“Nature answers only when she is questioned.” Jacob Henle

Broad Objectives
- to learn basic research approaches used in the biological sciences and in medical research.
- to explore the various ways that scientific knowledge is obtained and defined, philosophical issues and methodological approaches related to hypothesis formation, research design, making sense of data, the peer-review process, scientific responsibility and ethics, and the impact of culture on scientific investigation.
- to develop the mental tools and confidence to think scientifically.

Learning Objectives
After completing this course, a student should:
- understand the logic and general procedures and logic of scientific understanding
- understand basics of statistical inference and risk assessment
- understand basics of research design, as used in observation, experimentation, and modeling
- understand and be able to describe the structure of a scientific paper
- understand the peer-review process
- understand and be able to discuss ethical issues faced by scientists in conducting research

Lectures and Readings
1. There will be occasional required readings or other assignments (podcasts, etc.). These assignments will be given in class.
2. Lectures on Powerpoint will be made available on the class BB site within 48 hrs AFTER the lecture.

Evaluation
Semester exams (4) 80% (20% each) Fridays - Sept 7, Sept 28, Oct. 19, Nov. 9
Final exam (comprehensive) 20% Monday, Dec. 3 at noon

Exam Make-Up Policy: If you know you are to be absent for an exam, or have any problem in taking the exam at the designated time, contact me as soon as possible. If you miss an exam, it is your responsibility to contact me immediately. An exam may be taken at a time other than that designated only with my permission. Decisions are made on a case-by-case basis.

Course Grading
A 92.5-100% C+ 77.5-79.45
A- 89.5-92.45% C 69.5-77.45
B+ 87.5-89.45% D 59.5-69.45%
B 82.5-87.45 F <59.5%
B- 79.5-82.45
Schedule – Fall 2018

Week 1
Introduction
- The PEL model of scientific explanation.
  - The P in PEL = Presuppositions

Week 2
- The L in PEL = Logic

Week 3
Scientific Method – the Generic Basics
Scientific Method – All About Hypotheses

Weeks 4-5
Data, Variables, Samples, and Graphs

Weeks 6-10
The E in PEL = Seeking and Evaluating Evidence (and the 3 Cs)

Week 11
Models and Modeling

Week 12
Peering into peer review

Weeks 13-14
Research ethics and responsibilities

Other Notes and Policies

1. **Challenges to Assigned Grades.** Challenges to assigned grades will be welcomed in writing. A written format provides you the opportunity to present an articulate and well-considered argument. Challenges must be submitted within one week of a graded assignment.

2. **Academic Integrity.** Any form of misconduct – cheating, plagiarism, fabrication – will not be tolerated and will subject violators to a failing grade in the course.

3. **Incompletes.** Incompletes will not be given except in extreme circumstances beyond a student’s control.

4. **Deadline for coarse withdrawals (no refund) – Oct. 1**

5. **Disability Access and Inclusion:** The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course that result in barriers to your full inclusion and participation, or to accurate assessment of your achievement, please contact the course instructor as soon as possible. Barriers may include, but are not necessarily limited to, timed exams and in-class assignments, difficulty with the acquisition of lecture content, inaccessible web content, and the use of non-captioned or non-transcribed video and audio files. If you are approved through SDS, you must log in to your Rebel Access portal at [https://sds.olemiss.edu](https://sds.olemiss.edu) to request approved accommodations. If you are NOT approved through SDS, you must contact Student Disability Services at 662-915-7128 so the office can: 1. determine your eligibility for accommodations, 2. disseminate to your instructors a Faculty Notification Letter, 3. facilitate the removal of barriers, and 4. ensure you have equal access to the same opportunities for success that are available to all students.

**This syllabus is subject to change at the discretion of the instructor to accommodate instructional and/or student needs.**