**UNIV 103: Scientific Revolutions**

Fall 2011

Instructor: Dr. Lynn Marquez

Office: 107 Brossman

Office Hours: TR 9:00-11:00 and W 4:00-5:00

Or By Appointment

Phone: 872-3288

E-mail: [Lynn.Marquez@millersville.edu](mailto:Lynn.Marquez@millersville.edu)

Required Texts: *Science and Its Ways of Knowing*

Eds. John Hatton & Paul B. Plouffe

Prentice Hall 1997

D2L: https://millersville.desire2learn.com/

**Course Objectives**

Following successful completion of this course the competent student will be able to:

1. Distinguish between scientific and commonly accepted meaning of words such as hypothesis and theory.
2. Describe how scientific inquiry employs observations of the natural world to construct testable hypotheses.
3. List and describe the contributions of ten scientists critical to the advancement of major theories.
4. Explain how communication and collaboration among colleagues enhances the scientific process.
5. Describe the process by which ideas become theories and provide examples of such.
6. Compare and contrast the scientific method as practiced in different disciplines.
7. Evaluate, correlate, and synthesize information into coherent written and oral presentations.
8. Compare and contrast the development of major scientific ideas
9. Articulate and explain at least four lines of evidence that support the theories of Evolution and Plate Tectonics.
10. Describe the impact that revolutionary discoveries have made on society.
11. Discuss ethics as it applies to science and society.
12. Participate in and reflect on the Day of Caring experience.

C**ourse Schedule**

|  |  |  |
| --- | --- | --- |
| Date | Class Topic | Assignment Due |
| 8/30 | Introduction |  |
| 9/1 | Copernican Revolution  Read *Coming of Age in the Milky Way* Chs. 1-2 | Typed Resume |
| 9/6 | Copernican Revolution  Read *Coming of Age in the Milky Way* Chs. 3-5 |  |
| 9/8 | What’s a Syllabus? | Bring all Course Syllabi |
| 9/13 | Copernican Revolution  Read *Coming of Age in the Milky Way* Chs. 1-5 | Day of Caring Reflection |
| 9/15 | *Ethical Writing Skills – Plagiarism and Referencing* |  |
| 9/20 | **What is Science and how does it differ from other modes of inquiry?** | What is Science Essay |
| 9/22 | *Career Services* |  |
| 9/27 | WRAP UP & REVIEW |  |
| 9/29 | **EXAM 1 – Copernican Revolution & What is Science** | |
| Date | Class Topic | Assignment Due |
| 10/4 | *Reflection – Exams! Learning Styles? Study Skills!* | |
| 10/6 | Evolution  Read *Evolution: The Triumph of an Idea* Chs 1-2 |  |
| 10/11 | **Fall Break – No Class – Yahoo!** | |
| 10/13 | Evolution  Read *Evolution: The Triumph of an Idea* Chs 3-4 |  |
| 10/18 | Evolution  Read *Evolution: The Triumph of an Idea* Chs 1-4 |  |
| 10/20 | **Facts, Hypotheses, Theories, & Laws Discussion** | Scientific Meaning Essay |
| 10/25 | *Transition: Time Management? Financial Aid? Roomates Stink?* | |
| 10/27 | WRAP UP & REVIEW |  |
| 11/1 | **EXAM 2 – Evolution & Scientific Terminology** |  |
| 11/3 | *Academic Advising* | Printed DARS |
| 11/8 | Plate Tectonics  Read *Earth: Portrait of a Planet* Ch 3 |  |
| 11/10 | Plate Tectonics  Read *Earth: Portrait of a Planet* Ch 4 |  |
| 11/15 | **Scientific Breakthroughs & Scientific Consensus Discussion** | Scientific Breakthroughs Essay |
| 11/17 | Plate Tectonics  Read *Earth: Portrait of a Planet* Chs. 3-4 |  |
| 11/22 | **EXAM 3 – Plate Tectonics & Good Science** |  |
| 11/24 | **Thanksgiving – No Class – Yahoo!** |  |
| 11/29 | *Final Preparations & Transition* | Rough Draft of Final Paper |
| 12/1 | Science and You Presentation Topic #1 |  |
| 12/6 | Science and You Presentation Topic #2 |  |
| 12/8 | Science and You Presentation Topic #3 |  |
| Dec 16 12:30-2:30 | Semester ReCap | Final Paper Due |

**Course Policies and Procedures**

Attendance Policy: Regular attendance is expected and required. If you cannot attend class please notify me ahead of time. Thanks!

How to Succeed in this Class: The simple answer is pay attention. Show up to class and pay attention. Read the assigned texts prior to class, outline those texts and take notes, review your notes, complete assignments when due, ask questions, participate, be thoughtful and deliberate with your time, connect the dots. It’s incredibly easy to show up and read and NOT pay attention. If you don’t pay attention it won’t do you any good to be in class or to read. Be active not passive. Most importantly and this is the most difficult thing to do, pay attention to yourself. Recognize when you’ve lost the point and figure out where you lost it. Then if you’re still lost you must seek assistance immediately. Talk to your classmates. Talk to me. I’m more than willing to help you outside of class. It’s one of my favorite parts of the job. In short, PAY ATTENTION to yourself and to me.

Classroom Etiquette:

* Be on time.
* Do not socialize with your classmates during class.
* Be clean. Recycle.
* **Turn your phones and computers off and put them away**. I have a no tolerance policy for mobile phone use. Anyone caught texting or using any social/entertainment media on their cell phones or computers during class time will have their final grade reduced by 5% points (roughly a step in letter grade e.g. B+ to B) for every instance.

E-mail Use and Abuse: E-mail is a great thing, but it is often abused and is a poor substitute for personal contact. If you have a quick question such as, “What are we doing in class today?” Use your brain and look on the syllabus. That is why I’ve spent literally hours putting this document together. E-mails with questions such as, “I was reading Wegner’s Theory of Continental Drift and I don’t really understand how he used the geographic distribution of glossopteris leaves to prove that continents were once aligned. Could you please explain this to me?” are not appropriate. I cannot adequately answer those types of questions via e-mail. A more appropriate e-mail would be something like, “I’ve been reading about continental drift and I have a few questions about the lines of evidence. Could we meet tomorrow afternoon?” One last thing about e-mail, always use proper greetings, punctuation, grammar, and closings. Often times I receive e-mails with no salutations and no closings and the only identifier is the e-mail address which is often something like, [sugarbaby@yadayada.com](mailto:fatscott55@yahoo.com) . How am I supposed to know who sugarbaby is? And more importantly, do I really want to know who sugarbaby is?

Essays: There will be one essay due for each unit of the course. These essays will be based upon readings from the text, *Science and Its Ways of Knowing*. A well constructed essay will summarize, synthesize, and properly reference at least three readings from the text.

|  |  |
| --- | --- |
| ***Essay Topic*** | ***Relevant Reading from Hatton & Plouffe*** |
| What is science and how does it differ from other modes of inquiry? | You must reference the essay by Popper (page 81) as well as any additional essay in Part I. Especially relevant essays include those by Pirsig (page 3), Kneller (page 7), Bauer (page 11), and Hoagland (page 119). |
| The meaning of fact, hypothesis, theory, and law. | Any essay in Part II would be appropriate. Especially relevant essays include those by Wynn (page 60) and Gould (page 87). |
| Scientific Method and Breakthroughs | You must reference the essay by Root-Bernstein (page 108). Many essays throughout the book relate; however, other especially relevant essays include those by Scudder (page 143), and Poinar & Poinar (page 146) |

Discussion Expectations: We will have one major class discussion before each exam. These discussions will be based upon your readings from *Science and Its Ways of Knowing* as well as science in the news reports and of course class content. The class shares the responsibility for the success of the group discussion through active participation. ***Before each classroom discussion students should***: 1. Read or research the required articles carefully and purposefully. 2. Think about the ideas, arguments, theses, or views presented in these articles. 3. Make notes and identify questions you might want to explore. ***During each classroom discussion students should***: 1. Speak clearly and freely. 2. Listen to the ideas and opinions of others. 3. Stick to the topic or issue under discussion. 4. Abstain from monopolizing or dominating the discussion. 5. Refrain from private or side discussions while someone else is speaking.

Biography: Each student will be assigned an important person in the history of science related to either the heliocentric, evolution, or plate tectonic theories. Students will be expected to present what they learn to the class both through an informal classroom presentation as well as an on-line presentation.

Evaluation Criteria:

* Classroom Participation 10%
  + Properly prepared for class
  + Science in the news
  + Service Learning Participation and Reflection
  + Seminars and Co-curricular Events
* Classroom Discussion 10%
  + Regular participation
  + Insightful and thoughtful comments
* Biography Paper and/or Wiki 4%
* Essays 28%
  + How is science different?
  + Fact, Hypothesis, Theory, Law
  + Scientific Breakthroughs and Scientific Consensus
* Exams 28%
  + Copernican Revolution
  + Evolution
  + Plate Tectonics
* Final Paper, Presentation, Discussion 20%
  + Final paper 10%
    - The grade for the paper will be evenly split between the rough and final draft.
  + Final presentation 10%