Teaching Research Data Management: An Undergraduate/Graduate Curriculum

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Teaching Research Data Management: An Undergraduate/Graduate Curriculum

**Learning Objectives**
- Identify the types of data
- Identify the various ownership levels of research data
- Describe the typical data life cycle
- Categorize data storage requirements in terms of size/amounts
- Evaluate and appraise data publishing and storage options
- Indicate the various descriptors of raw data
- Record project identifiers for specific research data
- Define various naming conventions
- Recognize data format importance for long-term access needs
- List and select various ways to assure the security of their data
- Recognize data privacy requirements
- Identify data sharing and reporting requirements

**Project Overview**
With funding from the Institute of Museum and Library Services, the University of Massachusetts Medical School Library and Worcester Polytechnic Institute Library collaborated on a plan to expand the scope of science library practices and promote, among medical and graduate and undergraduate science students, the preservation of scientific data in relevant repositories and archives. This poster outlines curriculum frameworks and learning needs for research data management instruction that can be delivered through a variety of methods. Individual modules are based on faculty and student interviews, as well as a comprehensive literature review.

**LEARNING MODULES**

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
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<tr>
<td><strong>Introduction</strong></td>
<td>The data management module focuses on various forms of data and the plan of the researcher to collect, store, retrieve and disseminate their data to collaborators according to policies and standards.</td>
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<tr>
<td><strong>Life Cycle</strong></td>
<td>Appropriate life cycles of specific research data are discussed in this module, along with the different time-dependent values of data and its management in different phases of its life cycle.</td>
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<td><strong>Security</strong></td>
<td>This module employs various measures to establish adequate data integrity and protection. Including: keeping data safe from corruption and ensuring that access to it is suitably controlled.</td>
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<td><strong>Naming Conventions</strong></td>
<td>This module covers the importance of rules which when applied to data, could result in a set of data elements which are described in a standardized and logical fashion.</td>
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<td><strong>Sharing</strong></td>
<td>Gaining timely access to data for scholarly research from any computer using a simple, universal set of protocols and formats — while respecting policies of funding agencies, institutions and publication venues.</td>
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<tr>
<td><strong>Storage</strong></td>
<td>Coding of words, descriptions, figures, still or moving images, and sounds into digital format and onto an array of repositories that can be accessed by authorized users with standard search protocols.</td>
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<tr>
<td><strong>Describing &amp; Accessing</strong></td>
<td>This module covers the creation of descriptive, structural or administrative metadata for researchers’ data with an emphasis on deciding how or who will create the metadata for a given set of research data.</td>
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<tr>
<td><strong>Privacy &amp; Restrictions</strong></td>
<td>Information privacy and the relationship between the collection and dissemination of personally identifiable data are covered in this module.</td>
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**Project Team**
- **Steering Committee**
  - UMSL: Elaine Martin, D.A.; Mary Plorun and Donna Kafel (Project Manager)
  - WPI: Tracy Legier-Homby and Siham Najafi

- **Education Committee**
  - UMSL: Lisa Palmer, Myra Morales, David Lapointe and Patricia Franklin
  - WPI: Christine Drew, Laura Hanlan, Glenn Gaudette, John Sullivan and Erica Stults

- **External Consultants**
  - Curriculum Design: Paul Colombo
  - Evaluation Expert: Nancy LaPelle
  - Instructional Design: Heather Mc Morrow

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**Mix and Match Modules to Meet Researcher Needs**

- Undergrad Working on First Research Project
- New Graduate Student in a Lab
- Librarian Leads Workshop For New Faculty
- Medical Student Collects Personal Data