

SCI 397 B & C: Entering Research 1 & 2

Fall 2016 - Spring 2017

Instructor: Nathan Lysne
Day and Time: Friday 8:00AM – 8:50AM
Room: Kuiper 301

Instructors:

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Student Learning Objectives

The *Entering Research* workshop's student learning objectives and course goals support and complement the student research experience. To achieve the goals, students should concurrently enroll in the workshop and actively engage in a research experience.

Through concurrent participation in a research experience and the *Entering Research* workshop, students will be able to:

1. establish a positive relationship with their mentor by agreeing on common goals and expectations for the research experience.
2. define their roles and responsibilities as a member of their research group.
3. explain the focus of their group's research, how individual research group members and projects are connected, and how the research contributes new knowledge to the discipline.
4. relate their research group's goals and projects to what they learn in science courses.
5. define a research question.
6. find and evaluate relevant primary literature and background information related to their research question.
7. connect their research to issues relevant to society at large.
8. define and contribute to discussions about the forms and consequences of scientific misconduct.
9. construct a testable hypothesis.
10. design experiments to test their hypothesis.
11. learn and use the techniques needed to do their experiments.
12. appropriately document their research.
13. effectively communicate their research findings in oral and written scientific formats.
14. contribute to peer review and explain the role of peer review in science.
15. identify and secure future research positions with suitable mentors.

Grading

Attendance is required. Grades will decrease with each unexcused absence. Please let me know before class if you cannot make it. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. Absences pre-approved by the UA Dean of Students (or Dean designee) will be honored.

Total grades will be calculated based on the following:

10% - Attendance

50% - In-Class Discussion & Participation

40% - Written assignments & proposal/poster/peer review feedback/presentations

Total grades will correspond to the standard letter grade scheme below:

A: 90% and above B: 80-90% C: 70-80% D: 60-70% E: Below 60%

Student Guidelines

Reading and Materials:

There are no required texts or materials. Some sessions may include reading assignments that will be handed out in class or a URL will be provided for online reading.

Extracurricular (outside of scheduled classroom) time: It is assumed that students will also be conducting independent research concurrently with the course. One assignment may involve visiting another student's research group and another involves interviewing a person with a career you are interested in exploring. These are expected to be done outside of class time but should not take more than an hour.

In Class Behavior:

This class relies on class participation and discussion for everybody to get the most out of it. Please be on time to class and stay until the end to get full attendance points and maximum benefit out of the class. To fully participate it is necessary that students refrain from using their cell phones and laptops unless beneficial to the class discussion (i.e. having an online reading assignment open on a laptop). Disruptive behavior and/or threatening behavior will not be tolerated. Disruptive behavior is defined as conduct that interferes with the learning process or diverts resources away from the goals of the class. This can range from a student who consistently comes late to class to ringing cell phones. Threatening behavior is any conduct, statement, gesture, etc that causes apprehension of harm to a person or property within the University of Arizona community.

Cheating, plagiarism and academic integrity:

Everyone will have a different experience as they participate in research. It is expected that each student will turn in their own work. The UA Code of Academic Integrity can be found at http://deanofstudents.arizona.edu/sites/deanofstudents.arizona.edu/files/code_of_academic_integrity.pdf and the Arizona Board of Regents (ABOR) Student Code of Conduct can be found at <http://deanofstudents.arizona.edu/studentcodeofconduct>. Cheating and plagiarism are violations of these codes and can carry severe penalties at the University level. There is the expectation that students will maintain a high standard of academic integrity.

Accessibility and Accommodations:

It is the University's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish reasonable accommodations. Please be aware that the accessible table and chairs in the classroom should remain available for students who find that standard classroom seating is not usable.

Note on Syllabus Changes: This syllabus provides an outline of the goals and expectations of the course. However, dates, deadlines and topics may change. If it changes, an updated syllabus will be emailed to all enrolled students.

Entering Research Part I (Fall 2016)

Seminar Description

This 1-credit seminar course for undergraduate students is the first in a series, designed to complement the beginning of an independent research experience. Students meet weekly to share their research experiences and to get feedback on the progress of their research projects as they learn about the roles, responsibilities, and relationships that make for a successful research experience.

Week of:	Topics	Assignments Due
Session 0 (Before start)	Find a Research Mentor	
August 28		
September 4		
Session 1 September 11	Introductions Research Expectations	
Session 2 September 18	Nature of Science Searching the Literature for Scientific Articles	<ul style="list-style-type: none"> • Research Experience Expectations • Personal Statement
Session 3 September 25	Reading Scientific Articles	<ul style="list-style-type: none"> • Scientific Article Critique
Session 4 October 2	Your Research Group's Focus	<ul style="list-style-type: none"> • Your Research Group's Focus
Session 5 October 9	Establishing Goals & Expectations with Your Mentor	<ul style="list-style-type: none"> • Mentor Biography • Summary of Expectations
Session 6 October 16	Who's Who in Your Research Group	<ul style="list-style-type: none"> • Research Group Diagram
Session 7 October 23	Defining Your Hypothesis or Research Question	<ul style="list-style-type: none"> • Background Information & Hypothesis or Research Question
Session 8 October 30	Designing Your Experiments	<ul style="list-style-type: none"> • Experimental Design & Potential Results with Timeline
Session 9 November 6	Peer Review Process	
Session 10 November 13	Research Proposal Peer Reviews	<ul style="list-style-type: none"> • Research Proposal Draft #1
Session 11 November 20	No Class (Thanksgiving)	Will Reschedule Towards End of Term
Session 12 November 27	Future Plans, Summer Research Opportunities (REU application process)	
Session 13 December 4	Research Proposal Peer Reviews	<ul style="list-style-type: none"> • Research Proposal Draft #2
Session 14 December 11	Final Presentations, Survey & Seminar Evaluation	<ul style="list-style-type: none"> • Final Research Proposal • Poster of Proposal

Entering Research Part II (Spring 2016)

Seminar Description

This 1-credit seminar course is the second of a two-part series that begins with Entering Research, Part 1. This class meets weekly and is designed to enhance and support the student's continuing research experience as they learn about communicating science, the peer review process and presenting their results.

Dates	Topics	Assignments Due
Session 15 January 28	Introduction to Abstracts	
Session 16 February 1	Research Project Outline & Science Abstract	<ul style="list-style-type: none"> • Research Project Outline & Science Abstract
Session 17 February 8	Science Communication & Mentoring Reflections	<ul style="list-style-type: none"> • Reflecting on Your Mentoring Relationship
Session 18 February 15	Science & Society	<ul style="list-style-type: none"> • Read "Communicating Science" by Hendrix
Session 19 February 22	Peer Review of General Public Abstracts	<ul style="list-style-type: none"> • Draft General Public Abstract
Session 20 February 29	Research Ethics	<ul style="list-style-type: none"> • Final General Public Abstract • Ethics Case Discussion with Mentor
Session 21 March 7	Making Effective Scientific Presentations	<ul style="list-style-type: none"> • Scientific Poster Hunt
March 14-18	SPRING BREAK	
Session 22 March 21	Peer Review	<ul style="list-style-type: none"> • Presentation Draft #1
Session 23 March 28	Outside Review	<ul style="list-style-type: none"> • Presentation Draft #2
Session 24 April 4	Research Careers	<ul style="list-style-type: none"> • Researching Research Careers
Session 25 April 11	Introduction to Funding/Grants	<ul style="list-style-type: none"> • Your Research Group's Funding
If Applicable	Present at Space Grant Symposium: April 16	
Session 26 April 18	Curriculum Vitae	
Session 27 April 25	Peer Review of Mini-Grant Proposal	<ul style="list-style-type: none"> • Draft of Mini-Grant
Session 28 May 2	Presentations, Research Experience & Seminar Reflection/Evaluation	<ul style="list-style-type: none"> • Final Mini-Grant • Final Presentation
Session 29 Finals Week	Presentations, Research Experience & Seminar Reflection/Evaluation	<ul style="list-style-type: none"> • Final Mini-Grant • Final Presentation