description	Points	Totals
Plagiarism	Plagiarism Quiz	10	10
Quizzes	2 Quizzes	70 each	140
Participation	Canvas discussions, starting 3 <sup>rd</sup> week, no grading last 3 wks of class	10 pts for 10 weeks	100
Final Exam	Final exam	150	150
			<b>Total 400</b>

### **Grading Scale**

The following grading scale will be used for this class.

A+	99-100%	B +	87-89%	C +	77-79%	D +	67-69%
A	92-98%	B	82-86%	C	72-76%	D	60-66%
A-	90-91%	B -	80-81%	C -	70-71%	F	below 60%

## **Special Circumstances and UNK Policies**

### **Withdraw (W) and Incomplete (I) Grades:**

Until the conclusion of the 10th week of the semester, you may withdraw from any class and receive a grade of "W." This grade does not count toward your grade point average and merely indicates that you withdrew from (or "dropped") the class. No instructor can withdraw a student from the roster; that is, if you stop coming to class the instructor cannot withdraw you from the class. The instructor will be forced to assign you a failing ("F") grade for the class. Withdrawing from a class involves filling out a simple form that the instructor and student both sign and returning this form to the registrar's office by the withdraw deadline.

Under very unusual circumstances, a grade of incomplete ("I") may be issued. An incomplete is not a substitute for a "W" (withdraw), and it is not a substitute for a poor or failing grade. An incomplete is issued if circumstances beyond the student's control prevent the student from completing the required work for the class by the end of the semester (example: student is hospitalized during final exam week). If you qualify for an incomplete grade, it is expected that you will receive this grade in all your classes. An incomplete grade will give you an extension to complete outstanding work only; it is not an opportunity to "start over" in the class. All outstanding work must be completed within one year or the "I" grade automatically converts to a failing ("F") grade. An incomplete grade will be considered only during the final six weeks of the semester, after the deadline for receiving a "W" has passed.

### **Students with Disabilities**

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students with documented disabilities. To receive accommodation services for a disability, students must be registered with UNK Disabilities Services Coordinator, David Brandt, in the Academic Success Office, 163 Memorial Student Affairs Building, 308-865-8214 or by email [unkdso@unk.edu](mailto:unkdso@unk.edu)

### **Students Who are Pregnant**

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students who are pregnant. To receive accommodation services due to pregnancy, students must contact Cindy Hayes in Student Health, 308-865-8218. The following link provides information for students and faculty regarding pregnancy rights. <http://www.nwlc.org/resource/pregnant-and-parenting-students-rights-faqs-college-and-graduate-students>

### **Reporting Student Sexual Harassment, Sexual Violence or Sexual Assault**

Reporting allegations of rape, domestic violence, dating violence, sexual assault, sexual harassment, and stalking enables the University to promptly provide support to the impacted student(s), and to take appropriate action to prevent a recurrence of such sexual misconduct and protect the campus community. Confidentiality will be respected to the greatest degree possible. Any student who believes she or he may be the victim of sexual misconduct is encouraged to report to one or more of the following resources:

**Local Domestic Violence, Sexual Assault Advocacy Agency** 308-237-2599

**Campus Police (or Security)** 308-865-8911

**Title IX Coordinator** 308-865-8655

Retaliation against the student making the report, whether by students or University employees, will not be tolerated.

**Copyright Statement** *The materials on this course website are only for the use of students enrolled in this course for purposes associated with this course and may not be retained or further disseminated. The materials on this course website may be protected by copyright, and any further use of this material may be in violation of federal copyright law.*

# Syllabus Biology 823 Environ Bio Fall 2018

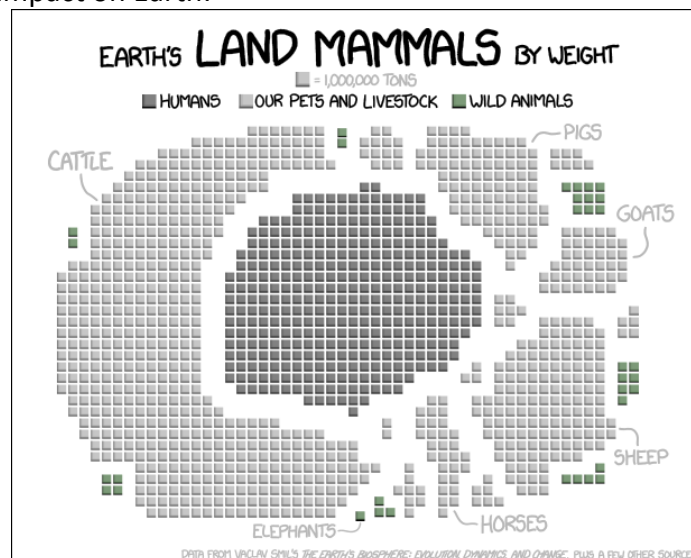
W&L = Environment: the science behind the stories, Easton = Taking Sides: Clashing Views on Environmental Issues, these will be posted on Canvas

Date	Week	Lectures	Readings	Assignments
Aug 20	1	<b>01 Class Intro</b> <b>02 Chap 01</b>	Introduction, W&L Chap 1: Science & Sustainability Intro to Environ Sci	
Aug 27	2	<b>03 Chaps 2, 3</b> <b>04 Chap 4, and 5</b>	W&L Chapters 2-5 Review: Earth, Evolution, Biodiversity, Comm. Ecology, Ecology	<b>Plagiarism Assign Due Fri</b>
Sept 3	3	<b>05 Chap 6</b> <b>06 Chap 7</b>	W&L 6 Ethics, Economics, and Sustainable Development, Chap 7 Environmental Policy	
Sept 10	4	<b>07 Chap 08</b> <b>08 Gapminder</b>	W&L Chap 8: Human Population and <a href="#">Hans Gosling Lecture</a> and the most important lecture ever	
Sept 17	5	<b>09 Chap 09</b> <b>10 Chap 10</b>	W&L Chap 9: Soil & Agriculture Chap 10 Ag, Biotech, and Future of Food	
Sept 24	6	<b>11 LLS</b>	UN report: Livestock's Long Shadow	<b>Quiz 1</b>
Oct 1	7	<b>12 Chap 11</b> <b>13 Cha 12</b>	W&L Chap 11: Biodiversity & Conservation Biology, Chap 12 Forests & Protected Areas	
Oct 8	8	<b>14 Chap 13</b> <b>15 Easton 1</b>	W&L Chap 13 The Urban Environment Easton Issues 1.1 and 1.3	
Oct 15	9	<b>16 Chap 14</b> <b>17 Lead Toxicity</b>	W&L Chap 14 Environmental Health and Toxicology, Lead Case Study	
Oct 26	10	<b>18 Chap 15</b> <b>19 Chap 16</b>	W&L Chap 15 Freshwater Systems Chap 16 Marine and Coastal Systems	
Oct 29	11	<b>20 Chap 17</b> <b>21 Easton 2</b>	W&L Chap 17 Atmospheric Science Easton Issues 2.3 and 4.1	<b>Quiz 2</b>
Nov 5	12	<b>22 Chap 18</b> <b>23 Easton 3</b>	Chap 18 Global Climate Change Easton Issues 4.2 and 4.3	
Nov 12	13	<b>24 Chap 19</b> <b>25 Chap 20</b>	W&L Chap 19 Fossil Fuels, Chap 20 Old Alternative Energy Sources	

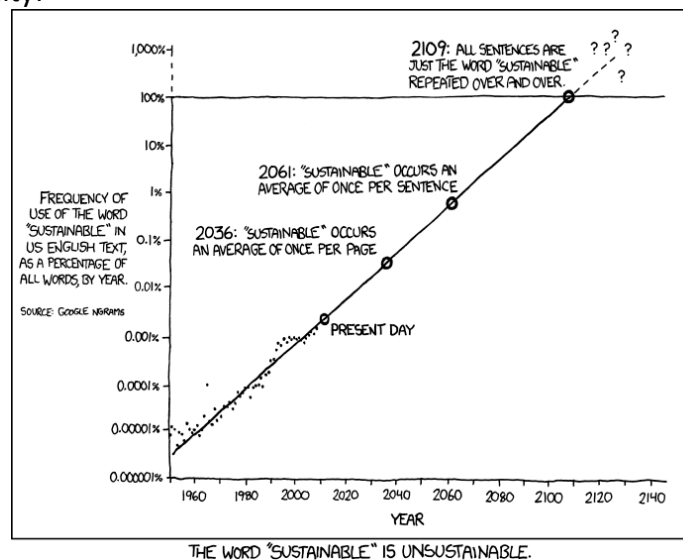
Date	Week	Lecture	Readings	Assignments
Nov 19	14	26 Wind Power	<b>Thanksgiving Break</b> Wind Energy Report	
Nov 26	15	27 Chap 21 28 Chap 22	W&L Chap 21 New Renewables Chap 22 Managing Waste	
Dec 3	16	29 Chap 23 30 Chap 24	W&L Chap 23 Minerals Chap 24 Sustainable Solutions	
Dec 10	17		<b>Exam week</b>	<b>Final Exam</b>

Some wisdom, ok humor, from xkcd:

On the scale of human impact on Earth:



On the word sustainability:



# Orientation to Dr. Albrecht Canvas Use

## Version 2.01 Spring 2018

## UNK Biology Department

### **Introduction:**

The UNK Biology Distance Master's program has many faculty participating. Part of the experience and challenge of the program is that, as in other professional situations, faculty are different from each other. Faculty have different lecture styles, different discussion board expectations, different grading priorities, and even different methods to deliver class material. I realize this might be confusing for people, but hopefully the various methods will demonstrate what works and what does not for you in your own careers. Please read this section as I try to clarify how I use Canvas in this class.

Please contact me with any questions about Canvas, the class materials or grading. Also note that the UNK e-Campus website does provide both Video Tutorials and Atomic Learning Tutorials on using Canvas, email, and MS Word see [this page](#).

### **A note about Expectations:**

I approach this program with the goal of providing, as closely as possible, the level of experience I was fortunate enough to experience in my graduate career at some very good universities. This means that generally my expectations are high. By this I mean at least six hours of study time per week, a high degree of mastery of even complex material, and the persistence to do outside research and ask questions as needed. I will do my best to find, present, and interpret material I think is important and appropriate for the subject area of classes. I will also do my best to explain how the process of science works including experimental design, statistical testing, writing, and thought processes. I will also work to be as available as possible, and turn around posts, emails, and graded work as quickly as I can. For graded work this means 2 weeks or less.

It is my hope and expectation that everyone in this program is here because they enjoy biology and wish to become more knowledgeable about the subject and more proficient at teaching or researching.

Here is a quick checklist of points that may help you succeed in the course, based on my experience as a graduate student and professor:

1. **Have you prepared for class?** Have you read the material, not just once but twice? Have you looked up authors, concepts, or words you were not familiar with during the reading? Do you understand how this reading fits into the discipline in general, and why it was assigned? On primary literature papers have you noticed the author, date, and author's institution of the paper in addition to the data, statistical tests, and concepts in the paper?

2. Before asking an entire class what a word means **have you tried to look it up?** Did you try to find the word from appropriate, professional, recognized sources? Have you used the assignment itself, an index book section (if present), or another biology text you own? Wikipedia is also a good place to start, but not a good place to end.
3. Is the work you are turning in **reflective of you** as the professional you are working towards? Have you looked at it for mistakes? Do you have all the important concepts covered in your work? Is the organization of the paper clear and useful? Have you put in thought and work on the figures and tables to make them clear, professional, and are they referenced correctly? Has the work been proofread for grammatical, factual, spelling, and formatting errors? Do you know that the formatting correct?

### **Canvas:**

The main portal for the class work in the UNK Biology Distance Master's program is the learning management system (LMS) Canvas. Being familiar with the LMS is helpful for success in the program. Here are the components are the ones I use the most:

1. "Files":
  - a. This is where I place Powerpoint, pdf, and video files that are the lectures for classes.
  - b. These files should be **downloaded** (not streamed) for printing out or viewing. This means a right click, not a left click on most computers.
  - c. The video files are in MP4 format, this can be viewed by many video players.
  - d. Some of these files are large and should be downloaded on fast internet connections.
  - e. I may post other papers here as well as book sections or links to other sites, these are class materials and should be read and have notes made on them.
  - f. It is fine to download all files available at any time during the semester. There are no restrictions on what devices you use or how many times you use them. Please note these files are UNK files created by me in terms of authorship.
2. "Discussions":
  - a. This section of the LMS is how you will communicate with me and each other in the class.
  - b. In my classes Discussions are an important part of the class experience, there are lot of points associated with participation on Discussion Board
  - c. Typically, each discussion board is opened Monday around 9:00 am Central Time, and closed Sunday night around 10:00 pm Central Time (I reserve the right to change these times).
  - d. Because discussions are important, posts will be graded.
    - i. I expect at least **two** substantial postings each week and not both on Sunday night.
    - ii. *The quality of your contribution.* This is a somewhat subjective category, but the more thoughtful your comments the better the quality of discussion will be for the entire class. Your comments should be at least a few sentences. Conciseness and clarity are necessary to keep the reading load for the class to a reasonable level, i.e.: page long postings are discouraged. Your comments should be supported with information, file attachments or web sites, and

should be relevant to the current topic of discussion. References are encouraged.

- iii. *How well you interact as classmates.* Your responses should demonstrate that you are aware of the discussion that has been taking place. Go beyond stating “I agree” with someone with someone by stating your reasoning. Posts that say just “I agree” in one form or another will not be counted as posts for the week.
- iv. *Be polite and professional* be polite and constructive in your responses to other students and me.

3. “Assignments”:

- a. Many, if not all, the assignments in the class will appear here, so please find this area of the LMS
- b. There are two types of assignments I use most:
  - i. Quizzes: these are timed tests, typically multiple choice questions that are available for a limited amount of time. The time frame is usually open at Friday at 5:00 pm on the week they are assigned and closing on the following Monday at 10:00 pm Central Time. These tests must be completed online within their time limit (e.g. 30 minutes) once started.
  - ii. Papers: I create assignments that are links through which you can upload documents. This system has the distinct advantage over email in that papers go directly to a ‘space’ that is specific to one person for one assignment. Users will see a paper icon in the Gradebook for the assignment when you have uploaded the document.
    - 1. This function also can be set to be available for a limited amount of time. See the syllabus or assignment description (or document detailing the assignment in the assignment description) for due dates. Typically, I post the assignments at least 1 week ahead of the deadline.

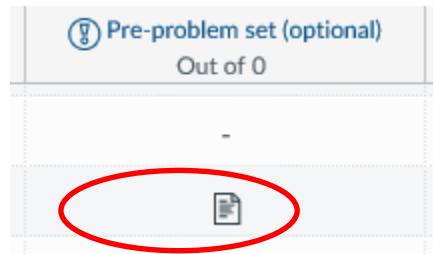
4. “Grades”:

- a. This is the area of Canvas where grades are recorded and displayed, these are the actual grades I use, so check your grades often.
- b. Note the symbols in the gradebook. The responsibility is yours to make sure assignments are in on time, uploaded correctly, and that the correct file is uploaded. If the wrong file is uploaded, or the file is late, penalty of at least 10% will be assessed.
  - i. Empty assignment: this means no file has been uploaded, or test taken according to Canvas. You **do not** want to see this if you have taken a test or uploaded a file.

Pre-problem set (optional)	
Out of 0	
	-
	-
	-



- ii. Paper icon: this means that Canvas has received a file, or that a test has been taken. A file that is uploaded may still be corrupt, or a person could still have uploaded the wrong file, but whatever it is, Canvas has it. This means I have to grade the assignment before you will see a grade. Any paper, and any test with subjective questions (such as fill-in, short answer) will have this symbol until graded.



- iii. Graded assignment: this is the grade for the assignment. It is what will be used in grade calculation.



- iv. Other symbols: I think there may be a failed upload symbol that looks like a broken paper icon, but I have not seen this icon recently and I am not sure how Canvas shows failed uploads. If you see something other than the images shown above please contact me immediately.

#### 5. “Announcements”:

- a. These are pieces of information I post that I think will help people with the class or a particular assignment as a semester progresses. Please read these when I post them.
- b. I will post class information here, such as changes to the syllabus or answering a question that is coming up repeatedly.

#### 6. Other Features:

- a. There are other features of LMS that I use from time to time so please look around at the program.

#### 7. Scientific Writing (**last but not least!**)

- a. I have included documents in Files/Scientific Writing folder to help with scientific writing. I hope to see the highest level of professional writing in assigned papers.

- b. I encourage everyone to work on improving their writing skills, as I continue to work on mine. Everyone in the program should have at least a few papers from primary journals from other classes or your own reading.
  - i. If not, get a few from the UNK library collection that you have access to as a UNK student on subjects you are interested in.
  - ii. Recent papers from a major journal should be read for style, voice, formatting. Such examples will show you how to build sentences, tables, figures, paragraphs, references, and abstracts. Everything you need to know is there.
- c. Also, you can always ask for feedback on sample writing before large assignments are due!
- d. Changing writing style or formatting seems easy for some students but hard for others. Not writing in scientific style or not formatting papers (or problem sets) correctly can cost a person a large number of points on assignments in a course. Please do your best with writing. This is why I have provided reference material and encourage people to read current literature articles for structure as well as content.

# Dr. Albrecht Class Policies

## Version 1.9 Spring 2018

### Introduction:

Every institution has its rules and policies and UNK and the Biology Department have them too. Because of the distance education environment, the degree of communication between student and faculty can be difficult, and misunderstandings do happen. Please keep in mind “talking” over the computer is not the same as face to face – several types of communication are lost. There is nothing quite like a conversation after class or in a hallway. Please be patient and allow more time than you might otherwise to get the solution you need. Here are my policies that will be in place for this class in addition to those of UNK and the Biology Department.

### Policies:

1. Paper formatting: all work turned should have the following formatting.
  - a. Size 12 font, 1” margins all around the page, page numbers present, no right justification for the text
  - b. Header information on the first page: name, class, date, assignment at least.
  - c. All text double-spaced with proper English spelling and grammar used. The writing should be simple, clear, scientific writing style. At the least this means: subject-verb-direct object structured sentences.
  - d. Tables must be labeled at the top and have captions that explain them.
  - e. Figures must be labeled at the bottom and have captions that explain them. No titles within the phase (graph) space which is the Excel default unfortunately.
  - f. All work turned in should have correct references. All citations must be “(author year)” format in the text (including figures and tables if they are adapted from existing work) with a full citation at the end of the paper. Papers should be listed alphabetically by last name of first author.
    - i. Citations **are** needed if textbook or lecture material is used (especially when quoted!). This is both the legal necessity and good practice for work beyond class.
    - ii. Full citations should be in a “References” section at the end of each paper and follow these formats, reverse indented and alphabetical by author.
    - iii. Each text citation should have a full citation in the Literature Cited section and each citation in the Literature Cited section must have at least one text citation.
  - g. **Failure of any of these policies will result in letter grade reductions.** For those of use familiar with rubrics, these are level one issues.

2. Citation Style Examples: further information here:

<http://www.scientificstyleandformat.org/Tools/SSF-Citation-Quick-Guide.html>

a. Books:

Darling D. 2001. Life Everywhere: The maverick science of astrobiology. Basic Books. New York. 206 pp.

b. Computer Programs:

Microsoft. 2010. Microsoft Excel Version 14.06112.5000. Redland, WA.

c. Journal Articles:

Chekalyuk A C, and M Hafez. 2008. Advanced laser fluorometry of natural aquatic environments. Limnological Oceanographic Methods 6: 591-609.

d. Websites:

Food and Agriculture Organization of the United Nations. 2006. Livestock impacts on the environment. URL: <http://www.fao.org/ag/magazine/0612sp1.htm>. Accessed Feb 26, 2014.

3. Plagiarism and Cheating:

- a. **Please see and complete (the underline ahead is the hyperlink, please click on it) [this page](#) - I require everyone in the class has visited this site, take the quiz and send me a completion certificate (Test & Certificate section) by the 5:00 pm Central Time on the second Friday of the semester. Every semester, even if you have done it before (but only once per academic year is needed). Post a Word document containing a screenshot or scan into the Assignment link. The reason? So everyone knows exactly what plagiarism is. **ALL** sources in **anything** turned in for this class must be cited, including figures and anything taken from class texts (such as copying the text of problems) every time!**
  - i. Also, I want to make sure you can take screenshots, place images in Word documents (and resize and crop as needed), as well as upload to Canvas.
- b. Also see the [UNK Student Handbook](#) for UNK policy statement on plagiarism
- c. I consider plagiarism a scourge and a stain on science and detrimental to the progress of humanity. Penalties include zeros on questions, or entire tests, or failing the class outright in addition to letters in the permanent files here at UNK
- d. Citation information for APA style is given at the UNK eCampus website [here](#).
- e. A quick rule: **more than 3 words in a row from any source must be referenced**

- f. Do not communicate with outside experts to answer tests. This includes non-UNK websites. Assignments are meant to assess your knowledge, not that of others, or “answers-provided” websites.
- g. Work individually unless directed into groups. Your work should be your own, and any personal pronouns used in your writing (which should be few in any case) should reflect this, i.e. no ‘we’ in assignments you work on by yourself!

4. Late work/technical difficulties:

- a. Late work will be subject to the following grade reductions:
  - i. 10% reduction of grade for any work submitted after stated deadline
  - ii. A further 10% grade reduction for each 24-hour period past the stated deadline
- b. I understand that online classes demand attention to deadlines. However, this graduate program is *not* a self-paced one. This program is structured to academic terms and time frames (such as breaks) as the brick and mortar University of Nebraska system. In general people in the program show great dedication and hope this tradition continues.
- c. Technical difficulties are part of the reality of the online world. Given that truism, do NOT wait to submit assignments until the last minute or hour of a deadline. Both you and I cannot be responsible for failures of power, computers, computer networks, or even Canvas. Do not procrastinate; *turn assignments in early*, so there is time to resubmit if there are any problems.
- d. Important: please install and run some sort of anti-virus and anti-malware software on your computer. This is for all of us in the class, so that viruses are not spread through the class. Finally, a utilities program will help your computer run well by fixing registry files and defragmenting and optimizing hard drives:
  - i. Microsoft Security Essentials (recommended and free):
  - ii. other maintenance software such as System Mechanic (my favorite), Symantec System Works, Glary Utilities (free)
  - iii. Malwarebytes Anti-malware (free)

5. Online etiquette:

- a. **Please be respectful of others in the class, even me.** It is easy to be more confrontational via electronic post than in person. I understand conversations may become heated, and irony, even sarcasm may be attempted at times be used to make a point; however, such attempts are often not understood via posts. Please try to remain clear and kind at all times.
- b. Posts I deem as offensive or inflammatory towards others or me will be removed from the discussion boards. If this becomes a continuing problem, grade reductions may result. I will keep copies of such posts.