PROFESSIONAL ASPECTS OF SCIENCE - BIOL 5200

Fall 2017

Professor:

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SHSU Natural History Collections room 178
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Lecture: SHSU Natural History Collections room 171
Tuesday 6:00 - 8:00 pm

Office Hours: MTWThF 9-10 am or by appointment

Textbooks: Lee, J.A. 2000. The scientific endeavor: a primer on scientific principles and practice. Addison Wesley Longman, Inc., New York.

Janovy, J. Jr. 1985. On becoming a biologist. Harper and Row Pub., New York.

Pechenik, J.A. 2001. A short guide to writing about biology. Addison-Wesley Educational Pub. Inc., New York.

Ambrose, H.W., III and K.P. Ambrose. 1981. A handbook of biological investigation. Hunter Textbook, Inc.

Gillen, C.M. 2007. Reading primary literature: A practical guide to evaluating research articles in biology. Benjamin Cummings, New York.

COURSE DESCRIPTION

Students entering a collegiate program to begin their training on becoming a professional scientist require an introduction to the professional aspects of science. This course is designed to help students become aware of their social responsibilities to institutions, governments, and the general public as scientists. Aspects of professionalism and ethics will be addressed and discussed in regard to research and the publication process. Other topics will include retrieval and use of the peer-reviewed literature, bibliographical procedures, research proposals and granting, professional job placement, scientific illustration, and presentation in science.

This course is important because: 1) many students entering a Master of Science program have no former experiences or knowledge of scientific professionalism and 2) institutions are now held accountable for the individual and unethical acts of their scientists regardless of intent. For these reasons ***Professional Aspects of Science*** is required by all incoming Master of Science students in the Department of Biological Sciences during their first fall semester after admittance and acquiring full graduate standing. If a student cannot register for this course due to particular responsibilities of their research program, they will be required to complete **BIOL 5200** prior to any general or qualifying examinations instated by the Department of Biological Sciences or, in the absence of general or qualifying examinations, prior to the defense of the M.S. thesis.

***Prerequisite*:** Admittance and full graduate standing in the Graduate College, College of Sciences, and the Department of Biological Sciences as outlined in the Sam Houston State University Graduate Catalogue.

CLASS DISCUSSION

Class discussion is absolutely essential for success in this course. Many of the topics discussed will be philosophical and controversial and should elicit a variety of valid opinions. The statements and opinions of the instructors regarding controversial issues should not discourage you from making your own dissenting viewpoints.

ASSIGNMENTS

All assignments must be completed and received by their due date for acceptance and consideration for grading.

Research Grant Proposals: Details of the research grant proposals will be discussed in class. A research grant proposal will be written in the format outlined by the current proposal instructions of the Texas Academy of Sciences. This exercise is to be used by students to formally prepare a proposal of support for their M.S. thesis. The research proposal must be submitted to the instructor no later than the posted due date. Review of proposals will be as if they were submitted for actual funding consideration. Thus, you can expect critical and thorough reviews which should prove helpful in your pursuit of future funding.

EXERCISES AND GRADING

Student *Curriculum vitae*	10 pts
Statements of Research and Teaching Philosophy	30 pts
Bibliographic and Literature Retrieval Exercise	20 pts
Editing Assignment	10 pts
Graphing Assignment	20 pts
Manuscript Submission Letter	20 pts
Critical Review of a Manuscript	50 pts
Title and Outline of Student Oral Presentation	10 pts
Research Grant Proposal	100 pts
Presentation of Proposed Research	50 pts
Summaries Presentations of Case Studies	20 pts
Overall Class Discussion and Participation	50 pts
Participation and Discussion of the book: *On Becoming a Biologist*	20 pts
Participation and Discussion of the book: *The Scientific Endeavor*	20 pts
Participation and Discussion of the book: *Reading Primary Literature*	20 pts
Collaborative Institutional Training Initiative (CITI)	50 pts
Total Course Point Value	**500 pts.**

Grades are based on the total number of points earned divided by the total possible number of points in this class (i.e. 500 points). Student grades will be calculated using the following grading scale in which A ≥ 90%, B = 80 - 89%, C = 70 - 79%, D = 60 - 69%, and F ≤ 59%.

ACADEMIC DISHONESTY

Regulations and responsibilities stated in the *Student Code* and *Faculty Handbook* will be followed in the event of academic dishonesty.

WITHDRAWAL POLICY

If grades of W(P), W(F), or I, are requested, University policy ***will be*** followed.

STUDENTS WITH DISABILITIES

Students who have disabilities that may prevent them from fully demonstrating their abilities should contact the instructor as soon as possible to discuss the accommodations necessary to facilitate full participation and to ensure each student's educational opportunity.

NOTE: This syllabus is subject to change at the discretion of the instructor.

Syllabus

Week	Date	Topics and Readings
2	8-29	Introduction to Professional Aspects of Science Responsibilities of a Young Scientist - *My Graduate School Days* Considering and Choosing a Graduate Program and Major Professor The *Curriculum Vitae* - Describing and Defining Who You Are in Science
3	9-5	What is Science? · Discussion of Lee (Chapters 1 & 2) · Discussion of Ambrose & Ambrose (Chapters 1 & 2) Scientific Societies and Organizations: Their Purpose and Services to Science Introducing and discussing federal funding agencies (NSF & NIH) ***Curriculum Vitae*** ***Prepared material on NSF and NIH**
4	9-12	What do Scientists do? · Discussion of Lee (Chapters 3,4, & 6) Critiquing and Peer Reviewing Science: A Professional Responsibility of Scientists Literature Retrieval and Bibliographic Procedures Citing Sources and Listing References · Discussion of Ambrose and Ambrose (Chapter 10) · Discussion of Pechenik (Chapter 4) Requesting Literature from Current and Potential Colleagues - Reprints Requests Organizing a Reprint Library - Introduction of Bibliographic Software ***Prepared information on Scientific Societies**
5	9-19	Evaluating Science and Scientists The Science Citation Index (SCI) and the H-Index Scientific Journals and Impact Factors How to Peer Review Science: · Discussion of Pechenik (Chapters 5 and 6; Appendix A, B, C, and D) · Discussion of Gillen Introduction to Editorial Notation in Editing Manuscripts Peer Reviewing Science - How to Critically Review a Manuscript Illustration and the Graphical Representation of Data · Discussion of *Writing Lab and Research Reports* (Pechenik - Chapter 8) · Discussion of *Illustrating Data* (Ambrose & Ambrose - Chapter 12) ***Bibliographic and Literature Retrieval Exercise**
6	9-26	Student Research Proposals and Future Funding Opportunities Preparing a Research proposal and Writhing about Science · Discussion of *Writing Research Proposals* (Pechenik - Chapter 1 - 4, & 10) · Discussion of Ambrose and Ambrose (Chapters 11 & 13) ***Manuscript Editing Assignment** ***Graphing Assignment**
7	10-3	Ethics in Animal Care and Use in Science Human Subjects · Discussion of *Research with Human and Animal Subjects* (Lee - Chapter 5)
8	10-10	The Publication Process from Submission to Page Proofs Manuscript Submission Letter ***Title and Outline of Student Oral Presentation** ***Discussion of *On Becoming a Biologist* by John Janovy, Jr.**

9	10-17	Special Evening Discussion
10	10-24	Revisiting the question: What is Science? Exploring Fields of Pseudoscience · Discussion of *The Scientific Endeavor* (Lee - Chapters 7,8,&9)
11	10-31	University Organization and Governance Scientists in Government Agencies and Private Industry ***Manuscript Submission Letter** ***Collaborative Institutional Training Initiative (CITI)**
12	11-7	Types of Universities and Agencies: Which is good for whom? What makes one marketable for what job? Job Placement and my *Curriculum vitae* - A Reality Check and Wake-up Call · Discuss of *Letters of Application* (Pechenik - Chapter 14) ***Critical Review of a Manuscript**
13	11-14	Promotion, Tenure, and Salary - How it usually works ***Assigned Readings on Tenure** ***Prepared Material for Formal Class Debate**
14	11-21	Social Responsibilities in Science and of the Scientist · Discussion of *The Scientific Endeavor* (Lee - Chapter 5) Introduction of Case Studies of Fraud and Unethical Practices in Science ***Student Research and Grant Proposal**
15	11-28	Professionalism and Professional Ethics in Science Attending and Presenting at Society Meetings · Discussion of Writing Poster Presentations (Pechenik - Chapter 11) · Discussion of Preparing Oral Presentations (Pechenik - Chapter 13) Course Synopsis ***Statements of Research and Teaching Philosophy** ***Summaries of Case Studies (Fraud and Unethical Practices in Science)**
16	12-5	An Example Paper Session at a Scientific Meeting ***Oral /Poster Presentations of Student Research**

*** Indicates dues dates for assignments**