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Frameworks for a Data Management Curriculum for Science, Health Sciences, and Engineering Students

Donna Kafel
University of Massachusetts Medical School

Mary E. Piorun
University of Massachusetts Medical School

Siamak Najafi
Worcester Polytechnic Institute

Tracey Leger-Hornby
Worcester Polytechnic Institute

Elaine Russo Martin
University of Massachusetts Medical School

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Donna Kafel, MLIS; Mary Piorun, AHIP; Sia Najafi, MS; Tracey Leger-Hornby, PhD; Elaine Martin, DA
Lamar Soutter Library of the University of Massachusetts Medical School

Introduction

This seven module curriculum is designed to be a teaching tool for faculty and librarians to use when teaching data management to undergraduate and graduate students who are studying science, health sciences, or engineering.

Each module addresses components of the National Science Foundation Data Management Plan including:

- Types of data
- Standards to be used for data and metadata format and content
- Physical and/or cyber resources used to store data
- Policies for access and sharing
- Policies for re-use, re-distribution, and production of derivatives
- Plans for archiving and preserving data

Delivery

There are multiple options for delivering course content::

- Online
- Face to face: individual or classroom
- All learning modules
- Specific learning modules
- For instruction by faculty
- For instruction by librarians

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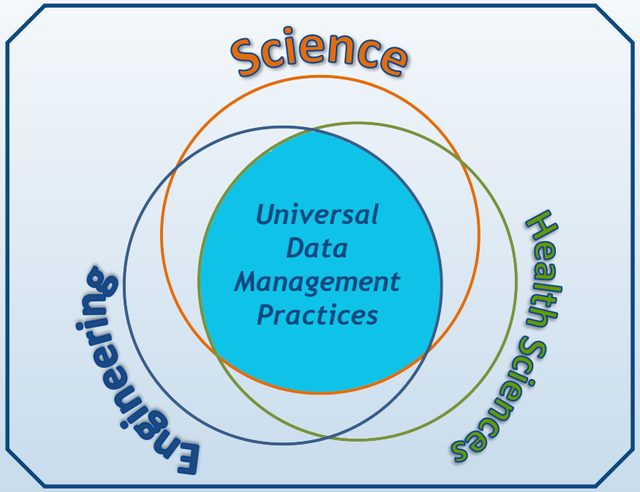
DOES RESEARCH DATA MANAGEMENT INSTRUCTION NEED TO BE DISCIPLINE SPECIFIC?



Learning Modules

Curriculum frameworks include lesson plans for these seven modules:

1. Introduction: Overview of RDM
2. Data: Types, Stages, and Formats
3. Metadata
4. Data Storage, Backup, and Security
5. Legal and Ethical Considerations
6. Data Sharing and Re-use Policies
7. Archiving and Preservation

Components of Learning Modules

- Learning objectives
- Lecture content
- Activities
- Readings
- Assessments

A simplified data management plan provides a template for student activity in Module 1.

Research Cases

Illustrate data management concepts in these real life research scenarios:

- Outcomes from Orthopedic Implant Surgery
- Regeneration of Functional Heart Tissue
- Improving End-of-Life Care for African Americans
- Characterizing a Component of a Rocket Engine used to Connect Satellites in Orbit

For each case, a summary of teaching points that relate to specific modules is included, and simplified data management plan provides a template for student activity in Module.

Assessment

By using case studies instruction can be customized for students in homogenous groups. An estimated 20% of RDM teaching can be tailored to emphasize a select few RDM issues for an audience from a specific discipline. The other 80% is generic, constituting good RDM practice that is applicable to all disciplines.[1]

This project is made possible by a grant from the U.S. Institute of Museum and Library Services

Footnote 1: Creamer, A. 2013. Crossing That Bridge We Have Come to: Teaching Students How to Manage Qualitative Data. A Conversation with Professor Julie McLeod and Susan Childs about DATUM for Health and DATUM: Research Data Management at Northumbria University