CLEAR SCIENTIFIC WRITING: COURSE PROGRAM 2024

COURSE OVERVIEW

OBJECTIVES

Improve participants' ability to write clearly about science for both scientists and non-scientists.

FORMAT AND CONTENT

Four-week online short course. Live sessions will include lecture, interactive exercises, hands-on practice, and Q+A. Short homework assignments will reinforce the concepts and offer additional hands-on practice. The course will incorporate writing examples of particular relevance to clinicians and researchers working in HIV and HIV treatment.

COURSE SCHEDULE

	April 2	April 9	April 16	April 23
Weekly theme	**Principles of clear and concise writing**	**Writing better sentences**	**Writing better paragraphs and documents**	**Writing for non-scientist audiences**
Session A 16:30-17:45	Hallmarks of clear and unclear writing; Cutting clutter	Improving sentence structure	Organizing paragraphs and documents	Avoiding the curse of knowledge
Session B 18:00-19:15	Writing with verbs	English grammar review	Establishing good writing habits	Prioritizing information for non-scientists

DETAILED SCHEDULE

WEEK 1, APRIL 2: PRINCIPLES OF CLEAR AND CONCISE WRITING

SESSION A, 16:30–17:45: INTRODUCTION; HALLMARKS OF CLEAR AND UNCLEAR WRITING; CUTTING CLUTTER

MODULE 1.1: COURSE INTRODUCTION

- Overview of course goals and expectations
- The problem of poor writing in the scientific literature

MODULE 1.2: RECOGNIZE INEFFICIENCIES: HOW TO SPOT CLEAR AND UNCLEAR WRITING

- Examples and hallmarks of clear and unclear scientific writing
- Before-and-after examples of how writing passages can be improved with strategic changes

MODULE 1.3: CUT CLUTTER: STRATEGIES TO STREAMLINE PROSE

- Cutting common sources of clutter:
  - dead-weight phrases
  - empty words and phrases
  - long words and phrases that could be short
  - superfluous jargon and acronyms/abbreviations
  - adverbs
  - unnecessary hedge words
  - negative constructions

SESSION B, 18:00–19:15: WRITING WITH VERBS

MODULE 1.4: WRITE WITH ACTIVE VOICE: HOW TO AVOID PASSIVE CONSTRUCTIONS

- Recognizing passive and active voice
- Using active voice to construct more readable sentences
- Discussion of when to use active voice and when to use passive voice

MODULE 1.5: PRIORITIZE VERBS: HOW TO STRENGTHEN AND SPEED UP SENTENCES

- Recognizing abstract nouns formed from verbs
- Replacing empty abstract nouns with more straightforward verbs
- Common abstract-noun problems in scientific writing and how to fix them

OUTCOMES:

After Week 1, participants will be able to:

- Differentiate well-written from poorly written prose
- Recognize the problem of poor writing in the scientific literature
- Spot and eliminate clutter in scientific writing
- Recognize passive voice and replace it with active voice and strong verbs
- Identify abstract nouns that can be made more concrete with verbs
- Choose verbs that make sentences flow more smoothly
- Craft text that conveys ideas clearly and concisely

WEEK 2, APRIL 9: WRITING BETTER SENTENCES

SESSION A, 16:30-17:45: IMPROVING SENTENCE STRUCTURE

MODULE 2.1: ANATOMY OF A SENTENCE: STRATEGIES FOR SIMPLIFYING SENTENCES

- Dissecting the structure of complicated sentences
- Knowing when to end a sentence
- How to keep subject and verb close together at the beginning of the sentence
- Reducing dependent clauses
- Using parallel syntax

MODULE 2.2: THE PUNCTUATION TOOLBOX: HOW TO VARY SENTENCE STRUCTURE AND CONNECT IDEAS

- Review of comma, semicolon, colon, dash and parentheses
- Knowing when and when not to use each type of punctuation
- Using punctuation marks to increase complexity of ideas while maintaining readability
- Using punctuation marks to connect ideas

SESSION B, 18:00-19:15: ENGLISH GRAMMAR REVIEW

MODULE 2.3: ENGLISH GRAMMAR CHECKLIST I

- Review and examples of:
    - Common punctuation and capitalization mistakes
    - Common spelling errors
    - Definite and indefinite articles (the, an, a)

MODULE 2.4: ENGLISH GRAMMAR CHECKLIST II

- Review and examples of:
    - Rules for writing with numbers
    - Subject-verb agreement
    - Modifiers

OUTCOMES:

After Week 2, participants will be able to:

- Recognize effective sentence structures
- Simplify and streamline complicated prose
- Use parallel syntax
- Understand proper use of the comma, semicolon, colon, dash, and parentheses
- Use punctuation to vary sentence structure and connect ideas
- Identify and fix common English grammar mistakes

WEEK 3, APRIL 16: WRITING BETTER PARAGRAPHS AND DOCUMENTS

SESSION A, 16:30-17:45: ORGANIZING PARAGRAPHS AND DOCUMENTS

MODULE 3.1: ORGANIZING PARAGRAPHS: HOW TO WRITE CONCISE, CLEAR PARAGRAPHS

- How to keep paragraphs to one main idea
- Using logic to improve paragraph flow
- Reducing repetition in paragraphs
- Beginning and ending a paragraph powerfully

MODULE 3.2: ORGANIZING DOCUMENTS: HOW TO CREATE EFFICIENT, EASY-TO-NAVIGATE DOCUMENTS

- Connecting the flow of ideas between paragraphs and between sections
- Reducing repetition across a document
- Using subheadings effectively
- Incorporating white space strategically
- Replacing text with visuals

SESSION B, 18:00-19:15: ESTABLISHING GOOD WRITING HABITS

MODULE 3.3: DISSECTING THE WRITING PROCESS

- Identifying the steps: prewriting, writing, revision
- How to benefit from prewriting and revision

MODULE 3.4: CREATING GOOD WRITING HABITS

- Getting started
- Dealing with writer's block
- Meeting deadlines
- Editing your own writing
- Strategies for improving efficiency and reducing procrastination

OUTCOMES

After Week 3, participants will be able to:

- Craft organized, easy-to-read paragraphs
- Begin and end paragraphs effectively
- Establish a coherence of ideas within and between paragraphs
- Create document-level structure for easy navigation
- Recognize the importance of prewriting and revision
- Establish good writing practices

WEEK 4, APRIL 23: WRITING FOR NON-SCIENTIST AUDIENCES

SESSION A, 16:30-17:45: AVOIDING THE CURSE OF KNOWLEDGE

MODULE 4.1: UNDERSTANDING YOUR AUDIENCE

- Understanding the curse of knowledge
- Recognizing jargon
- Recognizing "scientist speak"
- Understanding that acronyms and abbreviations impair readability

MODULE 4.2: ADAPTING PROSE FOR THE AUDIENCE

- Avoiding jargon, acronyms, and "scientist speak"
- Explaining/unpacking essential scientific concepts
- Signposting and connecting the dots for non-scientists
- Unpacking quantitative information for non-scientists

SESSION B, 18:00-19:15: PRIORITIZING INFORMATION AND COURSE WRAP-UP

MODULE 4.3: PRIORITIZING INFORMATION FOR THE AUDIENCE

- Giving away the punchline first
- Filtering out unnecessary precision
- Filtering out details that are unimportant for non-scientists
- Inverted pyramid style

MODULE 4.4: STEP-BY-STEP EXAMPLES

- Step-by-step examples of translating scientific abstracts into lay abstracts

MODULE 4.5: COURSE WRAP-UP

- Wrap-up, discussion, reflection on next steps

OUTCOMES

After Week 4, participants will be able to:

- Understand the needs of a non-technical audience
- Understand "the curse of knowledge"
- Identify the information most useful to non-scientist audiences
- Remove unnecessary details and unnecessary jargon
- Unpack scientific concepts for non-scientists
- Reorganize writing to suit different audiences
- Express quantitative information clearly

INSTRUCTOR BIOS

REGINA NUZZO, PHD

Regina Nuzzo is an award-winning science writer, statistician, communicator and professor. She earned her PhD in Statistics from Stanford University and received a graduate certificate from the Science Communication Program at the University of California, Santa Cruz. She is a Professor of Mathematics at the bilingual Gallaudet University in Washington, DC, and the Senior Advisor for Statistics Communication and Media Innovation at the American Statistical Association. She writes and speaks about probability, statistics, science, health, medicine, communication, and other topics for a variety of audiences.

Dr. Nuzzo's popular science writing has been published in *New York Times*, *Los Angeles Times*, *Scientific American*, *New Scientist*, *Cancer Today*, *ESPN Magazine*, *Science News*, *Time* books, *Prevention*, *AARP Magazine*, *30-Second Data Science*, and *Reader's Digest*, among others. For *Knowable* magazine, she collaborated with a science visual artist to create an illustrated graphic feature on statistical issues in forensic science.

Dr. Nuzzo also specializes in communicating technical and statistical concepts to scientific audiences. Her scientific writing has appeared in *Nature*, *Proceedings of the National Academy of Sciences*, *Biomedical Computational Review*, and *Physical Medicine & Rehabilitation*. Her 2014 feature on p-values won the ASA Excellence in Statistical Reporting Award.

In addition to teaching undergraduate and graduate statistics at Gallaudet University in American Sign Language, Dr. Nuzzo has taught statistics communication as an adjunct instructor at Virginia Tech. She has also given workshops and short courses in quantitative communication for the MIT Knight Science Journalism Program and the US Department of Health and Human Services, among others.

Dr. Nuzzo has been invited to speak on statistics and science communication in a dozen countries, including plenary talks for conferences by the American Psychological Association, the Association of University Anesthesiologists, and the American Association for Public Opinion Research. She was featured in PBS's NOVA episode *Prediction by the Numbers*.

KRISTIN SAINANI, PHD

Kristin Sainani (née Cobb) is an associate professor at Stanford University in the Department of Epidemiology and Population Health. She received her BA in biology and philosophy at Dartmouth College; received her MS in statistics and PhD in epidemiology at Stanford University; and subsequently earned a graduate certificate in science writing from the Science

Communication Program at the University of California, Santa Cruz. She writes about health, science, and statistics for a range of audiences; works on statistical projects in sports medicine; and teaches statistics and writing.

Dr. Sainani authored the health column Body News for *Allure magazine* for a decade. She has authored the statistics column Statistically Speaking for the journal *Physical Medicine & Rehabilitation* since 2009. She has also written for *Science News*, *Stanford Magazine*, *Biomedical Computation Review*, *Stanford Medicine Magazine*, *Muse Magazine*, *Nature Outlook*, the *Dartmouth Alumni Magazine*, *Sense About Science*, the American Chemical Society, and the National Science Foundation.

Dr. Sainani has authored more than 100 articles for academic journals. She serves as the statistician on projects in sports medicine and oversees statistical analyses for graduate students working on a range of clinical topics. She is an associate editor for the *International Journal of Environmental Research and Public Health*; *Research Quarterly in Sport and Exercise*; and *The American Journal of Sports Medicine*. She is the statistical editor for the journal *Physical Medicine & Rehabilitation* and the associate editor for statistics at *Medicine & Science in Sports & Exercise*. She also serves on the *Journal of Sports Sciences* Statistics and Research Design Advisory Group.

Dr. Sainani is an award-winning teacher and a pioneer in online learning. At Stanford, she has received three Excellence in Teaching Awards from the graduate program in epidemiology and was the recipient of the 2018 Biosciences Award for Excellence in Graduate Teaching. Her online courses in statistics and writing have reached more than half a million learners. Currently, she offers an online medical statistics certificate program through the Stanford Center for Professional Development and teaches the popular Massive Open Online Course (MOOC) Writing in the Sciences on Coursera. *Writing in the Sciences* was highlighted as one of the 21 Best Coursera Classes by *New York Magazine* in 2020 and has been translated into 11 languages.

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