

# Graduate Appointee Training Program

2020-21 Research Discovery  
Handbook



**WESTERN MICHIGAN UNIVERSITY**

Graduate College

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# WMU Mission and Vision

## **Mission**

Western Michigan University is a learner-centered research university, building intellectual inquiry and discovery into undergraduate, graduate, and professional programs in a way that fosters knowledge and innovation, and transforms wisdom into action. As a public university, WMU provides leadership in teaching, research, learning, and service, and is committed to enhancing the future of our global citizenry.

## **Vision**

Nationally and internationally recognized, the University aspires to distinguish itself as learner centered, discovery driven, and globally engaged.

### Learner centered

Western Michigan University is a university where every member of our community is responsive to and responsible for the education of our students. We challenge and engage all members of our community with a university experience that creates skilled, life-long learners.

### Discovery driven

Western Michigan University offers experiences that enable discovery, and promote creativity and research. We are committed to pursuing inquiry, disseminating knowledge, and fostering critical thinking that encourage life-long learning. Our scholarship creates new knowledge, forms a basis for innovative solutions, leads to economic development, and makes substantial contributions to society.

### Globally engaged

Western Michigan University impacts the globe positively. We are a community of learners committed to human dignity, sustainability, social responsibility, and justice. Our campus embraces a diverse population of students, faculty, and staff who develop learners and leaders who are locally oriented and globally competent, culturally aware, and ready to contribute to world knowledge and discovery.

The synergy of these three pillars enables WMU to be a premier and distinctive university of choice. Western Michigan University offers all students a learning community designed for and dedicated to their success. We are committed to access and affordability, and sustaining an environment in which every student can meet the world head-on and triumph.

# University Organization

Western Michigan University is led by its President, who reports to the Board of Trustees. The University consists of the following vice presidential units, each of which is headed by a Vice President:

- Academic Affairs
- Business and Finance
- Development and Alumni Relations
- Diversity and Inclusion
- Government Affairs and University Relations
- Legal Affairs and General Counsel
- Research
- Student Affairs

The **Academic Affairs** area, headed by the Provost and Vice President for Academic Affairs, is further divided into a variety of colleges, departments, schools, institutes, centers, and other units. Colleges are headed by a dean and all degree-granting academic programs are housed in colleges. Western Michigan University has the following colleges:

- Arts and Sciences
- Aviation (undergraduate only)
- Business (Haworth College of)
- Education and Human Development
- Engineering and Applied Sciences
- Fine Arts
- Graduate College
- Health and Human Services
- Lee Honors College (undergraduate only)

## The Graduate College

The Graduate College at Western Michigan University ([wmich.edu/grad](http://wmich.edu/grad)) provides an array of resources and services to assist graduate students and departments that house graduate programs. Headed by a dean and staffed by professional staff members, the Graduate College provides services such as the following:

- Serves as advocate for graduate education and programs across the University and seeks to sustain a high quality of programs. In this role, the Graduate College interacts with other academic colleges, the Graduate Studies Council of the Faculty Senate, Academic Affairs, and offices such as Admissions, Financial Aid, and the Registrar's office.
- Manages and oversees University policies and procedures related to graduate education and assists departments with consistent implementation of policies and procedures.
- Interacts with other graduate institutions through the Council of Graduate Schools and other organizations to share information and stay current with trends and issues in graduation education.
- Oversees the appointment process for graduate faculty members.
- Oversees and monitors graduate student appointments across the University for student eligibility and department compliance with minimum standards.
- Offers financial assistance to graduate students in the form of grants for research and conference travel expenses as well as some fellowships for graduate study.
- Assists students with thesis/dissertation writing and proposal development.
- Assists departments with recruitment of graduate students.
- Publicizes the scheduling of doctoral dissertation defenses, reviews format of all doctoral dissertations and master's theses, and holds workshops for formatting of dissertations and theses.
- Schedules and carries out numerous events for graduate students, including the new graduate appointee training, graduate student resource fair, annual graduate awards convocation, many workshops of interest to graduate students, etc.
- Provides a home for the Graduate Student Association and works with GSA to address graduate student concerns and develop opportunities for graduate students to get involved.

## WMU Online Orientation for Graduate Students

The Graduate College offers an online graduate student orientation course in e-learning. This serves as a resource for information about Western Michigan University and the surrounding community.

This course is not intended to replace traditional in-person orientation programs offered by graduate programs but serves as a way to enhance your experience at WMU. It is our intention to make sure that all incoming students have the opportunity to learn about WMU and the many programs and services available. You will have access to this course as long as you are a student. To access the course, follow these steps:

- Log into GoWMU and click the Elearning tab.
- Find the course “Graduate Student Online Orientation”

## Policies That Affect Graduate Appointees as Employees

For the full *Employee Handbook*, see: [wmich.edu/hr/policies/handbook](http://wmich.edu/hr/policies/handbook)

For the current TAU contract, see: [wmich.edu/academic-labor-relations/agreements](http://wmich.edu/academic-labor-relations/agreements)

## Stress Management and Conflict Resolution Resources

Graduate appointees who need assistance with academic, work-related, or personal issues have numerous places to go for help, including:

- **University Ombudsman** ([wmich.edu/ombudsman](http://wmich.edu/ombudsman)) —An intervention agent and impartial person who helps students, faculty, and staff resolve academic and non-academic concerns. The Ombudsman listens to you and discusses your question or concern; provides you with information that answers your question or helps you locate someone who can assist you; explains the University’s policies and procedures and how they may affect you; follows up with you and others at the University to make sure your concern is resolved; and recommends changes in the institution that will make it more responsive to every member of the community. The basic principles of the University Ombudsman are independence, impartiality, informality, and confidentiality. The Ombudsman is authorized to make thorough investigations and has access to most University offices and records, reports, and other documents. No person shall suffer any penalty for seeking assistance from the Ombudsman.
- **Office of Institutional Equity** ([wmich.edu/equity](http://wmich.edu/equity)) — Oversees and administers the University’s Affirmative Action and Equal Employment Opportunity programs and policies, the Americans with Disabilities Act and related accommodations, and also addresses issues of equality and justice for all members of the University as consistent with the University’s Non-discrimination Policy. Western Michigan University is committed to an environment which encourages fair, humane, and beneficial treatment of all faculty, staff, and students. In accordance with that fundamental objective, the University has a continuing commitment to assure equal opportunity and to oppose discrimination because of race, color, sex, sexual orientation, age, religion, national origin, handicap, height, weight, or marital status.
- **Campus Employee Dispute Resolution Services** ([wmich.edu/disputeresolution](http://wmich.edu/disputeresolution)) — Offers free confidential mediation and community conferencing services that assist faculty

and staff (including GAs) in finding mutually agreeable solutions to interpersonal disputes with other individuals in the workplace.

- **Counseling Services** ([wmich.edu/healthcenter/counseling](http://wmich.edu/healthcenter/counseling)) — Offers low-cost one-on-one personal counseling to assist individuals in better understanding themselves and the emotional conflicts that may interfere with their everyday lives as students, to help them become more aware of alternative means of coping with conflicts and stress, and to aid them in developing more healthy, satisfying, and fulfilling lifestyles.

## Campus Safety and Security

Like campuses all over the nation, Western Michigan University has made campus safety and security top priorities and responded with intense scrutiny of its resources and procedures for responding to immediate security threats. As a result, the University has implemented numerous procedures for notifying the campus community of threats and for protecting the safety and security of all campus citizens. Everyone in the campus community has a responsibility to be aware of potential threats to campus security and to follow these important procedures that will minimize such threats.

Find WMU's emergency procedures here: [wmich.edu/emergencymanagement/emergency-procedures](http://wmich.edu/emergencymanagement/emergency-procedures)

Western Michigan University has a 24/7/365 Department of Public Safety (DPS) with Patrol, Detective, and Community Policing divisions. The WMU DPS can be contacted using any one of the following procedures:

- Calling (269) 387-5555 from any phone any time
- Calling 118 from any campus blue light emergency call box or elevator phone

Please note: Calling 911 from a cell phone on campus will reach Kalamazoo County emergency dispatch, rather than WMU DPS.

**WMU Alert System:** All members of the WMU community may register a telephone number (cell, office, or home) through the GoWMU portal for "WMU Alert". If an extreme emergency is identified (including but not limited to severe weather, terrorism, shootings, hazardous materials incidents), the system employs preprogrammed text or voice messages that will deliver information to any currently enrolled WMU student or active WMU employee via a cell phone or a landline. Anyone who has registered the number of a text-capable phone in WMU Alert will receive messages about emergency situations in text format. Landlines or cell phones without text capability will receive messages as voice alerts. WMU urges all enrolled students and active employees to activate their WMU Alert account by following these steps:

- Log into GoWMU.
- Click on the yellow and red WMU Alert triangle.
- Enter the preferred phone number.
- Indicate preference for text or voice messages—or both.
- Click submit.

### **After hours Assistance**

The department of public safety offers Vehicle Escorts and Walking Escorts as after hour services for students on campus. Call 269-387-5555 or visit [wmudps.wmich.edu/safe-ride.php](http://wmudps.wmich.edu/safe-ride.php) for hours of operation.

**What should you do if you have reason to believe someone at WMU (e.g., a classmate, a student in a class you teach) is a threat to himself or to others?** Campus security threats are sometimes precipitated by mental health crises in individuals. Campus mental health professionals are trained to identify these kinds of issues in persons with whom they have contact. Other individuals on campus who don't have specific mental health training may also have concerns about the mental stability of persons they encounter in the campus setting. If someone you know at WMU has made threats against others or you believe an individual poses a possible danger to himself or others, you should immediately report your concerns to the WMU Department of Public Safety. They will investigate the potential threat and help determine what interventions may be necessary. Don't take it upon yourself to assess such possible threats, and don't assume that someone else will do something about it or that your concerns are not valid. Public Safety will listen to your concerns and take appropriate action. The Division of Student Affairs has more information on recognizing a student in distress and how to report a concern at [wmich.edu/studentaffairs/concern](http://wmich.edu/studentaffairs/concern).

## **Confidentiality/Disclosure of Student Records**

Western Michigan University is bound by federal law to comply with the provisions of the Family Educational Rights and Privacy Act of 1974 (FERPA). Maintaining confidentiality of educational records is the responsibility of all users whether the individuals are faculty, staff, or students.

According to FERPA, an education record, with limited exception, is a record which is maintained by the institution, directly related to the student, and from which a student can be identified. As graduate assistants, whether or not you are teaching you may be asked to handle student records, such as grades, as part of your assistantship responsibilities. It is important that you understand the limits of confidentiality in regard to student records (including your own records).

The Family Educational Rights and Privacy Act affords students certain rights with respect to their educational records. These include the right to consent to disclosures of personally identifiable information contained in the student's educational records, **except to the extent that FERPA authorizes disclosures without consent.**

Disclosure without consent is permitted when the information consists solely of "directory information." Directory information may be published or released by University faculty and staff at their discretion. Unless a student specifically directs otherwise by requesting confidentiality of his personally identifiable information, WMU designates all of the following categories of information about its students as "Directory Information":

- Name
- Address
- Telephone number
- WMU E-mail address
- Curriculum and major field of study
- Dates of attendance
- Enrollment status (full/part-time)

- Degrees/awards received
- Most recent previous educational agency or institution attended by the student
- Participation in officially recognized activities and sports
- Weight and height of athletes

The Registrar is the University officer charged with ensuring compliance with the Family Educational Rights and Privacy Act. More information on FERPA is available at: [wmich.edu/registrar/policies/ferpa](http://wmich.edu/registrar/policies/ferpa).

## Western Michigan University Libraries

University Libraries recognize that WMU graduate students engage in significant research and teaching while at WMU. The libraries are committed to providing resources and services that enhance your academic experience as both a researcher and an instructor at WMU.

**Get to know your library liaison:** WMU librarians are available to assist you whether in person or by phone, text, email, or online chat. Each academic department has an assigned liaison librarian whom you can contact about topics ranging from general inquiries to arranging in-depth research consultations. Your library liaison is the point person for many services available to you in your role as researcher as well as instructor. For example your liaison can assist with any of the following:

- Overview of services or introduction to resources (print, electronic, multimedia) available for your field
- Scheduling an in-depth research consultation
- Arranging hands-on library instruction for a class
- Recommending items you'd like the library to purchase or requesting a library workshop or service
- Find your library liaison here: [wmich.edu/library/subject-librarians](http://wmich.edu/library/subject-librarians)

### WMU Libraries collections and facilities:

- Collections include millions of print items as well as electronic books and databases, streaming video, DVDs, CDs, and maps.
- Off-campus access to databases, electronic journals, streaming video, and other online resources is available via Bronco Net ID.
- University Libraries consist of Waldo Library and several branches. Waldo Library houses collections in humanities, social sciences, science/technology, business, maps, government documents and special collections (includes medieval collection, rare books, women's poetry) and is the university's main library.
- Branch Libraries include:
  - Swain Education Library (Sangren Hall)
  - Maybee Music and Dance Library (Dalton Center)
  - Archives and Regional History (Zhang Legacy Collections Center)

**Course reserves:** WMU Libraries offer a reserve service for materials you would like set aside for your class. You can place physical or electronic materials on reserve for use by your students. More

information about setting up reserves for your classes, including copyright guidelines, can be found at [wmich.edu/library/reserves](http://wmich.edu/library/reserves).

### **Library instruction services:**

University Libraries provide a variety of instructional support services including course-related instruction, one-on-one consultations, virtual and self-guided tours, handouts, and tutorials. Librarians can work with you to develop research assignments that help students learn how to locate, evaluate, and effectively use information for their subject. Librarians can help you develop assignments using print collections, primary source materials, statistical information, etc. More information about Library Instruction Services is available at [wmich.edu/library/services/graduate](http://wmich.edu/library/services/graduate).

### **Borrowing books and other materials:**

- Books from WMU libraries may be checked out by graduate students for one semester. You may borrow up to 100 items from the general collections. See summary of library services for graduate students at [wmich.edu/library/services/graduate](http://wmich.edu/library/services/graduate)
- Present your Bronco Card whenever you wish to borrow library items.
- Items may be renewed online or in person.
- DVDs and videotapes from the **Instructional Video Collection** may be borrowed for seven (7) days.
- For information on borrowing other types of materials, as well as further information on borrowing and renewal policies see [wmich.edu/library/borrow](http://wmich.edu/library/borrow).

**Interlibrary loan:** The interlibrary loan service allows you to borrow items that are not in the WMU Libraries collections. Requests are placed through the interlibrary loan system by creating an account with your Bronco Net ID and password. Journal articles and book chapters are generally delivered electronically. Books, microfilm, CDs, DVDs, etc. can be picked up at Waldo Library. For more information about interlibrary loan services and to sign up for an account see [wmich.edu/library/borrow](http://wmich.edu/library/borrow).

**Recommend new books, journal subscriptions, etc.:** The libraries welcome your suggestions for new materials to add to the collections: books, electronic resources, journal subscriptions, media materials, etc. To recommend items for purchase you may either contact your library liaison or use one of the forms at [wmich.edu/library/new-item](http://wmich.edu/library/new-item).

**Reference Manager Software:** The Mendeley Desktop and Zotero citation management tools allow students to manage, read, share, annotate and cite research papers. Learn more at [libguides.wmich.edu/citing/tools](http://libguides.wmich.edu/citing/tools).

**Writing style guides:** The Libraries website provides “quick guides” as well as more extensive help with several of the more popular writing style systems: APA, Chicago, MLA, etc. These can be found at: [libguides.wmich.edu/citing](http://libguides.wmich.edu/citing).



## Research at Western Michigan University

Research at WMU is overseen by the Office of Research and Innovation (ORI) ([wmich.edu/research](http://wmich.edu/research)). In addition, the Research Policies Council, a standing council of the Faculty Senate, is responsible for reviewing, developing, and recommending policies dealing with the enhancement and implementation of research and creative activity at WMU.

The mission of ORI is to support the external funding initiatives of WMU faculty, students, and staff, and to advance the overall research agenda of the University. ORI assists researchers by offering information and services that include the following:

- Identifying funding sources
- Grant proposal preparation
- Grant and contract University approval and submission
- Partnerships with industry, government, and other institutions
- Multidisciplinary collaborations within the University
- Technology transfer and intellectual property support
- Research compliance regulation issues

In addition, the University possesses myriad research facilities and equipment. Facilities and equipment represented here are shared resources with varied availability. Some exist in the laboratories of individual scientists where access needs to be coordinated on a case-by-case basis through the ORI.

- BSL-1 and BSL-2 laboratories equipped to handle radioactive material
- A 5,616-square-foot animal facility maintained under AAALAC standards and housing rodents, reptiles, birds, aquatics, and amphibians in 14 animal rooms and two procedural rooms
- A Nuclear Regulatory Commission broad scope material license
- A University Imaging Center offering comprehensive scientific/technical expertise for basic research and light microscopy equipment
- Greenhouse facilities and environmental chambers
- High performance liquid chromatography (HPLC) for protein purification and other applications
- Spectroscopic assay capabilities for UV, visible, and fluorescence assays
- DNA sequencing capabilities
- Major instrumentation for research in chemistry
- A noise and reverberation laboratory for evaluation of noise levels and sound absorption capacity
- A wind tunnel for research in aviation and wind loading on structures
- Large load frames for mechanical testing
- High performance and large-scale computing facilities
- Papermaking, coating, recycling, and printing facilities for production and testing of printed media
- Technology transfer support available through the ORI.

External research funding provides many opportunities for graduate students to work as graduate research assistants. While conducting research can provide exciting opportunities to contribute to

advancing knowledge, it is fraught with the potential for serious problems. Although it is the responsibility of faculty research supervisors to train graduate student researchers in the art of research, student researchers need to make themselves aware of the principles of good research, such as regulations for working with human and animal subjects and potentially hazardous materials (e.g., viruses, radiation) and understanding the principles of research ethics. Other issues that must be considered are research misconduct and conflict of interest.

## Research Ethics

The Office of Research and Innovation has compiled a number of research ethics resources. There are nine core areas comprising the Responsible Conduct of Research, and ORI provides resources for each area at [wmich.edu/research/compliance](http://wmich.edu/research/compliance).

**Animal research:** There are materials that address issues important to conducting research involving animals, including definition of research involving animals, ethical principles for conducting research on animals, federal regulations governing animal research, institutional animal care and use committees, and treatment of animals.

**Authorship and publication practices:** The focus of these materials includes the purpose and importance of scientific publication, and the responsibilities of the authors. They cover topics such as collaborative work and assigning appropriate credit, acknowledgments, appropriate citations, repetitive publications, fragmentary publication, sufficient description of methods, corrections and retractions, conventions for deciding upon authors, author responsibilities, and the pressure to publish.

**Collaborative science:** These materials feature research collaborations and issues that may arise from such collaborations. Topics include setting ground rules early in the collaboration, avoiding authorship disputes, and the sharing of materials and information with internal and external collaborating scientists.

**Conflict of interest and commitment:** The definition of conflicts of interest and how to handle conflicts of interest are specified. Types of conflicts encountered by researchers and institutions are addressed, including topics such as conflicts associated with collaborators, publication, financial conflicts, obligations to other constituencies, and other types of conflicts.

**Data acquisition, management, sharing and ownership:** These resources focus on accepted practices for acquiring and maintaining research data and proper methods for record keeping and electronic data collection and storage in scientific research. Topics include defining what constitutes data; keeping data notebooks or electronic files; data privacy and confidentiality; data selection, retention, sharing, ownership, and analysis; data as legal documents and intellectual property, including copyright laws.

**Human subjects:** Issues important in conducting research involving human subjects are addressed, including topics such as the definition of human subjects research, ethical principles for conducting human subjects research, informed consent, confidentiality and privacy of data and patient records, risks and benefits, preparation of a research protocol, institutional review boards, adherence to study

protocol, proper conduct of the study, and special protections for targeted populations, (e.g., children, minorities, and the elderly).

**Mentor-trainee relationship responsibilities:** The responsibilities of mentors and trainees in pre-doctoral and postdoctoral research programs are addressed. Topics include the role of a mentor, responsibilities of a mentor, conflicts between mentor and trainee, collaboration and competition, selection of a mentor, and abuse of the mentor/trainee relationship.

**Peer review:** The purpose of peer review in determining merit for research funding and publications is addressed. Topics include the definition of peer review, impartiality, how peer review works, editorial boards and ad hoc reviewers, responsibilities of the reviewers, privileged information and confidentiality.

**Research misconduct:** The definition of research misconduct and the WMU Research Misconduct Policy and Procedures are available at [wmich.edu/research/compliance/ethicscenter/misconduct](http://wmich.edu/research/compliance/ethicscenter/misconduct). Topics include fabrication, falsification, and plagiarism; error vs. intentional misconduct; institutional misconduct policies; identifying misconduct; procedures for reporting misconduct; protection of whistleblowers; and outcomes of investigations, including institutional and Federal actions.

## Data Acquisition, Management, Sharing, and Ownership

[The material in this section was selected from the online course “Guidelines for Responsible Data Management in Scientific Research” ([ori.hhs.gov/data-management-0](http://ori.hhs.gov/data-management-0)), developed by Clinical Tools, Inc. and funded by the Office of Research Integrity, U.S. Dept. of Health and Human Services.]

### Data Collection

Data collection refers not only to what information is recorded and how it is recorded, but also to how a particular research project is designed. Although data collection methodology varies by project, the aim of successful data collection should always be to uphold the integrity of the project, the institution, and the researchers involved.

Data collection may seem tedious or repetitive, but the data produced in research ultimately prove or disprove hypotheses and justify or counter a body of research. In addition, thorough data collection accomplishes the following:

- Enables those involved in the research to more accurately analyze and assess their work
- Allows independent researchers to replicate the process and evaluate results
- Impresses upon research team members the importance of data management
- Details the rationale behind a research project
- Provides justification to sponsors for expenditures and project decisions
- Yields reliable and valid results, and hypothesis testing

### Collecting Reliable Data

Data collection guidelines and methodologies should be carefully developed before the research begins. The researchers must determine what sort of data will be collected and how this data will be analyzed. For data to be considered reliable, data collection should occur consistently and systematically throughout the course of the project.

### *The Importance of Planning for Data Collection*

Team members who will collect data should be thoroughly trained to ensure consistency in data collection. By collecting data in a well-planned, systematic manner, team members will be able to answer any question about a project, including the following:

- The purpose behind the research
- The particular methodologies chosen
- The implementation of these methodologies
- How data were collected and analyzed
- If unexpected results or significant errors were encountered
- The implications of the research and future directions

A clear and comprehensive account of a project and its purpose and direction make it much easier for research to be disseminated, understood, and evaluated by other members of the scientific community.

### *Collecting Valid Data*

Collecting valid data ensures that when research is evaluated it will be deemed good science—meaning that the research is both precise and honest. Thorough data collection should thus include a continuous system for rigorously evaluating effective or deficient elements in the project protocol or the research team's techniques.

### *Record Keeping*

When data are actually collected, the records should attempt to accurately represent the progress of a project and answer such questions as what, how, and why data were collected or amended. Records should be durable and accessible but safe from tampering or falsification. For smaller projects, bound notebooks provide a convenient way for all research team members to keep track of data and daily activities of a project. When keeping written records, errors should be marked and dated but never erased. This way, they can provide a quick visual account of any changes or errors that have occurred.

A downside of written records is that searching for a specific fact or trying to compare observations from several sources can be difficult. Also, maintaining handwritten records is not possible for larger projects such as clinical trials or epidemiological surveys.

### *Electronic Records*

Electronic records allow researchers to efficiently access and compare information from different sources and across similar projects. There are numerous electronic data capture programs that allow researchers to enter, store, and audit research data. However, security of electronic records is a significant concern, although there are methods for protecting electronic records. In addition, it may be time-consuming and may not be cost-effective for large ongoing projects to migrate their data records to electronic files. Therefore, most projects employ a combination of written and electronic record keeping to balance the risks and benefits.

### *Attention to Policy and Procedure*

In addition to record keeping, the validity of the data collected can also be affected by whether or not proper policies and procedures for research are followed on a project and an individual level. One should be constantly aware of all the guidelines that might apply to the project's

implementation and dissemination, including special regulations that involve human and animal subjects, hazardous materials, or other controlled biological agents. Every research team member should be aware of project guidelines and standards for collecting valid data, to ensure consistency throughout the project.

### *Best Practice Tips - Record Keeping*

Diligent record keeping is essential to ensuring the integrity of research data. To help maintain data validity and reliability, consider these tips when planning or completing data collection:

- **Include notes:** Your records should allow you not only to account for what occurred during the course of research but also to reconstruct and justify your findings. It is important that records include notes about what methods did or did not work, observations, and commentary on the project's progress. Keep notes according to the research team's predetermined communication plan.
- **Personal notebooks:** For smaller projects using handwritten data, each team member should have his or her own personal notebook for recording project data, observations, etc. Entries should be made in a chronological and consistent manner—for instance, each new workday should begin on a new page. Try not to leave blank lines between entries.
- **Noting errors:** Use a consistent system for noting errors or adjustments. In written records, make entries in indelible pen so that records cannot be altered or damaged. If information needs to be changed or amended, mark through the entry with one solid line and initial and date the change. The records can thus reflect what has occurred during the course of a project.
- **Recording information:** Record anything that seems relevant to the project, its data, and the standards of the project. At a minimum, records should include the following information:
  - date and time
  - names and roles of any team members who worked with the data
  - materials, instruments, and software used
  - identification number(s) to indicate the subject and/or session
  - data from the experiment and any pertinent observations from the data's collection
  - It may also be helpful to include a summary of the day's data collection activities and a task list for the next day.
- **Transferring information:** When transferring records from written to electronic format, use a double entry system to reduce rates of incorrectly entered electronic data. To implement such a system, have two different Research Assistants enter all of the raw data into the software program, then cross-check the data to identify and remedy inconsistencies at the time of data entry.

### **Data Management: Research Team Responsibilities**

Responsible data management is important in all phases of a project, from planning and data collection to data analysis and dissemination. Consequently, each research team member should know what role he or she plays in data management and his or her specific responsibilities. By clearly defining what is expected of each member and to whom each person reports, a PI can structure a project for success.

### *Research Team Members*

Although titles, roles, and responsibilities vary by organization or institution, most research teams are made up of at least five key members:

1. Principal Investigator: The Principal Investigator (PI) is the individual who is ultimately responsible for a project and its research. The PI **enables** other team members to conduct research, and is the final authority on all scientific and medical issues related to the project. By obtaining funding and seeing that a project has the right team members, proper resources, and guidance, a PI ensures the success of the project. A project may have more than one PI, in which case they are Co-Principal Investigators.

2. Research Director (Project Director): The Research Director **controls** the project. By directing the protocol for how the research and data collection are carried out, the Research Director often knows more about the day-to-day operations of the project than the PI. The Research Director works closely with the PI to both report on and redirect research. Sometimes, the Research Director is the PI.

3. Research Associate (Project Coordinator): Under the guidance of the Research Director and the PI, the Research Associate **coordinates** the project. This individual carries out the research itself, collecting data and assessing the effectiveness of project protocol, suggesting changes to the methodology as needed.

4. Research Assistant: A Research Assistant, although normally the least experienced member of a research team, **carries out** the project work. A Research Assistant performs the day-to-day tasks of a project, including collecting and processing the data and maintaining equipment.

5. Statistician: The Statistician **analyzes** the data that are collected during the project. In some projects, the statistician may simply analyze and report on the data (under the guidance of another team member) after data collection has been completed. In other projects, a statistician is involved in the construction and analysis of research throughout the entire course of a study.

### *Other Team Members*

Additional team members may be involved in research studies, including clinical research specialists, laboratory technicians, interns or student researchers, grant administrators, and others. Their roles should be defined by the PI at the outset of the project.

### **The Research Team's General Responsibilities**

It is important to note that the research team members' positions may be flexible—one person might serve in several positions or one role might involve the efforts of several individuals. Additionally, keep in mind that many organizations and/or research teams have limited funding, so team members may have to fill more than one role.

The table below provides further examples of each member's role and responsibilities, how these positions differ, and where there is overlap in team members' roles.

Team Member	Primary Responsibilities	Accountable To
Principal Investigator	<ul style="list-style-type: none"> <li>• Writes grant requests and proposals for a project</li> <li>• Initiates a research project and aids in the design and implementation of protocols</li> <li>• Selects the research team members</li> <li>• Provides team members with the necessary technical and equipment training</li> <li>• Creates a structured and effective work environment</li> <li>• Writes and publishes research articles to disseminate project findings</li> </ul>	<ul style="list-style-type: none"> <li>• Funding agency</li> <li>• Sponsor institutions</li> <li>• Professional associations</li> <li>• Employer and/or contractor</li> <li>• Legal and academic regulations</li> </ul>
Research Director (aka Project Director)	<ul style="list-style-type: none"> <li>• Designs guidelines for project methodology, including data collection procedures</li> <li>• Works with PI to redefine and redirect protocol as needed</li> <li>• Manages team members' time and project budgetary issues</li> <li>• Evaluates and documents project progress and compliance with protocols</li> <li>• Ensures that a project complies with federal and Institutional Review Board guidelines</li> <li>• Assists with writing research articles to disseminate findings</li> </ul>	<ul style="list-style-type: none"> <li>• Principal Investigator</li> </ul>
Research Associate (aka Project Coordinator)	<ul style="list-style-type: none"> <li>• Follows and implements research guidelines</li> <li>• Coordinates and conducts experiments and data collection</li> <li>• Provides basic analysis for data</li> <li>• Monitors experiments and their compliance with the protocols</li> <li>• Aids in reporting project research</li> </ul>	<ul style="list-style-type: none"> <li>• Principal Investigator</li> <li>• Research Director</li> <li>• Statistician (at times)</li> </ul>
Research Assistant	<ul style="list-style-type: none"> <li>• Performs experiments and collects data</li> <li>• Maintains research supplies and/or equipment</li> <li>• Performs general background and clerical work (e.g., literature review, transcription, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Principal Investigator</li> <li>• Research Director</li> <li>• Research Associate</li> <li>• Statistician (at times)</li> </ul>
Statistician	<ul style="list-style-type: none"> <li>• Ensures project design will produce reliable and valid data</li> <li>• Ensures research will create significant data (e.g., via sample size or analysis methods)</li> <li>• Monitors data collection and analysis</li> <li>• Analyzes and prepares data for reporting</li> </ul>	<ul style="list-style-type: none"> <li>• Principal Investigator</li> <li>• Research Director</li> </ul>

### *Data Management Responsibilities of the PI and Research Director*

Most of the specific tasks of data management fall to the PI and Research Director. For instance, these individuals are usually responsible for the following:

1. Ensuring that every person who is involved in the project knows his or her rights regarding data ownership.
2. Ensuring that the protocol is meticulously planned and that staff is thoroughly trained to maintain the integrity of the data collected.
3. Determining how to best store, protect, analyze, and disseminate the data.
4. Developing a plan for addressing research misconduct and data mismanagement.

### *Responsibilities of the Other Team Members*

The primary data management responsibilities of the Research Associates and Research Assistants are usually in data collection: ensuring the reliable and valid collection of the data and protecting the data that they have collected. Statisticians are primarily responsible for ensuring comprehensive and accurate data analysis. All research team members are responsible for letting the PI or Research Director know if they suspect data fraud, manipulation, or other misconduct.

## **Data Storage**

Once data have been collected and recorded, the next concern is data storage. Data storage is crucial to a research project for the following reasons:

- Properly storing data is a way to safeguard your research investment.
- Data may need to be accessed in the future to explain or augment subsequent research.
- Other researchers might wish to evaluate or use the results of your research.
- Stored data can establish precedence in the event that similar research is published.
- Storing data can protect research subjects and researchers in the event of legal allegations.

### *Type and Amount of Data to Retain*

Generally speaking, enough data should be retained so that the findings of a project can be reconstructed with ease. While this does not mean that a project needs to retain all the raw data that were collected, relevant statistics and analyses from this data should be saved, along with any notes or observations. Furthermore, if research involves the use of biological specimens, care should be taken to retain them until their quality degrades.

### *Electronic Data*

The key issues for electronic data storage are thorough documentation to allow data to be appropriately used in the future and storage format that is easily adaptable to evolving computer hardware and software. There are some additional considerations that are unique to electronic data storage, including the following:

- Rapid access to the data
- Fast read/write rates
- Low cost
- Ability to archive the data



- Removability
- A backup system, such as storing data on CDs

## **Data Protection**

Data protection should be a part of every project's plan for data storage. The best way to protect data, whether in written or electronic form, is by limiting access to the data.

In order to maintain the integrity of stored data, project data should be protected from physical damage as well as from tampering, loss, or theft. This is best done by limiting access to it. PIs should decide which project members are authorized to access and manage the stored data. Notebooks or questionnaires should be kept together in a safe, secure location away from public access, e.g., a locked file cabinet. Privacy and anonymity can be assured by replacing names and other information with encoded identifiers, with the encoding key kept in a different secure location. Ultimately, the best way to protect data may be to fully educate all members of the research team about data protection procedures.

### *How Can Data Be Protected?*

Theft and hacking are particular concerns with electronic data. Many research projects involve the collection and maintenance of human subjects data and other confidential records that could become the target of hackers. For example, thousands of personal information and identification records were jeopardized when hackers infiltrated systems at the University of California twice in 2005. The costs of reproducing, restoring, or replacing stolen data and the length of recovery time in the event of a theft highlight the need for protecting the computer system and the integrity of the data (Kramer et al., 2004).

Electronic data can be protected by taking the following precautions:

- **Protecting access to data**
  - Use unique user IDs and passwords that cannot be easily guessed.
  - Change passwords often to ensure that only current project members can access data.
  - Provide access to data files through a centralized process.
  - Evaluate and limit administrator access rights.
  - Ensure that outside wireless devices cannot access your system's network.
- **Protecting your system**
  - Keep updated anti-virus protection on every computer.
  - Maintain up-to-date versions of all software and media storage devices.
  - If your system is connected to the Internet, use a firewall.
  - If your system is connected to the Internet, use intrusion detection software to monitor access.
- **Protecting data integrity**
  - Record the original creation date and time for files on your systems.
  - Use encryption, electronic signatures, or watermarking to keep track of authorship and changes made to data files.
  - Regularly back up electronic data files (both on- and offsite) and create both hard and soft copies.
  - Ensure that data are properly destroyed.

### *Third-Party Data Protection*

Many research institutions have offices for information technology that work with the PI to assess the project's needs and develop a data protection protocol. For PIs without such an office, contracting with an outside information technology firm or hiring a project member to specifically focus on data protection and maintenance may be necessary.

Finally, database software programs often include features that help with data protection.

### **Data Sharing and Reporting**

Data sharing is the way in which research is accurately represented to the scientific community and the general public. As part of the scientific process, data are expected to be shared and reported. This serves several purposes, including the following:

- Acknowledging a study's implications
- Contributing to a field of study
- Stimulating new ideas

By sharing research results, a project may advance new techniques and theories and benefit other research. It encourages collaboration between researchers in the same field or across disciplines. Additionally, reporting of clinical research data can have a direct impact on the quality of health care provided to patients.

Data sharing usually occurs once a study has been completed. Data reporting includes discussion of the data, the data analysis, and the authorship of a project, especially in the context of a particular scientific field. Data sharing and reporting are typically accomplished by publishing results in a scientific journal or establishing a patent on a product.

### *Sharing Data Prior to Publication*

Before publication, there is often no obligation to share any preliminary data that have been collected. In fact, sharing at this stage is sometimes discouraged because of the following reasons:

- The implications for a set of data may not be understood while a project is still in progress. By waiting until a project is ready for publication, researchers ensure that what they share has been carefully reviewed and considered.
- There is fear that less scrupulous researchers will use shared research results for their own gain. This apprehension causes some researchers to refrain from disseminating their findings (Helly et al., 2002).

However, in some cases preliminary data should be shared immediately with the public and/or other researchers since it would be of immediate benefit (e.g., if a research project found that a new drug placed subjects at grave risk or greater benefit) (Steneck, 2004). In addition, many researchers find it worthwhile to present preliminary findings in a conference setting before the study is complete to inform peers about their forthcoming research.

### *Sharing Data After Publication*

After a project's research has been published or patented, any information related to the project should be considered open data. Other researchers may request raw data or miscellaneous information related to the project in order to verify the published data or to

further their own research project. However, each project should evaluate its ability to share raw data in terms of specific needs and budget constraints.

### *Obligation to Report*

PIs should be aware of the various guidelines and restrictions that may apply to the dissemination of their research. There are usually stipulations, specific to the funding agency or sponsor institution, describing when and how results should be shared. For instance, SBIR research may be subject to certain data reporting requirements, depending upon project phase. In addition, government-sponsored research or research related to biological agents may be subject to federal legislation such as the Patriot Act or the Freedom of Information Act.

### **Data Ownership**

Data ownership refers to the control and rights over the data as well as data management and use. Understanding data ownership, who can possess data, and who can publish books or articles about it are often complicated issues, related to questions of project funding, affiliations, and the sources and forms of the research itself. For federally funded research, ownership of data involves at least three different entities: the sponsoring institution, the funding agency, and the principal investigator (PI). In many cases, the institution/organization owns the project data, but the PI and the funding agency have “rights” to access and use the data. Usually the PI has physical custody of the data on behalf of the organization. However, these rules vary by institution and funding source. Some general guidelines are presented below:

1. **The Sponsoring Institution**, e.g., a university or a research firm:  
Most often, the sponsoring institution/organization maintains ownership of a project’s data as long as the PI is employed by that institution. The institution often controls all funding or the disbursement of government funding; consequently, it is also responsible for ensuring that funded research is conducted responsibly and ethically. Within the sponsoring institution, a PI is granted stewardship over the project data; the PI may control the course, publication, and copyright of any research, subject to institutional review.
2. **The Funding Agency**, e.g., The National Institutes of Health (NIH), the National Science Foundation (NSF), or the Centers for Disease Control and Prevention (CDC):  
Many research projects are funded by federal government agencies, philanthropic organizations, or private industries. These agencies often have specific stipulations for how data will be retained and disseminated: for example, they—rather than the PI—decide whether to publish the project’s results or market a resulting product. The PI and institution should understand his or her funding agency’s regulations regarding a research project and the data it produces. Note that requirements for federal grants may be different than government contracts.
3. **The Principal Investigator:**  
In addition to being the steward of a project’s data, a PI may retain some ownership of the data. In small businesses, it is assumed that rights and ownership of data remain with the business itself or with the funding agency, unless otherwise stipulated. In academic institutions, however, PIs are sometimes allowed to take their research and its data with them if they change research institutions. Many universities have offices

and policies in place to ensure that such a transfer of data respects both the rights of the researcher and those of the institution(s). (USDHHS, 1990)

### *Subjects' Rights to Ownership*

It is also important to consider data ownership from the perspective of individuals who suggest research ideas and/or participate in the research (see article suggested below for additional reading). Some research subjects are expressing a desire for partial ownership or control of research in which they have participated. For instance, in two recent court cases, the defense contended that research institutions had improperly benefited in extending their study's implications beyond any consent that the participating subjects had given. Since human subjects are often sources for data that may be otherwise unavailable to researchers, it is important to consider study participants' beneficence and dignity in relation to the project's progress and goals.

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- U.S. Dept. of Health and Human Services. Data management in biomedical research: Report of a workshop. Presented at: Workshop on Data Management in Biomedical Research; April 25, 1990; Chevy Chase, MD.

## **Guidelines for Human Subjects Research at WMU**

Much research at the university level involves the use of human research subjects. The primary role of the Human Subjects Institutional Review Board (HSIRB) is to protect the rights and welfare of human research participants.

Federal regulations define “research” as “a systematic empirical investigation designed to develop or contribute to generalizable knowledge.” Federal regulations define “human subject” as “a living individual about whom an investigator...conducting research obtains: 1) data through intervention or interaction ..., or 2) identifiable private information.”

The three basic ethical principles that guide the HSIRB are derived from the Belmont Report of 1979 ([hhs.gov/ohrp/regulations-and-policy/belmont-report](https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report)). These three principles are:

- **Respect for persons:** This principle involves protecting the autonomy of all people, treating them with courtesy and respect, and allowing for informed consent.
- **Beneficence:** This is the concept that researchers should act for the benefit of others and have the welfare of the participant as a goal of any study. The rules of this principle are (1) do not harm and (2) maximize possible benefits and minimize possible harms.
- **Justice:** This principle ensures that equals are treated equally and the costs and benefits to potential research participants are administered fairly and equally. For example, the selection of research subjects needs to be scrutinized in order to determine whether some classes are being systematically selected simply because of

their easy availability, their compromised position, or their manipulability, rather than for reasons directly related to the problem being studied.

By submitting a protocol to HSIRB:

- Investigators comply with university policy and federal regulations.
- Investigators promote the protection of the rights and welfare of research participants.
- Faculty set an example for student researchers.
- Students learn about the ethical conduct of human research.

**University policy requires that all research involving human subjects be submitted to HSIRB.**

Any full-time faculty or staff employee of WMU may serve as a Principal Investigator. Students (including graduate students) may serve as Student Investigators but not as Principal Investigators. Adjunct or part-time faculty may serve as Co-Principal Investigators, at the discretion of the Principal Investigator.

Before a protocol can be approved, all investigators must have completed the appropriate on-line training modules at [citiprogram.org](http://citiprogram.org). **Please note** that this is separate and distinct from the Responsible Conduct of Research online course in e-learning that is required for new graduate students. In taking the CITI on-line training modules, researchers will learn about the history of ethical concerns in human subjects research and important documents that govern such research, as well as be thoroughly informed about such principles as confidentiality of data, recruitment of subjects, informed consent/assent, etc.

Federal regulations divide human subjects research into categories based on the level of risk to which subjects will be exposed by participating in the research. University policy uses two categories—expedited review and full board review:

- **Research that can be reviewed by an expedited process** poses no more than minimal risk to the subject and falls into at least one of the federally defined categories. Examples include: research in educational settings; anonymous surveys; surveys collecting information that is not sensitive; analysis of voice recordings; studies involving moderate exercise; studies of existing data; and research on individual or group characteristics or behavior.
- **Research that requires full board review** may expose the subjects to greater than minimal risks or involves protected research populations (e.g., children, pregnant women, incarcerated individuals, persons unable to give consent due to diminished mental capacity). These research protocols will be reviewed by the full board at a convened meeting.

**Information and application forms are available online at [wmich.edu/research/compliance/hsirb](http://wmich.edu/research/compliance/hsirb).** There are no deadlines for expedited submissions. They are reviewed on a continuous basis.

Applications submitted for full board review must be submitted on or before the first Wednesday of the month and will be reviewed at a full board meeting on the third Wednesday of that month.

No research or subject recruitment may begin until HSIRB has given your research protocol full approval with no revisions. This includes research conducted by graduate students writing a thesis or dissertation which involves research with human subjects.

All changes in a research protocol must be approved before the change is incorporated into the protocol.

## Other Institutional Review Boards and Safety Committees

### Institutional Animal Care and Use Committee (IACUC)

([wmich.edu/research/compliance/animals](http://wmich.edu/research/compliance/animals)) is a local review board charged with the protection of the welfare of animals in research conducted at WMU. WMU policies adhere to federal requirements contained in the Animal Welfare Act, *The Public Health Service Policy on Humane Care and Use of Laboratory Animals*, the U.S. Department of Agriculture's *Guide for the Care and Use of Agricultural Animals in Research*, and the National Research Council's *Guide for the Care and Use of Laboratory Animals*.

The IACUC reviews **all** research and teaching protocols involving **vertebrate animals**. The use of animals in research involves responsibility for the stewardship of the animals and accountability to the scientific community and society. Stewardship goes beyond the immediate research needs to include acquisition, care, and disposition of the animals, while responsibility to the scientific community and society requires an appropriate understanding of, and sensitivity to, scientific needs and community attitudes toward the use of animals in research.

Three basic principles are particularly relevant to the ethics of research using animals:

- **Respect for Life:** Living creatures deserve respect. Animals used in research should be of an appropriate species and health status, and should involve the minimum number required to obtain valid scientific results. Methods such as mathematical models, computer simulation, and *in vitro* systems should be used whenever possible.
- **Societal Benefit:** The advancement of biological knowledge and improvements in the protection of the health and well-being of both humans and other animals provide strong justification for animal research. The assessment of the overall ethical value of animal use should include consideration of the full range of societal goods, the populations affected, and the burdens expected to be borne by the research animals.
- **Non-maleficance:** Vertebrate animals are sentient. Minimizing distress, pain, and suffering is a moral imperative. Unless the contrary is established, consider that procedures that cause pain or distress in humans also cause pain or distress in other sentient animals.

Before a researcher can order animals for research projects, he/she must have an IACUC approved protocol. The IACUC meets monthly to consider animal protocols.

Before a protocol can be approved, all investigators must have completed the appropriate on-line training modules at [citiprogram.org](http://citiprogram.org). Please note that this is separate and distinct from the Responsible Conduct of Research online course in e-learning that is required for new graduate students.

**Biosafety Committee** ([wmich.edu/research/compliance/biosafety](http://wmich.edu/research/compliance/biosafety)) was formed to ensure that all teaching, research, and clinical activities involving the use of potentially hazardous microbial agents and/or their products are conducted in a safe and secure environment. All research involving recombinant DNA molecules conducted under the aegis of Western Michigan University is reviewed by this committee. Recombinant DNA molecules are defined as either (i) molecules that are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell, or (ii) DNA molecules that result from the replication of those described in (i).

**Radiation:** Federal and State of Michigan rules and regulations require WMU to assure that exposure to radiation is ALARA (as low as reasonably achievable). The Radiation Safety/Biosafety Officer ([wmich.edu/research/compliance/radiation](http://wmich.edu/research/compliance/radiation)) must approve research involving use of radiation and/or radioactive materials. The Radiation Safety Committee provides guidance and assistance in the development and implementation of policies and procedures used to ensure compliance with the rules and regulations governing radiation and radioactive material use.

## Conduct in Research

Research and creative activities occur in a variety of settings at the University, including class papers, theses, dissertations, reports or projects, grant-funded projects, and service activities. Research and creative activities rest on a foundation of mutual trust. Misconduct in research and in creative activity destroys that trust and is prohibited. Students shall adhere to professional standards of integrity in both artistic and scientific research including appropriate representations of originality, authorship, and collaborative editing. More information is available at [wmich.edu/research/compliance/ethicscenter/misconduct](http://wmich.edu/research/compliance/ethicscenter/misconduct).

**Definition:** Misconduct in research is defined as serious deviation, such as fabrication or falsification of data, plagiarism, or scientific or creative misrepresentation, from accepted professional practices of the discipline or University in carrying out research and creative activities or in reporting or exhibiting/ performing the results of research and creative activities. It does not include honest error or honest differences in judgments or interpretations of data.

**Clarification:** Examples of misconduct in research include but are not limited to:

- **Fabrication of Data:** Deliberate invention or counterfeiting of information.
- **Falsification of Data:** Dishonesty in reporting results, ranging from unauthorized alteration of data, improper revision or correcting of data, gross negligence in collecting or analyzing data, to selective reporting or omission of conflicting data.
- **Plagiarism and Other Misappropriation of the Work of Another:** The representation of another's ideas or writing as one's own, in such ways as stealing others' results or methods, copying or presenting the writing or ideas of others without acknowledgment, or otherwise taking credit falsely. Representing another's artistic or technical work or creation as one's own. Just as there are standards to which one must adhere in the preparation and publication of written works, there are standards to which one must adhere in creative works in the tonal, temporal, visual, literary, and dramatic arts.

- **Abuse of Confidentiality:** Taking or releasing ideas or data of others which were given in the expectation of confidentiality, e.g., stealing ideas from grant proposals, award documents, or manuscripts intended for publication or exhibition/performance when one is a reviewer for granting agencies or journals or when one is a juror.
- **Dishonesty in Publication or Exhibition/Performance:** Knowingly publishing, exhibiting, or performing work that will mislead, e.g., misrepresenting material, particularly its originality, or adding or deleting the names of authors without permission.
- **Deliberate Violation of Requirements:** Failure to adhere to or receive the approval required for work under research regulations of federal, state, local, or university agencies, including guidelines for the protection of human subjects or animal subjects and the use of recombinant DNA, radioactive material, and chemical or biological hazards.
- **Failure to Report Fraud:** Concealing or otherwise failing to report known misconduct or breaches of research or artistic ethics.

**Research Board Requirements:** Misconduct in research includes failure to comply with requirements for the conduct of research and creative activities, e.g., the protection of human subjects, the welfare of laboratory animals, and biosafety. Allegations in these areas may be brought by the Human Subjects Institutional Review Board, the Institutional Animal Care and Use Committee, and the Institutional Biosafety Committee.

## Intellectual Property Rights, Conflict of Interest

A substantial amount of research being conducted at Western Michigan University results in new findings, developments, and discoveries that can benefit society. Graduate research assistants sometimes contribute to research findings with commercial potential. The transfer of these discoveries to the commercial sector is coordinated through the Technology and Innovation Advancement (“technology transfer”) function at WMU ([wmich.edu/policies/intellectual-property](http://wmich.edu/policies/intellectual-property)) and the Western Michigan University Research Foundation. The Office of the Research and Innovation is responsible for the management and commercialization of WMU’s intellectual property through the research foundation.

The increasing involvement of academic researchers and educators with industry and private enterprise makes it easier for promising research observations to be translated into practical application in many different sectors. WMU encourages employees to: patent and license inventions arising from their research, develop partnerships with industry to market new technology, apply for industry sponsored research funds, and serve as consultants for industry. Involvement in commercial activities comes with many benefits: practical application of new technology, royalty income for the employee and the University, the potential of external research funds, etc. The federal government, too, encourages universities to commercialize the results of federally supported research for the public good (Bayh-Dole Act). In some cases, graduate student researchers have been named as holders of patents and copyrights based on research conducted at universities.

Involvement with commercial ventures, however, could potentially divert university employees from their primary mission of education, research, and service. Conflicts of



interest and commitment can arise when the interests of the commercial venture differ from the interests and primary obligations of the University and its employees, or when the commercial enterprise consumes an undue share of employee time.

**Conflict of Commitment:** Full-time faculty are expected to devote their primary professional time to teaching, research, and administrative responsibilities. Outside financial interests and activities should not interfere with these commitments.

**Conflict of Interest:** Resources providing information on conflicts of interest are available on the ORI website ([wmich.edu/research/compliance/ethicscenter/conflicts](http://wmich.edu/research/compliance/ethicscenter/conflicts)). An actual or potential conflict of interest exists when the Vice President for Research reasonably determines that a Significant Financial Interest could affect the design, conduct, or reporting of the research or educational activities funded by a Governmental Agency.

The University is responsible for maintaining objectivity in research by ensuring that the design, conduct, and reporting of research will not be biased by any conflicting financial interest of investigators responsible for the research. The rationale for establishing policies to manage conflict of interest in research is to protect employees and the University from potential accusations of misconduct.

### **Why Should You Care About Conflicts of Interest?**

Researchers have a tradition of free inquiry and free exchange of ideas. Trust, the core ethical value in this issue, is essential in the scientific pursuit of the truth. A relationship based on trust is necessary with colleagues, the government, the study sponsors, and, of course, the public. Objectivity is fundamental to this trust.

Conflicts of interest are intrinsic to the researcher's enterprise. And that is why conflicts of interest are so serious. Not only can a conflict lead to injury or harm to particular study participants but, on a larger scale, a conflict of interest can damage an entire research enterprise by reducing the trust and confidence that people generally have in research.

Although graduate research assistants are not as likely as principal investigators to be vulnerable to a conflict of interest, they should be able to recognize potential conflicts that might occur.

### **Definition of a Conflict of Interest**

A conflict of interest involves the abuse—actual, apparent, or potential—of the trust that people have in professionals. The simplest working definition states: A conflict of interest is a situation in which financial or other personal considerations have the potential to compromise or bias professional judgment and objectivity. An apparent conflict of interest is one in which a reasonable person would think that the professional's judgment is likely to be compromised. A potential conflict of interest involves a situation that may develop into an actual conflict of interest. It is important to note that a conflict of interest exists whether or not decisions are affected by a personal interest; a conflict of interest implies only the potential—not a likelihood—for bias. It is also important to note that a conflict of interest is not considered misconduct in research, since the definition for misconduct is currently limited to fabrication, falsification, and plagiarism.

There are many varieties of conflicts of interest, and they appear in different settings and across all disciplines. All involve the use of a person's authority for personal and/or financial gain. Conflicts of interest may involve individuals as well as institutions. Furthermore, individuals, in certain circumstances, may have conflicts occurring on both an individual and an institutional level, as may be seen among members of an Institutional Review Board (IRB).

## **Mentor-Trainee Relationship Responsibilities**

### **Why is mentoring important?**

Mentoring is central to promoting responsible conduct in all areas of research since mentors function as role models and are often the primary means by which professional standards are informally communicated. A good mentor will demonstrate both professional and social responsibility in the context of research.

### **Who is a mentor?**

A number of people may function as both official and unofficial mentors:

- Thesis advisor or major professor who provides direction and guidance to students.
- Principal investigator of a project who demonstrates practices in research, obtaining funding, etc.
- Project coordinators.
- Post-doctoral students may function as mentors for graduate students.
- Graduate students may function as mentors for undergraduates.
- Colleagues
- Administrative staff—IRB personnel, department administrators, etc.

### **For mentees**

If you have the option of choosing your own mentor, select one who values the practice of responsibility in research, and has the background, experience, and time to assist you in the pursuit of your goals:

- Educate yourself on the ethical standards and principles of your field.
- Take an interest in the ethical aspects of your research and discuss them with your mentor.
- Find out what resources your program and your department offer with regards to mentoring and helping you grow into your professional role.
- Identify your goals and clarify your expectations with your mentor.
- Your mentoring needs will change as you progress in your career. Periodically evaluate the mentoring relationship for whether or not it addresses your current needs. If your needs are changing, inform your mentor.
- Don't be afraid to ask for help. If your mentor does not respond appropriately, find one who will.
- If you have problems with your data, discuss possible options with your mentor to make sure that your actions will not be construed as questionable or as research misconduct.
- Expect that there will be obstacles in the mentoring relationship and be proactive in trying to resolve them.

- Try not to take up or demand more time of your mentor than is appropriate.
- The mentoring relationship is one that should be beneficial to both mentor and mentee. Therefore don't enter the mentoring relationship with hidden agendas.

### **More on Mentoring**

There are a variety of resources available on the graduate student/faculty advisor relationship and how to get the most out of it. One very useful resource is a document prepared by the University of Michigan Rackham Graduate School (*How to Get the Mentoring You Want: A Guide for Graduate Students* (2018, The Regents of the University of Michigan: [rackham.umich.edu/downloads/publications/mentoring.pdf](http://rackham.umich.edu/downloads/publications/mentoring.pdf)). That document provided the basis for the information below.

### **What Is Mentoring?**

A mentoring relationship is a close, individualized relationship that develops over time between a graduate student and a faculty member (or others). Although there is a connection between mentors and advisors, not all mentors are advisors and not all advisors are mentors. Mentors provide more than just advice. In addition to providing advice and sharing subject knowledge, mentors also assist in the professional development of a graduate student. Rather than trying to find one person who can give you everything, seek out various faculty who can provide you with the components you need to succeed. It is to your benefit to have multiple mentors anyway. Having 3-4 faculty members who are knowledgeable about your work increases the likelihood that you will receive the experiences and support you desire. A team can also serve as your safety net in case any one of the professors you work with leaves the University, or if irreconcilable issues later develop between you and a faculty member (which, unfortunately, does sometimes happen). In addition, you will need a graduate committee, so these faculty may serve in that capacity.

As you may know by now, graduate school is vastly different from your undergraduate experience. One of the main differences is that as an undergraduate your goal was to *obtain* knowledge, while in graduate school your goal is to also *contribute* to a field of knowledge. Graduate school is the professional training ground where you learn the skills you need to be successful in your field and gain an understanding of how your discipline works.

Mentoring is important to graduate students not only because of the knowledge and skills that are imparted, but also because of the many other aspects of professional socialization and personal support that are needed to facilitate success in graduate school and beyond.

### **Why Is Mentoring Hard to Find?**

Regardless of their fields, faculty need to balance the many demands that are made of them. A partial list of their responsibilities includes: teaching undergraduate and graduate courses; advising undergraduate and graduate students; serving on dissertation and thesis committees; researching or working on creative projects; writing grants; writing books and articles; reviewing the work of their students and colleagues; serving on departmental and university committees; and fulfilling duties for professional organizations.

The pace of these demands does not let up over time. Junior faculty face the pressure of preparing for their tenure review, which means they have to be engaged in an active research agenda. As faculty become more senior, and their national and international prominence increases, the demands for their time and energies only grow.

Although faculty have numerous demands and responsibilities, keep in mind that the majority of faculty want to mentor graduate students. They can gain numerous benefits from this experience, including gaining collaborators for current or future projects, acquiring research assistants whose work is critical to the completion of a research grant, gaining increased professional stature by shaping future scholars, keeping abreast of new knowledge and new techniques, and reaping the personal joys and satisfactions inherent in the mentoring relationship.

### **How to Find a Mentor**

It is *your* responsibility to seek out interactions with faculty members. It is not unusual for graduate students to feel hesitant about initiating contact with a faculty member. Especially in the early stages of graduate school, students often feel they need guidance on how to choose possible faculty mentors.

Start the selection process by first undertaking a critical self-appraisal. Figure out what will help you to thrive as a graduate student. Use this information later on to match yourself with faculty or others who can provide you with what you need. Examples of things you should be asking yourself include:

- What are my objectives in entering graduate school?
- What type of training do I desire?
- What are my strengths?
- What skills do I need to develop?
- What kinds of research or creative projects do I want to work on?
- How much independent versus hand-in-hand work do I want to do?
- What type of career do I want to pursue?

You can identify potential faculty mentors within or outside your department using a variety of formal and informal means. Some suggestions are:

- Familiarize yourself with professors' work to gain a sense of their past and current interests and methodologies.
- Immerse yourself in departmental academic and social activities. Observe how faculty interact with colleagues and graduate students.
- Enroll in classes being taught by faculty who most interest you. Attend their public presentations.
- Ask advanced graduate students about their advisors and mentors. Share your interests and ask them for suggestions about whom you should meet.

Although such characteristics as race, gender, nationality, and sexual orientation are significant aspects of your identity, they constitute only some of the qualities you should consider when selecting a mentor. Faculty members who are different from you can contribute valuable insights to you and your work.

## How to Increase Your Chances of Finding Good Mentoring

### *Have Realistic Expectations*

As stated previously, in order for you to develop mentoring relationships, you must be proactive. It is your task to find and recruit the mentors who can help you achieve your goals.

You also need to have a realistic idea about what any single mentor can do for you. Faculty are more likely to respond to requests for specific types of assistance that they know they can provide. Analyze what you need from a specific faculty member and explicitly ask for those things.

Finally, remember that part of your task as a graduate student is to develop and demonstrate your abilities to be an independent scholar. If you ask for an *excessive* amount of help, you run the risk of having that faculty member feel they are doing your work. What is determined to be excessive will vary by professor and discipline. Discuss this with the professor if you have any concerns.

### *Clarify Roles and Responsibilities*

Problems in mentorship most often come about because of misunderstandings about the expectations the parties have of one another. Although you do not need to set up a formal contract, some people find it helpful to specify mutual agreements about their respective roles and responsibilities. Some of the expectations you will need to discuss, especially if this person is your advisor or dissertation chair, include:

**Goals:** Develop a work plan that includes both short-term and long-term goals as well as a timeframe for reaching those goals. At least once a semester, contact your mentor to discuss your progress, as well as any additional training and experiences you need in order to achieve your goals. If modifications are necessary, inform your mentor and agree upon a new work plan.

**Meetings:** Decide how often you will meet face-to-face, being sure that you request the amount of time you need in order to succeed. Discuss whether e-mail is okay for certain issues or questions that might arise between meetings. Show up for scheduled meetings on time. Meetings will be most productive when you accept responsibility for “running” the meeting. Your role is to raise the issues and questions while the professor’s role is to respond; prioritize your issues so you are asking your most important questions first. At the conclusion of the meeting or through e-mail, summarize any agreements that have been reached.

**Feedback:** Clarify how often the faculty member will give you feedback about your general work and your progress. For feedback on specific work, find out how long it typically takes them to return papers. However, in advance of actually handing them a paper or project to review, inquire about their current workload and whether they can still manage that timeframe. Find out if they tend to provide a lot of comments or very few, so that you won’t be taken aback later on. Do not submit a draft to a faculty member in its roughest form (unless otherwise instructed by the professor.) Seek the professor’s input once you are confident you have a presentable

draft. Be sure to proofread the document carefully. If you have doubts about the quality of your work, ask a friend to read your paper first.

**Reminders:** What is the best way to remind them about getting your work back within an agreed upon timeframe? For instance, you can ask: “When you are very busy, how should I remind you about a paper you have of mine? Should I e-mail you, call you, or come by your office?” “How much in advance should I remind you—is one week enough or would you prefer two?”

## **Other Advice for Mentees**

### Recommendation Letters

It is likely that you will, at some point, require letters of recommendation from your mentors. Note the following advice about asking for letters:

- Provide an updated copy of your curriculum vitae when asking someone to write a recommendation letter for you.
- Leave clear written instructions as to when the letters are due and to whom to send them. If you have several letters, create a calendar for your mentor that lists application deadlines.
- Provide a short description about the fellowship, grant, or program for which you are applying.
- Provide details about how you are structuring your application and what points you would like your mentor to emphasize.
- Submit these materials with enough advance time for your mentor to write a quality letter.

### Present Yourself Seriously

Make the transition from thinking of yourself as a bright student to seeing yourself as a potential colleague.

- Attend departmental lectures and other activities.
- Join professional associations and societies.
- Attend conferences and use these opportunities to network with others.
- Seek out opportunities to present your work (in your department or through outside conferences, publications, performances).
- Attend teaching workshops and discipline-specific pedagogy classes.

Accept critiques of your work in a professional manner. If you disagree with a particular criticism, demonstrate that you are willing to consider that point. If after thinking about it for some time you still disagree, demonstrate your ability to defend your ideas in a professional and well-thought-out manner.

It is your responsibility to update your mentors about your progress and your struggles. Do not avoid your mentors; instead, use their advice to assist you in moving past your struggles.

Although friendship is not a necessary component for mentorship, friendships between faculty and graduate students can and do develop. Be mindful that although you may have a friendship with a particular faculty member, a hierarchical arrangement still exists.

# Laboratory Tips for the Research Assistant

## Before the semester/school year begins:

Locate your research advisor's office and sit down and have a conversation.

- Discuss what the advisor expects to learn from the research and his/her expectations for you over the following 3 to 6 months or longer.
- Ask questions!!! You are being paid to perform the service of assisting the faculty member in his/her research. The more knowledge and understanding of the project(s) you have, the easier this task becomes.
- Discuss your expectations in performing this duty. Recognize that this is an integral part of your professional development. Assisting on research projects outside of your thesis/dissertation offers you a chance to gain additional knowledge and insight into aspects of your field that may not be your specialty.
- Find and inspect your lab and storeroom areas. Check: the materials lists and inventory, the location of the first aid kit, eyewash station, fire extinguisher, outlets, switches, temperature controls, etc.
- Find out departmental procedure for ordering and obtaining supplies.
- Become familiar with safety rules and procedures, emergency procedures, evacuation plans, and the layout of your building. Not only is this useful in the event of emergencies like fires, etc., it is vital that you understand that this is "tornado country" and in the event of such an occurrence, you will have to shut down your lab quickly and get to shelter.
- Set deadlines for submission of lab results or projects. Clarify rules and formats for reports.

## During the semester/year:

Set a schedule and stick to it. A full-time assistantship requires 20 hours of work per week. In consultation with your research advisor, select a block of time (mornings, afternoons, or some combination) and commit to that time of work. The set schedule makes you accessible to the faculty member and will aid you in budgeting your time.

Reminder: The assistantship is for 20 hours a week. You may work more or less than 20 hours in a given week, but your hours should average 20 per week. You should not be consistently working more than this. Your department should provide you with a timesheet on which to log your hours; the timesheet should be turned in every two weeks at the end of each pay period as a record of your hours worked.

Demonstrate the proper use and care of equipment. If you do not know how to use something, ask for help. It is better to ask for help and get trained than to try on your own and damage the equipment. If you do break something, report the damage immediately to someone of authority (your research advisor, the lab manager, or any faculty member) so that the damage can be repaired. Accidents and damaged equipment happen, but people get angry when others cover up their responsibility and equipment is not fixed when other researchers need to use it.

## After the project/semester/year:

Sit down with your research advisor and evaluate the experience.

- What went especially well?
- What could have been done a bit differently?
- Were expectations met for you? For the faculty member?

**Good luck and enjoy the experience!**



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