

BIOL 844 Course Syllabus  
Instructor: Dr. Moghe

**BIOL 844: Molecular Biotechnology  
Online Course (3 credits)  
Spring 2020**

**Instructor**

**Dr. Saili Moghe**

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You may contact me through email (using your Lopermail account) or Canvas inbox messages. Weekly discussion boards on Canvas 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**

The course will consist of a short review of pertinent principles in protein structure and function, enzyme mechanisms and kinetics, and the basics of the 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.

**Learning Objectives**

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

**Course Materials**

- **Required Textbook:** Molecular Biotechnology , 5<sup>th</sup> Edition, by Bernard R. Glick and Cheryl L. Patten.
- **Technical Requirements:** Full access to a computer and high-speed internet

**Course Structure**

Weekly materials will be posted on Canvas every Tuesday by 8:00am (CT), and an announcement will always go up at this same time letting you know that all materials are up and provide any information and details you need to know for that particular week.

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Each week the following will be posted:

- Video lectures
- Outline lecture notes corresponding to the lecture videos
- Assigned readings from the textbook or supplemental readings
- Quiz or Assignment
- Link to the weeks discussion board for questions/concerns/comments
- Any needed supplementary materials/resources

### **Assessments**

Your progress in class will be assessed by quizzes, assignments, and exams.

- **Quizzes**
  - 10pts each (total of 8 quizzes)
  - Multiple-choice questions (5-10 questions worth 1-2pts each)
  - 8-day access to each quiz
  - Timed at 10 minutes per quiz
- **Assignments**
  - 20pts each (total of 3 assignments)
  - Assignments will be 1-2 page short essay questions
- **Exams**
  - 100pts each (total of 3 exams)
  - Multiple choice, matching, fill-in the blank, short answer questions (2-6pts each)
  - 8-day access to each exam
  - Timed at 60 minutes per exam

### **Grades**

3 Exams – 300pts

8 Quizzes – 80pts

3 Assignments – 60pts

1 Introduction post – 10pts

**TOTAL: 450pts**

### **Grade Assignment**

Finals grades will be assigned using the following grade scale:

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%

All grades are final unless there is a calculation error.

### **Expectations from students**

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

- Log on to Canvas at least weekly and keep up with the posted course materials, as well as course announcements.
- Complete all listen to all lecture videos, and refer to provided notes and resources
- Complete exams, assignments and quizzes within the time that they are available and make any assignment submissions by the given deadlines (keep in mind all times are in Central Standard Time, so please account for any time differences, if needed).
- Seek help when you need it and do not wait till the last moment to do this.

Understandably, you all have several commitments in your life 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 above requirements and commit the needed time for this course.

### **Class Policies**

- **Assignments, quizzes, exams will receive zero (0) points if they are not completed by the given due date and time**
- **Extensions or rescheduling** of Exams/quizzes/assignments will NOT be possible unless circumstances are exceptional – a legitimate excuse (based on my discretion) with provided documentation will be required for such considerations
- **Policy on academic dishonesty:** Anyone caught plagiarizing or cheating on any exercise you will receive a 0 for that exercise; subsequent violations will result in referral to the Vice Chancellor for Academic Affairs for dismissal from the university.
- **Policy on incomplete:** All students are expected to progress through the requirements for this course in a timely fashion. Incompletes will only be considered if circumstances are extenuating and beyond your control and will require documentation.
- **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.

### **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 Sue Pedersen in Student Health, 308-865-8218. 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)** 308-627-4811

**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).

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### Tentative Class Schedule

- All weekly materials will be posted by 8am on Tuesdays
- Quizzes and exams will be available from 8am on Tuesdays until 8am on the following Wednesday
- All times in the syllabus and Canvas are in Central Standard Time

<b>Lesson: Topic</b>	<b>Textbook Reading</b>	<b>Assignment/Quiz/ Exam</b>	<b>Week</b>
1: Introduction to Biotechnology	Chapter 1	Assignment 1 & Introduction <i>Due: 8am Jan 22</i>	1 (Jan 13 – Jan 19)
2: Nucleic Acids & DNA Replication	No readings	No Assignment/Quiz/Exam	2 (Jan 20 – Jan 26) MLK Jr day: Jan 20
3: RNA & Protein Synthesis	p. 725	Quiz 1 (Lesson 1 & 2) <i>Available: Jan 28 – Feb 5</i>	3 (Jan 27 – Feb 2)
4: DNA Amplification & Sequencing	Chapter 2: pp. 35-41; Chapter 4: pp. 200-207	Quiz 2 (Lesson 3) <i>Available: Feb 4 – Feb 12</i>	4 (Feb 3 – Feb 9)
5: Molecular Cloning	Chapter 2: pp. 11-30	Quiz 3 (Lesson 4) <i>Available: Feb 11 – Feb 19</i>	5 (Feb 10 – 16)
6: Recombinant Protein Production	Chapter 3: pp. 93 - 153	<b>Exam 1</b> (Lesson 1-5) <i>Available: Feb 18 – Feb 26</i>	6 (Feb 17 – Feb 23)
7: Protein Engineering	Chapter 3: pp 153 - 173	Writing Assignment 2 <i>Due: Mar 4</i>	7 (Feb 24 – Mar 1)
8: Genomics, Proteomics & Molecular Diagnostics	Chapter 2: 64 – 87; Chapter 4	Quiz 4 (Lesson 6 & 7) <i>Available: Mar 3 – Mar 11</i>	8 (Mar 2 – Mar 8)
9: Therapeutic Proteins & Vaccines	Chapter 5; Chapter 7	Quiz 5 (Lesson 8) <i>Available: Mar 10 – Mar 18</i>	9 (Mar 9 – Mar 15)
10: Nucleic Acids as Therapeutic Agents	Chapter 6	<b>Exam 2</b> (Lesson 6 – 9) <i>Available: Mar 17 – Apr 1</i>	10 (Mar 16 – Mar 22)
SPRING BREAK	SPRING BREAK	SPRING BREAK	11 (Mar 23 – Mar 29)
11: Genetic Engineering in Plants	Chapter 10	Quiz 6 (Lesson 10) <i>Available: Mar 31 – Apr 8</i>	12 (Mar 30 – Apr 5)
12: Transgenic Plants	Chapter 11	Quiz 7 (Lesson 11) <i>Available: Apr 7 – Apr 15</i>	13 (Apr 6 – Apr 12)
13: Transgenic Animals	Chapter 12	Quiz 8 (Lesson 12) <i>Available: Apr 14 – Apr 22</i>	14 (Apr 13 – Apr 19)
14: Bioethics in Biotechnology	Chapter 13	Writing Assignment 3 <i>Due: Apr 29</i>	15 (Apr 20 – Apr 26)
		<b>Exam 3</b> (Lesson 10 – 14) <i>Available: Apr 28 – May 6</i>	16 (Apr 27 – May 3)
			17 (May 4 – May 7)

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