Course Syllabus

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CHEM 765: Molecular Mechanisms of Disease

Fall 2023

COURSE INFORMATION

Class Days: Monday/Wednesday

Class Times: 5:00-6:15pm

Class Location: SSW 2512

Mode of Delivery: Face to Face (pre-arrange with instructor for a zoom option only in the case of illness)

Instructor: Dr. Christal Sohl

Contact: The best way to reach me is via canvas messaging and usually respond within 1 business day; I usually respond to email within 4 business days (**csohl@sdsu.edu** (mailto:csohl@sdsu.edu))

Units: 3

PREREQUISITES

Biochemistry and organic chemistry courses with C or higher average, research experience, and graduate standing or undergraduate with permission from instructor (in an undergraduate senior must have completed a minimum of 90 units, with a GPA of 3.0 or better in their last 60 units). Talk to me after class during the first week for details or advice.

COURSE DESCRIPTION

We'll explore how cancer and HIV develop, are treated, and achieve therapeutic resistance through the lens of biochemistry, biophysics, and cell and molecular biology. We'll investigate the path of drug development from design through FDA approval while probing the science, business, and ethics of drug discovery and drug companies. We cover many disciplines, so there will be something for everyone. Students interested in biochemistry, chemistry, pharmacology, business, finance, law, ethics, or social justice in the context of human disease will find a topic of interest. Expertise in most of these topics is not expected! This is a flipped course, so you will watch lectures online and in class we will discuss, debate, design, practice, explore, and have assignments in class. It's normal to find much of this material new and to feel a little overwhelmed, but I am here to help you in your learning adventure! I also look forward to also learning from you – I love hearing your perspectives!

STUDENT LEARNING OUTCOMES (SLO)

1. Practice critical thinking and sharing your ideas in oral and written communication.
2. Evaluate the primary scientific literature.
3. Determine the effects of altered protein function in disease.
4. Apply research tools to solve scientific problems.
5. Explain the basic features and challenges of drug design.
6. Design hypothesis-driven experiments.
7. Assess and present research findings and challenges.
8. Discuss and relay scientific information to wider audiences.
9. Learn about careers in biotech/pharmaceutical industries.
10. Connect scientific concepts to the world around you.
11. Debate how money, power, and systemic racism can affect science.
12. Learn about scientists identifying from minoritized groups and how they have advanced our field.

ABOUT DR. SOHL (SHE/HER/HERS)

I study how proteins work – and how they run amok in cancer. My lab, made up of curious, kind, and hard-working undergraduate, graduate student, &

postdoctoral scientists, works on the biochemical features of metabolic enzymes and polymerases that drive tumor growth. I know that our lab's diversity is our superpower, and I am a fierce advocate for broadening access to STEM and STEM careers. One of my favorite parts of my job as a professor is facilitating learning and discovery in the lab and classroom. I am grateful for the unique and diverse perspectives and expertise of my student colleagues! Finally, when not in the lab or classroom, I love to hike and paddleboard, tinker about in the garden, listen to music, and learn new languages at an unfortunately alarmingly slow and somewhat ineffective rate.

COURSE DETAILS

Required course materials: Using **canvas** during class (via a tablet/laptop) for accessing and submission of in class activities is needed. The free protein structure viewing platform, Pymol (**https://www.pymol.org/** (https://www.pymol.org/)) are required. Zoom with video access may be necessary. Please come see me as soon as possible if you foresee any issues with required materials– I look forward to working with you. Please check canvas regularly!

We need your perspective in this class: I want you to participate fully in the in-class activities and to engage in class discussions by contributing your ideas, perspectives, and questions. Every member of this class is vital – you bring a unique and valued set of ideas, expertise, and perspectives from which we all can learn and benefit!

I am committed to creating a supportive, safe, and multiculturally affirming environment for all: You all belong in this class, and I am grateful you are here! We should all arrive each day committed to creating a safe environment for learning that allows everyone to feel comfortable to respectfully contribute their thoughts and questions.

Attendance and absences: Lecture content is delivered online, and we will discuss, design, practice, and explore in person during class. Attendance is expected since this is neither an asynchronous nor a hybrid class. If you have a planned absence, contact me at least one week before the missed day to arrange dates for making up work. For an unexpected or emergency absence, contact me no later than two days after the missed deadline/class period to determine a strategy for moving forward. This strategy for addressing the missed class period will seek to honor a compromise between equitable solutions for your success in this course, the efforts of colleagues who turned in materials on time, and the instructor's investment of time in the course.

SDSU policy states that when a student is hospitalized or has a serious, ongoing illness or injury, **Student Health Services** (http://shs.sdsu.edu/index.asp) (SHS) will, at the student's request and consent, communicate with the student's instructors and may communicate with the student's Assistant Dean.

Classroom norms: I expect you to attend class and participate actively in learning, and to help provide a positive, productive, and safe space for learning by being respectful to your colleagues and I. Please keep your devices on silent while in class and do not intentionally open sites that contain loud sounds or flashing lights. Please step out if you need to receive a phone call. If you need to use the bathroom, grab water, or take a break, you may do so without asking permission unless it is an exam day – in this case, you still don't need permission, but I ask that you leave your cell phone at the front of the classroom. If you need to bring in a child/young sibling to class as part of childcare responsibilities, you do not need permission for this.

Contact me immediately if you foresee or are experiencing challenges that threaten your success in this class: You and I are on the same team -- we both want you to be successful in this class and in your educational journal in general. Let's work together on strategies to keep you on track for success. I can usually work with you for just about anything imaginable that can come up – you just need to communicate to me about what you need as early as possible. It is my commitment to you that I provide a learning environment where everyone is able to participate. I look forward to working with you to ensure you have the tools you need for success.

DIVERSITY, EQUITY, INCLUSION, ACCESS, & JUSTICE COMMITMENT

Land acknowledgment: For millennia, the Kumeyaay people have been a part of this land. This land has nourished, healed, protected and embraced them for many generations in a relationship of balance and harmony. As members of the SDSU community, we acknowledge this legacy. We promote this balance and harmony. We find inspiration from this land, the land of the Kumeyaay.

Equity, justice, and access statement: I am firmly committed to social justice, diversity, equity, and inclusion, creating and maintaining an inclusive community in all areas of campus life, including specifically members of minoritized and historically excluded communities. In this class I will work to promote not simply a non-discriminatory, but an active anti-discriminatory environment where everyone feels safe and welcome. I recognize that discrimination can be direct or indirect and take place at both institutional and personal levels. I believe that such discrimination is unacceptable and I am committed to providing equality of opportunity for all by eliminating any and all discrimination, harassment, bullying, or victimization. The success of this policy relies on the support and understanding of everyone in this class. We all have a responsibility not to be offensive to each other, and to explicitly call out and stop harassment or discrimination of any kind.

Students with disabilities: If you are a student with a disability and believe you will need accommodations for this class, make sure to **contact the Student Ability Success Center** (https://newscenter.sdsu.edu/student_affairs/sds/) (SASC) at (619) 594-6473 as soon as possible. Please do note I cannot provide some types of accommodations (like increased exam time times) based upon disability until I have received an accommodation letter from Student Ability Success Center. However, you are not required to have documentation or a diagnosis to talk to me about how we can talk about your access needs to facilitate your participation in class! Please also come talk to me – I look forward to advocating for you so that you may enjoy the same access to this class that folks without disability enjoy.

Religious observances: By the end of the 1st week of class, notify me of any planned absences for religious observances, and then we can work together to reasonably accommodate students.

Safe zone statement: I am part of the Safe Zone Ally community network of trained SDSU faculty/staff/students who are available to listen and support you in a

safe and confidential manner. As a Safe Zone Ally, I can help you connect with resources on campus to address concerns you may face that interfere with your academic and social success on campus as it relates to issues surrounding sexual orientation/gender identity. My goal is to help you be successful and to maintain a safe and equitable campus.

Undocumented & mixed status inclusivity statement: I and SDSU in general value diversity and are committed to creating and maintaining an inclusive community, which includes members of the Undocumented and Mixed Immigration status community. I will work towards promoting an anti-discriminatory environment, which may be direct or indirect that take place in the class, at the institution and on a personal level. I will treat your disclosure with the utmost confidentiality permitted and value your trust. I will work with you should you encounter barriers to your academic success.

Preferred name & gender pronouns, and positionality statement: I enter this classroom identifying as a white, cis-gender, straight woman who was raised in a household that highly valued education, even if no one had yet taken my path to a PhD. I value my identities as a wife, daughter, mentor, scholar, advocate, teacher, and learner. My preferred gender pronouns are she/her/hers. Class rosters are provided to me with only your legal name, and I will gladly honor your request to address you by an alternate name and/or gender pronoun. Please let me know so I may update my records.

ADDITIONAL RESOURCES AND POLICY

Safe learning environment: As an instructor, one of my responsibilities is to help create a safe learning environment on campus. I am required to share information regarding sexual violence on SDSU's campus with the **Title IX** (http://titleix.sdsu.edu/) coordinator, Gail Mendez (619-594-6464), who will contact you to let you know about SDSU support services and possibilities for holding accountable the person who harmed you. If you do not want the Title IX Officer notified, you can speak confidentially SDSU's Sexual Violence Victim Advocate (619-594-0210) or Counseling and Psychological Services (619-594-5220, **psycserv@sdsu.edu** (mailto:psycserv@sdsu.edu)). To be prepared for emergencies, each student is responsible for becoming familiar with the evacuation plan specific to each classroom. The evacuation plan is posted within each classroom and should be examined on the first day of class. Campus police can be reached by dialing (619) 594-1991 or call 911 in the event of an emergency.

Mental health and wellness: I see and interact with you as bright, creative, and hard-working students in my class. However, I know that sometimes life's circumstances can be intense, and as a result, you may have a hard time prioritizing coursework due to mental health, economic stability, or other challenges. You're not alone -- we all experience periods at some point in our lives where circumstances demand too much of our mental resources. It is really tempting to disengage during these times, and not let anyone know you need help -- but please resist this temptation! It takes courage to reach out for help, and I and others on campus are here to help -- and we want to. This is because we know how much potential you have, and we want to empower you to ensure you can achieve anything you want! I've included a list of resources on Canvas if you find you're grappling with things beyond the classroom (if it's course content...just ask me for help during class or request help hours!) You can also reach out to me, and I will help you connect to services you need. To prepare myself to better guide you to resources, I have trained to be an Adult Mental Health First Aid (MHFA) and Economic Crisis Response Team (ECRT) advocate. I'd be happy and honored to help you find help – I've done so for students in the past, and know I will for years to come.

- **Counseling and Psychological Services** (http://go.sdsu.edu/student_affairs/cps/Default.aspx) offers confidential counseling services by licensed therapists. Students can talk with a therapist by calling (619) 594-5220 between 4:00pm and 4:00pm. For after-hours services, students can call the San Diego Access and Crisis Line 24-hours a day at (888) 724-7240.
- **ECRT** (http://go.sdsu.edu/student_affairs/ecrt/Default.aspx) : If you or a friend are experiencing food or housing insecurity, or any unforeseen financial crisis, visit **sdsu.edu/ecrt** (http://go.sdsu.edu/student_affairs/ecrt/Default.aspx) or email **ecrt@sdsu.edu** (mailto:ecrt@sdsu.edu)

Student privacy and intellectual property: The **Family Educational Rights and Privacy Act** (http://bfa.sdsu.edu/hr/oerc/students/ferpa.aspx) (FERPA) mandates the protection of student information, including contact information, grades, and graded assignments. I will use Canvas to communicate with you, and I will not post grades or leave graded assignments in public places. Students will be notified at the time of an assignment if copies of student work will be retained beyond the end of the semester or used as examples for future students or the wider public. Students maintain intellectual property rights to work products they create as part of this course unless they are formally notified otherwise.

Resources for students: A complete list of all academic support services--including the **Writing Center** (http://writingcenter.sdsu.edu/) and **Math Learning Center** (https://mlc.sdsu.edu/) --is available on the Student Affairs' **Academic Success** (http://go.sdsu.edu/student_affairs/academic_success.aspx) website.

Academic Honesty: Students agree that by taking this class they will uphold the principles of academic integrity. Academic integrity is one of the fundamental principles of a university community. San Diego State University expects the highest standards of academic honesty from all students. Cheating and plagiarism represent violations of academic integrity and will not be tolerated in this class. **SDSU adheres to a strict policy prohibiting cheating and plagiarism** (http://go.sdsu.edu/student_affairs/srr/cheating-plagiarism.aspx) **. Examples of academic dishonesty include but are not limited to:**

- copying, in part or in whole, from another's test or other examination;
- obtaining copies of a test, an examination, or other course material without the permission of the instructor;
- collaborating with another or others in work to be presented without the permission of the instructor;
- falsifying records, laboratory work, or other course data;
- submitting work previously presented in another course, if contrary to the rules of the course;
- altering or interfering with grading procedures;
- assisting another student in any of the above;
- using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work);
- copying and pasting work from an online or offline source (including AI) directly and calling it your own -- this includes the use of ChatGPT and other resources

to generate written information for this class as an example of academic dishonesty
- using information you find from an online or offline source without giving the author credit;
- replacing words or phrases from another source and inserting your own words or phrases.

The California State University system requires instructors to report all instances of academic misconduct to the Center for Student Rights and Responsibilities. Academic dishonesty will result in disciplinary review by the University and may lead to probation, suspension, or expulsion. Instructors may also, at their discretion, penalize student grades on any assignment or assessment discovered to have been produced in an academically dishonest manner.

Student concerns, problems, and complaints: If there are ever issues with the conduct of this course, including lectures, assignments, quizzes, etc., please see me immediately so we can work together to address your concerns. If we cannot resolve it, you must follow the appropriate **procedures for registering a complaint** (https://sacd.sdsu.edu/student-ombudsman/procedures). Speak first to me, and if no resolution has been reached, contact the Dept. Chair. If you are still not satisfied, contact the Assistant Dean for Student Affairs (see College of Sciences contacts here: **https://sciences.sdsu.edu/deans-office-personnel/** (https://sciences.sdsu.edu/deans-office-personnel/)). If still no resolution is met, you may contact the University Ombudsman. Students must exhaust informal levels of redress before filing a formal grievance with the **Student Grievance Committee** (https://sacd.sdsu.edu/student-ombudsman/student-grievance-committee).

ASSIGNMENT DETAILS

NIH-style paper review: You will individually review a bioarchives paper that has not yet been peer reviewed using NIH criteria. Then you will debate in small groups on what revisions are needed before the paper can be published. More details are on canvas. This is an individual assignment with a group component. SLO #1, 2, 3, 7, 8.

Reflections: Twice during this class you will be asked to reflect on ways in which what you've been learning applies to your own lives, interests, hobbies, etc. It has been shown that assignments that give you the freedom to put material within your own greater purpose and relevance boost motivation and interest. This is an individual assignment. More details are on canvas. SLO #10.

Presentation: "Biotech startup due diligence—preparing for a job in industry": You will research a local biotech start-up company of interest to you, reporting on their science, history, financials, and more. This is an individual assignment. More details are on canvas. SLO #1, 2, 4, 5, 7, 8, 9, 10.

Online embedded lecture quizzes: You'll view lectures prior to class and take the embedded quiz as many times as you like (only the highest score is retained) within the allotted time window. This is an individual assignment. More details are on canvas. SLO #1, 3, 5, 10, 12.

Groupwork: You will have the opportunity to apply the ideas and content presented in class in small teams. Please make sure you come prepared for groupwork – this may include required watching online lectures, reading assignments, etc. These are group assignments. More details are on canvas. SLO #1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

Take home assignment: "Assessing FDA-approved drugs": You will select one active-site-binding small molecule drug recently approved by the FDA to practice the evaluative studies that scientists perform during drug discovery and development. This is an individual assignment. More details are on canvas. SLO #1, 2, 3, 4, 5, 6, 7, 8.

NIH Specific Aims writing assignment: You will prepare an NIH-style Specific Aims page on the research you are working on in your previous research lab or current research lab. You will develop a novel question with testable hypotheses, including brief information on how you will test them. This is an individual assignment. More details are on canvas. SLO #1, 2, 4, 6, 7, 8, 10.

TENTATIVE GRADING AND POINTS INFORMATION

Take home assignment: 200 points total

Study-section-style paper review: 150 points total

Presentation: 150 points total (125 points from professor evaluation of individual, 25 points from audience evaluation (average)).

Groupwork: 140 points total (20 points for each of the 7 assignments).

Online embedded lecture quizzes: 72 (4 points for each of the 18 lectures).

Reflections: 50 points total (25 points for each of the 2 reflections)

Specific Aims: 250 points total (50 points for Part 1 with option to revise/resubmit for up to 75% of points back, 200 points for Part 2 final version)

Total points: 1,012

A = ≥ 92.5%

A- = 89.5-92.4%

B+ = 87.5-89.4%

B = 82.5-87.4%

B- = 79.5-82.4%

C+ = 77.5-79.4%

C = 72.5-77.4%

C- = 69.5-72.4%

D+ = 67.5-69.4%

D = 62.5-67.4%

D- = 59.5-62.4%

F < 59.4%

CLASS SCHEDULE

The following tentative schedule provides the topics, readings, and important dates. Changes to dates or content and other important information will be communicated via Canvas announcements, so **please check canvas regularly.**

Date	**Topic**	**Required reading, complete before class**	**Assignments due dates, instructions**
Module 1: Mechanisms of cancer, and strategies to combat it			
8/21	**Discussion #1**: Introduction, a brief cancer history	No pre-class preparation; module will unlock after class on 8/23	
8/23	**Discussion #2**: Hallmarks of cancer	No pre-class preparation; module will unlock after class on 8/23	
Deadline of 8/28 by 3pm to watch **Online Lecture #1:** Cancer development			
8/28	**Discussion #3**: Writing hypotheses, NIH Specific Aims, Specific Aims review criteria		
Deadline of 8/30 by 3pm to watch **Online Lecture #2** *In vitro* tools to study cancer -- biochemistry and biophysics			
8/30	**Groupwork 1**: study a tumor driver using biochemical/biophysical methods		**Reflection #1 due 8/31 by 5 pm** Bring your laptop
Deadline of 9/4 by 3pm to watch **Online Lecture #3**: *In vitro* tools to study cancer – cellular methods			
9/4	***No class – Labor Day***		
9/6	**Groupwork 2**: study a tumor driver using cellular methods		Bring your laptop Receive assigned paper for NIH-style review assignment
Deadline of 9/11 by 3pm to watch **Online Lecture #4** -- Methods of fighting cancer			
9/11	**Specific Aims writing and help session**		Bring your laptop
Deadline of 9/13 by 3pm to watch **Online Lecture #5** -- Kinases -- structure, function, druggability; x-ray crystallography			

Deadline of 9/13 by 3pm to read Adams_JBC_2023			
9/13	**Small group discussion:**Adams_JBC_2023: frame as testable aims/hypotheses, discuss results and next steps	Adams_JBC_2023	Bring access to paper
Deadline of 9/18 by 3pm to watch **Online Lecture #6** -- Using TCGA/cbioportal and pymol **Deadline of 9/18 by 3pm** to read Middleton_Nature_2020			
9/18	**Small group discussion:** Middleton_Nature_2020: frame as testable aims/hypotheses, discuss results and next steps	Middleton_Nature_2020	Bring access to paper
Deadline of 9/20 by 3pm to watch **Online Lecture #7** -- Kinase inhibition and resistance **Deadline of 9/20 by 3pm** to read Ditsiou_SciAdv_2020			
9/20	**Small group discussion:**Ditsiou_ScienceAdv_2020: frame as testable aims/hypotheses, discuss results and next steps	Ditsiou_ScienceAdv_2020	Bring access to paper
Deadline of 9/24 by 5pm to submit your NIH-style review of your assigned manuscript			
9/25	**Small group discussion: NIH-style review**	Assigned bioarchives paper	Bring your laptop **Specific Aims Part 1 due 9/26 by 5 pm**
9/27	**Present** your NIH-style review		
Module 2: Drug design, development, and clinical trials through the lens of HIV			
Deadline of 10/2 by 3pm to watch **Online Lecture #8** – Primer on enzyme kinetics			
10/2	**Groupwork 3**: Short lecture, HIV infection and design-a-drug challenge		Bring your laptop with pymol loaded
10/4	**Specific Aims writing and help session/Pymol practice**		Bring your laptop
Deadline of 10/9 by 3pm to watch **Online Lecture #9** -- PK/PD, ADME basics			
10/9	**Groupwork 4**: Short lecture, Designing inhibitor binding experiments		Bring your laptop
Deadline of 10/11 by 3pm to watch **Online Lecture #10** – Pre-steady-state kinetics			
10/11	**Discussion #4**: Practicing with Transient-state kinetics		
Deadline of 10/16 by 3pm to watch **Online Lecture #11** -- SAR, features of a successful drug			
10/16	**Groupwork 5**: Using transient-state		Bring access to paper

	kinetics to study polymerases		**Optional Revised Specific Aims Part 1 due 10/17 by 5 pm**
Deadline of 10/18 by 3pm to watch **Online Lecture #12** – Drug regulation and approval **Deadline of 10/18 by 3pm** to read Kellinger_PNAS_2010			
10/18	**Small group discussion:**Kellinger_PNAS_2010: frame as testable aims/hypotheses, discuss results and next steps	Kellinger_PNAS_2010	Bring your laptop
Deadline of 10/23 by 3pm to watch **Online Lecture #13** -- Ethical minefield of drug pricing			
10/23	**Groupwork 6**: Short lecture: 1980s-you designs your 1980s AIDS drug trial		**Take-home assignment on an FDA-approved drug due 10/24 by 5 pm** Bring your laptop
10/25	**Groupwork 6 Debate**: share your trial design		Bring your laptop
Deadline of 10/30 by 3pm to watch **Online Lecture #14** -- Researching a drug company"			
10/30	**Specific Aims writing and help session**		Bring your laptop **Select startup company for your presentation here (https://docs.google.com/spreadsheets/d/1_gWHhMOlB0NITanS6FMaCOL1A0LyQKbom-IkjDICjeQ/edit?usp=sharing) , deadline of 10/30 by 11:59pm**
Module 3: Business and ethics of science			
Deadline of 11/1 by 3pm to watch **Online Lecture #15**: The story of Vioxx **Deadline of 11/1 by 3pm** to read Ross_JAMA_2008			
11/1	**Small group/full group ethics discussion:** Ross_JAMA_2008	Ross_JAMA_2008	Bring access to paper
Deadline of 11/6 by 3pm to watch **Online Lecture #16**: The story of BiDil **Deadline of 11/6 by 3pm** to read Reverby_JLawMedEthics_2008			
11/6	**Small group/full group ethics discussion:** Reverby_JLawMedEthics_2008	Reverby_JLawMedEthics_2008	Bring access to paper
11/8	**Specific Aims writing/help session**		Bring your laptop
Deadline of 11/13 by 3pm to watch **Online Lecture #17** – Patents and BRCA **Deadline of 11/13 by 3pm** to read materials for patent law case			
11/13	**Groupwork 7:** Patent law case study: BRCA	Required reading for Patent trial	Bring your laptop
11/15	***NO CLASS TODAY***		
11/20	**Groupwork 7 Debate**: Present your		Bring your laptop

	case, lecture		**Specific Aims Part 2 due 11/21 by 5 pm**
11/22	***No Class, Happy Thanksgiving!***		
Deadline of 11/27 by 3pm to watch **Online Lecture #18** – Cancer disparities **Deadline of 11/27 by 3pm** to read Bradley_JNCI_2002 **Deadline of 11/27 by 12PM to email your slides to Dr. Sohl. Presentation order will be assigned randomly**			
11/27	**Small group/full group disparities discussion:** Bradley_JNCI_2002	Bradley_JNCI_2002	Bring access to paper **Reflection #2 due 11/28 by 5 pm**
11/29	In-class presentations		
12/4	In-class presentations		
12/6	In-class presentations		
12/11	In-class presentations		
Final exam date TBD	Finish In-class presentations if needed		

Course Summary:

Date	Details	Due
Mon Aug 28, 2023	**Online Lecture #1 with Embedded Quiz** (https://sdsu.instructure.com/courses/134567/assignments/966329)	due by 3pm
Wed Aug 30, 2023	**Online Lecture #2 with Embedded Quiz** (https://sdsu.instructure.com/courses/134567/assignments/966331)	due by 3pm
	Groupwork 1: Study a new tumor driver using biochemistry and biophysics (https://sdsu.instructure.com/courses/134567/assignments/964886)	due by 7pm
Thu Aug 31, 2023	**Reflection 1** (https://sdsu.instructure.com/courses/134567/assignments/964900)	due by 5pm
Mon Sep 4, 2023	**Online Lecture #3 with Embedded Quiz** (https://sdsu.instructure.com/courses/134567/assignments/966341)	due by 3pm
Wed Sep 6, 2023	**Groupwork 2: Study a new tumor driver using cellular tools** (https://sdsu.instructure.com/courses/134567/assignments/964888)	due by 7pm
Mon Sep 11, 2023	**Online Lecture #4 with Embedded Quiz** (https://sdsu.instructure.com/courses/134567/assignments/966976)	due by 3pm
Wed Sep 13, 2023	**Adams_JBC_2023** (https://sdsu.instructure.com/courses/134567/assignments/964873)	due by 3pm
	Online Lecture #5 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/966979)	due by 3pm
	Middleton_Nature_2020 (https://sdsu.instructure.com/courses/134567/assignments/964874)	due by 3pm

Mon Sep 18, 2023	Online Lecture #6 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/966989)	due by 3pm
Wed Sep 20, 2023	Ditsiou_SciAdv_2020 (https://sdsu.instructure.com/courses/134567/assignments/964875)	due by 3pm
	Online Lecture #7 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/966990)	due by 3pm
Sun Sep 24, 2023	Take-home and In-class Assignment: NIH-style review of a manuscript (https://sdsu.instructure.com/courses/134567/assignments/964899)	due by 5pm
Tue Sep 26, 2023	Take-home Assignment: NIH F31 Specific Aims, Part 1 (https://sdsu.instructure.com/courses/134567/assignments/964895)	due by 5pm
Mon Oct 2, 2023	Online Lecture #8 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/966992)	due by 3pm
	Groupwork 3: HIV design-a-drug challenge (https://sdsu.instructure.com/courses/134567/assignments/964889)	due by 7pm
Mon Oct 9, 2023	Online Lecture #9 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/966993)	due by 3pm
	Groupwork 4: Designing inhibitor binding experiments (https://sdsu.instructure.com/courses/134567/assignments/964890)	due by 7pm
Wed Oct 11, 2023	Online Lecture #10 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/966995)	due by 3pm
Mon Oct 16, 2023	Online Lecture #11 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/966998)	due by 3pm
	Groupwork 5: Using transient-state kinetics to study polymerases (https://sdsu.instructure.com/courses/134567/assignments/964891)	due by 7pm
Wed Oct 18, 2023	Kellinger_PNAS_2010 (https://sdsu.instructure.com/courses/134567/assignments/964876)	due by 3pm
	Online Lecture #12 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/969011)	due by 3pm
Mon Oct 23, 2023	Online Lecture #13 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/969025)	due by 3pm
	Groupwork 6: 1980s-you designs your 1980s AIDS drug trial (https://sdsu.instructure.com/courses/134567/assignments/964892)	due by 7pm
Tue Oct 24, 2023	Take-home Assignment: Assessing FDA-approved drugs (https://sdsu.instructure.com/courses/134567/assignments/964897)	due by 5pm
Mon Oct 30, 2023	Online Lecture #14 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/972764)	due by 3pm
	Startup selection link (https://sdsu.instructure.com/courses/134567/assignments/964898)	due by 11:59pm
	Online Lecture #15 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/974862)	due by 3pm

Wed Nov 1, 2023	Ross_JAMA_2008 (https://sdsu.instructure.com/courses/134567/assignments/964877)	due by 3pm
Mon Nov 6, 2023	Online Lecture #16 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/974863)	due by 3pm
	Reverby_JLawMedEthics_2008 (https://sdsu.instructure.com/courses/134567/assignments/964878)	due by 3pm
Mon Nov 13, 2023	Class Trial assigned readings (https://sdsu.instructure.com/courses/134567/assignments/964884)	due by 3pm
	Online Lecture #17 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/974864)	due by 3pm
Mon Nov 20, 2023	Groupwork 7: Patent law case study: BRCA (https://sdsu.instructure.com/courses/134567/assignments/964893)	due by 7pm
Tue Nov 21, 2023	Take-home Assignment: NIH F31 Specific Aims, Part 2 (https://sdsu.instructure.com/courses/134567/assignments/964896)	due by 5pm
Mon Nov 27, 2023	Presentation: Biotech startup due diligence - preparing for a job/investing in industry (https://sdsu.instructure.com/courses/134567/assignments/964894)	due by 12pm
	Bradley_JNCI_2002 (https://sdsu.instructure.com/courses/134567/assignments/964879)	due by 3pm
	Online Lecture #18 with Embedded Quiz (https://sdsu.instructure.com/courses/134567/assignments/975967)	due by 3pm
Tue Nov 28, 2023	Reflection 2 (https://sdsu.instructure.com/courses/134567/assignments/964901)	due by 11:59pm