

**USC Marshall School of Business**  
**DSO 699: Special Topics in Data Sciences and Operations**  
**Spring 2021 – Workshop on Expository Writing in Mathematics**

**Professor:** Vishal Gupta  
**Meeting Time:** W 9 am to 12pm  
**Class Dates:** Weekly from 10 March 2021 to 28 April 2021  
**Zoom Meeting Link:** Prepopulated on Blackboard site  
**Office:** See Zoom and Slack  
**Email:** None! **Use Slack only.**  
**Office Hours:** *By appointment only*

**Course Description**

This is a Ph.D. level *workshop* focused on **clear expository writing for mathematical disciplines.** Its structure will mirror writing composition classes at good liberal arts schools and will generally involve

- Limited lecture from me (Vishal)
- Students writing short pieces *every week*
- Students editing peer work with feedback *every week*

We will cover guidelines for structuring proofs (including notation and layout), breaking down a larger argument for clarity, formulating impactful introductions and literature reviews, and creating high-quality supporting visualizations.

Over the entire course, students will also incrementally edit/revise a larger document they are working on (e.g., the summer research paper, a first journal draft, or a conference publication.)

***Note: This class will only have 8 sessions and will meet in the second half of the semester.***

**Should I take this class?**

Why take a dedicated course on mathematical writing at all? The answer is simple: writing is hard. Many students (and some faculty) believe you can learn to write well “on the fly,” i.e., as you draft novel research results for publication. Unfortunately, this strategy is incredibly challenging because it conflates two hard tasks: learning to write and learning to perform research. Said another way, learning to write well is very difficult if your subject matter is an idea that you and your advisor only fully understood last week. By disassociating the subject matter from the act of writing, itself, this course hopes to help students refine their skills as expositors without having to struggle through the underlying mathematics.

**Learning Objectives**

By the end of the course, student should be able to

- Critically assess the clarity of a written proof and make constructive suggestions to restructure it and improve notation
- Analyze the structure of longer documents/arguments to reorganize them for maximal clarity
- Explain how audience and venue affect the presentation of mathematical writing
- Create high-quality supporting visualizations for the writing

**Required Materials**

There is no required textbook for the course. Lecture notes, class readings and recordings will be distributed through Blackboard/Slack.

**Office Hours/Contacting Me:**

*I will not be using email for this course.* We will attempt to use Slack to replace email. Hence, I will NOT respond to any emails sent to me about course materials. Please instead send me a Slack Message. Slack is available (for free) to all USC students and you should automatically be enrolled in the class channel. If you aren't, send me a slack message and I will add you. Familiarize yourself with slack and how to use it on IT's website: <https://cio.usc.edu/digital-campus-slack/>

Occasionally, you may need to contact me about a private matter. In that case, please use the direct message feature. If upon reading your message, I deem it should be public, instead, I might ask you to resend to the public class slack channel so that all students can benefit from the question.

I will do my best to respond promptly to slack messages. Some common emoji's we will use in this course are listed on blackboard and our first pinned Slack message.

1-on-1 office hours are available at any time by appointment. Slack Me and we'll schedule a time.

Please keep in mind that Slack is as much part of the academic environment of this course as is class-time. Hence, please keep language professional (but fun!). You know how to be a good citizen. Just do what you know.

**Prerequisites and/or Recommended Preparation:**

There are no formal prerequisites for the course but our examples in class will be drawn from a variety of topics in undergraduate and master's level mathematics: basic probability theory, basic graph theory, basic optimization, etc. Since the focus is on writing, students should always approach the professor early about any unclear mathematical ideas so they can focus on exposition. Any students concerned about their background ability should reach out to the instructor to discuss their particular situation.

**Course Notes:**

All meetings for this course will be online over ZOOM. Please log-into class using your USC Zoom account. Note, if you're a Marshall student or have a personal zoom account, you may have multiple log-ins. If you use an account other than your USC zoom account, you will be placed in a "Waiting Room" upon entry. To avoid this, please use your USC zoom account. I will only allow participants in from the waiting room BEFORE class starts. So if you're late or if your internet drops-out, you won't be able to re-join. It's better in general to just use your USC account.

As an experiment, the course will be using its Slack channel extensively to distribute materials, lecture slides, make announcements. Part of the rationale is I would like to encourage discussion among students to coordinate working on homework together, sharing materials, and in general building their academic community. All that said, if Slack turns out to be too difficult to use, we will transition back to Blackboard.

**Grading Policies:**

There will be several graded deliverables for the class:

- Pre-Class Assignments: Each of the 8 sessions will have a pre-class assignment, typically due on Sunday 5pm. These assignments may include readings and short writing exercises.
- Post-Class Assignments: Each of the 8 sessions will have a short post-class assignment, typically due on Friday at 5pm.
- Final Write-Up: After the course completes you will turn in a reflection piece discussing the changes that you made over the semester to your longer written paper.

All deliverables should be typed up and formatted nicely in LaTeX.

In addition, participation in discussion and “Zoom-Etiquette” and Slack participation will contribute to your final grade. This is a workshop course. Giving and receiving feedback is a critical feedback.

### **Policy on Group Work**

Group discussion is STRONGLY encouraged throughout this class with other students in the class. Throughout your PhD, your peers will always be your best resource. Use them.

That said, to develop your own writing, you must write on your own. Hence, all assignments will be either marked as “No Group Work” or “Group Work Allowed.” For “No Group-Work” assignments, please complete them on your own, without the help of external editors or feedback from other readers. For “Group Work Allowed,” please feel free to ask your peers for help editing or giving feedback on your work.

For “Group Work Allowed” assignments, you MUST always list the names of students you collaborated with on the deliverable under your name, with a brief description of their contribution.

For example, on my assignment, I might write:

Collaborated with: John Snow (provided feedback on first draft of problem 1), Sansa Stark (helped edit problem 2), Tyrion Lannister (explained the math behind problem 3, but did not show me his solution)

### **Grading Breakdown:**

<b><u>Assignment</u></b>	<b><u>% of Total Grade</u></b>
<b><u>Participation/Discussion</u></b>	<u>10%</u>
<b><u>Pre-Class</u></b>	<u>40%</u>
<b><u>Post-Class</u></b>	<u>40%</u>
<b><u>Final Reflection Piece</u></b>	<u>10%</u>
<b><u>Total</u></b>	<u>100%</u>

### **Synchronous session recording notice**

All sessions of the course will be recorded and provided to all students enrolled in the course (and officially auditing non-USC students) via Slack (or, failing slack, BB). Consequently, it is also important that students respect USC’s policy and do NOT share any of the course content outside the course. This includes recordings, lecture notes, or other materials. For clarity, from SCampus:

*SCampus Section 11.12(B)*

*Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).*

### **Zoom Etiquette Expectations**

Online-learning brings some additional challenges outside the usual environment. I expect students to bring the same curiosity, engagement, and professionalism that they would normally in an in-person class.

To that end, students are required

- To ensure they are in a quiet, private place to attend class. They should be able, if called upon, to unmute and participate in discussion.
- To ensure they have adequate technology and internet access to attend class without disturbance. If you have particular technology concerns, please reach out to me ASAP to discuss.
- To be familiar with Zoom: How to share screen, present, mute/unmute audio, raise your hand, ask for a coffee-break, etc.
- To keep their cameras on during class-time and mute their microphones when not speaking
- To participate in breakout rooms and discussion.

In summary, you know how to be a good student and a good citizen. Just do what you know.

## ADDITIONAL INFORMATION

### USC Statement on Academic Conduct and Support Systems

*Explanation - This section, or an enhanced version, is required by the University. You are free to enhance the content as you deem necessary within the structure of the following.*

#### Academic Conduct:

Students are expected to make themselves aware of and abide by the University community's standards of behavior as articulated in the [Student Conduct Code](#). Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" <https://policy.usc.edu/scampus-part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

#### Support Systems:

It is important to recognize that distance learning is hard. The online platform is difficult, but being isolated, especially in a process as challenging as Ph.D., is also hard. Please look out for one another. If you are feeling overwhelmed, reach out. You may always reach out to me or to your classmates. In other circumstances, you might feel more comfortable reaching out to one of the resources below.

*Counseling and Mental Health - (213) 740-9355– 24/7 on call*

<https://studenthealth.usc.edu/counseling/>

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](https://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call*

<https://studenthealth.usc.edu/sexual-assault/>

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298*

[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[https://usc-advocate.symplicity.com/care\\_report/](https://usc-advocate.symplicity.com/care_report/)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](http://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC is committed to making reasonable accommodations to assist individuals with disabilities in reaching their academic potential. If you have a disability which may impact your performance, attendance, or grades in this course and require accommodations, you must first register with the Office of Disability Services and Programs ([www.usc.edu/disability](http://www.usc.edu/disability)). DSP provides certification for students with disabilities and helps arrange the relevant accommodations. Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to your TA) as early in the semester as possible. DSP is located in GFS (Grace Ford Salvatori Hall) 120 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776. Email: [ability@usc.edu](mailto:ability@usc.edu).

*USC Campus Support and Intervention - (213) 821-4710*

<https://uscса.usc.edu/>

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu) Non-emergency assistance or information.

## COURSE CALENDAR

The details of the course calendar are subject to change depending on the pace of the class.

<b>Session</b>	<b>Topic</b>
1	The Pattern Perception Hypothesis.
2	Contrasting different approaches to the same proof.
3	Mechanics of writing cleaner proofs
4	Structuring Long Arguments
5	Interpreting a theorem for your reader
6	Making Impactful Graphs and Tables
7	The Introduction: The only part of a paper most people read
8	Tightening your Writing