Writing 101
Writing About Modern Physics and Technology
Davidson College
Fall 2016

Professor John Yukich                                                                                        Dana 169
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REQUIRED TEXTS:
- QED by Richard Feynman
- The Elements of Style, by William Strunk and E.B. White, 4th edition
- Easy Writer by Andrea Lunsford, 4th or 5th edition

COURSE RESERVES: Additional texts will be on reserve in Little Library, including:
- Science Writers Guide - John Foster
- Scientists Must Write - Robert Barrass
- A Brief History of Time – Stephen Hawking
- The Elegant Universe – Brian Greene
- The Making of the Atomic Bomb – Richard Rhodes
- Disturbing the Universe – Freeman Dyson

PREREQUISITES: None. This course fulfills the college composition requirement.

CLASS MEETING: Monday, Wednesday and Friday 10:30-11:20 AM in Dana 153.

OFFICE HOURS: will be posted on the class webpage; however, I will generally be available during numerous other hours as well.

INTRODUCTION: In this writing-intensive class, students will be introduced to the art of writing about science, with modern physics and technology as the primary subjects of consideration. As a class we will read and critique science writing intended for the educated public including popular science books, news articles, science reports, and abstracts. Students will learn to write concisely for the educated public about technical topics. Students will also learn to think objectively about science and technology and to distinguish opinion from scientific fact. Although the primary topics in this course are physics and technology, students will develop transferable writing skills that will be useful in all technical areas.

LEARNING OBJECTIVES:
By the end of this course, students will:
1. Learn to write formally, concisely, and grammatically for the educated public about topics in modern physics.
2. Develop skills to critique science writing for the educated public.
3. Learn the art of careful revision of manuscripts.
4. Learn to make fair and effective use of the work of others.
5. Learn to identify ambiguity and to write with clarity and precision using technical terms.
6. Learn to enhance or augment a persuasive argument.

LEARNING OUTCOMES:
By the end of this course, students will be able to:
1. Identify the rudimentary highlights of 20th century, including quantum physics, atomic physics, nuclear physics, and relativity, as well as related technology.
2. Qualitatively describe the fundamentals of 20th physics in lay terms for the educated public.
3. Form a persuasive argument for or against nuclear power.
4. Write a scientific book review, historical narrative and science abstract.
5. Apply the principles of modern physics to explanations for the educated public of modern technological applications of 20th century physics.

ATTENDANCE and PARTICIPATION: The attendance policy for this class follows the college’s 25% rule. You are required to attend each class unless you have a legitimate reason for being absent. In this case, please see me in advance (except in the case of illness). You must initial the class attendance sheet each day. Students are expected to come to class prepared to discuss and critique assigned readings. There is to be no use of cell phones, laptops or I-pads for anything other than in-class exercises.

ASSIGNMENTS: There will be regular assignments consisting of readings and both formal and informal writings. These and other useful announcements will be posted periodically on the course Moodle page. Written assignments will be collected electronically and on paper, and feedback will be provided in a timely manner, especially for rough drafts. Both electronic copies and hard copies will be due by 1 PM on the designated due dates indicated on the Moodle page:

- **Rough drafts:** electronic copies (in .doc or .pdf format) must be uploaded on the class Moodle page and emailed to your designated peer reviewer by 1 PM. Hardcopy must be delivered to my office by 1 PM.
- **Peer reviews:** (.doc or .pdf) must be uploaded to the Moodle page and emailed to the document’s author by 1 PM.
- **Final drafts:** (.doc or .pdf) of your papers must be uploaded to the Moodle page and hardcopy delivered to my office by 1 PM.
- **Grammar exercises:** will be due electronically (through Easy Writer web site) on dates designated on Moodle page.

**Assignment #1:** In 1000 words or less, write a book review of QED by Richard Feynman. The review should summarize the primary concepts conveyed by the text and critique the author’s writing. The intended audience will be the “educated public” – those with some college-level education – and who would likely be interested in reading the original text.
Assignment #2: In 1200 words or less, write a news report on a recent research development or discovery in the field of physics (e.g., measurements of the speed of light. Topics will be chosen from an approved list.) Your article should convey the relevant physics concepts to a general audience and explain the relevance of the development to the overall field of physics and/or the other sciences. Why should your readers care about the recent work? Your intended audience should be the readers of *Smithsonian, Science, Nature,* or *American Scientist.*

Assignment #3: In 1500 words or less, write an argumentative essay for or against nuclear power. Your essay should convey a layperson’s understanding of the physics principles behind nuclear energy. Your ultimate objective is to present a balanced analysis that ultimately makes a case one way or the other. Your intended audience should be the readers of newspapers, magazines or news websites.

Assignment #4: In 1500 words or less, write an historical narrative about a fundamental development or discovery in physics research that led to a significant technological application (consumer, medical, military, industrial, etc. Topics will be chosen from an approved list.) Describe the initial impetus behind the research, initial reactions to the research by other scientists, and how the results led to the eventual technological application. What social ramifications came about as a result of the technology? Again, your intended audience should be the readers of *Smithsonian, Science, Nature,* or *American Scientist.*

Assignment #5: In 300 words or less, write an abstract for a research development in physics (from approved list). The abstract should summarize all relevant aspects of the project without resorting to detailed explanations. This abstract will serve as the opening to your final paper (see below). Intended audience is readers of *Smithsonian, Science, Nature,* or *American Scientist.*

Assignment #6: In 5 to 6 pages (of text), write a comprehensive research paper on a topic in modern physics or in a related technology. The paper should include careful presentation of the physics fundamentals, including any helpful diagrams. While the paper does not need to be mathematically rigorous, it should nonetheless include a quantitative analysis that would be accessible to the college-educated public. Has this area of physics led to a technological development? Is it expected to lead to a technological application in the future?

HONOR CODE: Each student is expected to affirm and comply with the Davidson College Honor Code on all written assignments by signing your name. Your signature indicates full compliance with the code, which states: “On my honor I have neither given nor received unauthorized information regarding this work; I have followed and will continue to observe all regulations regarding it, and I am unaware of any violation of the Honor Code by others.” Plagiarism is an Honor Code violation. It is defined as representing another person’s words or ideas as one’s own. The course will include extensive discussion of the various forms of plagiarism, and will pay attention to the extra challenges presented by use of precise technical terminology. Note that paraphrasing is not equivalent to writing something in your own words, and is considered
You may not copy material from another person or any book, website, or other external resource. All ideas presented must be either 1) original with you or 2) must be attributed to the appropriate person and be properly cited.

**FINAL PAPER:** The last formal written assignment in the course is a research paper on a topic of the student’s choosing from a list of approved topics. This longer paper will require several types of references. This assignment will include several preliminary deadlines for topic choice and drafts.

**WRITING CENTER:** Students are encouraged to visit the Writing Center, where free assistance with writing is available from student peers. The Writing Center is found in the Little Library.

**GRADING:** First five, regular assignments: 50%, Final research paper: 15%, Critiques: 15%, Grammar assignments: 15%, Class participation: 5%. There will be no reviews or exams.

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<th>WEEKS</th>
<th>TOPICS</th>
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<td>3 - 6</td>
<td>Science news reports, quantitative reporting, causality, quantitative analysis of news reports. Grammar, punctuation, concision, plagiarism. Conjecturing about social ramifications. Writing for broad audiences, use of analogies, and use of diagrams/figures. Assignment #2: science news report. Rough draft due at end of Week 5. Peer review due at middle of Week 6, final draft due at end of Week 6.</td>
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<td>6 - 10</td>
<td>Introduction to nuclear physics. Separating opinion from scientific fact. Forming a balanced, objective argument. Grammar, punctuation, plagiarism. Quantitative argument, social ramifications. Assignment #3: Argumentative essay for or against nuclear power. Rough draft due at end of Week 8. Peer review due at middle of Week 9, final draft due at end of Week 9.</td>
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<td>10 - 13</td>
<td>Writing historical narratives. Writing about motivations and cause and effects. Grammar, punctuation, plagiarism. Assignment #4: science historical narrative. Rough draft due at end of Week 11, peer review due at middle of Week 12, final draft due at end of Week 12.</td>
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<td>14 - 17</td>
<td>Abstracts and research papers, grammar, punctuation, plagiarism. Assignments 5 &amp; 6: rough draft for #5 due at end of Week 13, rough draft for #6 due at middle of Week 15 (Dec 30). Final drafts for #5 and #6 (combined) due at end of Week 16, on Dec. 9. #5 peer review due on 11/22 and #6 peer review due Dec. 5</td>
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N.B.: The above outline is a *rough approximation* of the schedule. Adjustments may be necessary, but I will give ample notice before any changes are made. Any such adjustments will be noted on the class Moodle page.