SYLLABUS
Physics 199: First Year Seminar
Scientists at Work

STREAMS Summer Bridge Program
Summer 2011

Course Instructor: Dr. Thomas Kling tkling@bridgew.edu

Course Concept:

This STREAMS Summer Bridge First Year Seminar is specially designed for incoming science and math majors. The course is writing intensive and includes a significant laboratory immersion experience in scientific research. By balancing writing assignments, research experiences, and class activities, students will learn how scientists think and what scientists do.

All first year students at BSU are required to take a writing intensive first year seminar. Writing intensive seminars are courses where students focus on writing within a discipline. The rationale for these courses is that by writing, one learns to organize thoughts and ideas, find and present evidence, and compose a thesis. In this class, students will learn about how scientists think and what counts as a scientific argument by writing about science, like scientists, using experiences from the laboratory.

Critical to learning to understand how scientists think is to develop skills as a reflective thinker – a thinker who constantly evaluates what they know, why they know it, and how they need to pursue learning further. We will use learning portfolios as a central component of the writing in this course so that we practice the types of reflective thinking scientists do.

You will be supported in writing by a team of mentors – your course instructor, your faculty research advisor, your advanced undergraduate research mentor, peer writing mentors, and classmates.

Centrality of Electronic Portfolio:

The purpose of this seminar is to emphasize the view of scientists and mathematicians as reflective thinkers. The e-portfolio will be a working platform where we write to organize thoughts on our science and how our lives as scientists and mathematicians are changing as we learn and develop.

The e-portfolio is not a document whose purpose is to impress the instructor or your classmates. Its purpose is not to sell yourself in any way, and treating it as such will be obvious to any reader. The e-portfolio is a working document that requires honest self-assessment. It will be clearly linked to evidence of learning (the quality and clarity of which will be graded).

Meeting Times:

Class meets according to the overall schedule. In addition, students will meet with the peer writing mentor during lunch or breakfast times on a regular basis, and will work on their FYS materials during the nightly study sessions and on weekends. The 3-week period for the STREAMS Summer Bridge program is very packed. Student attendance is critical to success. There is no time to fall behind.

Learning Outcomes:

Students in this seminar will

* Reflect on their learning and what they know as a model of scientific behavior
* Improve their critical thinking skills by analyzing evidence, organizing their thoughts, and writing
* Improve their writing skills, particularly the ability to present evidence in support of a scientific argument
* Begin to understand the importance of drafting and revision as part of the process of deeper understanding
* Learn about some of the hot areas in science and mathematics research today
* Understand the role of inquiry in scientific thinking
* Learn some tools and methodologies used in scientific research
* Learn about collaboration in science and math and the responsible conduct of research

Course Expectations:

Students in this seminar will

* Come to class, and all summer bridge meetings, prepared, ready and eager to learn
* Put forward their best effort on all assignments
* Be honest in their reflective work
* Ask for help from the course instructor and/or their student mentors when needed
* Share their ideas and work with other students in the class
* Listen to other members of the class respectfully and provide constructive feedback

Assignments: The main assignments in this course are writing assignments. You must do all the parts of all the writing assignments – including drafts, revisions, and structural elements. These are there for a purpose! The assignments are

1. Portfolio writing – including reflective writing on scientific inquiry, reflections on examples of work, and a course blog detailing research activities.
2. “What’s the hot topic in my discipline?” – revised 2-page paper examining a “hot topic” in your discipline that is supported by basic research.
3. “What’s the hot topic in a different discipline?” – revised 2-page paper examining a “hot topic” in a different discipline that is supported by basic research.
4. “What is research?” – a project spanning the program’s length focusing on the research being conducted by your research group at BSU.

Course Grading:

You will be graded on the basis of your writing assignments and the evidence in your e-portfolio that you have participated and learned from your research experience. The grade break-down will be 15% for each of the two short “hot topic” papers and 70% for the e-portfolio.

The “hot topic” papers will be graded via a rubric emphasizing clarity of writing, proper handling of scientific attribution, and the application of evidence to support the thesis.

The e-portfolio will be graded on the basis of three components.

1. Broad Reflections (20% of course grade). You will write and revise several broad reflections on your development as a scientist or mathematician during this program. These reflections should be clearly written and focused, emphasizing an honest accounting of your work. The reflections will be linked to evidence presented elsewhere in the portfolio and should capture multiple academic and co-curricular elements of the program.
2. Research Blogs (25% of course grade). Nearly every day you will write a research blog entry on a particular topic. These reflective writing exercises will ask you to explain what you know, are learning, and need to learn as you progress through your research experiences. You will be provided specific writing prompts (or a choice of a few writing prompts) for each entry, along with specific instructions regarding content and length. The text from the blogs should become text that you can use in other formats – for example, explaining in your blog what you learned about using a particular piece of lab equipment will later be used as part of the “methods section” of your Evidence.
3. Evidence (25% of course grade). A clearly written explanation of your learning during this program that focuses on your research experience. There should be written “introduction,” “methods,” and “results” sections – these will be assessed for clarity of writing, correctness of presentation (within scientific expectations), etc. You will also have the opportunity to include multiple media in this section – video of you with your poster or in the lab, computer programs or demonstrations, etc.