BIOL 820: Introduction to Graduate Study

Online Course (3 credits)

Spring 2020

Instructor Information

Dr. Saili Moghe

Email: moghes1@unk.edu

Feel free to contact me at any time through email (using your Lopermail account) or Canvas inbox messages. The "General Course Questions" discussion board in the Canvas course site can also be used to post general comments/questions/concerns. I will respond to emails, inbox messages, and discussion board posts within 48 hours.

Course Description

An introduction to graduate study and requirements at UNK, with emphasis on research methods and biological techniques for the professional teacher and biologist will be provided. Students will gain an appreciation for the scientific method by formulating good scientific questions including sound null and alternative hypotheses, design experimental methods addressing the hypotheses, and propose appropriate statistical tests for evaluation of results. Students will practice the art of locating and understanding scientific literature. In addition, students will engage in scientific writing, which will include the submission of a research proposal.

Course Objectives

Upon successful completion of the course, students will be able to:

1. Understand the requirements for the degree program (thesis and non-thesis) and complete plausible plans for completion of the degree requirements.
2. Effectively apply appropriate formatting, style and language in professional electronic communications.
3. Develop scientific questions and develop testable hypotheses to answer a specific aspect of a scientific question.
4. Effectively search for scientific literature using open-source databases and UNK Library resources.
5. Design methods to test a scientific hypothesis with an understanding of the interdependence of data collection and statistical methods.
6. Effectively read scientific literature.
7. Appreciate the role of the IACUC and IRB in research projects.
8. Complete a generic application for funding and have familiarity with common funding sources.
9. Write a well-developed scientific review paper on a chosen topic.
10. Use proper citation methods and understand the importance of academic honesty.

BIOL 820 Course Syllabus
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Course Materials

Required Textbooks:

- Writing Papers in the Biological Sciences, 6th edition, Victoria E. McMillan, Bedford/St. Martin's, Boston, 2016 (ISBN 9781319047139).
- McDonald, J.H. 2014. Handbook of Biological Statistics, 3rd ed. Sparky House Publishing, Baltimore, Maryland. The free PDF is used for this course and can be obtained online. (http://www.biostathandbook.com/HandbookBioStatThird.pdf)

Technical Requirements:

- Full access to a computer and high-speed internet
- Word processor for written assignments (including ability to convert into PDF).
- Software for spreadsheets (e.g. Open Office Calc, Excel, Calc, Quattro, etc.)

Course Structure

Weekly materials will be posted on Canvas by Monday at 8:00am, and an announcement will always go up at this same time, informing you about posted materials and any updates or details you need to know for that particular week. Each week, the following will be posted:

- Video lectures
- Outline notes corresponding to the lecture videos (for Module 3 onwards)
- Assigned readings from the textbook and/or supplemental readings
- Exam/Assignment/Discussion (if scheduled for the week)

Assessments

Your progress in the class will be assessed in the following ways:
Mini-assignments (mA): small assignments done throughout the semester to reinforce introduced concepts and provide an opportunity to practice skills.
Assignments (A): assignments are more detailed and rigorous than mini-assignments.
Discussions (D): Discussion boards will cover topics introduced during the course. Full credit will require meaningful contribution to the discussion as demonstrated by a minimum of 2 thoughtful postings per discussion (generic "I agree with …" are not viewed as thoughtful). Severe point deductions are assessed for any breach in earnest and intelligent discourse (i.e. cordial comments and discussion that is well intentioned and supported by rational thought, is expected).
Online Exams (including a comprehensive final Exam):

- Time-limited, single attempt, “closed book” exams
- 75 pts multiple choice (50 questions, in 1hour) and 25pts short answer questions (5 questions in 1 hour).

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Grading Scheme:

Assignment	Points	Total Points
Mini-assignments	6 (10 pts each)	60
Assignments	A1: bibliography @ 30 pts A2: review paper @ 70 pts A3: hypotheses and design @ 70 pts A4: IRB or IACUC protocol @ 30 pts A5: student grant reviews @ 20 pts A6: generic grant @ 50 pts	270
Discussions	4 (5 pts each)	20
Exams	3 (100 pts each)	300
	Total	650

Grade Assignment

Grades will be assigned using the standard grading scale for the Department of Biology, as follows:

A+	97 - 100%	B+	88 - 89%	C+	78 - 79%	D+	68 - 69%
A	93 - 96%	B	83 - 87%	C	73 - 77%	D	63 - 67%
A-	90 - 92%	B-	80 - 82%	C-	70 - 72%	D-	60 - 62%
						F	Below 60%

Expectations:

As students enrolled in this class, it is your responsibility to meet the following basic expectations:

- Keep up with announcements posted on Canvas to stay informed about the course, weekly materials, and assigned materials.
- Complete all readings, listen to all lecture videos, and refer to provided notes and resources.
- Complete all assignments (mini-assignments, assignments, discussions, exams, final exam) by the given deadlines (date and time) posted on Canvas.
- Maintain academic integrity throughout the course.
- Maintain a professional and respectful mannerism when communicating with all members of the class.
- Because students admitted to the graduate program in biology have significant exposure to biology, related disciplines (math, chemistry, physics, etc.) and general education coursework (English, writing, grammar, geography, history, etc.), it is anticipated that previously developed skills and knowledge will be utilized extensively throughout the course and be reflected in the student's academic performance.
- Seek help or ask questions about course materials or assignments when you need to and do not wait until the last moment to do this.

Course Policies:

Extensions or rescheduling: All students are expected to complete and submit any assignments, discussions, and exams by the provided deadlines (date and time), failure to submit by the give deadlines will result in zero (0) points for that exercise. Extensions or rescheduling will only possible if you are facing extraordinary circumstances. Please inform me as soon as you can if you have a valid and legitimate excuse for missing an exam or other class activity (I will inform you about the next steps to take; do not submit any of your personal health information directly to me).

Academic honesty: Anyone caught cheating or plagiarizing any exercises will receive zero (0) points for that exercise; subsequent violations will result in referral to the Vice Chancellor for Academic Affairs for dismissal from the university.

Policy on Incomplete: In unusual circumstances beyond the student's control, an incomplete (I) may be issued. The (I) is issued as a final grade with the student having 12 months to complete the necessary work. If the coursework is not completed in this time the (I) will be converted to a failing grade (F) on the student's transcript. Incompletes will only be considered if circumstances are exceptional and beyond your control (and will require documentation). When needed, a request for an Incomplete must be made before the end of the semester.

Course Withdrawal: Students may withdraw from the course before 9 weeks have been completed and a (W) will appear on the transcript. Instructors are not able to withdraw students, and students are responsible for the process of withdrawing through MyBlue. If a student drops the class, the (W) will not contribute to the student's overall GPA. The deadline to withdraw from Spring 2020 courses is March 13.

Copyright Law and Compliance:

Materials for this course are only for the use of students enrolled in this course for purposes associated with this course. Course materials are protected by copyright, and material may not be further disseminated, adapted, or copied in anyway.

Students with Disabilities

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students with documented disabilities. To receive accommodation services for a disability, students must be registered with UNK Disabilities Services Coordinator, David Brandt, in the Disability Services for Students office, 175 Memorial Student Affairs Building, 308-865-8214 or by email unkdso@unk.edu.

Students Who are Pregnant

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students who are pregnant. To receive accommodation services due to pregnancy, students must contact Cindy Ference in Student Health, 308-865-8219. The following link provides information for students and faculty regarding pregnancy rights. http://www.nwlc.org/resource/pregnant-and-parenting-students-rights-faqs-college-and-graduate-students

Reporting Student Sexual Harassment, Sexual Violence or Sexual Assault

Reporting allegations of rape, domestic violence, dating violence, sexual assault, sexual harassment, and stalking enables the University to promptly provide support to the impacted student(s), and to take appropriate action to prevent a recurrence of such sexual misconduct and protect the campus community. Confidentiality will be respected to the greatest degree possible. Any student who believes she or he may be the victim of sexual misconduct is encouraged to report to one or more of the following resources:

Local Domestic Violence, Sexual Assault Advocacy Agency 308-237-2599

Campus Police (or Security) 308-865-8911

Title IX Coordinator 308-865-8655

Retaliation against the student making the report, whether by students or University employees, will not be tolerated.

Veterans Services

UNK works diligently to support UNK's military community by providing military and veteran students and families with resources and services to help them succeed. Veterans Services assists with the GI Bill process and acts as a liaison between the student and the Veterans Administration. If you need assistance or would like more information, please contact Lori Weed Skarka at 308-865- 8520 or unkveterans@unk.edu.

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Course Schedule

Please note that all times listed on the course site and in course documents are in Central Time, so please account for any time zone differences when submitting assignments, discussion boards, and exams. For each week, materials will be posted on **Monday by 8am.**

Topic	Assignment/Discussion/Exam	Reading	Week
Module1.1: Introduction & Syllabus Module 1.2: Why graduate school? Module 1.3: Online Etiquette	D1: Class introductions (open: 8am Jan 13 – 8am Jan 21) mA1: Why graduate school? (due: 8am Jan 21)	-Syllabus -Email advice	Week 1: Jan 13 – Jan 19
Module 2.1: Fields in Biology Module 2.2: UNK Biology Faculty Module 2.3: Scope of Research Projects	mA2: What area of Biology is most interesting to you? (due: 8am Jan 28)	-Biology wiki -Biology faculty at UNK	Week 2: Jan 20 – Jan 26 (MLK Jr. day: Jan 20)
Module 3.1: MS Degree Requirements Module 3.2: What is Science? Module 3.3: Doing Good Science	mA3: Hypothetical program of study (due: 8am Feb 4) mA4: Preliminary scientific question, null and alternative hypotheses (due: 8am Feb 11)	-Department of Biology Graduate Student Handbook and Graduate Catalog McDonald, pp.16-17	Week 3: Jan 27 – Feb 2
Module 4.1: Using Scientific Literature Module 4.2: Reading Scientific Papers Module 4.3: Writing Scientific material Module 4.4: Writing Research Papers	D2: Scientific paper evaluation (open: 8am Feb 3 – 8am Feb 11)	-McMillan, Chapter 1 & 4 -Papers posted for D2	Week 4: Feb 3 – Feb 9
Module 5.1: Writing review papers Module 5.2: Proper citation of sources	A1: Annotated bibliography (due: 8am Feb 25) A2: Review Paper (due: 8am Mar 17)	-McMillan Chapters 5 and 6 - Paper on graduate writing	Week 5 Feb 10 – Feb 16
	EXAM 1 – covers Module 1-5 (available: 8am Feb 17 – Feb 25)		Week 6 Feb 17 – Feb 23
Module 6.1: Fundamentals of experimental Design Module 6.2: Types of Data Module 6.3: Data Collection & Management	mA5: Critical evaluation of scientific questions and hypotheses with preliminary experimental design (due: 8am Mar 3)	McMillan, Chapter 2 McDonald, pp 3-17; 24-28	Week 7 Feb 24 – Mar 1

Module 7.1: Statistical Theory Module 7.2: Descriptive Statistics Module 7.3: Hypothesis Tests	D3: experimental design and statistics (open: 8am Mar 2 – 8am Mar 10)	McDonald, pp16-23; 101-131; 146-157;173-179	Week 8 Mar 2 – Mar 8
Module 8.1: Displaying Data Module 9.1: Evaluation of Study Design	mA6: Table and graphs for provided data sets (due: 8am Mar 17) A3: Final scientific question with hypotheses, experimental design and proposed statistical tests (due: 8am Apr 7)	McMillan Chapter 3 McDonald, pp. 296-299	Week 9 Mar 9 – Mar 15
	EXAM 2 – covers Module 6-9 (available: 8am Mar 16 – 8am Mar 31)		Week 110 Mar 16 – Mar 22
	SPRING BREAK		Week 11 Mar 23 – Mar 29
Module 10.1: Research and Regulations Module 10.2: Research Using Vertebrate Animals Module 10.3: Research Using Human Participants	A4: IRB or IACUC as required for your hypothesis OR provided option (due: 8am Apr 14) D4: Research regulations (open: 8am Mar 30 – 8am Apr 7)	-IRB instructions and forms IACUC instructions and forms, NIH guide Federal collection permit forms, Nebraska collection permit forms Protected plants and non-vertebrates	Week 12 Mar 30 – Apr 5
Module 11.1: Scientific Presentations Module 11.2: Research Proposals (Grants)	A5: Submit generic grant application initial draft for review by peers (due: 8am Apr 21) A6: Generic grant application final draft (due: May 5)	McMillan Chapter 10	Week 13 Apr 6 – Apr 12
Module 12.1: Student research funding Peer review of grants		Funding sources	Week 14 Apr 13 – Apr 19
	A5: review peers submitted grant applications on discussion board (due: 8am Apr 28)	-Student grants posted on discussion groups	Week 15 Apr 20 – Apr 26
	FINAL EXAM - covers Module 1-11 (available: 8am Apr 27 – 8am May 5)		Week 16 April 27 – May 3 Week 17 May 4 – May 7