

Discernment and Discourse (DISC 1313): Writing for Science and Engineering

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Class Meeting: Dallas Hall 105 (M-F, 8 AM - Noon)

Office: Fondren Science 7 – this is on the ground floor.

Course Description

This section of DISC 1313 is for students in the areas of engineering, science, mathematics, and technology. The focus is developing writing skills, rhetoric, and awareness of content standards students need to succeed in SMU undergraduate courses and beyond; in graduate and professional training; and in careers.

Good writing is enabled by extensive reading. Examples of good writing will be assigned for close reading, and will be selected from landmark papers and articles in topics relevant to major courses of study of students in the class. The most prevalent forms of communication will be studied, including peer review journal articles, biographies, correspondence, resumes, funding proposals, and oral presentations.

Because of the large volume of reading required to maintain up-to-date knowledge of a technical field, writing is typically compact, direct, and precise. Simple declarative sentences are highly valued. Students will practice editing the organization and text of documents to achieve economy and clarity.

Technical-themed communications have unique components. There will be special emphasis on these characteristic features. For example, the stated “student learning outcome” (below) of “demonstrating proper usage” will expand to include practicing correct implementation of graphs, tables, and equations.

We will exploit to the intensive nature of a Maymester course to do a lot of in-class writing, editing, and one-on-one coaching.

SMU Student Learning Outcomes (SLO): Discernment and Discourse

- Students will state and defend a thesis with adequate attention to analysis and evidence.
- Students will demonstrate an understanding of essay and paragraph development and organization.
- Students will craft sentences with attention to audience, purpose, and tone, as well as sentence variety and diction.
- Students will demonstrate proper use of grammatically and mechanically correct English.
- Students will incorporate and document sources correctly and appropriately.

Knowledgeable use of all the SLOs will come into play in all class assignments. Class time will be devoted to a mixture of lectures, student presentations, and student-led discussion, with an emphasis on the latter.

Texts

- “The Sense of Style: The Thinking Person’s Guide to Writing in the 21st Century”, Steven Pinker, 2014, Viking Press. Chapters from this text will be assigned for nightly reading, as the course progresses.
- "Disturbing the Universe" (1979), Freeman Dyson. Students must read this before the course begins.
- A copious number of journal article examples (available through the SMU library).
- Note: this list may strike you as being thin, short, or easy. Do not be misled by the brevity of this list into thinking the reading will be a breeze. As you are likely aware, science writing spans a range from “fun and entertaining” to “extremely difficult”. Through practice, you will learn to get something useful out of even the most impenetrable articles. You will learn effective writing by reading journal articles.

Topics

- Formal scientific journal articles
- Correspondence (formal letters and email)
- R sum s (you will produce a r sum  for use in job fair and internship applications)
- Presentations (presentation software and making effective slides; public speaking)
- Proposals (obtaining project funding)
- Opinion editorials (how to read and write this specific genre)
- Interviews (being interviewed and effectively reading interviews)
- Conferences (submission process and final proceedings)
- Tools-of-the-trade: literate graphs, tables, figures, abstracts, type-setting software, etc.

Assignments

- In most class meetings, two-student teams will be “rapporteur”, collecting input in advance from other students to lead a critical discussion on various themes, such as:
 - “best argument in the article we read last night”
 - “interesting sentences and effective phrases in the assignment”
- Students will learn to use online text analysis tools to analyze writing and provide feedback about complexity, clarity, and statistical properties (word counts, keywords, lexical diversity, etc.). For example, see: <http://textalyser.net/>.
- Develop and practice oral and visual presentation strategies and skills, by making a presentation to the class on a recently completed laboratory experiment.
- Exercise and improve written communication in letters and emails.
- Write an editorial on a technical subject relevant to public policy.
- Summarize a single article, in written and presentation form. This is practice for working in a technical team and communicating knowledge. This will be done as a “quick turn-around” assignment – email the assignment (with warning of when it will happen) on the afternoon before morning class. You will have only a few hours to read the article, summarize it, and construct your response.
- Final project: write a review paper, synthesizing observations from a collection of writing on a unified topic, and utilizing key elements learned in class. Students will be free to choose a topic in consultation with instructor, drawn from the literature of biology, chemistry, physics, engineering, medicine, math, etc.

Course Schedule:

- 14-May-15: Discussion of “Disturbing the Universe”. Science biographies. Writing your own résumé and biography.
- 15-May-15: Overview of journal article style; form 2-student teams; student discussion of goals; discussion of résumé assignment; reading assignment from “Style”
- 18-May-15: Tools of trade (graphs, tables, equations, etc.). Training in SMU Library to use resources for research. Assignment of term paper (4-8 pages) due at end of course. Science editorial form and style.
- 19-May-15: Writing style tips: discussion and examples; Analysis of journal articles about climate change. Writing assignment on climate change.
- 20-May-15: Editorial due (2 pages at most). Analysis of journal articles about food safety (pesticides, GMOs, irradiation) and animal testing of drugs. Writing assignments on food safety and animal testing.
- 21-May-15: Analysis of journal articles about space exploration (comet missions, space station, Moon, Mars). Writing assignment on space exploration. “Article quick-summary” assignment due.
- 22-May-15: Writing style tips: discussion and examples. Analysis of journal articles about exercise physiology and sports physics (baseball, limits of human endurance). Writing assignment on sports.
- 25-May-15: Memorial Day (Holiday)
- 26-May-15: Effective communication: letters and email. Assignment: letter about your term paper topic.
- 27-May-15: Writing style tips: discussion and examples. Analysis of journal articles about earthquakes in Irving, Texas. Writing assignment on earthquakes.
- 28-May-15: Working on term paper and editing.
- 29-May-15: Research term paper due. Student oral presentations on research papers. Final exam (1 hour).

About the Professor

I am an Adjunct Professor in Physics at SMU, and received my Ph.D. in experimental particle physics from The University of Texas at Austin. I periodically teach Phy3305, “Introduction to Modern Physics” (relativity, quantum mechanics, nuclear physics and atomic physics), and developed the course CF3337, “Nuclear Physics and Society”. Since 2007 (with Prof. Hopkins of the SMU History Department), I have taught “The Secret City: Los Alamos and the Atomic Age” at SMU-in-Taos.

My career in physics has included designing and planning experiments for the Superconducting Super Collider Laboratory, and searching for rare kaon, pion, and muon decays at Brookhaven and Los Alamos Laboratories. In Summer, 2015, I will be collaborating with an international team to measure the precise location of melted fuel in the damaged Fukushima Daiichi nuclear reactors. My continuing research interests include particle physics and cosmic ray physics. I have authored or co-authored over 40 scientific papers.

In recent years, I have also worked in business, applying quantitative techniques to managing investments.