Group Projects and Presentations

1.0 Expected Learning Outcomes

- ***As a group***, write a proposal describing your project, the required resources, and the expected outcomes.
- Independently design and complete the proposed project ***with your group***.
- ***As a group***, present your results in an oral presentation. The format will be similar to that used for the College Student Research Conference.

2.0 Project guidelines

You are expected to pick a project that is substantial (*i.e.*, it will take most of the allotted time on the schedule), and in which you are interested. This means that there is usually a wide range of project topics in the class because interests vary. There are several rules:

- It must contain an experimental component (*i.e.*, you must actually measure something)
- A proposal for your project must be submitted to the course instructor before you begin.
- The project must be approved by the course instructor before you begin.
- You can not violate any EPA regulations (*i.e.*, you are limited in what chemicals can be used)
- You can not attract the attention of either BATF or the Department of Homeland Security (*i.e.*, no explosives)
- You can not attract the attention of the Campus Risk Management and Safety Office (*i.e.*, nothing that endangers the class, sets off smoke or fire alarms, etc.)
- No more than three individuals are allowed to participate in a single project.
  - You are *not* required to work with the same lab partner(s) with whom you have worked in previous lab exercises.

Finding supplies and equipment for some projects can be a limitation on whether they can be done as your group project. Some things can be found from various sources within the department. We will help you find as much as we can to make your project possible.

It may be necessary to visit some of the local scientific supply stores (Maceys, Home Depot, Lowes, Deseret Industries, etc.). Unless you consider your project well in advance, it is often not possible to have items ordered online and delivered in time.

3.0 Oral presentation

3.1 Scheduled presentation time

Your presentation will be given during the scheduled final exam period for your section.

3.2 Presentation audience

Your primary audience is the other students in Physics 240. Your secondary audience is the instructor or the TAs that will be evaluating your presentation. This means your presentation should be at a level to be understood by the other students in the class.

3.3 Presentation guidelines

- Time limit: 12 minutes followed by 3 minutes for questions and discussion; 15 minutes total.
- The group members must present roughly equal portions.
- Your primary medium of presentation will be graphics and text in PowerPoint, Acrobat, or similar presentation software.
- You may use other audiovisuals to get your points across effectively in limited time. The whiteboard should not be used in short presentations, except to answer questions.
- A general rule for how many slides to prepare is one slide per minute. Don't forget to allow time for any included videos.
- Don't be late for the presentations; get your reports and presentations done before the last minute.

3.4 Grading of presentations/projects

- The project proposal (50 points, 27.8% of total points for the project, 4% of class points). Note that all the components of the proposal are ***submitted as a group***. Consult "Project or Research Proposals" in Learning Suite under Content ⇒ Student-Designed Experiements for more information on the proposal. The proposal is submitted in three stages:

  1. Project abstract (10 points). The abstract is a short description of your project and what you wish to accomplish. The abstract is due about three weeks before the projects start.
  2. Project proposal draft (15 points). The draft should be as complete as you can make it so the feasibility and appropriateness of the project can be evaluated. You should also include any special equipment or materials needed so they can be obtained if it is possible. The draft is due about a week before we start the projects.
  3. Project proposal (25 points). This is the final, polished version of your project proposal. The final proposal is due on the day we start the projects.

- Lab notebook for your project (40 points, 22.2% of project total, 3.2% of class total).
- The actual project (30 points, 16.7% of project total, 2.4% of class total). This is based on how your group carried out your project and evidence of roughly equal participation of group members on the project. Much of the evidence for how the project was done will come from your presentation. It is *not* based on whether your project was successful.
- The project presentation (60 points, 33.3% of project total, 4.8% of class total).

  – Effective use of PowerPoint slides or other media in your presentation (20 points)

    * No distractions, concise (4 points)
    * Good graphics (8 points)
    * Readable text (the instructor will be sitting in the back of the room to evaluate this point) (8 points)

  – Good use of time (15 points)

    * Reasonable length (roughly 12 ± 2 minutes) (6 points)
    * Equal share of all participants (6 points)
    * No fluff (3 points)

  – Presentation clarity and completeness (25 points, 16.7% of total)

    The following format for your presentation is suggested:

    1. Introduce problem (6 points)
    2. Describe method (6 points)
    3. Present results (6 points)

4. Tell us what it means (That is, what physics is illustrated and how well did the experiment work.) (7 points)

3.5 Suggested reading

The following two articles from Physics Today contain pointers on giving physics talks. Though not all that is said will apply to the presentations on your student designed experiments, much of it will. These are issues you should consider when presenting your research.

The first article, "Advice to Beginning Physics Speakers", by James C. Garland, Physics Today **44**(7), 42-45 (July 1991) doi:10.1063/1.881265, gives suggestions for students who give scientific talks.

The second article, "What's Wrong with Those Talks?", by N. David Mermin, Physics Today **41**(11), 9-11 (November 1992) doi:10.1063/1.2809861, is a response to the first article. If David Mermin's talks are as entertaining as his writing, then he must be a fun speaker.

Note: as of the writing of this document, access to the full text of Physics Today articles directly from a BYU on-campus IP address appears to be blocked unless you are willing to pay $30 per article. However, if you look up Physics Today on the BYU library website ("Journals") and select "EBSCOhost Academic Search Premier" you will be able to find the correct issues from the references above and read the articles. You will have to sign in on the library website if you are coming from off campus.

There are two other resources that can be useful in preparing scientific talks. One is Chapters 8, "Writing and Speaking Skills," and 10, "Presentation and Publication of Papers," in the book Graduate Research (Fourth Edition), A Guide for Students in the Sciences (Robert V. Smith, Llewellyn D. Densmore, Edward F. Lener, Academic Press, 2016, `http://www.sciencedirect.com/science/book/9780128037492`). These chapters contain a lot of useful information on presentations.

Another is materials from a talk "Preparation of Effective Scientific Talks" given by J. D. Callen from the University of Wisconsin-Madison in October 2014. They can be found at `http://homepages.cae.wisc.edu/~callen/talks.html`.

[Modified: January 16, 2019]