

## BIOL844- Molecular Biotechnology Spring 2024- 3 Credits

### Instructor Information

**Instructor:** Dr. Surabhi Chandra

**Office:** BHS 201B

**Phone:** 308-865 8695

**Email:** chandras2@unk.edu (preferred contact); emails responded within 24 hours

### Textbook and Computer Requirements

**Required Text:** Molecular Biotechnology: Principles and Applications of Recombinant DNA, 6th Edition.  
Bernard R. Glick, Cheryl L. Patten

ISBN: 978-1-683-67366-8

**Computer:** You will need to have an up-to-date browser, operating system, and some additional software on your computer in order to take this class. Some of the documents in this course will be available in PDF form. If you do not have Adobe Acrobat Reader software on your computer, you can download it from <https://get.adobe.com/reader/>

### Course Description and Objectives

#### Course Description:

The course will consist of a short review of pertinent principles in protein structure and function, enzyme mechanisms and kinetics, and the basics of genetic dogma and recombinant DNA technology. The bulk of the course will be made up of a topical consideration of subjects in biotechnology such as: the production of protein pharmaceuticals, genetic engineering of animals and plants, and cloning of organisms. Special consideration will be given to the molecular mechanisms behind the processes discussed.

#### Course objectives:

1. Recognize the foundations of modern biotechnology.
2. Identify the steps involved in gene expression and protein engineering.
3. Describe the steps and principles of molecular cloning.
4. Provide examples of current applications of biotechnology in different areas.
5. such as the medical, and agricultural fields.
6. Describe the principles of generating transgenic plants and animals.
7. Discuss the ethical challenges and issues related to biotechnology.

### Course Format, Access, and Attendance

#### Course Format:

Because this is a web-based course and conducted entirely online, it is extremely important that you **regularly check your UNK email and Canvas**. In this course students will demonstrate their level of achievement by completing tests, participating in discussion boards, and submitting assignments, which will be completed online.

**Course Access:** After accessing the course on Canvas, use the links on the left of the screen for syllabus, modules, lectures, discussions, quizzes, assignments, or additional resources.

#### Attendance:

Since this is an online course, "attendance" refers to checking announcements, reading the content, doing the activities, and submitting the assignments by the deadline. It is required that you should be logging in the course at least 3-4 times a week. The instructor can check if you have been accessing the course regularly or not. You are advised to allot specific times on several days of the week (MWF or TTh) towards this course like your regular in-class sessions.

## Course Design

The course is outlined in the form of modules as mentioned below. Each module will entail reading the textbook chapters, watching the lecture videos, reading additional resources, and participating in a quiz. In addition to the quizzes, there will be mid-term and final exams. The details of these will be provided as per their schedule.

**Modules:** There will be 4 modules in this course (schedule on the last page) which are categorized based on the content covered.

**Lecture Content:** Lecture content including lecture notes, lecture videos, and additional material will be posted on Monday of each week. The content covered in these will be primarily from the textbook.

**Quiz:** Topics covered in the quiz will be announced on Canvas (Schedule on the last page). Content would include chapters covered in the week and additional reading materials as provided. Quizzes will open on Friday @ 8 am and due by Tuesday @ midnight. These will typically include multiple choice questions, true/false and fill in the blank type of questions. *Two of the lowest scores* from these quizzes will be dropped at the end of the semester.

**Exams:** These will include content for that module i.e., textbook chapters as well as extra referencing based on the topics covered. These exams will have both a timed-online (MCQ) component as well as a take-home short-answer/essay component. The final exam is NOT comprehensive.

## Course Communication

**Announcements:** Announcements will be posted on Canvas. Please make sure to check them regularly, as they will contain important information regarding assignments, or class concerns.

### Discussion Board:

Discussion Board will be used as a means of online communication between students and the instructor.

Original Post- Each module in this course would have a discussion board. You will be assigned to specific groups to participate in the discussion boards. Please read the material assigned and respond to the question posted. The length of the post must be a minimum of 150-200 words with critical and thoughtful explanation of the topics. Support your post with relevant peer-reviewed articles. Original post is due by Friday @ midnight.

Reply to Postings- There will be a minimum of 2 responses that you are required to provide on other students' postings. These responses should not be limited to one word such as "bravo", "nice" or use internet lingo (LOL, ROFL etc.). Typical responses should be at least 2-3 sentences after carefully analyzing the post and providing your inputs. Responses are due by Sunday @midnight.

Grading - Each original post will be worth 7 points and responses will be 3 points (1.5 points each). Points will be deducted if original posts and responses are submitted within an hour of each other. Discussion boards are meant for interaction with your peers', hence continued participation is encouraged.

**Coffee House:** Since this is an online course, it is normal to have questions regarding assignments, tests, and lecture material. You can post these questions in the COFFEE HOUSE forum under the Discussion Board. This will be an open forum where you can help each other.

## Grades

Discussion board postings	50 points = 4 modules (10 points each) + Introduction (10 points)
Quizzes	80 points = 10 quizzes (10 points each) – 2 lowest (10 points each)
Exam	400 points = 4 exams (100 points each)

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**Total** **530 points**

Grades will be assigned as follows:

- 100 – 90% - A grades (>98% = A+; 97-93% = A; 92-90% = A-)
- 89 – 80% - B grades (89-88% = B+; 87-83% = B; 82-80% = B-)
- 79 – 70% - C grades (79-78% = C+; 77-73% = C; 72-70% = C-)
- 69 – 60% - D grades (69-68% = D+; 67-63% = D; 62-60% = D-)
- 60% and lower – F grade

### Grade Policy

- Final grades will be rounded up, i.e., 0.5 and higher would go to the next point.
- Since this is a graduate level course, I do not provide any extra credit opportunities.

### Other Course Policies

**Late Work:** Late work will not be accepted. If you have an extenuating circumstance, please contact me before the assignment/work is due to make alternate arrangements. I will require documentation in such cases.

**Dropping the Class:** To avoid getting an F for the course, it is your responsibility to officially withdraw from the course prior to the deadline. Withdrawing from a class is done through your secure student account in MyBlue.

**Receiving an Incomplete:** An incomplete ("I") is issued only if circumstances beyond your control (for example, hospitalization during finals week) prevent you from completing the required work for the class by the end of the semester. The circumstances preventing you from finishing the class must have arisen *after* the withdraw deadline. An incomplete grade will give you an *extension* to complete outstanding work only; it is *not* an opportunity to "start over" in the class. A contract must be signed detailing a timeline for completing the work, and all outstanding work must be completed within one year or the "I" grade *automatically* converts to a failing "F" grade. The conversion of an incomplete grade to a failing grade is university policy and is not within the control of instructor.

### Ethics and Behavior

You should be following the highest ethical, academic, and professional standards. The University's Academic Integrity policy is listed in Article VI of the Student Handbook. UNK Student Handbook or (<http://www.unk.edu/offices/reslife.aspx?id=2402>). Use of proper language and maintaining appropriate decorum is expected during the course. Discussion boards will be moderated, and any use of abusive/foul language will be dealt strictly and can result in expulsion from the university.

### UNK Student Code of Conduct

Please review the student code of conduct ([http://www.unk.edu/offices/reslife/Student\\_Handbook/](http://www.unk.edu/offices/reslife/Student_Handbook/)). Anyone caught cheating will fail the course.

### 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)

### 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.

### [Graduate Academic Integrity Policy](#)

## UNK Academic Calendar- Spring 2024

Please take a note of the deadlines for dropping or withdrawing from the course

[https://www.unk.edu/offices/registrar/academic\\_policies\\_handbook/Academic\\_Calendar.php](https://www.unk.edu/offices/registrar/academic_policies_handbook/Academic_Calendar.php)

Last day to withdraw from one or more full-semester course for the term: April 19

## 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.

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## 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>

## Military and Veterans 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)

## Additional Resources

\*\*\*\***Tech Support:** Available through email at [unkhelpdesk@unk.edu](mailto:unkhelpdesk@unk.edu) or phone 308-865-8363.

\*\*\*\***Learning Commons (Tutoring):** The UNK Learning Commons offers support for this course! The Learning Commons, located on the 2<sup>nd</sup> floor of the Calvin T. Ryan Library, offers Subject Tutoring, the Writing Center, Success Coaching, and Language Support. These services are available to all UNK students in-person and on Zoom. The Learning Commons can help you with course content for select subjects, time-management skills, getting organized for class, and any type of writing project. To get the most out of your time with the Learning Commons, visit early and often! Contact the Learning Commons at 308-865-8905, [unklearningcommons@unk.edu](mailto:unklearningcommons@unk.edu), or stop by in person. Website: [www.unk.edu/lc](http://www.unk.edu/lc)

Weekly Schedule (Tentative)				
Week	Dates	Module	Chapters Tested	Assessment
1	01/22-01/26	M 1	Chap 1- The Development of Molecular Biotechnology (Self-read)	Quiz 1 (01/26-01/30) Chap 1
2	01/29-02/02	M 1	Chap 2- Fundamental Technologies	Quiz 2 (02/02-02/06) Chap 2
3	02/05-02/09	M 1	Chap 2- Fundamental Technologies (contd.)	Quiz 3 (02/09-02/13) Chap 2
4	02/12-02/16	M 1	Chap 3- Production of Recombinant Proteins	Quiz 4 (02/16-02/20) Chap 3
5	02/19-02/23	M 2	Chap 4- Molecular Diagnostics	<b>EXAM 1</b> (02/19-02/26) Chap 1, 2, 3
6	02/26-03/01	M 2	Chap 5- Protein Therapeutics	Quiz 5 (03/01-03/05) Chap 4 and 5
7	03/04-03/08	M 2	Chap 6- Nucleic Acids as Therapeutic Agents	Quiz 6 (03/08-03/12) Chap 6
8	03/11-03/15	<b>SPRING BREAK</b>		
9	03/18-03/22	M 3	Chap 7- Vaccines	<b>EXAM 2</b> (03/18-03/25) Chap 4, 5, 6
10	03/25-03/29	M 3	Chap 8- Industrial and Environmental Uses of Recombinant Microorganisms	Quiz 7 (03/29-04/02) Chap 7, 8
11	04/01-04/05	M 4	Chap 11- Transgenic Plants	<b>EXAM 3</b> (04/01-04/08) Chap 7, 8
12	04/08-04/12	M 4	Chap 11- Transgenic Plants (contd.)	Quiz 8 (04/12-04/16) Chap 11
13	04/15-04/19	M 4	Chap 12- Transgenic Animals	Quiz 9 (04/19-04/23) Chap 12
14	04/22-04/26	M 4	Chap 13- Molecular Biotechnology and Society	NO QUIZ
15	04/29-05/03	M 4	Chap 13- Molecular Biotechnology and Society (contd.) and Review	Quiz 10 (05/03-05/07) Chap 13
16	05/06-05/10		Finals Week	<b>FINAL EXAM</b> (05/06-05/13) Chap 11, 12, 13

Discussion Board Schedule		
Module	Topic	Due Date
M 1	Chap 1, 2, 3	Original: 02/16; Response: 02/18
M 2	Chap 4, 5, 6	Original: 03/08; Response: 03/10
M3	Chap 7, 8	Original: 03/29; Response: 03/31
M 4	Chap 11, 12, 13	Original: 05/03; Response: 05/05