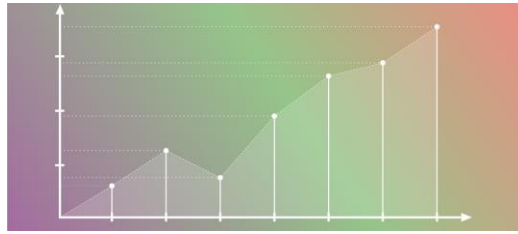


# Statistical & Data Sciences



## Executive Summary

One goal of the Statistical & Data Science (SDS) program is to produce leaders in statistics and data science. This leadership includes excellence in writing. This document lays out the second version of our program's writing plan, including updates to our writing goals for students, a curricular mapping of those goals, and the proposed criteria for use in our curriculum to achieve these goals.

SDS was particularly interested in the WEC Program due in large part to our project-heavy curriculum and the writing products that we ask our students to create. Many of our courses culminate in a poster or a paper that reports on a statistical procedure or task undertaken by our students. Despite the emphasis of writing in our course projects, the faculty of SDS felt limited in our ability to effectively teach and evaluate writing.

Given the ubiquity of computational notebooks (like R Markdown, Quarto documents, and Jupyter notebooks) both in and beyond SDS's curriculum, we have decided to center our writing plan around Markdown files, using them as the vehicle both for procedural writing (like problem sets) and for summative writing (like project write-ups and posters). Using this consistent file type allows SDS faculty to coordinate the introduction of components of Markdown files across the curriculum. Additionally, our students will be able to develop their writing skills by focusing on the content, instead of being distracted by the minutiae of the different file types necessary to create high-quality documents, reports, presentations, and dashboards.

Our writing plan also makes thoughtful use of skills and resources both within SDS and at Smith more broadly. In our implementation plan, we will continue to work closely with the Jacobson Center to develop our writing pedagogy as faculty and to develop writing-based training sessions for student peer-tutors and graders. Within the department, we will continue creating and sharing rubrics for course projects and assignments that align with the writing criteria in this plan.

This second edition of our writing plan is informed by three things:

- Our program's meeting in which we mapped our writing goals to existing courses
- The creation of SDS 100
- Our WEC liaison's participation in the 2022 WEC Institute

Section #1: What characterizes writing in SDS fields (academic, professional, all levels)?

## What characterizes academic and professional communication in this discipline?

✔There have been substantial revisions to this section of the Writing Plan. (Discuss these explicitly.)

We have expanded on the list of characteristics to provide more details and offered two suggestions to make our WEC implementation more anti-racist.

WE have identified that writing in statistics and data science have four characteristics:

1. **Contextual;** depends on: 1) Purpose and 2) Audience (about tone based on modalities/venue). That is, the writing is grounded in the goals and purpose of the data analysis and is then modulated for the audience. For example a document about data collected from the Mill River to demonstrate the effects of climate change should be grounded in that original purpose, and it will differ in tone for an undergraduate student vs. an EPA official.
2. **Translational and framed:** depicting a specific contextual problem. Writing in SDS connects abstract ideas to people, places and things. This is where writing in SDS differs from math and computer science. In SDS, written documentation aims to transcend from technical ideas in statistics and data science back to the data's provenance and original goals. The purpose of the writing is not only to simplify complex ideas but also to frame them so that the intended audience can understand the impacts of abstract concepts in the context of the data and the analysis.
3. **Grounding in real-world problem solving** with explicit connections between the problem/solution to the data analysis and collection methods. Considerations include: How is the work relevant in the real world? What are the peculiarities of the data? How is the data collection then impacting your analysis which is then impacting your conclusions?
4. **Visual:** dependent on quick readings of images. There are many ways to visualize data and as such, visualization should be regarded as a toolbox of ways to express ideas. This means that you use the correct tool for the correct job (text, table, histogram, etc.). There is an interplay between the visualizations and the prose, and so making appropriate choices (including visual vs. text) is critical.

One suggestion from a panel on Anti-Racist teaching at the 2022 WEC Institute is focus on process over product. The above characterizations about writing in statistics and data science do largely focus on process, but we note that there are a number of underlying assumptions in these characterizations that would need to be made more explicit for assignment rubrics.

A second recommendation that surfaced as part of the Anti-Racist teaching panels at the WEC institute is to interrogate where our ideas of “professional” writing come from and from whom. This kind of examination is critical both when building a writing curriculum and developing anti-racist teaching practices. Given that the SDS faculty were trained in male-dominated and largely white fields, it is likely that all of us have learned definitions of “professional” that are both white-

and male-centered. As we continue to develop our curriculum, we acknowledge that we need to be more intentional about asking and answering these questions of “where?” and “from whom?”

## Section #2: What writing abilities should SDS majors be able to demonstrate by the time they graduate?

**With which writing abilities should students in this unit’s major(s) graduate?**

**✗There have not been substantial revisions to this section of the Writing Plan.**

Our writing goals are structured from the most consequential writing decisions to the more nuanced ones. We begin with the goals concerning selection of writing form and engaging in an iterative writing process. The third goal focuses on using precision and clarity of language. The next two goals concern structure with the fourth goal focused on the overall structure of the written piece while the fifth centers on the introduction. Impactful figures and tables are discussed in the sixth writing goal. Coding is an important kind of writing in statistical and data sciences; the final writing goal focuses on the nuances of coding.

**By the time they graduate, Smith SDS majors should:**

- 1. Be specific & competent at differentiating between and utilizing different types of writing -- sci report, journalistic article, etc. -- including:**
  - Articulating differences between various types of writing: science report, journal article, blog post, etc.
  - Using notebooks (like Rmarkdown or QMD) when appropriate as a final product (as opposed to a poster, paper, or presentation)
  - Adjusting to a specific level of conversation (blog post vs. peer-reviewed publication)
  - Adjusting tone for the appropriate audience
  
- 2. Engage in a process (writing or coding), including**
  - Brainstorming
  - Outlining
  - Initial drafting
  - Peer review
  - Editing
  - Revising
  
- 3. Write with precision and clear language, regardless of audience and venue. This includes being able to write about ambiguity and uncertainty.**
  - Reason well about the complexity of what they did through reflection and exploration about their process without writing in an overly complex manner
  - Use precise, correct, and accurate language

- Use correct tense consistently and in keeping with disciplinary norms.
- Understand the difference between active voice vs. passive (including using the former instead of the latter)
- Engage metaphors that connect the audience with highly technical ideas (that is, using language and cultural norms that are consistent with the audience's expectations and comfort, but that add clarification or provide a bridge to the technical content)

**4. Prioritize the important parts of the process and/or project to communicate, including**

- Being critical about what is useful or necessary to communicate, instead of -- for example -- showing off the method that they think is fancy, cool, or most "advanced" regardless of the relevance of that tool
- Constructing a sequence and flow of ideas that build on each other
- Constructing narratives that tell a well-motivated story instead of reporting a chronolog listing every step that the student(s) did and every thought the student(s) had in the order that they had them
- Using formatting intentionally and mindfully to organize ideas (and not just as bells and whistles only used to make the document "look good")

**5. Clearly communicating the research question and how analysis will support the question in the introduction and abstract (if applicable). The introduction (and abstract) should preview the following:**

- A persuasive argument and/or list of processes and analysis strategies
- Results that are supported by analysis/evidence

**6. Create impactful figures and tables, including**

- Considering the context and audience for each figure and table, including accessibility and cultural nuances
- Making well-reasoned choices concerning the kind of plot used for a figure; similarly making well-reasoned choices when including variables and results in a table
- Seeking aesthetic balance in terms of colors selected, the ink to information ratio, etc. (colors, ink/info ratio, etc.)
- Using visual elements that accurately reflect data representation (e.g., using a diverging palette for variables that have a natural midpoint)
- Ensuring visualizations and tables are both legible and provide meaningful context (including labeling axes, using legible font sizes, and writing meaningful captions)

**7. Code with documentation and comments that are correctly indented, use a consistent style, and are human-readable. Their code should:**

- Be the result of an iterative process as outlined in Writing Goal 2 above

- Provide minimally reproducible examples (e.g. using the reprex package) when trying to recreate errors
- Engage in technical writing when appropriate, including:
  - i. Writing a README.md for GitHub repositories
  - ii. Filing issues on GitHub

### Section #3: Integration of writing into the department's curriculum

**How is writing instruction currently positioned in this unit's undergraduate curriculum (or curricula)? What, if any, course sequencing issues impede an intentional integration of relevant, developmentally appropriate writing instruction?**

**✓There have been substantial revisions to this section of the Writing Plan. (Discuss these explicitly.)**

Updates to this section include a curricular mapping and the description of our new SDS 100 course which introduces students to the form and function of computational notebooks, the primary mechanism that we use for assignments in SDS.

At present, writing exists within the SDS curriculum in the following forms:

- Problem sets
- Lab assignments and activities
- Project write-ups
- Project posters
- Capstone papers

Many SDS assignments and materials are prepared in the Markdown notebook format. The Rmarkdown (or Rmd) format allows for prose and code to coexist in the same document. This coexistence allows for narrative code and for computational narratives; that is, a statistician can share their methods both in the prose that is typical for scholarly articles and with code snippets of their methods being implemented. This is an implementation of literate programming (Knuth 1983).

Like a journal article or a scientific poster, there is an inherent structure to Rmd files supported by section headings, text blocks, code blocks, figures, and tables. Given the wide adoption of Rmd files in both educational and industrial settings, writing Rmd files that make thoughtful use of these elements is critical to the development of statistical and data science students. It also enables students to share their work with colleagues or prospective employers in a readable, reproducible, and portable format. This is our motivation for centering our writing plan around Rmd files.

By centering our writing enriched curriculum around Rmd files, we give our students a consistent vehicle for written assignments during their whole major experience. This consistency allows for us -- as faculty -- to develop a coherent curriculum that builds on previous courses work

in Rmd. As such, the writing curriculum in SDS will demonstrate iteratively revisiting and improving writing skills in a procedural sense as well as in terms of our writing goals from Section 2.

Curricular Mapping

During the Fall 2021 Semester, the SDS faculty met to map our writing goals into the existing curriculum. Our discussion focused largely on the core classes: SDS 192, 201/220, 291, and 410. Table 1 summarizes our discussion:

Table 1: Summary of the curricular mapping of writing goals onto existing SDS Courses. The boxes are colored to indicate the depth that a particular course interacts with each writing goal. Dark green means that the writing goal is assessed in the course. Lighter green with an asterisk indicates that the depth of treatment depends on the course enrollment. Yellow means that aspects of the writing goal are in the course but not necessarily assessed (depending on the section and instructor).

	Core SDS Major Classes				Non Core Classes	
	192	201/220	291	410	270/ DSC WAV	Other courses
Writing Goal 1	Yellow	Yellow	Yellow	Dark Green		
Writing Goal 2			Yellow	Dark Green		Dark Green
Writing Goal 3	Dark Green	Dark Green	Yellow			
Writing Goal 4	Light Green *	Light Green *		Dark Green		Dark Green
Writing Goal 5		Dark Green	Dark Green			
Writing Goal 6	Dark Green		Dark Green	Dark Green		Dark Green
Writing Goal 7	Light Green *			Dark Green	Dark Green	

The green boxes mean that this writing goal is currently assessed in that course. The yellow boxes mean that it is mentioned, but either not specifically assessed in the course or not assessed in all versions of that course. The lighter green boxes with the asterisk indicate that the fulfillment of this writing goal is dependent on the course’s enrollment.

What became clear in this curricular mapping meeting is that our existing curriculum did not have a coherent introduction to the Rmarkdown eco-system. While each of the core classes use Rmarkdown documents and do surface level introductions, there was a lot of overlap of introductory R and Rmarkdown content and few structured activities beyond these basics. What is more, similar overlaps in content are known between SDS 192 and SDS 201/220, which has led to additional pedagogical challenges in these courses. To begin addressing these issues, in Academic

Year 2021-22, SDS established a curricular subcommittee, and one outcome of this subcommittee was the creation of SDS 100: Reproducible Scientific Computing with Data.

### Introduction of SDS 100

SDS 100: Reproducible Scientific Computing with Data is a new 1-credit course that introduces students to the computational ecosystem used in statistical and data sciences, and to the ethical considerations of working with data. Specifically, this course serves as a common introduction to R and Rmarkdown for all students in SDS, as this course is a co-requisite for any student taking SDS 192, 201, 220, 290, or 291 for the first time.

Our writing plan relies on students developing their writing through Rmarkdown, which, like programs such as Microsoft Word or Apple's Pages, has its own idiosyncrasies surrounding formatting. By having one course with an established common curriculum, the SDS program can better ensure that all students have a consistent introduction to R and Rmarkdown. Additionally, this allows instructors to devote time, previously spent on the basics of R and Rmarkdown, both to discipline-specific content and to improving students' writing skills.

During Summer 2022, a group of four SDS colleagues worked together to develop the SDS 100 curriculum. The current version of the course has aspects of writing goals 1, 2, 3, 4, and 6 as part of the course activities and assessment. Specifically, the SDS 100 final project has been developed so that students engage in an iterative process (writing goal 2) where they consider their audience (writing goal 1) and write clearly about a dataset (writing goal 3). The final product will tell a coherent story (writing goal 4) arguing why that particular dataset should be added to SDS 100. They are also required to use a variety of formatting techniques (writing goal 4) and to include both figures and tables (writing goal 6).

### Section #4: Assessment of student writing including the Criteria

**What concerns, if any, have unit faculty and undergraduate students voiced about grading practices? Please include a menu of criteria extrapolated from the list of Desired Writing Abilities provided in Section 2 of this plan. (This menu can be offered to faculty/instructors for selective adaptation and will function as a starting point in the WEC's longitudinal rating process.).**

**XThere have not been substantial revisions to this section of the Writing Plan.**

In our discussions, SDS was most excited about having explicit criteria for each writing goal with example rubrics (to be developed as part of our implementation plans). In our first writing plan, we wrote lists of criteria for each writing goal (below). These can be adapted into rubrics or into assignment prompts. Additionally, during Spring 2022, we established a folder on our program's shared google drive for instructors to share the instructions and rubrics for their final projects.

## Writing Goal 1 - Be specific & competent in terms of types of writing

Demonstrates understanding of the venue through the selection of delivery mediums.

Possible choices include:

- Blog post
- Journal-styled rendered Rmarkdown (articles, papaja packages)
- Poster (e.g., with posterdown)
- Newspaper article

Demonstrates understanding of the audience and level of abstraction, including:

- Balancing tone between casual and technical
  - For example, using scientific tone for academic research reports while being more casual when writing for a lay audience (and not using too much jargon)
- Using types of visualization that are appropriate for audience (e.g., not assuming too much mathematical or information design knowledge for general audience)
  - Simple visualizations (e.g., bar charts) might be better than too wordy a piece.
- Paying attention to their assumptions about level of mathematical fluency/literacy
- Using a level of abstraction appropriate for audience
  - Starting with personal stories and experience are important for general audiences. For example: many NYTimes articles follow this flow: start by telling a story about an individual, zoom out to larger/high-level societal discussion, but then close by refocusing on the individual.
  - Jumping in at a high level appropriate for academic research papers

Create writing that is comparable to other writings for a similar audience and venue, including using citations and references that are appropriate to the venue.

## Writing Goal 2 - Engage in a process (writing or coding)

With the six phases of an iterative process identified in this goal, we have potential criteria for each one:

- Brainstorming -
  - a. An outcome of a good brainstorming session includes multiple ideas. For example, students could be asked to identify two “safe” ideas and one stretch/reach/beyond possibility idea. Alternatively, they could be asked for the least inventive idea, the one they’ll probably do, the one they like the most, and the most out-of-the-box thing they can think of



- b. In each case, students should articulate why each idea falls under the given classification.
- Outlining -
  - a. A good outline includes evidence of multiple ideas, a scaffolded argument and may include ideas that didn't work
  - b. In the case of coding, there may be pseudo-code and/or commented out code that didn't work.
- Initial Drafting -
  - a. A good initial draft is a complete document with an introduction, a complete argument borne out in the main text, and a conclusion
  - b. Evidence of creativity and/or evidence of passion
  - c. *Writing* - Describe relevant procedures (and removed the "chronology" aspects of the writing)
  - d. *Code* - Only working relevant code included
  - e. There should also be evidence of proofreading, including:
    - That the draft is readable
      - Free of basic typos (not perfect polish, but all errors that would be found by using spell check have been resolved)
      - The tools available to students to check the "easy" things (spell check, grammar check on google docs) have been used
      - Students should have read the document from start to finish with "fresh eyes" before submitting
    - In the case of code, the file compiles and produces no syntax errors
- Peer Review - There are two roles in a peer review: the author and the reviewer. We will denote these criteria separately:
  - a. Reviewer -
    - Comments are empathetic "Comment as if it were you" Golden Rule
    - Offering specific advice and comments, as well as questions
    - Noting areas for improvement as well as highlighting strong parts of the work
  - b. Author -
    - Full draft provided (see above criteria for the Initial Drafting)
    - If desired, questions or areas of concern noted to assist reviewer's focus during the review
- Editing -

- a. We note that “editing” depends on the draft number and state. Earlier drafts will be inherently less polished than later ones. However for all drafts, students will
  - Complete line editing their own writing, including:
    - Checking for typos, grammar, consistency of tense
    - Checking for missing figure and table references
    - Checking for missing citations (i.e. the [?] in LaTeX)
  - Polish is commensurate with draft number/state, with increasingly fewer typos and grammatical errors
  - Ensuring that code is readable and/or meets a style guideline (e.g., run a linter, ensuring lines of code as much as possible don’t exceed 80 characters )
- Revision -
  - a. Noting that a revision is a larger process than editing, students are expected to have improved and/or altered the structure of the work beyond simple line edits.
  - b. Students should visibly address at least 50% of the comments (including addressing comments with a response.)
    - Could include revision of figures, tables, etc
  - c. Creativity/passion for subject is honed (not sanitized), supported further with more evidence, citations, and/or process

**Writing Goal 3 - Write with precision and clear language, regardless of audience and venue. This includes being able to write about ambiguity and uncertainty.**

Writes with clarity, precision, and appropriate tone and tenor, including:

- Using active voice throughout
- Using present tense throughout. (Though future tense is appropriate for a section labeled “future work”)
- Detailing assumptions made of their data and by their methods
- Explaining their steps with a sequence using easy-to-follow logic
- Crisply defining terms and methods using precise language
- Detailing issues of complexity in an enumerative fashion (instead of simply stating “it’s complicated” or “it’s complex”)

**Writing Goal 4 - Prioritize the important parts of the process and/or project to communicate**

Creates a coherent structure for the work by prioritizing the important elements of the process and/or project. The work should:

- Announce an organizational logic so that readers know where they are going and why
- Directly communicate a scientific narrative using an overt logical structure: Moves from problem, to procedure, data, conclusions, and back to target problem
- State how the selected analysis methods facilitate answering the research question
- Describe the analysis method at a level appropriate for the primary audience
- Limit description of data cleaning tasks that support the narrative at hand
- Have justifications for methodology that are limited to the scope of problem/research question.

**Writing Goal 5 - Clearly communicating the research question and how analysis will support the question in the introduction and abstract (if applicable).**

For this writing goal, we have two options for criteria: one focused on an abstract and the second on an introduction.

Introduction Criteria -

- For scoping the introduction, there are three parts:
  1. Setting the scene - Why should we care about this? (prior work and motivation) Provide an explanation of who this is important to and why?
  2. What is your contribution to the conversation? This should be framed for a general audience without statistical jargon. (How should a person with no prior knowledge of this course (e.g., a parent, roommate, etc.) understand your work?)
  3. Explain how you are going to do part 2 (in one sentence)
- A good introduction:
- Provides minimally necessary relevant background information to motivate the importance of the main question being asked, so that those without prior subject matter knowledge understand why the question is important to answer.
- Identifies response variable (or outcome) and one or more of the most relevant explanatory variables, and specifies the scope (who or what is covered by the analysis?) and method of inquiry (what kind of model?).
  - Example - “Want to investigate relationship between X and Y among {Z}, and we want to investigate how this relationship is related to these constructs”
- Previews the remainder of the paper in one (non-run on) sentence

Abstract Criteria -

- A good abstract should:
  1. Set the scene: Explain and justify the importance of the work, and its constituency.

2. Articulate the specific contributions of this work. This should be framed for a general audience without statistical jargon. A person with no prior knowledge of this course (a parent, roommate, etc.) should be able to understand this.
3. Explicate methodology: Explain how the paper will articulate these contributions.
4. Provide the minimally necessary relevant background information to motivate the importance of the main question being asked, so those without prior subject matter knowledge understand why the question is important to answer.
5. Identify the response (or outcome) variable and one or more of the most relevant explanatory variables
6. Specify the scope (who or what is covered by the analysis?) and method of inquiry (what kind of model?)
  - Example - “Want to investigate relationship between Y and X, and we want to investigate how this relationship is related to these constructs”
7. Preview the remainder of the paper in one (non-run on) sentence

### **Writing Goal 6 - Create impactful figures and tables**

For this writing goal, we have two options for criteria: one focused on visualizations and the second on tables

A good visualization should:

- Include readable axis labels, units and legends
- Reveal the data
- Be attention grabbing, but uses a low ink density to data ratio
- Tell the same story of the task you are addressing in prose
- Is not reliant on the prose to understand the graphic
- Include a meaningful and self-contained caption with proper grammar
- Help the reader see themselves in the graphic (e.g., “That’s my state”)

A good table should:

- Use readable font in every cell
- Use vertical and horizontal lines to bound data and results
- Be sized to fit either in a column or on a single page
- Reveal meaningful information about the data, experiments, or results
- Enhance the story you are telling
- Not rely on the prose to explain the significance of the table’s contents
- Include a meaningful and self-contained caption with proper grammar

- Include explicit units
- Avoid pseudoprecision / use appropriate digits of precision or scientific notation

**Writing Goal 7 - Code with documentation and comments that are correctly indented, use a consistent style, and are human-readable.**

Demonstrates code is the result of an iterative process, with a final product such that

- Code is readable, formatted, follows a style guide, linted, and contains only that which is necessary.
- Code expresses the ideas/logic/sequence used in analysis process

Code that is impenetrable to anyone but the author is clearly not the result of an iterative process

Can provide minimally reproducible examples when trying to recreate errors, such that an Instructor/TA can copy-and-paste code into a fresh R session and produce the exact same error. Examples of not meeting this goal include:

- Creating GitHub repos that are incomprehensible to outside reviewers
- Reporting errors in a manner that they are impossible to reproduce, or not fully specified.
- Using passive voice with no information to report errors (e.g., “it doesn’t work”, “my R hates me”)

Demonstrates engagement with technical writing when appropriate. Examples include:

- Creating a complete home page for GitHub repository that has a README file illustrating how to use project, and includes both brief of description of the goal and a simple example
- Writing GitHub issues in a manner so that they can be quickly understood and are accessible and inviting for collaboration from:
  - a. Your most important collaborator: Future you
  - b. Other current collaborators
  - c. Future collaborators

## Section #5: Summary of implementation plans and requested support

**What does the unit plan to implement during the period covered by this plan? What forms of instructional support does this unit request to help implement proposed changes? What are the expected outcomes of named support?**

**✓There have been substantial revisions to this section of the Writing Plan. (Discuss these explicitly.)**

There have been necessary updates to this section to reflect both how we are implementing our existing implementation plans and the changes that we have made to our implementation plans. Changes were necessary to our implementation plans due to both the COVID-19 pandemic and due to changes within our department including new courses and new staffing.

With our writing goals and criteria in place, the next step has been incorporating both into our courses. Implementing the first version of our writing plan happened during the COVID-19 pandemic, and as such our implementation has been more moderate. It is clear that faculty have been adding more writing instruction to their courses and being more explicit with their assessment strategies. Sara Eddy drafted syllabus language about our writing plan which some members of the faculty included in their AY 21-22 syllabi.

As we continue to develop our writing curriculum, we will do the following:

- Have a “now what?” meeting to reflect on this version of the writing plan. During this meeting, individual faculty will articulate what changes they will be incorporating into their classes. Additionally, we will discuss, agree on, and document modest program-wide changes in regards to WEC.
- At the 2022 WEC Institute, one of the presenters suggested looking for “opportunities not to grade.” As we develop our writing activities, we will think critically about where we can create meaningful experiences for students that do not create more grading for the faculty. One existing example is in SDS 100, in the iterative brainstorming activity where students rotate individual work to each other as they move through the stages of the project.
- We will have a discussion about where our ideas of professional writing in statistical and data sciences come from and from whom we learned these ideas. The goals of this discussion are to examine our own assumptions and to note where we are perpetuating white supremacy in our activities and assessments. Additionally, we will ascertain which faculty have interest and capacity to be part of a reading group on Anti-Racist writing pedagogy.

As we continue to implement this version, we plan to focus SDS faculty efforts on creating rubrics and project prompts, including:

- Create rubrics with examples of student work (both positive and less successful ones)
- Course specific rubrics and project specific rubrics ([for example](#))
- Starting project prompts (i.e., what do we give to students?)
- *Potentially* - Create a function in the SDS package with vector inputs to generate rubrics

Additionally, in an effort to be transparent with our efforts to incorporate writing into the SDS curriculum, we plan to develop a pamphlet on writing expectations for students. A version of this pamphlet would be on our department website. At the WEC institute, Appalachian State shared a version of their public documents about their writing program that included an effective metaphor with a verb associated to the goals for each year:

- Year 1 - Walking

- Year 2 - Trail walking
- Year 3 - Hiking
- Year 4 - Climbing

SDS could plan to adopt a similar place-based metaphor that would resonate with Smith students in the same tangible way that the verbs related to mountains would resonate with students at Appalachian State.

Successfully implementing this writing plan will require robust assessment. To that end, we propose the following possible assessments:

- A new survey of both students and faculty about the current state of writing and writing instruction in SDS courses
- A longitudinal study examining the development of students' writing skills from introductory course (192/201/220) to the intermediate courses (290/291) and through to the capstone (410).
- When we do our next rating of capstone work (as previously done in Summer 2020), we will carefully consider who we are asking to serve as raters. Specifically, we will take a diversity and inclusion lens to our considerations, working to have a slate of raters with a variety of backgrounds and experiences.

To implement and test this initial writing plan within the SDS curriculum, we have followed the below timeline:

- **Summer 2020** - Draft of writing plan submitted to SDS Chair and Jacobson Center
  - Capstone work reviewed by Kinnaird and outside reader (TBD)
  - Implementation ideas deployed (if possible)
- **Fall 2020** - Beta test of criteria and writing plan (This is *totally optional*)
  - Use the plan in your courses, if you want
  - Implementation ideas deployed (as possible)
- **January 2021** - Edits to plan based on Faculty feedback from beta test
- **Spring 2021** - Deployment of full writing plan across SDS curriculum
- **Summer 2022** - Review and edit writing plan based on Spring 2021

Our future plans may include (timing subject to staffing constraints):

- In collaboration with Sara Eddy, the current WEC liaison, we will create an online archive of writing support materials and pedagogy. This repository will include:
  - Project prompts → Started Spring 2022
  - Examples from Dr. Flash of materials from statistics departments who have completed the WEC program and incorporated writing across their curriculum
- In collaboration with both the Jacobson and Spinelli Centers, we would like to create training about giving writing feedback on a variety of SDS assignments for the Spinelli center tutors as well as SDS graders

- There are three implementation strategies that could require additional funding:
  - We would like to test our criteria on prior student work. To do this, we would like to offer a stipend (or other payment) for someone to apply the draft criteria to student work
  - We would like to bring Prof. Annette Vee of the University of Pittsburgh to discuss her recent [book](#) and [paper](#) on coding literacy
  - As we develop new curriculum to implement a writing-enriched SDS curriculum, we plan on applying for curricular grants through Sherrerd Center

## Section #6: Process used to create this writing plan

**How, and to what degree, were a substantial number of stakeholders in this unit (faculty members, instructors, affiliates, teaching assistants, undergraduates, others) engaged in providing, revising, and approving the content of this Writing Plan?**

Crafting this version of our writing plan was similar to the previous version. This plan represents a distillation of ideas generated during meetings with all tenure ladder SDS faculty as well as discussions with Sara Eddy and notes from sessions at the 2022 WEC Institute. Additionally, comments and suggestions from Prof. Scott LaCombe (SDS/GOV) and Prof. Randi Garcia (SDS/PSY) have been incorporated into this version.

For approval of this proposed version of the SDS Writing Plan, Katherine Kinnaird (WEC liaison) submitted this plan to the faculty for comment and approval. Kinnaird then made the requested edits and has submitted this plan to both the Chair of SDS and the Director of the Jacobson Center.