PHYS 4175: Physics Research Proposals
Course Syllabus for Spring 2022 R 11:00-11:55 am

Instructor: Dr. Wayne Keith 793-3874, keith.wayne@mcm.edu
Office Hours: S 110-C: MWF 9-11, MWF 1-2:30, and TW 2:30-3:30
Web: http://www.mcm.edu/~keith.wayne
Text: *None*
Required: paper, pencil, access to a computer
Prerequisites: Physics minor (equivalent)

Course Description: This is a required course for physics majors. Students will use this course to investigate the feasibility of a research project of their choice. Weekly meetings and periodic assignments will be used to guide students through this process, with the result being a formal written and oral proposal of the student's research topic of choice.

Grading: 20% Participation: Students are expected to be present and engaged in all group or individual meetings throughout the semester. Regular progress and effort outside of these meetings is expected.
5% Informal Memo: Students will submit an informal memo (email) to the instructor for approval prior to beginning work on the proposal itself.
5% Proposal Outline: This outline should contain the major and minor topics that will be addressed in the final proposal. Examples will be provided.
10% Proposal Reference List: A list of planned references will be submitted for approval prior to turning in the first draft.
10% Proposal Draft: A draft of the formal written proposal will be submitted for comment.
10% Presentation Draft: A draft of the oral presentation will be presented to the instructor for comment.
20% Final written proposal: This should be a well-polished document detailing the research to be conducted, along with a detailed budget and schedule.
20% Final oral presentation: This presentation should be given in PowerPoint or similar format to an audience of science faculty and physics majors.

Classroom Rules: Students are expected to be present and on-time for all group and individual meetings as scheduled. Excessive absences (more than 3 consecutive unexcused) may result in the student being dropped from the course. Late work will **NOT** be accepted.

Final notes: Group meetings will be discussion dominated; there is no formal "lecture" component to this course. The topic you choose is completely up to you, although you are free to solicit ideas from students, faculty, the Internet etc. as you see fit. It is usually a good idea to select a topic that is in some way related to your career goals, but the only hard requirement is that your proposal is something that can actually be accomplished in a subsequent semester.

University Information and Policies: See "Disability, Counseling Services, Covid" on Moodle.

PHYS 4175 Course Schedule

All dates are tentative and subject to change except **bold** dates.

Date	Activity or Item Due
1/20	Discussion
1/27	Discussion
2/3	Discussion
2/10	Discussion
2/17	Discussion
2/24	**Memo Due**
3/3	Discussion
3/10	**Outline Due**
3/17	**NO CLASS**
3/24	Draft Proposal
3/31	**Reference List Due**
4/7	Draft Proposal
4/14	Draft Proposal
4/21	**Proposal Draft Due**
4/28	**Proposal Due**/Draft Oral Presentations
5/5	**Oral Presentations**
5/12	**Final Exams – NO CLASS**

PHYS 4175 Course Objectives

Course objectives and goals	Linked to which departmental program goal(s)	Linked to which institutional goal(s)?	Types of evidence used to demonstrate student achievement of objectives & goals
Students will demonstrate the ability to employ the methods of science for inquiry.	- to prepare physics graduates for a wide range of career opportunities including not only graduate study in physics, engineering, pre-med, or other sciences; but also, science teaching and careers in industry and science-related business	1,2,3,8	Students will show the ability to formulate rational approaches to problem-solving, whether their chosen project is conceptual or a hands-on experiment.
Students will demonstrate the ability to formally communicate scientific findings and interpretations, both in writing and speaking, using formats appropriate to the audience and the discipline.	- to prepare physics graduates for a wide range of career opportunities including not only graduate study in physics, engineering, pre-med, or other sciences; but also, science teaching and careers in industry and science-related business	1,2,3,8	Students will demonstrate their ability to present their work formally in writing through the writing and revision of the project proposal. Students will demonstrate their ability for formal speaking during oral presentation of the proposal in front of an audience.