

**Aquatic Trophic Ecology**  
**BIOL 883, 3 credits**  
**Spring 2020**

**Department of Biology**  
**College of Natural and Social Sciences**  
**University of Nebraska Kearney**

**CLASS LOCATION AND MEETING TIME:**

This course is delivered entirely in an online format; consequently, there will not be any on-campus meetings. Also, there are no formal online meeting requirements for this course, though regular check-ins throughout the week are highly recommended. Deadlines for all assessments are provided in Canvas in several locations (e.g., on the assignment directions, in the announcements, etc.).

**COURSE WEBSITE:** [canvas.unk.edu](https://canvas.unk.edu)

**INSTRUCTOR'S CONTACT INFORMATION:**

Dr. Melissa R. Wuellner, Associate Professor

Office: BHS 345

Office hours: Mondays and Wednesdays: 1:30 – 2:30 pm; Tuesdays: 2:00 – 3:00 pm (*\*\*Note that these are the best times to get in contact with me during the week, but other times may be available to fit with your schedule.*)

Office phone: (308) 865-8006

Email: [wuellnermr@unk.edu](mailto:wuellnermr@unk.edu) or through Canvas

**COURSE DESCRIPTION:**

This course was developed to provide a thorough examination of the interactions between abiotic and biotic components of freshwater ecosystems incorporating both theoretical and applied aspects of aquatic food web management. Major themes of the course will include nutrient cycling, trophic state and eutrophication, predation and food webs, and fisheries ecology. Selected scientific literature and text readings will stress professional differences of opinion during discussion of topics, which is intended to guide students toward an understanding that ecological principles rarely are simple and that current dogma can at times be incorrect or incomplete. Finally, this course is directed at improving student communication (written and electronic information/technology based) and critical thinking skills.

**STUDENT LEARNING OUTCOMES:**

By the end of this course, students should be able to:

- 1) Describe the cycling of important nutrients in aquatic ecosystems.
- 2) Link abiotic factors to biotic processes (e.g., nutrient and energy cycling) in aquatic food webs.
- 3) Describe several approaches to understanding trophic dynamics in aquatic food webs.
- 3) Describe how conservation and management actions (or inactions) may influence nutrient and energy cycling in aquatic ecosystems.

**PREREQUISITES:**

There are no formal prerequisites for this course but this course is only open to those who are enrolled at UNK as graduate students.

**INSTRUCTIONAL METHOD:**

This course is presented entirely online; therefore, good time management and self-study skills are critical to your success! Extra effort is often required in an online course compared to the classroom-based version because most of the work rests on your shoulders. You will be required to read or view the assigned materials (including the short lecture videos) each week. Most weeks include at least one discussion. Weekly course updates and reminders will be provided via the “Announcements” feature in Canvas. Communication with the instructor can be by phone, e-mail, or in person. You are encouraged to use all three as frequently as needed.

You will be evaluated on your ability to critically evaluate, reflect on, integrate, and apply course information various assessments, including (but not limited to) regular discussions, assignments, and exams. You are welcomed to work with or share thoughts about your various assignments with your classmates, but you will be required to write and submit your own original material.

**COURSE REQUIREMENTS:**

Students are required to complete all assigned readings, view all presentations, and contribute to all discussions as scheduled. All assessments must be submitted by the assigned due dates. Students should make the effort to log into the class throughout the week, even if it’s just a “quick check” of the discussions or announcements, rather than just on one or two days each week.

**MISSED ASSIGNMENTS/QUIZZES/EXAMS AND MAKE-UP POLICY:**

Any and all discussions, assignments, and or other assessments in this class **MUST** be submitted by the designated deadline (see course calendar below) unless you and I have discussed otherwise. If you do not have an approved absence, you will receive a zero on that assignment. Please note that computer emergencies (e.g., hard drive crashed, etc.) are **NOT** considered an excuse. You should always have an alternative means of accessing or submitting electronic information and course work. If you have an emergency (e.g., illness, death in the family, etc.), please contact me no later than 36 hours after the missed deadline to make new arrangements.

**REQUIRED MATERIALS:**

All required readings will be provided on Canvas. There is no single textbook to purchase as I will be drawing from many textbooks, journal articles, and popular readings to illustrate the concepts of this course. If you are interested in purchasing any of the textbooks referenced in class for the future, please let me know and I can provide more information.

For research resources, please be sure to use your local library, the online UNK library, UNK interlibrary loan (Loper Loan – which finds sources at other libraries that UNK does not own), or online search engines (e.g., Google Scholar). Some of the best articles that you may find related to a topic are older and may not be available online. In this case, interlibrary loan or your local library may be your best option. *Don’t avoid a source just because you can’t access it online.*

**GRADING POLICY:** Below is a roughly estimated breakdown of the assignments and points for this course. Please note that these points may be subject to change but that those changes will be communicated with you in a timely fashion. Grades will be entered in Canvas so you should be aware of where you stand throughout the semester.

<b>Grade Item</b>	<b>Points</b>
Introductory Video	10
Weekly Discussions (Contributing)	200 – 300
Discussion Leading	50
2 exams (@100 points each)	200
Other Assignments	100 – 200
<b>TOTAL</b>	<b>560 – 610</b>

Grades in this class will be assigned according to the standard scoring system described below. Only by attaining these percentages can you be assured of receiving a desired grade.

<b>A+</b>	97 – 100%	<b>A</b>	94 – 96 %	<b>A-</b>	90 – 93%
<b>B+</b>	87 – 89%	<b>B</b>	84 – 86%	<b>B-</b>	80 – 83%
<b>C+</b>	77 – 79%	<b>C</b>	74 – 76%	<b>C-</b>	70 – 73%
<b>D+</b>	67 – 69 %	<b>D</b>	66 – 64%	<b>D-</b>	60 – 63%
		<b>F</b>	< 60%		

*Please note: If your final grade is within 0.5% of the next highest grade, your grade will be rounded up (e.g., an 89.50% will be considered an "A-"). This is the definitive cutoff for rounding grades. There will be no exceptions to this policy.*

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**COURSE CALENDAR:** This is a *tentative* course schedule. If changes are made to the schedule, the class will be notified. Check the assignment directions, the Canvas calendar, and the “Announcements” page for due dates for discussions, assignments, and exams. **All times listed are for Central Time Zone. Please adjust according to your time zone (i.e., 11:59 pm Central is 10:59 pm Mountain).** Please note that this schedule is subject to revision as necessary. Changes to the schedule will be communicated in a timely fashion.

Week	Dates	Unit(s)	Readings	Discussions	Assignments
1	1/13 – 1/19	Welcome!	None	Post personal introduction (due 1/19 by 11:59 pm)	Sign up for Student-led Discussions (due 1/19 by 11:59 pm)
2	1/20 – 1/26	Bottom-up Processes	Properties of Water (Dodds 2002)  Nutrients in Water (sections of Chapter 15 by Cole 1994)	Instructor-led discussion #1 (1 <sup>st</sup> post due 1/22 by 11:59 pm; 2 <sup>nd</sup> post due by 1/26 by 11:59 pm)	Demonstrating the Properties of Water at Home (due 1/26 by 11:59 pm)
3	1/27 – 2/2	Bottom-up Processes: Lentic Systems	Density, Layering, and Lake Classification (Chapter 10 by Cole 1994)  Trophic Relationships in Pelagic Ecosystems (McQueen et al. 1986)	Student-led Discussion #1 (see <i>Student-led Discussion General Directions for days which leader and participants need to post</i> )	None
4	2/3 – 2/9	Bottom-up Processes: Lotic Systems	River Continuum Concept (Vannote et al. 1980)  River Continuum Critique (Statzner and Hignier 1985)  Riverine Productivity Model (Thorpe and Delong 1994)  Flood Pulse Concept (Junk et al. 1989)	Student-led Discussion #2 (see <i>Student-led Discussion General Directions for days which leader and participants need to post</i> )	What if...? Scenario Assignment #1 (due 2/9 by 11:59 pm)

Week	Dates	Unit(s)	Readings	Discussions	Assignments
5	2/10 – 2/16	Linking Abiotic and Biotic Processes	Ecosystems, Energy, and Production (Chapter 5 by Cole 1994)  Nutrient Cycling by Animals in Freshwater (Vanni 2002)	Student-led Discussion(s) #3 and 4 ( <i>see Student-led Discussion General Directions for days which leader and participants need to post</i> )	None
<b>6</b>	<b>2/17 – 2/23</b>	<b>Exam #1 (due by 11:59 pm on Sunday, February 23)</b>			
7	2/24 – 3/1	Approaches to Understanding Trophic Dynamics: Food Habits Studies	Selections from Chapter 16 (Garvey and Chipps 2012)  Chapter 11 (Chipps and Garvey 2007)	Student-led Discussion(s) #5 and 6 ( <i>see Student-led Discussion General Directions for days which leader and participants need to post</i> )	Analysing and Interpreting Food Habits Data ( <i>due 3/1 by 11:59 pm</i> )
8	3/2 – 3/8	Approaches to Understanding Trophic Dynamics: Bioenergetics Modelling (Part I)	Chapter 12 (Hartman and Hayward 2007)	Student-led Discussion(s) #7 and 8 ( <i>see Student-led Discussion General Directions for days which leader and participants need to post</i> )	Begin “Working with Bioenergetics Models” ( <i>due 3/15 by 11:59 pm</i> )
9	3/9 – 3/15	Approaches to Understanding Trophic Dynamics: Bioenergetics Modelling (Part II)	Chapter 12 (Hartman and Hayward 2007)	None	Complete “Working with Bioenergetics Models” ( <i>due 3/15 by 11:59 pm</i> )

Week	Dates	Unit(s)	Readings	Discussions	Assignments
10	3/16 – 3/22	Approaches to Understanding Trophic Dynamics: Stable Isotope Analyses	Selections from Chapter 16 (Garvey and Chipps 2012)  Galster et al. (2012)	Student-led Discussion(s) #9 and 10 (see <i>Student-led Discussion General Directions</i> for days which leader and participants need to post)	None
11	3/23 – 3/29	<b>SPRING BREAK</b>			
12	3/30 – 4/5	Trophic Ecology in Action: Eutrophication	Basic Concepts of Eutrophication (Sawyer 1966)  Limnological Changes Associated with Reservoir Aging (Kimmel and Groeger 1986)	Student-led Discussion(s) #11 and 12 (see <i>Student-led Discussion General Directions</i> for days which leader and participants need to post)	None
13	4/6 – 4/12	Trophic Ecology in Action: Alternative Stable States	Alternative Stable States (Scheffer 1989)	Student-led Discussion(s) #13 and 14 (see <i>Student-led Discussion General Directions</i> for days which leader and participants need to post)	What if...? Scenario Assignment #3 (due 4/12 by 11:59 pm)
14	4/13 – 4/19	Trophic Ecology in Action: Prey Stocking	Ney (1981)  Vanni et al. (1986)	Student-led Discussion(s) #15 (see <i>Student-led Discussion General Directions</i> for days which leader and participants need to post)	None

Week	Dates	Unit(s)	Readings	Discussions	Assignments
15	4/20 – 4/26	Trophic Ecology in Action: Predator Stocking	Seda et al. (2000)	Student-led Discussion(s) #16 and 17 (see <i>Student-led Discussion General Directions</i> for days which leader and participants need to post)	Question: Is it better to stock predators or prey? (due 4/26 by 11:59 pm)
16	4/27 – 5/3	Trophic Ecology in Action: Introduced Species	Spencer et al. (1991) Vander Zanden et al. (1999) Zhang et al. (2016)	Student-led Discussion(s) #18 and 19 (see <i>Student-led Discussion General Directions</i> for days which leader and participants need to post)	None
8	<b>FINAL EXAM (100 points) – Due by 11:59 pm on Thursday, May 7</b>				

**PLAGIARISM:**

Plagiarism is defined as using more than four consecutive words from a source without a citation. You may not use another's words directly without putting them within quotations. It is also plagiarism when either an author's ideas or organization of concepts are used without giving a citation. We expect you to use references for assignments given in this course and we expect you to cite your sources. Students caught plagiarizing will receive a failing grade for the assignment and will face additional punishments up to expulsion as outlined by University policy. I invite you to visit the online resource <http://www.plagiarism.org/> to make sure you understand what plagiarism is and how to avoid it.

**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](mailto: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](mailto:unkveterans@unk.edu).