

PHYS 1001 (iSeminar) – The Pursuit of Scientific Discovery

Fri 2:10-3:00 (Jan 11) or 2:10-4:10 pm (Jan 18 to Mar 1)

Commons Crawford House 208

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iSeminar Boilerplate: This seminar will introduce the basic tenets of the proposed Immersion Vanderbilt program and approach discipline-specific responses and opportunities to develop creative and independent projects during a student's four years at Vanderbilt. By introducing the general concept of immersion and then by grounding immersive experience within the disciplines, students in this seminar will have opportunities to engage, to question, and to forge change. Students in this seminar will work with a faculty seminar director to identify experiences and projects that could well shape them for the rest of their lives.

What is this specific iSeminar going to focus on? We will focus on immersion experiences in scientific research – emphasizing the pursuit of discovery that sparks the curiosity and passion of scientists. Students will be asked to think about what science means beyond their textbooks: Where did all those facts and equations come from? What does it mean to work on a question that does not have the safety net of a known solution? How do scientists deal with the continual cycle of what some would see as “failure” – coming up with a hypothesis, testing it, and finding that it doesn't work – but that scientists see as the core premise of how we get closer and closer to a scientific understanding of the universe. Along the way, we will address the sociology and interactions among the community of scientists and students that populate a research lab and will help students learn how to make the most of an immersion experience in scientific research.

I have personally mentored dozens of undergraduate researchers, but I do not pretend to have all the answers as to what makes for a great immersion experience in research. I expect us to try and figure that out together this semester. The weekly two-hour sessions will be a mix of lab visits and discussions with scientists and budding scientists from undergraduates to graduate students, postdocs and faculty members. Labs, speakers and examples will be drawn primarily, but not exclusively, from research in physics and astronomy.

Methods of evaluation: Short (~1 page) weekly write-ups turned in before each class to prepare students for each week's discussions (50%). In addition, students will write up and orally present a self-designed plan for an immersion experience in scientific research (50%). This plan should be one that the student might do – something that sparks the student's curiosity. The plan should include a proposed lab and project area, details on preparation needed before engaging in the proposed project, discussion of the timing and commitment required to conduct such research, and goals for the final immersion experience “product.” Note that we only meet 8 times this semester (one 1-hr session and seven 2-hr sessions). It is critical that you are present for all of these course meetings.

Required text: None. Selected readings will be provided.

Schedule – The schedule is still in flux as I coordinate with potential guests and organize lab tours. I will announce readings and topics for each week as we go.

Jan 11	Introductions (1 hr)
Jan 18	What makes for GREAT research? What important QUESTIONS interest you?
Jan 25	Sociology of research labs
Feb 1, 8, 15	TBD lab tours and discussions with VU scientists
Feb 22, Mar 1	Student presentations of plans for immersion experiences in scientific research