

## BIOL 876: Natural Science Curriculum

**Term:** Summer 2024

**Course Credits:** 3

**Course Delivery:** Online -  
Asynchronous

**Instructor:** Dr. Gregory J. Pec

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**Phone:** 308.865.8410

**Office hours (link to schedule appointments on Canvas homepage):** Mondays 12 PM – 2 PM, Wednesdays 12 PM – 2 PM and Fridays 12 PM – 2 PM Central Time, or by appointment. Please take advantage of office hours to check-in, ask questions, or follow-up on anything you would like to understand better. Email should be used judiciously to address questions pertaining to course administration/scheduling or urgent matters. I respond to messages as quickly as I can, generally within 24-48 hours. Direct issues related to the course content should be posted to the Canvas forum described below.

**Course Description:** This course explores the development and implementation of natural science curricula, focusing on promoting scientific literacy and ensuring alignment with state and national standards. Students will critically analyze curriculum coherence, apply pedagogical content knowledge, and use the curriculum topic study process to inform curriculum design and delivery. Emphasis is placed on understanding the contextual factors that shape science education in K-12 settings and ensuring that curricula meet established benchmarks for educational standards.

**Course Learning Objectives:** At the completion of the course, students will be able to:

1. Evaluate science curricula for alignment with state and national standards.
2. Apply state and national science education standards to curriculum delivery.
3. Integrate pedagogical content knowledge into the design and teaching of science curricula.
4. Utilize the curriculum topic study process for curriculum development and implementation.
5. Analyze the contextual factors influencing science curriculum decisions and outcomes.

### Required Texts and Materials

**Required Text:** Keeley, P & Tugel, J. Science Curriculum Topic Study: Bridging the Gap Between Three-Dimensional Standards, Research, and Practice. Second Edition. 2019. ISBN-13: 978-1452244648; ISBN-10: 1452244642.

### Required Technology

- As an online course, access to an up-to-date computer and Canvas several times a week is required (checking in daily is encouraged).
- An updated PDF reader will also be needed to read course materials.
- You may need to use software, such as Microsoft Word, Excel, or PowerPoint or another equivalent.
- Microsoft365 software is available to UNK students for free download.
- Ability to use search engines (for example, [Google Scholar](#) or [the Calvin Library search engine](#)) to locate scholarly works is expected of graduate students. If you are not already comfortable with this, I encourage you to reach out to me or the [Natural Sciences Librarian](#) at Calvin Library for assistance.

- For issues with Canvas or other technologies associated with your university account, please contact the University technology help desk.

## Course Organization

### Canvas

For this class we will use an online course management system called Canvas. Course information, updates, and related information, etc. will be posted here. I have also created a forum in Canvas for asking/answering questions about course information.

### Participation

The more students are engaged in a course, the more they tend to get out of it. I encourage you to spend at least a little time each day with course material or activities though I recognize this is not always possible.

### Communication

Please check course announcements in Canvas frequently. This the primary way I will communicate. Please feel free to reach out to me at any time via Canvas messages, email, or office phone. I will respond as quickly as possible, usually within 24-48 hours. Emails sent after 3 pm (CST) on Fridays will be answered by the following Monday. If sending an email or leaving a voicemail, please be sure to include BIOL 876 in the subject (email) or message (voicemail) so I can prioritize responding to it.

### Course Structure and Assessment

All work is due by 11:59 PM Central Time on the date listed in Canvas and on the course schedule, unless otherwise indicated. **This is a discussion-based graduate course. No lectures will be given by the instructor – instead, my role will be to facilitate discussions and learning.** All materials for each week will be posted on Canvas. This is not a self-paced course. You will be expected to keep up with the pace of the course, and the course structure is designed to help with this. If this is your first distance class, you will find that these classes can be fast paced.

Understandably, everyone in this class has several commitments other than this class. Nonetheless, as a student who has registered for this class, it is your full responsibility to ensure that you can meet the requirements and commit the needed time for this course. Students are responsible for all material covered, even for assignments that are missed. If you start to fall behind, it may be difficult to catch up. Please do not hesitate to contact me.

### Assignments:

**Discussion Boards (D):** Students will organize into groups of 2-4 (depending on enrollment) to lead a discussion on selected reading material. Discussion leaders should briefly outline the major points of the readings and have a list of discussion points and questions ready to stimulate discussion (see *evaluation of group discussion leadership on Canvas under the Week 1 module*). Discussion boards will begin on Tuesdays and run through to Monday of the following week. Students will be expected to respond to one of the discussion questions posed by the discussion leaders and to other students' comments. This will allow us to talk about the topics and answer any questions that students might have. There will be a total of 6 weeks of discussion, each week being worth 20 points with two discussion topics per week (120 points total). Participation marks will be based on the following criteria:

- For the initial posts, you will reply to one of the questions in each of the topic forums posted by Friday (10 points total (5 points/topic)).
- The second part of the assignment is to respond to another of your classmates' postings in each of the topic forums by expanding on what they have written. These responses are due by Monday (10 points total (5 points/topic)).

Further details will be provided for each discussion board assignment. In addition to this weekly mechanism for student participation, please become familiar with all other such policies on attendance found in the [University Graduate catalog](#).

**Reflection Papers (RP):** Students will choose two out of five different reading reflections, which are intended to capture four major sources of understanding that can inform effective science teaching: (1) the nature of science, (2) the nature of learning, (3) the nature of learners, and (4) the nature of teaching (*see reflection paper information on Canvas under the Week 1 module*).

**Curriculum Topic Study (CTS):** Students will select a topic of study and complete one of the six CTS sections (*see CTS information on Canvas under the Week 1 module*).

### **Basis for final grade**

<b>Assessment</b>	<b>Points</b>
Discussions (6 @ 20 points each)	120
Reflection papers (2 @ 25 points each)	50
Curriculum topic study (1 @ 50 points)	50
<b>Total</b>	220

Grades will be assigned using the standard grading scale for the Department of Biology, as follows: A (93-100%), A- (90-92%), B+ (88-89%), B (83-87%), B- (80-82%), C+ (78-79%), C (73-77%), C- (70-72%), D+ (68-69%), D (63-67%), D- (60-62%), and F (below 60%).

### **Course Policies and Resources**

I take my role as your instructor very seriously; I care about how well you do in this course and that you have a challenging and rewarding experience. It is my commitment to you to respond individually to the work you submit in this class and to return your work promptly.

### **Grading Policy**

Scores for each assignment will be posted on the course Canvas page. If you think there was a grading error or do not understand the feedback you receive on graded work, please contact me as soon as possible. If you would like me to regrade your work, requests should be made within three days after the graded work has been returned to you. Regrade requests may result in a lower grade.

### **Late Work Policy**

As a student enrolled in this course, one of your responsibilities is to submit course work on time. With that said, I recognize there may be times when you are unable to complete or submit these tasks by their due dates. To accommodate this, late assignments will be accepted up to 3 days late. If more than 3 days late, the submission will not be accepted and a grade of 0 (zero) will be recorded for that assignment. Course work will not be accepted after the 3 days late period unless prior arrangements have been made due to documented professional or extenuating personal circumstances (e.g., family emergency, participation in university-sanctioned activities, religious observation, etc.). Please contact me as soon as possible to discuss alternative arrangements.

***All students at the University of Nebraska Kearney should be aware of the following university-wide course policies and resources.***

### **Attendance Policy**

Your instructor may have indicated on their syllabus an attendance policy specific to their class. If so, that is the policy with which you must comply. If no other policy is stated, the University-wide attendance policy will apply.

[Undergraduate Student Attendance Policy](#)

[Graduate Student Attendance Policy](#)

### **Academic Honesty Policy**

Academic honesty is essential to the existence and integrity of an institution of higher education. The responsibility for maintaining that integrity is shared by all members of the academic community. To further serve this end, the University of Nebraska at Kearney has a policy relating to academic integrity.

[Undergraduate Academic Integrity Policy](#)

[Graduate Academic Integrity Policy](#)

### **Finals Week Policy (not applicable for summer sessions)**

The final exam will be administered in the time period scheduled during finals week in accordance with University policy ([Final Exam Schedule](#)). More information about UNK's Finals Week Policy, including when it is appropriate to ask for special accommodations to move a course's final exam, can be found here: [Finals Week Policy](#).

### **Mental Wellness**

The UNK Counseling Center provides mental health services to support the academic success of students. The Counseling Center provides a full range of short-term professional mental health services. Getting help is a smart and courageous thing to do. Contact the UNK Counseling Center at 308-865-8248 or visit their website for more

information: [https://www.unk.edu/offices/counseling\\_healthcare/counseling\\_care/index.php](https://www.unk.edu/offices/counseling_healthcare/counseling_care/index.php)

### **Military and Veteran Services**

Military and Veteran Services assist veterans, service members, and their dependents with education benefits and academic and supporting resources. They serve as a liaison between students and the Veterans Administration and branches of the military. Contact the UNK Military and Veteran Services office at 308-865-8677 or visit their website for more

information: [https://www.unk.edu/offices/financial\\_aid/veterans\\_services/index.php](https://www.unk.edu/offices/financial_aid/veterans_services/index.php)

### **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 they 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.

### **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 the UNK Disabilities Services for Students (DSS) 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 the Student Health office at 308.865.8218. The following links provide information for students and faculty regarding pregnancy rights. <https://thepregnantscholar.org/title-ix-basics/>  
<https://nwlc.org/resource/faq-pregnant-and-parenting-college-graduate-students-rights/>

## UNK Statement of Diversity & Inclusion

UNK stands in solidarity and unity with our students of color, our Latinx and international students, our LGBTQIA+ students and students from other marginalized groups in opposition to racism and prejudice in any form, wherever it may exist. It is the job of institutions of higher education, indeed their duty, to provide a haven for the safe and meaningful exchange of ideas and to support peaceful disagreement and discussion. In our classes, we strive to maintain a positive learning environment based upon open communication and mutual respect. UNK does not discriminate on the basis of race, color, national origin, age, religion, sex, gender, sexual orientation, disability or political affiliation. Respect for the diversity of our backgrounds and varied life experiences is essential to learning from our similarities as well as our differences. The following link provides resources and other information regarding D&I: <https://www.unk.edu/about/equity-access-diversity.php>

**Distribution of course materials:** The materials on the course website are only for the use of students enrolled in this course for purposes associated with this course and may not be retained or further disseminated. The materials on the course website may be protected by copyright, and any further use of this material maybe in violation of Federal copyright law.

**Disclaimer:** Any typographical errors in this Course Outline are subject to change and will be announced on the course Canvas page.

## Tentative Summer 2024 Course Schedule

All work due by 11:59PM Central Time unless otherwise indicated. Required content not listed here may be provided in Canvas.

Week	Topics	Readings	Assessment
1	Pre-course module information; Introductions	Syllabus; Canvas 'start here' module; Canvas Week 1 module	
2	What is curriculum - Views from early 20 <sup>th</sup> century; What is curriculum - Views from late 20 <sup>th</sup> century	Canvas Week 2 module readings	D1
3	How should curriculum be developed; Science literacy as a curriculum goal	Canvas Week 3 module readings	D2
4	How do standards relate to curriculum; What is essential in the natural science curriculum?	Canvas Week 4 module readings	D3; RP1
5	Critique on Keeley and Tugel list of curriculum topics; Processes and practices in the curriculum; Addressing cross-cutting concepts	Canvas Week 5 module readings; Keeley and Tugel Ch. 1-4	D4

6	Curriculum support for pedagogical concerns; P-16 curriculum	Canvas Week 6 module readings; Keeley and Tugel Ch. 5	D5
7	Curriculum assessment issues; Differentiating the curriculum	Canvas Week 7 module readings; Keeley and Tugel Ch. 5	D6; RP2
8	Current issues in science curricula (optional); Concluding remarks	Keeley and Tugel Ch. 5	CTS1

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