UTTyler SCHOOL OF MEDICINE

BIOT 5131 **Critical Reading I** **Credit Hours: 1**

Semester: Spring **Year:** 2023
Class Day/Time: Mondays, 12:00-1:00p **Class Location:** BMR Rm 113

Instructor of Record: Dr. Pierre Neuenschwander Professor
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Office Hours: Can arrange any time. Email first, please.

Course Description: This course exposes students to current research published in major scientific journals. Students will learn how to read and interpret methodologies and results published by other scientists. This course will provide the student with a thorough understanding of the strengths and limitations of scientific writing. This course is the first of a two-course sequence and introduces the student to basic organization of scientific papers and how to identify the questions being addressed based on the scientific method.

Prerequisite: None **Co-requisite:** None

Goals of Course & Course Objectives:
Critical Reading I is the first course in a two-course sequence that is designed to teach the early graduate student how to read and critically interpret scientific papers taken from the primary literature. Reading for knowledge (i.e. textbook reading) is much different than reading critically, and thus the latter must be approached much differently. When one reads for knowledge, the focus is on accepting as fact what is written and absorbing and understanding the material. For critical reading, one must learn how to question and analyze the material. The student should not blindly accept what is written, but must read, absorb, analyze, question and formulate their own opinion as to the validity of the presented results and their interpretation. This is very difficult to become accustomed to and students need to learn, develop and hone this skill by exposure and repeated practice.

What we will do in this class is hand out papers taken directly from the primary literature and learn how to read them to extract the information in a way that allows you, the student, to individually develop and hone your skills in critical reading. For each paper you will have one week to read it, take notes and write down questions you may have. In the next week's class we will read the paper together from the beginning and answer questions throughout. We will generate a "flow-chart" of the logic the authors used (or should have used) to lay out the study in an understandable way and then critique the paper. If needed, we will go into the following week to do this. We will work at your pace since the idea isn't necessarily to learn the science, but rather understand how to read a study, present a study, discuss a study and interpret its significance and validity. We will then move on to the next paper and repeat the process. As each week progresses, there will be less and less input from me and (hopefully) more and more discussion by and among the entire class. For the "final" paper you will read the paper that will be handed out and informally present/discuss it in class with your classmates and with little or no input from me.

Course Objectives (Learning Outcomes):

1. General strategies for critical reading, interpretation, summarizing and presenting studies from the primary literature.
2. How to develop a working flow-chart that describes the logic and flow of a scientific study.
3. How to present and discuss data in figures, tables and text.

Course Assessment/Methods of Evaluation:
Please note that this is NOT a didactic-type class. In order for you to get something out of it you need to participate, and in order to do that you need to actually read each paper carefully before the class. DO NOT WAIT UNTIL THE HOUR BEFORE CLASS TO LOOK AT THE PAPER FOR THE FIRST TIME! If you do this, it will be obvious during class and it will be a very boring class as nobody will be speaking. The idea is for you to learn how to present and discuss the paper, not for me to present it to you. Don't be shy, the first paper will be difficult but it will get easier as you learn how to do it and gain confidence.

Attendance & Participation (20% of final grade): Punctual attendance is critical. There will be a sign-up sheet for each class and it will be mandatory to sign in (legibly) for each class to record your attendance. Students are expected to be in attendance for the majority of class time to receive full credit. Tardiness of more than 30 minutes will result in the reduction or complete loss of attendance credit for that class. In this course, the *scientific method* is of primary concern in class discussions. Although the science is important, it is secondary for our purposes here.

Assignments (60% of final grade): Assignments for this class will be in the form of generating "flow charts" for each paper discussed. These will be graded out of 10 points, and you should anticipate six of these over the course of the semester.

Final flow chart (20% of final grade): There is no final exam for this course. In its place there will be a final flow chart from a paper of your choosing. Rules for selecting your final paper will be given in class.

Attendance & Participation	= 20%
Assignments	= 60%
Final flow chart (#6)	= 20%
Total	**= 100%**

Each person's total score in each category will be divided into the maximum possible score for that category and then multiplied by the fractional percentage. These will be summed to obtain your final grade. For example:

[(19/20)*0.2] + [(48/60)*0.6] + [(20/20)*0.2] = 0.870 = 87% = B
[*Attendance & Participation*] + [*Assignments*] + [*Final FC*]

The following scale will be used to convert to a final letter grade:

C	B	A
70-79%	80-89%	90-100%

Linked Program Learning Outcomes:
The student learning outcomes listed above address the following Biotechnology Program PLOs:

- PLO-1. The student will demonstrate English communication skills in both oral and written forms.
- PLO-4. The student will demonstrate independent and critical thinking skills integrated with the ability to utilize multiple informational resources.
- PLO-5. The student will explain the principles, mechanisms and interrelatedness of both in vivo and in vitro biochemical, molecular biological and genetic processes.

Textbook:
Papers will be from the primary literature and will be as assigned.

Course Content:

Discuss and critique papers as assigned:

Class Date	Discussion Paper/Topic
1/9/2023	Strategy for Reading and Critiquing a Scientific Article. Making a flow chart.
1/16/2023	*No Class. MLK Holiday.*
1/23/2023	**Paper 1**: Identify main question and strategy. Q&A and discuss methodology.
1/30/2023	Flow chart for Paper 1 due on *CANVAS* by class start. Finish discussion of paper.
2/6/2023	**Paper 2**: Identify main question and strategy. Q&A and discuss methodology.
2/13/2023	Flow chart for Paper 2 due on *CANVAS* by class start. Finish discussion of paper.
2/20/2023	**Paper 3**: Identify main question and strategy. Q&A and discuss methodology.
2/27/2023	Flow chart for Paper 3 due on *CANVAS* by class start. Finish discussion of paper.
3/6/2023	**Paper 4**: Identify main question and strategy. Q&A and discuss methodology.
3/13/2023	*No Class. SPRING BREAK.*
3/20/2023	Flow chart for Paper 4 due on *CANVAS* by class start. Finish discussion of paper.
3/27/2023	**Paper 5**: Identify main question and strategy. Q&A and discuss methodology.
4/3/2023	Flow chart for Paper 5 due on *CANVAS* by class start. Finish discussion of paper.
4/10/2023	***Paper 6**: Identify main question and strategy. Q&A and discuss methodology.
4/17/2023	Final flow chart (for Paper 6) due on *CANVAS* by class start. Finish discussion of paper.
4/24/2022	*FINALS WEEK- No class*

Other Class Policies:

Attendance & Participation:

Regular or punctual attendance is expected and essential for this class. If a student misses a class, the student is responsible for obtaining any information distributed during those times. Make-ups are not possible since this is a discussion class. ATTENDANCE & PARTICIPATION go hand-in-hand. Together they are worth 2**0%** of your grade in this course!

Academic Honesty:

Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Cheating

Dishonesty of any kind involving examinations, assignments, alteration of records, wrongful possession of examinations, and unpermitted submission of duplicate papers for multiple classes or unauthorized use of keys to examinations is considered cheating. Cheating includes but is not limited to:

- Using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class.
- Falsifying or inventing any information, including citations, on an assigned exercise.
- Helping or attempting to help another in an act of cheating or plagiarism.

Plagiarism

Plagiarism is presenting the words or ideas of another person as if they were your own. Materials, even ideas, borrowed from others necessitate full and complete acknowledgment of the original authors. Offering the work of another as one's own is plagiarism and is unacceptable in the academic community. A lack of adequate recognition constitutes plagiarism, whether it utilizes a few sentences, whole paragraphs, articles, books, audio-visual materials, or even the writing of a fellow student. In addition, the presentation

of material gathered, assembled or formatted by others as one's own is also plagiarism. Because the university takes such misconduct very seriously, the student is urged to carefully read university policies on Misconduct in Research and Other Scholarly Activity 05.00. Examples of plagiarism are:

- Submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another.
- Submitting a work that has been purchased or otherwise obtained from an Internet source or another source.
- Incorporating the words or ideas of an author into one's paper without giving the author due credit.

Adding/Dropping:
The official deadline for adding and dropping courses is as published in the academic calendar (Registrar Withdrawal webpage). However, students are strongly encouraged to meet with their graduate advisor or the Program Coordinator prior to adding/dropping courses. Movement into and out of classes after the 4th class day requires approval of the Program Director. Each student is responsible for their own enrollment status with the university

Disability Accommodations:
UT Tyler HSC abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, which mandate reasonable accommodations be provided for students with documented disabilities. If you have a disability and may require some type of instructional and/or examination accommodations, please contact me early in the semester so that I can provide or facilitate provision of accommodations you may need. If you have not already done so, you will need to register with the Student Services Office (located on the main campus). You may call 903-566-7079 for more information.

Program:	Master of Science in Biotechnology
Degree:	MS
Department:	Cellular and Molecular Biology
School:	Medical Biological Sciences
Course:	**BIOT5131 – Critical Reading I**

Area	Marketable Skill*
SKILLS	**Reading Comprehension** — Understanding written sentences and paragraphs in work-related documents.
	Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.
	Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
ABILITIES	**Written Comprehension** — The ability to read and understand information and ideas presented in writing.
	Oral Comprehension — The ability to listen to and understand information and ideas presented through spoken words and sentences.
	Inductive Reasoning — The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).
	Oral Expression — The ability to communicate information and ideas in speaking so others will understand.

*All marketable skills listed for this course and program were drawn from the Knowledge, Skills, and Abilities identified by the US Department of Labor and Statistics for "Biological Technicians" and "Molecular and Cellular Biologists" as published on O*Net Online (www.onetonline.org)