

Learning Objectives

Treatment of data

- Explain the difference between ownership of data, control of data, and access to data.
- Explain who has ownership of data, control of data, and access to data.
- Describe how to maintain good records of data. (General)
- Define what data includes. (General)
- Describe good data collection practices. (General)
- Explain good data storage practices.
- Describe how to maintain good records of data. (Program Specific)
- Define what data includes. (Program Specific)
- Describe good data collection practices. (Program Specific)
- Explain what types of data might require authorization prior to being collected or to use.
- Explain how long data should be retained.
- Describe how to determine how long data should be retained.
- Explain how to determine if data may be shared.
- Explain how to determine if there is an obligation to share the data.

Errors and Negligence

- Define an error in research.
- Define negligence in research.
- Explain the difference between errors and negligence in research.
- Describe the appropriate course of action when an error is discovered in research.
- Explain how other investigators can be affected by errors in research.

Learning Objectives

Mentor/Trainee Responsibilities

- Explain the basic responsibilities of a mentor which include:
 - Providing training in research methods needed to successfully complete project
 - Providing training in discipline-specific standards for responsible conduct of research
 - Setting expectations and goals for project
 - Setting criteria for evaluation
 - Setting an example for trainees by following the protocols established by the University, field, and mentor
 - Evaluating the trainee's progress
 - Setting criteria for credit in publications and/or proposals
 - Managing staff time and equipment use (especially important where projects and equipment may overlap)
 - Providing equal opportunities to all researchers in lab, regardless of race, gender, ethnicity, or sexual orientation
 - Reviewing work performed by trainee
- Explain the basic responsibilities of a trainee which include:
 - Performing work expected in a timely and responsible manner
 - Asking questions when expectations or protocols are unclear
 - Following the policies of the research group, University, funding agencies, etc.
 - Setting expectations for their training
 - Maintaining good research records

Misconduct

- Define research misconduct and fabrication, falsification, and plagiarism.
- Describe an instance that is not research misconduct.
- Describe techniques to resolve professional problems before they might lead to allegations of misconduct.
- Describe two historical cases of misconduct and the subsequent regulations because of these cases.
- Describe the procedures and policies for dealing with misconduct.
- Describe issues surrounding the reporting of misconduct, including both positive and negative outcomes.
- Describe two different ways to report misconduct.
- Describe two different courses of action to take if you are the subject of a misconduct investigation.

Learning Objectives

Ethical Standards (legal, institutional and discipline-based)

- List the office at Michigan Tech that administers the RCR rules.
- Define what is considered misconduct by Michigan Tech.
- Explain the responsibilities of students, faculty, and staff in understanding what actions constitute misconduct.
- List the four sources of rules for RCR.
- List the agencies in the US government that establish policies on research misconduct.
- Define what is considered misconduct by the federal government.
- Explain the actions that are considered misconduct by the federal government.
- Compare and contrast the definitions of misconduct by the US federal government and Michigan Tech.

Violations and Sanctions

- Determine if an example is an RCR violation (fabrication, falsification, or plagiarism)
- List the possible sanctions by the University for violating the RCR policies on the Michigan Tech campus.
- List possible governmental administrative actions for researchers found responsible for violating RCR rules.

Publication Practices and Responsible Authorship

- Describe how copyright law affects author's rights when preparing a publication.
- Describe how copyright law affects what an author may reprint in another publication.
- Explain the role of a primary, or corresponding author. m
- Explain the responsibilities of an author which include
 - Accurately reporting work (fabrication, falsification, plagiarism)
 - Fully describing work
 - Honestly assessing work
- Describe practices that are generally considered unsuitable for publications and explain why, including
 - Honorary authorship
 - Salami publication (aka bologna or trivial publication) – publishing small pieces of work to gain more publications
 - Duplicate publication
 - Premature publication

Learning Objectives

Allocation of Credit

- Explain the criteria for authorship on a publication. (basics included in orientation)
- Explain the difference between an author and an individual included in the acknowledgments of a publication. (basics included in orientation)

Peer Review Process

- Explain the purpose and importance of peer review
- Define “peer” in the context of peer review
- List and describe four uses for peer review
- Explain why researchers participate in the peer review process
- Explain the responsibilities and obligations of a peer reviewer which include:
 - Conducting the review in a timely fashion
 - Assessing the quality of the research
 - Judging the importance of the research
 - Ensuring confidentiality

Collaborative Science

- Explain the state of collaborative research in the student’s field and how it is increasing, decreasing, or maintaining the same frequency.
- Identify the pitfalls that may occur in collaborative research.
- Describe three ways to enhance good collaborative research.
- Explain the institutional processes established to guide collaborative research.
- Identify and describe three ethical considerations in collaborative research.
- List three resources available to deal with collaborative research.

Learning Objectives

Conflict of Interest

- Explain the importance of identifying conflicts of interest.
- Define conflict of interest.
- Define and describe specific types and levels of conflicts of interest.
- Define an institutional conflict of interest.
- Identify a conflict of interest when given a scenario.
- Define a conflict of interest with respect to an IRB member.
- Identify conflicts of interest for IRB members when given a scenario
- Explain the specific guidelines in government policies on conflicts of interest.
- Explain the problematic areas of governmental policies on conflicts of interest.
- Compare and contrast Michigan Tech's conflict of interest policy with a professional organization's policy.
- Develop and describe a possible strategy for managing a conflict of interest when presented with a conflict of interest.

Societal Expectations

- Describe the societal expectations of researchers.
- Explain why there is not one set of RCR rules for researchers.
- Describe the shared values of researchers.
- Explain the societal importance of research conducted with integrity.
- Identify a source for discipline specific RCR standards.
- Explain the difference between research fields and business or law.