



# MODULE: EXPERIMENTAL DESIGN

## MENTOR GUIDE

### Checklist

#### Prior to meeting with mentee(s)

- Familiarize yourself with the module materials, starting with the Experimental Design Definitions. These concepts should serve as the foundation for the experimental design conversation.
- Review Experimental Design Example handout highlighting research design in everyday life. Prepare to answer mentee questions by pointing them back to the provided definitions
- Decide the focus for experimental design discussion by emphasizing the approach in your research environment – engineering design vs scientific method
- Ask mentee(s) to read through the Experimental Design Definitions and the Engineering Design vs Scientific Method document prior to meeting with mentor

#### Discussion with mentee(s)

The specific approach to experimental design is often discipline-specific (cultural!); for example, engineers use engineering design (goal oriented), while life scientists use scientific method (hypothesis oriented). This is an example of a technical “cultural” difference; differences of these types are important to understand, especially as one works in groups with persons from different disciplines. In discussion with mentee, consider using a simple example and talking through the two different approaches. For example “we want to understand the effect of sunshine on plant growth. How would we explore this idea using scientific method? How would we explore this idea using engineering design?” Important message is that both approaches reach the same endpoint, simply using different means.

- Review provided definitions with mentees and provide examples where prompted in the Experimental Design Definitions document that are relevant to your research environment
- Assign as a take-home assignment or perform in meeting the Experimental Design Example exercise. Be prepared to assist mentees through the exercise, referring back to previously discussed definitions
- During the meeting, discuss with mentees the differences between Engineering Design and Scientific Method. Use the Engineering Design vs Scientific Method document as a guide for this discussion.
- Consider asking mentees to complete (on their own) the Engineering Design example at the end of the Engineering Design vs Scientific Method document



# Research Experience and Mentoring

Created under NSF Grant: EAGER CBET 1451319

<http://eqpoint.info/rem>

- Five-Minute Reflection

## Suggested Schedule

1. Mentor, contact mentee(s) and assign Experimental Design Definitions and Engineering Design vs Scientific Method documents
2. Schedule mentor-mentee meeting
3. Discuss definitions and example exercises. Use examples and discussion points relevant to your environment
4. Have mentees consider the differences between Engineering Design and the Scientific Method
5. Review the completed Five-Minute Reflection and discuss any points of confusion