

Instructor- Dr. James Youngblom (Ph. D. - University of Minnesota- Dept. of Genetics and Cell Biology)

Contact Information:

**Best** - email- [jyoungblom@csustan.edu](mailto:jyoungblom@csustan.edu)

Office- N260, phone: 664-6924

**Office Hours-** 2:00-3:30 Tues. & Thurs. or by appt.

**Required books-** *DNA Science* by Micklos & Freyer, 2nd Edition

*A Crack in Creation* by Jennifer Doudna and Samuel Sternberg

This is predominantly a hands-on laboratory class. To succeed, you must understand each lab exercise. Read each day's lab exercise before coming to class. Read the protocol and the supplementary material before and after each lab exercise. Understand why you are performing each step in a protocol. It is critical that you know and understand the expected result for each exercise. When performing the lab exercises, split the duties evenly. Do not let one person do all of the lab work. Rotate duties so that both of you know how to perform all of the laboratory tasks. Strive for excellent results. All of these labs will generate appropriate results, if the experimental procedures are done properly.

Pay attention and ask questions during the lectures and films. Take good notes during the lectures. All films, lectures, handouts, and lab exercises can be a source for an exam question.

**Attendance is expected for all labs.** If you know in advance that you cannot attend all labs, please see me about taking this class another time. **Attendance is required.** (-10 for unexcused absences).

**Dates to Remember-**

Mon. Sept. 2- Campus closed, Labor Day

Thur. Sept. 19- Last day to drop a course

Tues. Oct. 8- No classes, Columbus Day

Mon. Nov 11- Campus closed, Veteran's Day

Th./Fri. Nov. 28/29- Thanksgiving

Tues. Dec. 10- Last day of classes

Wed. Dec. 11- Reading Day

Final Exam- Fri. Dec. 13, 2 p.m.

**Grading:** > 90% = A-, > 80% = B-, > 70% = C-, > 60% = D-, < 60% = F

I will use +/- grading system.

## **Tuesday Schedule**

All labs listed below with a # are from DNA Science; all other labs will be from class handouts.

#1-Aug. 28- Lab #1, #2	lecture- “Lab Safety”
#2-Sept. 4- Lab #3, Electroporation	lecture- “Agarose Gels; Electroporation” <b><u>Assignment #1 due at beginning of class</u></b>
#3- Sept. 11- Lab #3	lecture- “Use of Restriction Enzymes”
#4- Sept. 18- Lab #9	lecture- “Transforming E. coli” <b>Take Home Exam due/Quiz (25 pts.)</b>
#5- Sept. 25- Lab #10, Set up PCR	lecture- “PCR 1”
#6- Oct. 2- Lab #11, Analyze PCR	lecture- “PCR 2”
#7- Oct. 9- Lab #12A, Analyze PCR	<b>Take Home Exam due/Quiz (25 pts.)</b> lecture- “Making Solutions”, <b>Assn #2 due</b>
#8- Oct. 16- Lab #12B	lecture- “CRISPR-Cas 9”
#9- Oct. 23- CRISPR project	<b>MIDTERM EXAM (75 pts)</b>
#10- Oct. 30- CRISPR project	lecture- CRISPR, lab notebooks
#11- Nov. 6- CRISPR project	lecture- “Recombineering”, <b>Notebooks due</b> , Quiz- “A Crack in Creation”, through Chap 3
#12- Nov. 13- CRISPR project	lecture- “DNA sequencing Technology” Quiz on “A Crack in Creation”, Chap 4-6
#13- Nov. 20- CRISPR project	<b>Take Home Exam due/Quiz (25 pts.)</b> Quiz on “A Crack in Creation”, Chap 7-end.
#14-Nov. 27- CRISPR project	<b>Lab Notebooks due</b>
#15-Dec. 4- CRISPR project	Lecture- “Current Events in Biotechnology” Concept Maps due

**Final Exam: Friday Dec. 13 at 2:00, 100 pts**

**Total pts = 360 pts.:**

Assignments #1 = 5 pts.

Assignment #2 = 10 pts.

Midterm exam = 75 pts.

Three Take Home Exams = 45 pts.

Quiz #1-3 = 30 pts.

Book quizzes = 36 pts.

Concept Map = 25 pts.

Lab notebooks = 34 pts.

Final Exam = 100 pts.

Assessment	Date	Points	Percent of Final Grade
Assignment 1	Due Sept. 4	5 pts.	1.4%
Take Home Exam #1 & quiz	Due Sept. 18	25 pts.	6.9%
Take Home Exam #2 & quiz	Due Oct. 9	25 pts.	6.9%
Assignment 2	Due Oct. 9	10 pts.	2.8%
Exam 1	Oct. 23	75 pts.	20.8%
Lab Notebook	Due Nov. 8	10 pts.	2.8%
Book quizzes	Nov. 6, 13, 20	36 pts.	10%
Take Home Exam #3 & quiz	Due Nov. 20	25 pts.	6.9%
Lab Notebook	Due Nov. 22	24 pts.	6.7%
Concept Map	Due Dec. 4	25 pts.	6.9 %
Final Exam	Dec. 13	100 pts.	27.8 %
		360 pts.	100%

All **exams** and quizzes will be a mixture of different types of questions (including solving problems and short essay). **The final exam is comprehensive.** The exams cover readings, lectures, films, and lab exercises. No leaving the classroom during exams.

The **Take Home Exams** are designed to assist students in reviewing materials and getting the most of out of this class. These assessments are to be completed individually not as a team or a group.

**Quizzes-** The quizzes are based on the book 'A Crack in Creation'. The first quiz on Nov. 6 covers the beginning of the book through the end of chap. 3. The second quiz on Nov. 13 covers chap. 4, 5 and 6. The last quiz on Nov. 20 cover chapter 7-end. The quiz questions will all come directly from the book.

**Writing Assignment:**

You will be given a short article to read in week 1- see the document titled "rDNA debate" on Blackboard. At the end of the article is a related question. Your **assignment** is to answer the question by writing a 200-250 word response. Make sure you have 200-250 words in your response (don't count the words in your title, references, your name, etc.). Don't copy text from any sources. Don't copy this article! Read the article, highlight important points, and then write

your answer in your own words. Run a spelling and grammar check. Proof read your writing to make sure your sentences are coherent. Write a thoughtful, nuanced reply. Use complete sentences. Print your document. It should all be on one page. Make sure it is double-spaced. The assignment is due on Sept. 4. It will be graded and returned to you on Sept. 11. Between Sept. 11 and Oct. 1 you need to spend 5 minutes with your instructor reviewing your writing. This part of the assignment is worth 5 pts. On Oct. 2 everyone is giving a second article and second question. Your 2<sup>nd</sup> writing **assignment** is to answer the the 2<sup>nd</sup> question with a 150-200 word response. This part of the assignment is worth 10 pts and is due on Oct. 9.

**Concept Map-** Concepts maps are due on Dec. 4. The concept maps should illustrate all of your lab work from the start of the CRISPR project through week 14. Each pair of students submits one concept map. Students will be given the poster board for the concept maps. The concepts maps are grading on their thoroughness, accuracy, creativity, and the amount of effort put into the production.

**Lab Book-** The lab books are a documentation of your work related to the *CRISPR* project. Documentation should begin on Oct. 30 and continue until the work is completed at the end of the semester. Every week starting on Oct. 30 needs a clear entry. Each student submits one lab book. They will be graded twice. The first grade is based on your entry for Week #11 (Nov. 6; 10 pts). Lab books need to be turned in at the end the week (Friday, Nov. 8). The second grade is based on entries for week #12 and week #13 (Nov. 13/Nov.20; 24 pts.) and is due on Friday Nov. 22.

**Make-up-** If you know you can not be in class on the day of an exam or quiz, please see me beforehand so we can discuss your situation. In some circumstances, I will allow a make-up exam. If something comes up unexpectedly on the day of an exam or quiz , please call me. If you a leave a message, leave a phone number and I will contact you to discuss your situation. Don't 'let it ride' and plan on discussing it with me later. If your situation warrants a make-up exam or quiz, then schedule your make-up ASAP. If I don't hear from you soon enough, you will get a 0.

**Cheating-** Students caught cheating are automatically awarded an F. They are no longer allowed in class and a report is filed with the Dean of Student Affairs. All electronic devices (including phones) & headphones must be kept in purses or backpacks during the exams and quizzes. No exceptions. You can use a real calculator and not the calculator function on a cell phone or PDA.

**Taping Policy-** Audiotaping of classes is permitted only with prior permission of the instructor; videotaping is not permitted under any circumstances. Authorized tapes are for the personal use of the student, and may not be distributed to others without the permission of the instructor.

**Guest Policy-** Guests are not permitted in this class due to the present of hazardous chemicals.

### **How to do well in this class-**

1. **COME TO CLASS-** take good notes, ask questions. Go over your notes, rewrite them, and think about them after each lecture.

2. If material is unclear, come and see me in my office.
3. Use YouTube and other sources to review important concepts.
4. Start early in the semester and stay on top of the material. Don't start studying the night before the exams.
5. Strive for good results. Plan each experiment carefully with your partner.
6. Strive to understand each week's exercise. Why are we doing it and what is the expected result? What is the biological basis of the technique?
7. Talk to others about each experiment- What was supposed to happen? Why did this happen? Why did we do this?