

# Lesson Plan

GRAD 521 – Research Data Management | Amanda L. Whitmire, Assistant Professor  
Winter term, 2014 | Tu/Th, 10 – 10:50 a.m., Furman 105 | 2 credits | CRN 39926

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**Week: 1**  
**Lecture: 1**

**Date:** Tuesday, 7 January 2014  
**Topic:** Introduction to Research Data Management

## Learning Outcomes

1. Explain what research data is/are
  2. Describe the value and relative importance of data management to the success of a research project
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## Section 1: 20 minutes

<b>Learning Outcome</b>	NONE
<b>Lecture Content</b>	Introductions, review syllabus
<b>Teaching strategy</b>	Pair & Share
<b>Description of strategy</b>	Pairs of students interview each other and report back to the class. Introduces students to each other, and to the active teaching framework of the course (e.g., you won't just be sitting here listening)
<b>Products</b>	Notecards w/details about each student will be collected by instructor
<b>DIL Core Competency</b>	N/A
<b>Assessment</b>	N/A

## Section 2: 5 minutes

<b>Learning Outcome</b>	Explain what research data is/are
<b>Lecture Content</b>	Explain broadly what research data are; review various definitions
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	N/A
<b>DIL Core Competency</b>	Data formats
<b>Assessment</b>	N/A

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## Section 3: 20 Minutes

<b>Learning Outcome</b>	Describe the value and relative importance of data management to the success of a research project
<b>Lecture Content</b>	Illustrate the need for proper and effective data management strategies. Present several real-world examples
<b>Teaching strategy</b>	Reflective Writing (notecards)
<b>Description of strategy</b>	Immediately following lecture topic, students write down why good DM will be important during their graduate work. Solicit a few students to share with class. Collect notecards.
<b>Products</b>	Notecards will be collected by instructor
<b>DIL Core Competency</b>	Data management & organization
<b>Assessment</b>	Responses will demonstrate if students understood learning objective and were able to apply it to their own experience.

## Readings

1. Committee on Ensuring the Utility and Integrity of Research Data in a Digital Age; National Academy of Sciences. 2013. (pages 95-99) Ensuring the Integrity, Accessibility, and Stewardship of Research Data in the Digital Age. Washington, D.C.: The National Academies Press.  
[http://books.nap.edu/openbook.php?record\\_id=12615&page=95](http://books.nap.edu/openbook.php?record_id=12615&page=95)
2. Interagency Working Group on Digital Data to the Committee on Science of the National Science and Technology Council. 2009. "Harnessing the Power of Digital Data for Science and Society." Introduction: A Revolution in Science: p. 3–5 (p. 11-13 of PDF).  
<http://www.nitrd.gov/Publications/PublicationDetail.aspx?pubid=25>
3. Whitmire, Amanda. "LibGuides. Research Data Services. Funder Mandates."  
<http://guides.library.oregonstate.edu/data-management-funder-mandates>
4. Whitmire, Amanda. 2013. "Data Management Throughout the Research Lifecycle" (August 16).  
<http://dx.doi.org/10.6084/m9.figshare.774628>
5. Example Data Management Plan (DataONE):  
[http://www.dataone.org/sites/all/documents/DMP\\_MaunaLoa\\_Formatted.pdf](http://www.dataone.org/sites/all/documents/DMP_MaunaLoa_Formatted.pdf)

## Assignments

Take the course pre-assessment.

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**Week: 1**

**Date:** Thursday, 9 January 2014

**Lecture: 2**

**Topic:** Data management plans and planning

## Learning Outcomes

1. Familiar with the lifecycle continuum to manage and preserve research data
  2. Understands US federal agency context for data management and sharing
  3. Identify data management plan (DMP) requirements used to characterize and plan for the lifecycle of research data
- 

## Section 1: 10 minutes

<b>Learning Outcome</b>	Understands US federal agency context for data management and sharing
<b>Lecture content</b>	Describe history of federal mandates, current NSF & NIH policies, and OSTP memo
<b>Teaching strategy</b>	Reflective writing
<b>Description of strategy</b>	Students respond to following questions, in writing, and some share with class:  “How is your research being funded? Are you aware of any data management requirements related to your work? Has your advisor or your mentor mentioned data management to you?”
<b>Products</b>	N/A
<b>DIL Core Competency</b>	Data management & organization
<b>Assessment</b>	N/A

## Section 2: 5 minutes

<b>Learning Outcome</b>	Familiar with the lifecycle continuum to manage and preserve research data
<b>Lecture Content</b>	Basic introduction to research lifecycle and RDM actions; more detail and assessment next week
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	N/A
<b>DIL Core Competency</b>	Data management & organization
<b>Assessment</b>	N/A

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## Section 3: 30 minutes

<b>Learning Outcome</b>	Identify data management plan (DMP) requirements used to characterize and plan for the lifecycle of research data
<b>Lecture content</b>	Introduction to DMPs, agency-specific guidelines, examples
<b>Teaching strategy</b>	One minute paper
<b>Description of strategy</b>	After the lecture on DMPs, students prepare a short written response to: “Spend a minute thinking about data management planning for your research project. Q: Are there areas that you think will be more difficult to plan for than others? <i>If so, what are they?</i> ”
<b>Products</b>	Instructor will collect notecards and review after class
<b>DIL Core Competency</b>	Data management & organization
<b>Assessment</b>	Thoughtful responses on notecards could indicate application of material to individual situation

## Readings

1. Whitmire, Amanda. “LibGuides. Research Data Services. Funder Mandates.”
2. Whitmire, Amanda. 2013. “Data Management Throughout the Research Lifecycle” (August 16).  
<http://dx.doi.org/10.6084/m9.figshare.774628>
3. Example Data Management Plan (DataONE):  
[http://www.dataone.org/sites/all/documents/DMP\\_MaunaLoa\\_Formatted.pdf](http://www.dataone.org/sites/all/documents/DMP_MaunaLoa_Formatted.pdf)

## Assignments

In preparation for next week, you should start familiarizing yourself with data types and formats in your discipline, if not your research project. Think about common data collection methods in your field, and how paper or electronic notebooks are used.

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**Week: 2**

**Date:** Tuesday, 14 January 2014

**Lecture: 3**

**Topic:** Types, Formats & Stages of Data

## Learning Outcomes

1. Explain what a research data set is, and the range of data types and formats;
  2. Understands which data types are appropriate for answering different types of research questions;
  3. Understands the lifecycle of data; Can identify stages of research data, and which data management actions are associated with lifecycle stages
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## Section 1: 20 minutes

<b>Learning Outcome</b>	Explain what a research data set is, and the range of data types and formats
<b>Lecture content</b>	Data types (observational, experimental, etc.) and formats; which formats are usually associated with data types
<b>Teaching strategy</b>	Reflective writing
<b>Description of strategy</b>	Students write down their main research question or topic; then write down which types of data they will be generating, and formats, if known; have a few report back to the class
<b>Products</b>	Notecard for each student
<b>DIL Core Competency</b>	Databases & Data Formats
<b>Assessment</b>	N/A

## Section 2: 25 minutes

<b>Learning Outcome</b>	Understands the lifecycle of data; can identify stages of research data, and which data management actions are associated with lifecycle stages
<b>Lecture content</b>	Detailed review of research lifecycle and associated data types, data phases and DM actions
<b>Teaching strategy</b>	Buzz groups
<b>Description of strategy</b>	Get students into groups; give each group an easel pad and several markers; have students draw the research lifecycle from memory; have them add & match DM actions with lifecycle phases; roam around to monitor participation and answer questions; bring class back together to share results
<b>Products</b>	Easel pads with group work
<b>DIL Core Competency</b>	Data management & organization

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<b>Assessment</b>	N/A
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## Readings

1. Create and Manage Data: Formatting your Data: File Formats & Software (UK Data Archive):  
<http://data-archive.ac.uk/create-manage/format/formats>
2. Data Types and File Formats: (Oregon State University Libraries):  
<http://guides.library.oregonstate.edu/data-management-types-formats>
3. File Naming & Versioning (Oregon State University Libraries):  
<http://guides.library.oregonstate.edu/data-management-file-organization>

## Assignments

In preparation for Thursday, think about common data collection methods in your field, and how paper or electronic notebooks are used.

Homework #1: Read mini-case study and answer the included questions: [Mini-Case: Identifying Data Types and Stages of Data](http://library.umassmed.edu/necdmc/necdmc_activity2c.docx) ([http://library.umassmed.edu/necdmc/necdmc\\_activity2c.docx](http://library.umassmed.edu/necdmc/necdmc_activity2c.docx))

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**Week: 2**

**Lecture: 4**

**Date:** Tuesday, 16 January 2014

**Topic:** Organizing your data

## Learning Outcomes

1. Develops appropriate file- and folder-naming conventions
  2. Organizes data and documentation in a logical manner
  3. Creates standard operating procedures for data management and documentation, including proper use of a field or laboratory notebook (if applicable)
- 

## Section 1: 20 minutes

<b>Learning Outcome</b>	Develops appropriate file- and folder-naming conventions
<b>Lecture content</b>	Best practices on file- and folder naming conventions, examples
<b>Teaching strategy</b>	Pair and share
<b>Description of strategy</b>	Students take 5 minutes to generate potential file names for their data; students get into pairs and share results, explaining why they developed their naming convention
<b>Products</b>	Notecards
<b>DIL Core Competency</b>	Data management & organization
<b>Assessment</b>	Notecards

## Section 2: 10 minutes

<b>Learning Outcome</b>	Organizes data and documentation in a logical manner
<b>Lecture content</b>	Review various strategies for organizing data and documentation in a strategic manner
<b>Teaching strategy</b>	Reflective writing (outside of class)
<b>Description of strategy</b>	Students will be assigned homework as described below
<b>Products</b>	1-2 paragraphs from each student
<b>DIL Core Competency</b>	Data management & organization
<b>Assessment</b>	Evaluation of written assignments

## Section 3: 15 minutes

<b>Learning Outcome</b>	Creates standard operating procedures for data management and documentation, including proper use of a field or laboratory notebook
<b>Lecture content</b>	Review concepts of proper maintenance of notebook, both for field/laboratory notes and for capturing data processing and analysis

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	details
<b>Teaching strategy</b>	Group brainstorming session
<b>Description of strategy</b>	Before I review what goes into a notebook, ask students to brainstorm as many ideas as they can regarding what they think should be recorded. I'll write these ideas on the white board to keep track.
<b>Products</b>	Photo of whiteboard with ideas
<b>DIL Core Competency</b>	Data management & organization
<b>Assessment</b>	N/A

## Readings

1. Purrington, C.B. Maintaining a laboratory notebook. Retrieved 2014-01-14 from <http://colinpurrington.com/tips/academic/labnotebooks>

## Assignments

Homework #2: Write a summary describing your current or expected approach for documenting and organizing your research activities. See assignment description on Blackboard (\*.docx) for more details.



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**Week:** 3

**Date:** Tuesday, 21 January 2014

**Lecture:** 5

**Topic:** Data Management Planning, For YOUR Research

## Learning Outcomes

1. Outline planned thesis/dissertation project, expected data types and formats
  2. Describe research process and tasks
  3. Identify roles and responsibilities for each member and research task for your research group
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## Section 1: 15 minutes

<b>Learning Outcome</b>	- Outline planned thesis/dissertation project, expected data types and formats - Describe research process and tasks - Identify roles and responsibilities for each member and research task for your research group
<b>Lecture content</b>	Review why these learning outcomes are critical to succeeding in this course (connection to DMP). Offer to spend individual time w/students who need guidance in fleshing out these details.
<b>Teaching strategy</b>	Reflective writing
<b>Description of strategy</b>	Students are assigned homework: Address sections 1.1 – 1.6 of a general data management plan. Include the aims and scope of your research project.
<b>Products</b>	Writing assignment
<b>DIL Core Competency</b>	None
<b>Assessment</b>	Evaluation of writing assignment

## Readings

None.

## Assignments

Address sections 1.1 – 1.6 of a general data management plan. Include the aims and scope of your research project. See assignment description for more details (\*.docx).

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**Week:** 3

**Lecture:** 6

**Date:** Thursday, 23 January 2014

**Topic:** Introduction to Data Curation Profiles

## Learning Outcomes

1. Understands the purpose, value and process of creating a Data Curation Profile (DCP)
  2. Determines the appropriate scope of a DCP for a student assignment
  3. Recognizes the practices values, and norms of their chosen field, discipline or sub-discipline as they relate to managing, sharing, curating and preserving data
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## Section 1: 35 minutes

<b>Learning Outcome</b>	Understands the purpose, value and process of creating a Data Curation Profile (DCP)
<b>Lecture content</b>	Introduce the DCP and DCP Toolkit
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	N/A
<b>DIL Core Competency</b>	N/A
<b>Assessment</b>	N/A

## Section 2: 15 minutes

<b>Learning Outcome</b>	Determines the appropriate scope of a DCP for a student assignment
<b>Lecture content</b>	N/A
<b>Teaching strategy</b>	Group discussion
<b>Description of strategy</b>	Engage students in a discussion about which sections of a DCP <i>they</i> think should be required for their assignment. What about recording and transcription or indexing? What do they think will be the biggest challenges in creating a DCP? What do they think is a realistic timeframe for this “midterm” assignment?
<b>Products</b>	Decisions about scope and timeline of the DCP assignment
<b>DIL Core Competency</b>	N/A
<b>Assessment</b>	N/A

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## Section 3: 0 minutes

<b>Learning Outcome</b>	Recognizes the practices values, and norms of their chosen field, discipline or sub-discipline as they relate to managing, sharing, curating and preserving data
<b>Lecture content</b>	N/A
<b>Teaching strategy</b>	Student Project
<b>Description of strategy</b>	This will be an out of class assignment that is considered their midterm.
<b>Products</b>	For each student, a DCP
<b>DIL Core Competency</b>	Cultures of Practice
<b>Assessment</b>	Quality of DCPs

## Readings

1. Carlson, Jake (2010). Data Curation Profiles Toolkit User Guide, Purdue University Libraries / Distributed Data Curation Center. Retrieved 10 October 2012 from:  
<http://datacurationprofiles.org/download>
2. Carlson, Jake (2010). Data Curation Profiles Toolkit: Interviewer's Manual, Purdue University Libraries / Distributed Data Curation Center. Retrieved 10 October 2012 from:  
<http://datacurationprofiles.org/download>
3. Carlson, Jake (2010). Data Curation Profiles Toolkit: Interview Worksheet, Purdue University Libraries / Distributed Data Curation Center. Retrieved 10 October 2012 from:  
<http://datacurationprofiles.org/download>
4. Carlson, Jake (2010). Data Curation Profiles Toolkit: The Profile Template, Purdue University Libraries / Distributed Data Curation Center. Retrieved 10 October 2012 from:  
<http://datacurationprofiles.org/download>
5. Free choice: any of the public Data Curation Profiles listed in the DCP Directory:  
<http://docs.lib.purdue.edu/dcp/> Be sure to browse around by year – there are many DCPs to choose from.

## Assignments

Students select an interview subject, read through DCP Toolkit materials, and start preparing for the interview.

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**Week:** 4  
**Lecture:** 7

**Date:** Tuesday, 28 January 2014  
**Topic:** Data storage, backup & security

## Learning Outcomes

1. Understand why data storage, backup and security of research data are important
  2. Understand best practices methods for research data storage, backup, access control, migration to newer storage media and security of research data
  3. Formulate an approach to creating a data storage, backup and security plan for your project
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## Section 1: 10 minutes

<b>Learning Outcome</b>	Understand why data storage, backup and security of research data are important
<b>Lecture Content</b>	Data loss scenarios from real life
<b>Teaching strategy</b>	Discussion
<b>Description of strategy</b>	Ask students to volunteer a personal or second-hand story about data loss
<b>Products</b>	N/A
<b>DIL Core Competency</b>	Data management and organization
<b>Assessment</b>	None

## Section 2: 30 minutes

<b>Learning Outcome</b>	Understand best practices methods for research data storage, backup, access control, migration to newer storage media and security of research data
<b>Lecture Content</b>	Review storage options, backup strategies, and security
<b>Teaching strategy</b>	None
<b>Description of strategy</b>	N/A
<b>Products</b>	N/A
<b>DIL Core Competency</b>	Data management and organization
<b>Assessment</b>	None

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## Section 3: 10 Minutes

<b>Learning Outcome</b>	Formulate an approach to creating a data storage, backup and security plan for your project
<b>Lecture Content</b>	None
<b>Teaching strategy</b>	Handout
<b>Description of strategy</b>	Give students data storage, backup & security checklist
<b>Products</b>	None
<b>DIL Core Competency</b>	Data management and organization
<b>Assessment</b>	None

## Readings

1. Backing Up Data (UK Data Archive): <http://www.data-archive.ac.uk/create-manage/storage/back-up>
2. Data Security (UK Data Archive): <http://www.data-archive.ac.uk/create-manage/storage/security>

## Assignments

Complete the 'Data Storage, Backup, and Security Checklist'. This is for your own use and will not be graded.

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**Week 4**

**Lecture:** 8

**Location:** classroom

**Date:** Thursday, 30 January, 2014

**Topic:** Version control theory and methods

**Guest:** Thomas Johnson, Digital Application Librarian, OSU Libraries

## Learning Outcomes

1. Understand value and function of version control for data and documents
  2. Familiar with version control software Git
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## Summary:

Tom reviewed the concept of version control, and introduced Git. He then stepped out of his presentation and showed the students how Git functions in the GitLab environment. Students asked questions throughout his presentation.

## Readings:

None.

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**Week 5**

**Lecture: 9**

**Date:** Tuesday, 4 February, 2014

**Topic:** Data documentation through metadata

## Learning Outcomes

1. Understands the concept of, and rationale for, metadata
  2. Identify and list the types of information typically included in metadata records
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## Section 1: 15 minutes

<b>Learning Outcome</b>	Understands the concept of, and rationale for, metadata
<b>Lecture Content</b>	Background on metadata definition and standards; show examples of metadata from online data repositories
<b>Teaching strategy</b>	Muddiest point
<b>Description of strategy</b>	Students write down what they found unclear about the concept of, or rationale for, metadata; results shared with class
<b>Products</b>	Notecards
<b>DIL Core Competency</b>	Metadata and data documentation
<b>Assessment</b>	Use notecards to clarify misconceptions and improve future lecture notes

## Section 2: 35 minutes

<b>Learning Outcome</b>	Identify and list the types of information typically included in metadata records, its utility beyond discovery
<b>Lecture Content</b>	The value of metadata to various stakeholders; review utility of metadata beyond discovery
<b>Teaching strategy</b>	None
<b>Description of strategy</b>	N/A
<b>Products</b>	N/A
<b>DIL Core Competency</b>	Metadata and data documentation
<b>Assessment</b>	None

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## Readings

1. What is Metadata? (David Woodbury: 5 minutes): <http://vimeo.com/3161893>
2. Introduction to Metadata: Setting the Stage (Getty Research Institute):  
[http://www.getty.edu/research/publications/electronic\\_publications/intrometadata/setting.html](http://www.getty.edu/research/publications/electronic_publications/intrometadata/setting.html)
3. Whitmire, Amanda. "LibGuides. Research Data Services. Metadata/Documentation."  
<http://guides.library.oregonstate.edu/data-management-metadata>
4. Seeing Standards: A Visualization of the Metadata Universe (Jenn Riley, Indiana University Libraries):  
<http://www.dlib.indiana.edu/~jenlrile/metadatamap/>

## Assignments

None. Assessment survey forthcoming.



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<b>Week 5</b>	<b>Date:</b> Tuesday, 4 February, 2014
<b>Lecture:</b> 10	<b>Topic:</b> Data documentation through metadata
<b>Location:</b> computer lab	<b>Guest:</b> Maura Valentino, Metadata Librarian w/OSU Libraries

## Learning Outcomes

1. Familiar with tools for creating metadata appropriate for your discipline and data type
  2. Identify applicable standards for documenting and capturing metadata in your discipline
  3. Develops an ability to read and interpret metadata from external disciplinary sources
  4. Formulate an approach to creating metadata for a project
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## Section 1: 40 minutes

<b>Learning Outcome</b>	Familiar with tools for creating metadata appropriate for your discipline and data type
<b>Lecture Content</b>	Introduction to tools for creating metadata (Colectica, DataUP, Morpho, etc.)
<b>Teaching strategy</b>	Integrating technology
<b>Description of strategy</b>	Students load sample dataset into either Excel (Coletica) or the online tool for DataUP, and practice annotating the dataset with metadata.
<b>Products</b>	None
<b>DIL Core Competency</b>	Metadata and data documentation
<b>Assessment</b>	None

## Section 2: 10 minutes

<b>Learning Outcome</b>	Identify applicable standards for documenting and capturing metadata in your discipline; Develops an ability to read and interpret metadata from external disciplinary sources
<b>Lecture Content</b>	None
<b>Teaching strategy</b>	Integrating technology
<b>Description of strategy</b>	Students browse online data repositories in their field (if existing) and determine the metadata standard used (either by the repository, if it's discipline-based) or attached to the dataset (if it is general, e.g. Dryad)
<b>Products</b>	None
<b>DIL Core Competency</b>	Metadata and data documentation
<b>Assessment</b>	None

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## Section 3: 0 Minutes

<b>Learning Outcome</b>	Formulate an approach to creating metadata for a project
<b>Lecture Content</b>	None
<b>Teaching strategy</b>	None
<b>Description of strategy</b>	N/A
<b>Products</b>	Info. regarding metadata standard chosen will be included in their DMP/final project
<b>DIL Core Competency</b>	Metadata and data documentation
<b>Assessment</b>	None

## Readings

See previous lesson plan

## Assignments

None.

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**Week 6****Lecture: 11****Location:** classroom**Date:** Tuesday, 11 February, 2014**Topic:** Legal & ethical considerations for research data**Guest:** Candi Loeb, OSU Institutional Research Board**Learning Outcomes**

3. Understand privacy levels for research data as required by potential funding agencies
  4. Recognize the importance of privacy with some forms of research data (HIPAA)
  5. Understand the importance of removing key personal identifiers to facilitate confidentiality
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**Summary:**

Candi reviewed the concepts of risk (to research subjects, not risk to the university), consent, data security and related issues. Students asked questions throughout her informal presentation.

**Readings:**

1. Guidelines for Responsible Data Management in Scientific Research, p. 6-8 (US DHHS):  
<http://ori.hhs.gov/education/products/clinicaltools/data.pdf>
2. "Who Owns Research Data?" (US DHHS):  
[http://ori.dhhs.gov/education/products/columbia\\_wbt/rcr\\_data/case/index.html#2](http://ori.dhhs.gov/education/products/columbia_wbt/rcr_data/case/index.html#2)
3. Westra, Brian. 2013. "Sharing or Publishing Your Research Data: Constructing Access Provisions." Accessed November 14. <http://libweb.uoregon.edu/datamanagement/sharingdata.html#three>
4. "Prison for HIPAA Privacy Violator" (Health Data Management Magazine, 06/01/2010):  
[http://www.healthdatamanagement.com/issues/18\\_6/hipaa-prison-for-hipaa-privacy-violator-40382-1.html](http://www.healthdatamanagement.com/issues/18_6/hipaa-prison-for-hipaa-privacy-violator-40382-1.html)

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**Week 6****Lecture:** 12**Location:** classroom**Date:** Thursday, 13 February, 2014**Topic:** Legal & ethical considerations for research data**Guest:** Denis Sather, OSU Office of Commercialization and Corporate Development**Learning Outcomes**

1. Explain ownership considerations related to data sharing
  2. Understand potential legal issues connected to your data; intellectual property, copyright claims, licenses needed for use, monetary charges for data
  3. Explain ethical considerations related to data sharing (not covered this week)
- 

**Summary:**

Denis assigned a reading beforehand, and then held an informal roundtable discussion with the students about intellectual property, patents, and the role of the OCCD in helping students and faculty at OSU.

**Readings:**

1. Baylor University (no date), Patent Law Basics for University Researchers, <http://www.baylor.edu/research/vpr/files/patentlawbasics.pdf>

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<b>Week 7</b>	<b>Date:</b> Tuesday, 18 February, 2014
<b>Lecture:</b> 13	<b>Topic:</b> Data sharing and reuse policies
<b>Location:</b> classroom	<b>Guest:</b> Sue Kunda, Digital Scholarship Librarian w/OSU Libraries

## Learning Outcomes

1. Identify benefits and obstacles to sharing and re-using data
  2. Describe steps to make data sharing easier (metadata, std formats, null values, interoperability, QA/QC, credible repositories, open licenses)
  3. Understand the difference between CC0, Public Domain and OpenData Licenses
- 

## Section 1: 15 minutes

<b>Learning Outcome</b>	Identify benefits and obstacles to sharing and re-using data
<b>Lecture Content</b>	Review obstacles and benefits of data sharing
<b>Teaching strategy</b>	Group work
<b>Description of strategy</b>	Break class into two groups. Group 1 will come up with benefits to sharing data. Group 2 will list obstacles to sharing data.
<b>Products</b>	lists of benefits/obstacles
<b>DIL Core Competency</b>	Data curation and reuse
<b>Assessment</b>	None

## Section 2: 25 minutes

<b>Learning Outcome</b>	Describe steps to make data sharing easier
<b>Lecture Content</b>	Review steps to sharing data from Peer J article
<b>Teaching strategy</b>	Lego toy model exercise
<b>Description of strategy</b>	Ask Sue
<b>Products</b>	None
<b>DIL Core Competency</b>	Data curation and reuse
<b>Assessment</b>	None

## Section 3: 5 minutes

<b>Learning Outcome</b>	Understand the difference between CC0, Public Domain and OpenData licenses
<b>Lecture Content</b>	Review various options for licensing data (included in the PeerJ article)

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	discussion)
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	None
<b>DIL Core Competency</b>	Data curation and reuse
<b>Assessment</b>	None

## Readings

1. White EP, Baldrige E, Brym ZT, Locey KJ, McGlinn DJ et al. (2013) Nine simple ways to make it easier to (re)use your data. PeerJ PrePrints 1:e7v2 <http://dx.doi.org/10.7287/peerj.preprints.7v2>
2. Whitmire, Amanda. "LibGuides. Research Data Services. IP & Licensing Data." 2013.  
<http://guides.library.oregonstate.edu/data-licensing-ip>.

## Assignments

None.

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**Week 7**

**Lecture: 14**

**Location:** classroom

**Date:** Thursday, 20 February, 2014

**Topic:** Data sharing and reuse policies

## Learning Outcomes

1. Address re-use/sharing requirements from granting agencies or sponsors
  2. Understand options for maximizing data reuse
  3. Understand data identifiers and their use
  4. Understand benefits of using a unique researcher ID in metadata (e.g. ORCID or ISNI)
- 

## Section 1: 5 minutes

<b>Learning Outcome</b>	Address re-use/sharing requirements from granting agencies or sponsors
<b>Lecture Content</b>	Review federal policies on data sharing and reuse, OSTP memo, etc.
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	None
<b>DIL Core Competency</b>	
<b>Assessment</b>	None

## Section 2: 25 minutes

<b>Learning Outcome</b>	Understand options for maximizing data reuse
<b>Lecture Content</b>	Introduce data sharing platforms at various levels (federal, discipline-specific, general, local, etc. and when each is appropriate. Explain reciprocal linking, data journals and papers
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	None
<b>DIL Core Competency</b>	data curation
<b>Assessment</b>	N/A

## Section 1: 5 minutes

<b>Learning Outcome</b>	Understand data identifiers and their use
<b>Lecture Content</b>	Introduce DOIs and data citation standards

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<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	None
<b>DIL Core Competency</b>	
<b>Assessment</b>	None

## Section 2: 5 minutes

<b>Learning Outcome</b>	Understand benefits of using a unique researcher ID in metadata (e.g. ORCID or ISNI)
<b>Lecture Content</b>	Introduce ORCID ids and show example of why they are important
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	None
<b>DIL Core Competency</b>	data curation
<b>Assessment</b>	N/A



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**Week 9**

**Lecture: 15**

**Location:** classroom

**Date:** Tuesday, 4 March, 2014

**Topic:** Plan for Archiving and Preservation of Data

## Learning Outcomes

1. Understand basic archival processes: checksum, auditing, format migration, etc.
  2. Address the need for conversion to standard formats needed for re-use
  3. Explain options for a long-term sustainable preservation strategy/policy for your data (e.g., discipline specific, institutional, departmental, individual)
  4. Understand costs & timelines for data storage, management tools and services
- 

## Section 1: 15 minutes

<b>Learning Outcomes</b>	Understand basic archival processes: format migration, checksums, auditing, etc.; Address the need for conversion to standard formats needed for re-use
<b>Lecture Content</b>	Discuss difference between backup and archive; review archive processes: data selection, formats, checksums, periodic file- and bit-level audits of archived data
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	None
<b>DIL Core Competency</b>	Data preservation
<b>Assessment</b>	None

## Section 2: 20 minutes

<b>Learning Outcome</b>	Explain options for a long-term sustainable preservation strategy/policy for your data (e.g., discipline specific, institutional, departmental, individual)
<b>Lecture Content</b>	We've covered data repositories, but need to address difference between basic repositories, purpose-built archives, and local storage
<b>Teaching strategy</b>	Write-Group-Share
<b>Description of strategy</b>	Students respond to the following on notecards: plans for archiving their thesis or dissertation data. If they haven't decided, which options seem best? If they don't plan on archiving it, explain why not. Put students in small-groups, by discipline if possible; have them discuss their responses.
<b>Products</b>	Notecards
<b>DIL Core Competency</b>	Data preservation

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<b>Assessment</b>	Review notecard responses
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## Section 2: 10 minutes

<b>Learning Outcome</b>	Understand costs & timelines for data storage, management tools and services
<b>Lecture Content</b>	Review cost models for various archive and storage options (e.g. IR, Dryad, figshare), and benefits and drawbacks of each
<b>Teaching strategy</b>	Lecture
<b>Description of strategy</b>	N/A
<b>Products</b>	None
<b>DIL Core Competency</b>	Data preservation
<b>Assessment</b>	None

## Readings

1. Whyte, A. & Wilson, A. (2010). "How to Appraise and Select Research Data for Curation". DCC How-to Guides. Edinburgh: Digital Curation Centre. <http://www.dcc.ac.uk/resources/how-guides>
2. Neil Beagrie, Lorraine Eakin-Richards, Todd Vision (2010). Business Models and Cost Estimation: Dryad Repository Case Study 7th International Conference on Preservation of Digital Objects (iPRES), <http://www.ifs.tuwien.ac.at/dp/ipres2010/papers/beagrie-37.pdf>
3. Goldstein, Serge J., Ratliff, Mark (2010). DataSpace: A Funding and Operational Model for Long-Term Preservation and Sharing of Research Data, <http://arks.princeton.edu/ark:/88435/dsp01w6634361k>
4. Crosas, Mercè. "The Dataverse Network®: An Open-Source Application for Sharing, Discovering and Preserving Data." D-Lib Magazine 17, no. 1/2 (January 2011). doi:10.1045/january2011-crosas: <http://dlib.org/dlib/january11/crosas/01crosas.html>

## Assignments

Weeks 5 – 9 evaluation survey will be posted today or tomorrow. Please have it done by Monday.