



Biological Literature and Communication

The University of Toledo

Department of Biological Sciences, College of Natural Sciences and Mathematics

BIOL 4700 - 001 CRN 14714

Instructor:	Rafael Garcia-Mata	Term:	Spring 2016
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Office Hours:	Mon, Wed: 11-12	Class Day/Time:	Tue, Thu: 11:00-12:15
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COURSE/CATALOG DESCRIPTION

A writing intensive course that focuses on reading original literature in biology in a variety of formats. Required of all biology majors.

COURSE OVERVIEW

Biology of Embryonic Stem Cells and their role in Medicine

This course will focus on the approaches that scientists use to communicate with one another. To accomplish this, we will read primary research articles, discuss their content and conclusions, and formulate our own opinions on the results and interpretations put forth by the authors. Our discussions will focus on the biology of embryonic stem cells and their potential use in medical therapies. Ethics in scientific research and writing will also be addressed.

This is a writing/discussion-based class that requires class attendance and class participation. Selected papers from the scientific literature will be assigned and covered in-depth during class. Students are expected to be prepared and have completed reading assignments prior to each class. In addition, each student will write an 8-10 page term paper and prepare a 15-minute oral presentation on an approved topic. Detailed instructions for the reading assignments, the preparation of the Term paper and Oral presentation will be provided in class.

The primary research articles used in this course usually contain microscopic images and/or complex graphical representations of averaged data sets. When reading these articles in preparation for class, students are required to complete a Figure Facts template provided in advance as a Word document for selected figures in each article. Prior to the class meeting, students upload the completed template into an assignments folder in Blackboard. Students should also bring a hard copy of their completed template to class, so they can refer to their notes as we examine the data.



STUDENT LEARNING OUTCOMES

The goal of this course is to give you the skills needed to go beyond understanding the “mass media” view of science, and to acquaint students with the methods and processes used by the scientific community to communicate, evaluate findings, and develop a consensus on basic concepts.

Upon completion of this course, students will be able to:

- 1. Read, understand and interpret a primary research article.*
- 2. Understand the main techniques and tools utilized by researchers*
- 3. Understand and interpret scientific graphs and figures*
- 4. Search the scientific databases.*
- 5. Use scientific citation software*
- 6. Summarize and write a summary of several primary articles into a review article*
- 7. Prepare, design and present a talk based on scientific literature*

TEACHING STRATEGIES

In class lecture to introduce the new material and topics.

Reading, analysis and interpretation of real NIH applications. Support material is provided as well as study guides.

In class discussions.

Group assignments.

In class quizzes.

In class and homework writing assignments.

In class oral presentation skills.

PREREQUISITES AND COREQUISITES

Undergraduate level BIOL 3030 Minimum Grade of C

REQUIRED TEXTS AND ANCILLARY MATERIALS

All the required material is provided by the instructor and will be uploaded in Blackboard before the class starts.

TECHNOLOGY REQUIREMENTS

We will be using an online student engagement system called echo360. Registering at echo360 or at a dedicated link in Blackboard is required. Echo360 can be used in a Smartphone, Computer, iPad or tablet with access to WiFi or cellular network.

UNIVERSITY POLICIES

The University is an equal opportunity educational institution. Please read [The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.](#))

Academic Accommodations

The University of Toledo is committed to providing equal access to education for all students. If you have a



documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the [Student Disability Services Office.](#))

ACADEMIC POLICIES

Since much of the course requires individual research and writing, special emphasis will be placed on the importance of avoiding plagiarism, either intentional or otherwise. It should be recognized that students handing in assignments that do not represent their own work will receive a failing grade in this course. Thus, it is important to understand what plagiarism is and how to avoid it. One class period may be devoted to this topic.

COURSE EXPECTATIONS

Since this course is based almost entirely on demonstrating comprehension of the materials presented, students are required to attend every class. Unexcused absences will not be tolerated, and excused absences should be rare. While attending class is important, participating in class discussions is also critical for a good grade in this class. Students must demonstrate that they have read and completed the assignments and that they have done the extra background analyses needed to comprehend the material. The only way to do this is to get involved in the discussions, ask questions and be prepared to answer. Everyone will talk every class period, so come prepared.

Term Paper

By the third week of the semester, students will have selected a topic on which to prepare a term paper (Jan. 31). The final term papers will be 8-10 double-spaced type written pages (not counting references). A list of suggested topics is provided, but students are also encouraged to come up with their own ideas. Nevertheless, I must approve all topics. The term paper will be based on the primary scientific literature, and several steps in the paper's presentation will be graded – e.g. an outline (due Feb. 23), a rough draft (due March 23) and the final draft (due Apr. 18). These are estimated dates and are subject to change.

Potential Topics for Term Paper

ES cell and their use in therapeutics (pick a particular disease or strategy)

Whole genome analysis- It's use in identifying therapeutic targets

Whole genome analysis- It's use in preventive medicine

Any signal transduction pathway

Proteomics in identifying therapeutic targets

Gene Therapy – pick a disease or a strategy

Tumor suppressor genes (pick one)

Knockout mouse models of disease

Antibiotic over-prescription

New antibody therapeutics – Herceptin, Remicade

SARS, Ebola, H1N1 Flu

Angiogenesis and cancer therapy

Energy drinks- good or bad

Vaccination-

CRISPR/Cas9 system



Oral presentation

During the last two weeks of the semester (prior to finals week) we will have student presentations of their term papers. The Power Point presentations will be 15 minutes in length (10-12 min plus a few min for questions), and will include an introduction of the topic's relevance, methods used to gather pertinent data, summary of the findings, comments on the conclusions drawn and a discussion of the future of the topic. Students will also be graded on knowledge of the topic, organization, ability to handle questions, etc. Although I will be grading each student, presentations also will be evaluated by the student's peers, which will impact their overall score on the presentation. Note that on days in which we have presentations class will probably run long, so please let me know if you have a class immediately following this one.

Issues that will be discussed in class (not necessarily in order):

Understanding the scientific process

Funding of scientific research

Finding scientific papers

Scientific literature Search engines

Writing an abstract

Writing a scientific paper

Reading primary scientific papers

Preparing oral and poster presentations

Plagiarism and scientific misconduct

Use of audio/visual equipment (PowerPoint)

Inception of ideas, authorship, patents



GRADING

Grades will be determined based upon student performance on writing assignments, class participation (including attendance) and oral presentations. An approximate breakdown of how the class will be graded is as follows:

	% of grade
Class Participation/In class quizzes	15
Attendance (days present/class period)	15
Class Assignments (in class and take home)	25
Term Paper (Due April 18)	25
Oral Presentation (April 20-27)	20

Midterm Grading

N/A

Final Grading

Grades will be determined based upon student class performance and class tests. Grades will be letter-based and will utilize a straight scale (see below) unless overall class performance dictates use of a curve.

A = 93-100%	B- = 80-82%	D+ = 67-69%
A- = 90-92%	C+ = 77-79%	D = 63-66%
B+ = 87-89%	C = 73-76%	D- = 60-62%
B = 83-86%	C- = 70-72 %	F = 0-59%

Writing assignments have specific due dates – papers handed in late will receive a penalty of no less than 5% per day late. Writing assignments will be uploaded in Blackboard. Figure Facts assignments will not be accepted if submitted late and will be graded with a 0.

*I will be posting the grades for each of the assignments regularly so you will know in advance how you are doing overall. **PLEASE DON'T WAIT UNTIL THE CLASS IS FINISHED TO TRY TO IMPROVE YOUR GRADE.** Once the class is finished the grades are final.*

COMMUNICATION GUIDELINES

The instructor can also answer E-mail questions at almost any time, and is available by appointment at times other than the office hours. Please allow 24-48 for a response.

STUDENT SUPPORT SERVICES

If you encounter technical difficulties with Blackboard, please contact the **UT Online Help Desk** at (419) 530-8835 or utdl@utoledo.edu. The Help Desk offers extended hours in the evenings and on weekends to assist students with technical problems. When calling after hours, leave a detailed message, including your Rocket Number and phone number, and an Online Learning staff member will respond on the next business day. The UT Online Help Desk website is available at: <http://www.utoledo.edu/dl/helpdesk/index.html>



Technical questions related to on-campus Internet access, virtual labs, hardware, software, personal website hosting, and UTAD account management can be directed to UT's IT Help Desk at (419) 530-2400 or ithelpdesk@utoledo.edu. The IT Help Desk website is available at <http://www.utoledo.edu/it/CS/HelpDesk.html>.

COURSE SCHEDULE

Tentative Schedule based on last time class was offered.