

# AS.491 ( SCIENCE WRITING)

## Courses

### AS.491.658. Techniques of Science and Medical Writing. 4 Credits.

This core course develops and hones the reporting, creative, and explanatory skills demonstrated by the best science and medical writers. The course features writing assignments and exercises in journalistic and literary writing, plus interviewing, ethics and the use of scientific journals and databases. In some cases, students may be able to choose from a range of writing topics, including nature, technology, health, space, biology, medicine, or other scientific issues. Science Writing students should complete this course before enrolling in any writing workshop. Departmental approval and a writing sample required for students not enrolled in the Science Writing Program.

### AS.491.673. Science and Medical Writing Workshop. 4 Credits.

In a writing workshop, students receive professional guidance in translating complex scientific, medical, or technological knowledge and research into graceful, lucid prose. Students submit individual essays or articles, or parts of a larger work in progress. Writing submissions are critiqued by peers as well as by the instructor, then revised. Students are encouraged but not required to take this course from different instructors. (The three section numbers designate the academic term in which the workshop is offered. Students earn workshop credit by taking any section number multiple times, or by combining any sections.) Prerequisite: 491.658 or 491.750 (or 490.656 for MA in Writing students).

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### AS.491.675. Science and Medical Writing Workshop. 4 Credits.

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### AS.491.680. Writing the Tech Story Workshop. 4 Credits.

This workshop course explores the reporting and writing techniques used to produce compelling stories about technology, its inventors, and its consumers. Students first analyze outstanding examples of technology writing on a range of subjects, forms, and styles, from hard news to creative nonfiction. They then submit their own writing about technology for standard workshop discussion. Special topics include making technology interesting to the non-geek and avoiding a tendency to sound promotional about consumer goods. Guest speakers who specialize in technology writing will discuss how to attract readers and find work in the field. This course counts as a workshop for degree or certificate requirements. Prerequisite 491.658 or 491.750

### AS.491.691. Science Policy, Funding and Politics. 4 Credits.

This Residency course, intended to be onsite in Washington, D.C., explores how science, medicine and technology are affected by politics and practices within government, the private sector and within the fields themselves. Students use the evolution of science policy as context for discussion, research, and writing about contemporary issues. Students meet with leaders from Capitol Hill, the White House, and federal agencies, and they visit important sites relevant to science policy.

### AS.491.696. The Nature of Nature. 4 Credits.

This reading course focuses on the species and phenomena that make up "nature" (the outdoors, ecosystems) and human interaction with nature. Students analyze books, essays, and articles from writers who tell stories ranging from the gripping outdoor adventure to the reflective yet penetrating personal essay. Students will also engage in immersive nature writing exercises. For this course, you will be taking a step into the wild. Nature writing is considered a subset of science writing. Readings may include authors such as David Quammen, John McPhee, Elizabeth Kolbert, Gretel Ehrlich, Camille T. Dungy, Helen Macdonald, Kathryn Schulz, Latria Graham, Robin Wall Kimmerer, and Bonnie Tsui.

### AS.491.697. The Literature of Science. 4 Credits.

In this reading elective, students analyze books, magazine articles, and newspaper series to discover how the best science, medical, nature, and environmental writers create compelling, entertaining, factual literature. Craft topics include structure, pace, sources, content, explanatory writing, and clear, lyrical language. Assignments may include brief reviews and a team presentation of an assigned book. Featured authors vary from one semester to the next; past courses have read works by Atul Gawande, Rachel Carson, Sushma Subramanian, Daniel Duane, Lauren Redniss, Emma Marris, Michael Pollan, John McPhee, and Elizabeth Kolbert, among others.

### AS.491.700. Subatomic Writing. 4 Credits.

This elective examines writing on the particle level: sound, syntax, punctuation, rhythm, and pacing. Together, these elements can generate meaningful, understandable, and nuanced content. How does sound echo sense? How does the spin of syntax affect the flavor of the sentence? How does pacing affect the joke? Writers who know the laws of language can navigate them with flexibility or break them with aplomb and purpose. Momentum and energy at these basic levels keep readers engaged and make editors and agents sit up with interest. This elective with workshop elements asks students to bring their favorite sentences from literature and analyze why they work at the most fundamental levels. Class discussions on VoiceThread or other online tools allow students to interact with sound and old-school sentence diagrams. Students will then create science writing projects crafted at the quantum level without losing sight of global goals and overall quality. Science writers who feel like weak bosons when it comes to voice, style, grammar, and punctuation will particularly benefit from this course.

**AS.491.701. Communicating Climate Change. 4 Credits.**

This elective course will focus on engaging and educating the public regarding climate change, the most serious environmental issue of our time. Students will read, listen to, and view journalism and other forms of communication that address the topic, to learn how top science writers inform and inspire the public. They will consider challenges to effective communication; ways of finding reliable sources, confirming data, and countering misinformation; and strategies for reporting accurate and solutions-based stories. They will participate often and actively on discussion boards to share their learning and ideas and will complete several writing exercises and assignments including a story pitch. Guest speakers will present real-world experiences and expertise.

**AS.491.702. The Funny Side of Science. 4 Credits.**

In this course, students will learn the basic techniques of humor writing and how to include humor effectively in science writing. Aided by funny weekly readings and completely serious class discussions, students will analyze their favorite comedic writings and discover their own style of humor. Students will write and workshop several funny science essays/articles.

**AS.491.704. Science Writing for Change. 4 Credits.**

Science Writing for Change (SWFC) focuses on science writing as a direct tool for action. We will review the difference between opinion and news, discuss ethics and boundaries as journalists, delve into opinion writing using evidence to support arguments, study rhetorical techniques, and focus on the writing tools of advocacy. Students will use science writing skills to research and write opinion pieces to advocate for something specific and promote a call to action. Students will examine and discuss many samples of opinion pieces. Each student will choose a topic and angle—a local, state, regional, or national issue related to science, medicine, technology, nature, landscape, or the environment; conduct research (including interviews) to understand the issue and gather information; determine all sides of the issue, including the opposition and other stakeholders involved; develop arguments and evidence; determine specific calls to action; and craft persuasive and informative prose using all the techniques of science writing. Students will also research publication outlets for these pieces, such as local, regional, and national newspapers or trade magazines, including studying audiences and contemplating how to reach those who might think differently (e.g., science denial), and pitch and submit one piece for publication. Pre-requisites: Students should have taken a foundational core class (AS.491.658 or AS.491.750) before registering for this class.

**AS.491.705. Storytelling with Data. 4 Credits.**

Discover the power and impact of data-driven stories. Through case studies and hands-on experience, students will explore the art of sourcing, analyzing, and verifying data, while applying narrative skills to write compelling data-driven stories about science, medicine, and technology. Engage in discussions about the biases buried in data, the influence data has on our lives, the channels for mis- and disinformation, and the unique ways in which data storytelling can enhance reader engagement. Learn to work with three key aspects of data storytelling: sourcing the data, presenting the data (often called visualization), and writing narratives that unpack hidden messages. This writing elective opens with a 4-week introduction to data, including data sourcing, analysis, and verification, with user-friendly tools that don't require deep technical skills. Accompanying readings will focus on best practices in data journalism, with examples of compelling data-driven stories. In preparation for writing their own data-driven stories, students will examine case studies that demonstrate how data is collected, transformed, analyzed, and interpreted to forge engaging narratives and accompanying visuals. Following the case studies, students will share their data-driven stories and critique their classmates' work. By the end of the course, students can expect to have a solid foundation in data literacy and the ability to tell stories with data. Prerequisite: AS.491.658, AS.491.750, or permission of your academic advisor.

**AS.491.707. Prizewinners: The Best Writing about Science, Technology, Environment & Health. 4 Credits.**

Whether the author has received a National Magazine Award, a Pulitzer, a Peabody award for electronic media, or a lesser-known writing award, the readings in this course offer lessons in reporting and writing for any science writer. Assigned readings and multimedia may include articles, essays, books, or podcasts. Prizewinning guest authors visit the class, by video or tape, to discuss how they created their winning work. Students may join in team or individual presentations, with several options for a final writing assignment.

**AS.491.708. Medicine in Action. 4 Credits.**

There are few topics more fascinating than medicine in the United States. The U.S. offers some of the world's best clinicians, technology, and biomedical scientists. At the same time, it has perhaps the most Byzantine, expensive, and inequitable health system in the world. Life and death, near-miraculous procedures, frustration, elation, desperation, and discovery—the panoply of human experience plays out daily in a major research hospital like Johns Hopkins. Of course, our society's larger social challenges—such as gun violence, chronic diseases, and extreme socioeconomic inequity—spill over into hospital hallways and create countless human dramas. For the committed science writer, the biomedical beat offers a career's worth of engaging, challenging stories. Medicine in Action is an intense, immersive experience based at the world-renowned Johns Hopkins Hospital and School of Medicine in Baltimore. Students observe doctors and nurses in action, hear patients' stories, and meet with biomedical researchers. In past courses, students have attended surgery, joined a medical resident on rounds, and interviewed a Nobel laureate. Students work on joint reporting projects, stretch their writing skills through exercises, and produce a medical story based on the week's experience.

**AS.491.709. Science in Action. 4 Credits.**

This Residency course takes students to the front lines of scientific research, with a focus on reporting skills, story idea development, and the craft of explanatory writing. Science in Action explores fields beyond medicine and health, including space, environment, energy, climate change, and other topics. The course involves field trips and lab visits, plus video and other links with visiting or out-of-town scientists. This Residency course is held in Washington, Baltimore, or other locations, as announced.

**AS.491.710. In the Field: Science Writing in the Woods, Coasts, & Labs of Mt. Desert Island. 4 Credits.**

Maine's Mount Desert Island, home to Bar Harbor and Acadia National Park, is a place of exquisite natural beauty. With thriving environmental science centers and a world-class genetics laboratory, the island is also a hub of cutting-edge research. This Residency course allows participants to immerse themselves in the region's stimulating natural and intellectual environments while honing their reporting skills, refining their writing artistry, and gathering information for stories. The course will include field excursions, group discussions, and independent writing/reporting time

**AS.491.711. Public Health in Action. 4 Credits.**

This residency course is a fast-moving journey into the world of public health. Students will come face-to-face with public health practitioners and researchers working on the world's most pressing health issues, as well as with journalists who cover the critical work they do. In presentations and meetings, public health researchers, practitioners, and advocates will discuss their work; and the instructor and guest journalists will offer guidance on public health reporting. Possible discussion or lecture topics: communicating the uncertainty of disease modeling, avoiding sensationalizing or downplaying a public health issue, explaining confusing concepts such as prevalence vs. incidence, and telling accurate and complete stories that present diverse perspectives. Students will develop their own story ideas on public health, receive coaching on publishing their writing, and may have the opportunity to contribute to a group writing project.

**AS.491.712. Discovering Science History in "The Athens of the North". 4 Credits.**

Empiricism, skepticism, reason – ideas central to modern science (and science writing)–flourished during the Scottish Enlightenment of the 18th and early 19th centuries. At Scottish universities and intellectual societies, thinkers and scientists such as James Hutton, Joseph Black, Mary Somerville, and James Watt advanced the fields of chemistry, medicine, engineering, and others. This course will travel back through the centuries to visit key sites and figures of this seminal period. Home base will be Edinburgh, named in the 18th century as "The Athens of the North" for its Greek-inspired architecture and explosion of new ideas. Activities will include talks with historians of science and medicine and visits to sites important to science heritage, such as the Royal College of Physicians (est. 1681) and Arthur's Seat volcano, where geologist James Hutton's research helped reveal that Earth is billions of years old. The group will also contemplate more recent Scottish science history (e.g., the cloning of Dolly the Sheep). Discussions will explore science history's place in today's science writing: As science and science journalism move apace, why bother to investigate science history? How and when might looking backward enrich a story about a contemporary scientific development? Moreover, science history itself proffers a trove of fascinating untold stories – How can writers find such historical gems? Students will also critically examine the writer's role in reckoning with historical events now perceived as negative. As we "fix our eye on the now distant point from which we have drifted" (Sir Walter Scott), what can we ascertain about that starting point, including its more troubling aspects? Finally, the course will provide practical guidance, including lessons on searching archives and pitching history-grounded science stories for publication. As a final assignment, students will write a science story that makes use of historical sources.

**AS.491.713. Science and Global Conflict. 4 Credits.**

This course explores the central role that science and scientists play in the most important global conflicts of our time. We'll study the nuclear science of the Cold War era and how Cold War science continues to shape today's global conflicts – the war in Ukraine, first and foremost. We'll look at how scientific ingenuity led to global warming and ecological destruction and also at how science can bring about policy solutions that resolve conflicts between competing nations. We'll look at how new technologies, such as drones and cyberwarfare operations, have changed how wars are fought and the dangerous implications of these new weapons. At every step of the way, as in all Science Writing courses, we'll approach these topics through the lens of the science writer. We'll explore the many different ways journalists can write about global conflicts and meet with war correspondents who have covered wars on the front lines. Perhaps most important of all, as we learn how to cover global conflicts, we'll also learn how to tell human stories, from the harrowing accounts of soldiers suffering from PTSD, to the struggles of families living in war zones. Poland, situated precariously between East and West, is an ideal setting for this residency. Krakow is less than a thousand kilometers from the Ukrainian border, and the city still bears the scars of the Soviet era. But Krakow has also emerged as a modern Western city, a home to leading scientific institutes (Jagiellonian University, Krakow University of Technology) and centers for international diplomacy (Centre for International Studies and Development). Students in the residency will visit these institutes and meet with their leading figures. Polish journalists, in turn, will visit our classrooms to discuss how they cover science and global politics.

**AS.491.748. Principles of Editing. 4 Credits.**

This hands-on course focuses on the art and craft of editing science nonfiction stories. Writing exercises and editing projects are designed to mimic work in a paying market, and you will learn to think like an editor as you work through each step in the process of crafting concise and compelling science articles—from pitch selection to developmental editing, line editing, copyediting, fact-checking, and proofreading. You will face the myriad factors editors must consider at every stage as you craft your own nonfiction story and edit the work of your colleagues. Students will also be introduced to new editing tools. This course will benefit any writer hoping to pursue an editing career, work with an editor, or sharpen self-editing skills. Prerequisite: 491.658

**AS.491.750. Contemporary Science and Medical Writing: Creative and Professional Forms. 4 Credits.**

This core course provides a broad foundation in the diverse forms and venues encountered in contemporary science writing careers. Students learn elements of classic forms, such as essay, profile, news article, and op-ed, and they explore magazines, institutional publications, literary journals, blogs, speeches, and even museum exhibit text. The course covers the differing goals of various forms and how they might be used in multimedia, social networks, and other digital communication. Guest speakers present real-world expertise, with students engaged in discussion, exercises, and writing assignments. Science writing students needing a stronger foundation should complete this course before enrolling in any writing workshop.

**AS.491.754. Science Narratives Workshop. 4 Credits.**

Students in this specialized workshop explore and write science narratives, an approach that joins scientific information and storytelling. Students read and discuss examples by authors such as Rebecca Skloot, Ferris Jabr, Sarah Zhang, Elizabeth Kolbert, and Dava Sobel, as well as write their own narratives. This course provides a workshop credit for science writers. Prerequisite: 491.658 or 491.750

**AS.491.755. Science Personal Essay and Memoir Workshop. 4 Credits.**

In this specialized workshop, students experiment with memoir and the personal essay as distinct forms and as an exploration of the self. Seminal essays are read to clarify students' thoughts and to help them develop their own voice and style in personal science writing. The topics of health, technology, environment, and other realms of science or medicine will be paramount, whether in reported content or within the personal experience, feelings or ideas of the writer. This course provides a workshop credit for science writers. Prerequisite: 491.658 or 491.750 (or 490.656 for MA in Writing students).

**AS.491.757. Science Profiles Workshop: Writing About People. 4 Credits.**

This workshop focuses on writing about people involved in science, medicine, technology, or policy. Students analyze models of the form, then report and write profiles of various lengths and purpose, from mini-profiles to quick features to longer, in-depth works. The course includes guest speakers who specialize in the research, interviews, and writing needed for effective, readable biographical works. This course provides a workshop credit for science writers. Prerequisite: 491.658 or 491.750

**AS.491.785. In the Wild: Science Writers Explore Montana's Wilderness and Wildlife Biology. 4 Credits.**

With its snow-capped mountains, icy trout-filled streams, glaciers, bison, and grizzly bears, Montana is a land of rugged natural beauty. It is also home to a unique set of environmental concerns. Those glaciers are melting. Invasive species threaten native habitats. The range and population of the grizzly are hotly debated. Research indicates climate change is increasing the size and frequency of wildfires. Students in this residency course will meet with scientists – wildlife biologists, ecologists, and wildfire management experts – who use Montana's lakes, mountains, forests, and animals as their laboratories to explore such issues. Students will also consider Traditional Ecological Knowledge, older Indigenous approaches to ecology, which are helping to inform today's science and policies. In field trips to sites of active research, students will practice reporting skills and gather story ideas; a previous class took excursions to a lakeside ecology research station; a fire science laboratory; and the Clark and Blackfoot Rivers, site of a Superfund success story and the inspiration for Norman Maclean's *A River Runs Through It*. Students will engage in craft discussions and creative writing exercises and be invited to take part in an open mic. The group will join with MA in Writing program students for lectures on Native American literature, culture, and science, and have a chance to attend nightly talks by eminent authors. Discussions will explore how writers can explain complex, nuanced environmental issues to broad groups of readers, and how writers have evoked the lyricism of Big Sky country in their prose.

**AS.491.802. Thesis and Careers in Science Writing. 4 Credits.**

This final degree program course involves the creation of a thesis and a final capstone experience that prepares a student for a writing career. Students should try to take this course after completing all other cores, workshops, and electives, although exceptions can be made in special cases. Thesis: Each student's thesis is created from work in earlier courses. Students revise and refine an individual portfolio that may include creative writing, journalism, multimedia, and/or communication writing. The first draft of a thesis is due in the first or second week of the thesis term; students spend the term revising that work under the direction of a one-on-one thesis advisor. Capstone: The group experience of the course requires each participant to develop a career plan that includes personal goals such as publication, job applications, or career advancement. Other capstone experiences may include attending science writing events or seminars, discussions of the changing business of writing, and participation in a thesis reading. Note: All thesis students should submit a Science Writing Thesis Planning Form at least one month before the course begins. Offered only in Fall and Spring terms.

**AS.491.807. Independent Study in Science Writing. 4 Credits.**

An independent study is reserved for science writing students who have special interests not covered in the program's curriculum. Most independent studies involve a student working one-on-one with a faculty member or other writer or editor. Students should submit an Independent Study proposal at least 60 days before the start of any term. The proposal must include work equivalent to a full-semester, graduate-level course; interested students should consult their adviser well in advance. Only students who have completed four courses or more are eligible to propose an independent study, and only a limited number are approved each year. The tuition for an independent study is the regular, single-course rate for the term in question. With adviser approval, this course counts as an elective or workshop.

**AS.491.808. Internship in Science Writing. 4 Credits.**

Internships are available to select students with advisor approval. Students should submit an internship proposal well in advance. With the advisor's help, students may develop their own internship where they live, or they may apply for existing internships at publications, companies, agencies or elsewhere. Internships usually are reserved for students who have completed four courses or more. In most cases, an internship counts as an elective.

**AS.491.888. Thesis Continuation.**

This course is for students who completed 491.802 Thesis and Careers in Science Writing but failed to finish an approved thesis and were not approved for an incomplete. If both conditions are met, students must register for this course and pay its accompanying fee for every term (including summer) until a final thesis is approved.