BIOT 350: Ethics and Professionalism in Biotechnology, Section 1001

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Appointment

Course Times/Location: Tues/Thurs 12:00-1:15pm /RTBA  
Number of units: 3

Course Description: This course is designed to provide formal training in literature searches, primary literature interpretation, science writing, workforce preparation, ethics and honesty in the workplace, and the resolution of ethical issues in a research environment.

Prerequisite: pre-requisite or co-requisite CHEM 341 or equivalent. Co-enrollment in 2 or more credits of either BCH280, BCH480, BIOT 447 or other research/independent study course.

Silver Core Objective 12: Students will demonstrate understanding of the ethical principles in general or in application of specialized knowledge. Students will demonstrate an ability to recognize, articulate, and apply ethical principles in various academic, professional, social, and personal contexts.

Student Learning Outcomes:

Core Objective 12 (Ethics)

- Students will be able to identify ethical concerns in research and intellectual contexts, including academic integrity and objective presentation of data (quizzes).
- Students will be able to identify the multiple ethical interests at stake in real-world situations and in practice (Good lab Practices [GLP] and resume evaluations).

Additional Objectives:

1. Students will continue to build on their foundation in core writing (CO1) by learning how to read and summarize scientific papers and produce an introduction for an EPSCOR undergraduate research proposal. The student will also learn to write a standard operating procedure.
2. Students will further build their skills in quantitative reasoning (CO2) by practicing and being tested on the manipulation of algebraic formulas associated with formulation chemistry. Students will also practice interpretation of various scientific data and graphs, and basic statistical formulas that applied to the biological sciences (quiz).
3. Students will begin to learn how to present research and share their knowledge with others in the classroom. This will better prepare students for the BIOT 448: Senior Thesis course (CO13 & CO14) to be taken senior year (no formal assessment, but informal assessment through Q&A time after presentation).

August 27, Monday  
First Day of Classes
### Tentative Timeline:

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Topics</th>
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<tr>
<td>(August 28)</td>
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<tr>
<td>August 30</td>
<td>• Introduction and class outline</td>
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<td>• Classroom sharing and safe environment discussions</td>
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<td></td>
<td>• Ethics: Expectations and professional conduct in a research lab</td>
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<td>• Identify consequences of non-ethical decision-making on short and</td>
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<td>long term reputation</td>
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<td></td>
<td>• Introduction to Good Lab Practices (GLP’s)- Invited speaker</td>
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<td>• Laboratory Safety in Research: Read Safety Data Sheets!</td>
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<td>In-class exercise</td>
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**Homework, etc...**

*Review at home:* Good Lab Practices and ethical expectations  
*Homework:* Sit down with your immediate supervisor and fill out the 15-week goals form.

| Week 2  | Quiz: Good Lab Practices  
|---------|--------------------------|
| (September 4) | Student Presentations and Q&A: “What’s happening in my lab?”  
| September 6 | Topics                                                                 |
|          | • Ethics: Mistakes and Negligence (case study: Discovering an error)      |
|          | • Why and how to write a Standard Operating Procedures (SOP)               |

| Week 2  | Homwork, etc..  
|---------|--------------------------|
| (September 4) | Due: Turn in your 15-week goals form.  
| September 6 |                                        |
|          | • How to sign up for Environmental Health and Safety Training (Ben Owens)  |
|          | • How to keep an organized research notebook (guest speaker)               |

**Homework due next week:** Choose a protocol (from the list given in class) and convert it into an SOP.  
Sign up for EH&S training (if needed)
| Week 3 (September 11) | Quiz: Ethical issues and proper conduct in the lab  
|----------------------|------------------------------------------------------|
| September 13         | Review for next week’s quiz: Ethical conduct in the lab (from weeks 1 & 2)  
|                      | Bring wifi-capable laptops or smart phones next week  
|                      | Student Presentations and Q&A: “What’s happening in my lab?”  
| Topic                | Structure of a scientific paper (Part I)  
|                      | • What does the abstract mean?  
|                      | • What does the introduction say? What question(s) are they asking? Why even do this research?  
|                      | • Methods Section: Can you recognize or understand any of the methods? How do you find out more about these methods? Are these methods commonly used in your lab?  
|                      | • In-class: Practice interpreting the assigned research paper; go over examples in class; work in teams (group work) to interpret others papers (do research with laptops and smart phones)  
| Homework, etc...     | Due: Turn in written SOP assignment  
|                      | Homework this week and next week: Bring in an example of a scientific paper from your research lab.  
|                      | Homework next week: Answer the questions (above) for both your paper and the one given in class.  
| Week 4 (September 18) | Homework: Turn in questions from last week (both scientific papers)  
| September 20         | Student Presentations and Q&A: “What’s happening in my lab?”  
| Topic                | Structure of a scientific paper (Part II)  
|                      | • Graphs and results: What do the figures mean? Which two figures (and related results) represent the most important data in this paper? Why?  
|                      | • Discussion section: What is the most important point the author is trying to make from this paper?  
|                      | • Discuss papers from your lab  
| Homework, etc...     | Due: Proof of EH&S Training  
|                      | Homework this week: Read the papers from your group members lab and write a summary  
| Week 5 (September 25) | Homework: Turn in summary from last week (group work)  
<p>|                      | Student Presentations and Q&amp;A: “What’s happening in my lab?” |</p>
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<th>Date</th>
<th>Topics</th>
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| September 27 | • Developing an INBRE, GURA or EPSCoR undergraduate research proposals. Requirements and outline (one page)  
|           | • How to research your research. (Scott Mensing, Director for Undergraduate Research) |
|           | • Library research and databases (Amy Shannon, Library Services)  
|           | • Research on your topic with the help of the reference librarians!  
|           | • **Online quiz: Which is an example of plagiarism?** |
|           | **Homework, etc...**  
|           | *Online quiz on WebCampus - plagiarism*  
|           | *Homework due next week: Find 3 papers that can be used in your EPSCoR introduction.*  
|           | *Homework due next week: Annotation of the 3-5 papers* |
| Week 6 (October 2) | **Due: Annotation Homework**  
|           | **Student Presentations and Q&A: “What’s happening in my lab?”**  
|           | **Topic**  
|           | • Ethics: Authorship and allocation of credit (case study on Web Campus)  
|           | • Ethics: When is it plagiarism? (case study on Web Campus)  
|           | • Analyze ethical conduct that provides proper credit to those whose ideas and content have been used.  
|           | • How credit is given for use of copyright materials  
| | • **On-line quiz: Who should get the credit?**  
| | • Communicating with people of different generations (Guest speaker)  
| | • How to properly talk on the phone  
| | • How to properly send an email  
| | • How to properly introduce yourself  
| | **Homework, etc...**  
| | *Online Quiz on WebCampus: Authorship credit*  
| | • *Homework due next week: Rough draft of EPSCoR introduction* |
| Week 7 (October 9) | **Homework due: Rough draft of INBRE/GURA/EPSCOR introduction**  
|           | **Student Presentations and Q&A: “What’s happening in my lab?”**  
|           | **Topic**  
|           | Review of EPSCoR introductions  
| October 11 | • Review of algebraic formulas and common laboratory calculations  
|           | • Good Lab Practices (GLP): Regression analysis-when is the
| Week 8  | Due: Final Introduction- INBRE/NURA/EPSCoR  
Student Presentations and Q&A: “What’s happening in my lab?”  
**Topic**  
- Sharing your introduction with others. Does it make sense to them? Student and instructor feedback  
- Review of some basic statistics  
- Ethics: Treatment of data (case study: The selection of data)  
  - GLP: Accuracy and Precision: Testing the robustness of your data (Rebecca Young)  
- Discovering an error in data (case study: Discovering an Error)  
**Homework etc:** Find and read retracted papers and corrections posted; why was the paper retracted/corrections made  
**Edit introduction based on reviews (INBRE/GURA/EPSCoR)** |
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<td>October 18</td>
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**Due next week:** Final Draft of INBRE/GURA/EPSCoR Introduction |
| **Week 9** | **Due:** Answers of IACUC/IRB protocol  
Edited Introduction- INBRE/GURA/EPSCoR  
**Topic**  
- Human Subjects in Research (case study)  
- Animal Subjects in Research (case study)  
- Review IRB and IACUC protocols  
- What do you need to know before writing an IACUC protocol  
- Ethics for Animal Use  
- Invited Speaker Ben Weigler, Director of Lab Animals  
**Due next week:** Read IRB and IACUC protocols (on WebCampus) and answer four questions  
Online Quiz on WebCampus: IACUC protocol- 3Rs |
| **October 25** |  
**Week 10** | **Student Presentations and Q&A:** “What’s happening in my lab?”  
**Topic**  
- The right attitude for finding and keeping a job  
- Cover letters  
- Developing your resume (guest speaker) |
| **November 1** |---------------------------------------------------------|
| Week 11 (November 6) | **Homework, etc…**  
Draft or updated resume |
|----------------------|------------------------------------------------------------------|
| November 8           | • Due: Updated Resume  
Student Presentations and Q&A: “What’s happening in my lab?” **Topic**  
• Searching for summer internships and tailoring your resume to meet the job description  
• Sharing your resumes and class feedback  
• Ethics: Is that resume really you? Questions you should ask yourself before submitting. |
|                       | **Homework, etc…**  
• Have your resume ready by next week. |

| Week 12 (November 13) | Due: Updated resume **Topic**  
• Prepare for Job Interviews.  
• List information to be obtained before and during a job interview.  
• Dress appropriately for interview  
• Review recommended interviewing practices. |
|-----------------------|------------------------------------------------------------------|
| November 15           | • List possible interviewing questions.  
• Exhibit professional conduct before, during and after interview.  
• Explain your qualifications and interests clearly and concisely  
• Answer all questions honestly and concisely. |
|                       | **Homework-**  
• Prepare interview for a job ad  
• Complete the Implicit Association Test (IAT) online [https://implicit.harvard.edu/implicit/education.html](https://implicit.harvard.edu/implicit/education.html) |

| Week 13 (November 20) | Due: Job interview Q&A  
Student Presentations and Q&A: “What’s happening in my lab?” **Topic**  
• Preconceived bias in science/ implicit bias  
• How to manage implicit bias in classroom and on the job Jennifer Grogan (Presentation) |
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<tr>
<td>November 22</td>
<td>NO CLASS- Thanksgiving Day</td>
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Week 14 (November 27) | Reviews -
---|---
November 29 | 
Week 15 (December 4) | Invited speakers from companies
---|---
December 6 | 

**Grade scale:**

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<tr>
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<th>Lowest</th>
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<td>92.99 %</td>
<td>90.00 %</td>
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**Late Assignments:**

Late work will be accepted up to **one week** (7 days) after assignment is given; however, there is a 10% reduction in grade for each day the assignment is late (this includes weekends and weekdays).

**Academic Standards:** Academic dishonesty will not be tolerated in any form. This includes inadvertent as well as deliberate misrepresentation of one’s own work.
Plagiarism is a serious offense and will be treated with the most severe sanctions permitted under university policy. Refer to the policies in the General Catalog on student conduct, academic standards, and academic dishonesty. Any student caught cheating in any way will be referred to the UNR Office of Student Conduct. Penalties include, but are not limited to, course failure and dismissal from the University.

**Academic Success Services:** Your student fees cover usage of the Tutoring Center (www.unr.edu/tutoring), the Math Center (www.unr.edu/mathcenter), and the University Writing Center (www.unr.edu/writing_center). Disabilities: If you have a disability and will be requiring assistance please contact me and the Disability Resource Center (Thompson Building Suite 101) as soon as possible to arrange for appropriate accommodations.

**Audio and Video Recording:** Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.