

NetCDF and NASA Data Centers and DMPs - Oh my! Developing a 2-credit Data Literacy Course for Graduate Students in Climate and Space Sciences

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Future Work

- Evaluate feasibility of continuing to offer the course for the Climate & Space Department.
- Explore working with other librarian liaisons to offer the course to other departments.
- Potentially transfer parts of the content to adaptable online learning modules.

ABET Criteria for Engineering

Our course helps students meet the following ABET criteria:

- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (d) an ability to function on multidisciplinary teams
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (j) a knowledge of contemporary issues

Assessment

- Pre- and post-course surveys:
 - Evaluate importance of and skill level for each topic
 - Post-course survey will ask additional questions about the course effectiveness
- Mid-semester discussion
- Weekly online reflections
- Formal teaching evaluations
- Potentially reconnect with students 6 months after the course

"Today's session was very efficient in helping me realize the bigger picture where Responsible Conduct in Research Seminars, Policy and Data Management all play important roles. These guidelines are not restricting the research we are doing, it is not a burden as proposal-writers always complain about. These guidelines help us get the most out of our research by regulating it and providing a path that is free of common repetitive mistakes."
- Student reflection

IDEA

Developing Research Data Services at U-M Library
+
Climate & Space Department faculty input
=
Experimental course AOSS 605-002:
Data Management and Stewardship in
Climate and Space Sciences
(2 credits, Winter 2016)

"This class should be a part of the curriculum."
- Mid-semester teaching evaluation

"I think this session was quite effective in conveying the important aspects of data discovery and data consumerism. Once again, I really enjoyed hearing personal experiences and direct examples from my fellow students."
- Student reflection

Special Thanks

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Developing Course Content

1. Data Literacy Competencies¹
2. Interview CLaSP faculty & graduate students
 - Visualizations are critical
 - netCDF is the most common format
 - Researchers generate & consume data
 - Data sharing is prevalent, especially in space science (NASA requirements)
3. Synthesize best practices, needs discovered from interviews, and subject-specific resources

Course Learning Objectives

After completing this course, students will:

- Be able to write a comprehensive action plan for managing data.
- Be able to apply data management and stewardship concepts to their research.
- Know the community standards and best practices for data management in their specific field.

Teaching the Course

- Safe space for students to process topics that aren't often explicitly taught
- Sessions = Presentation + Discussion + Activity (emphasis on discussion)
- Begin with "What is data?" and address other data topics like Storage, Metadata, Sharing, Preservation & Curation
- Final Project is a comprehensive action plan for managing their data set
- Final presentations delve deep into a data-related topic

¹ Carlson, J., Fosmire, M., Miller, C. & Sapp Nelson, M. (2011) "Determining Data Information Literacy Needs: A Study of Students and Research Faculty" portal: Libraries and the Academy 11(2). 629-657.