

COURSE SYLLABUS (Fall 2026)

Course Title	BIOL 4005/5005 Contemporary Topics in Biology (Molecular Biology of Cancer)
Meeting Times	Tues, Thurs 8:00-9:20 AM
Location	Business Leadership Building 250 (BLB 250)
Instructor	Dr. Ikjot Singh Sohal Assistant Professor of Cancer Biology
Contact Information	ikjot.sohal@unt.edu
Office Hours	Mon 11AM-1 PM (or by appointment)
Office Location	Science Research Building (SRB), Room 238

Recommended Textbook (not required):

*The Biology of Cancer by Robert A. Weinberg; 3rd edition, 2023**

*Prior editions of the textbook are also acceptable.

Course prerequisites, Corequisites, and/or Other restrictions:

BIOC/BIOL 4570 (Biochemistry & Molecular Biology of the Gene)

Minimum Technology Requirements:

An **iClicker app-compatible device** will be required for attendance and answering questions. If you haven't, please sign up for an iClicker student account via the link provided [here](#). If you don't have a compatible device or have technical challenges, please contact Dr. Sohal at the beginning of the semester.

Course description

Cancer is the second leading cause of human mortality worldwide after cardiovascular diseases. While survival rates are improving for many cancers due to advancements in cancer therapies, the incidence rates are also rising among the younger population, partly due to frequent screening but also due to lifestyle choices and environment exposures.

This course explores how cancer arises from gene dysregulation, impacting hallmarks such as uncontrolled proliferation, resisting cell death, evading/suppressing immune system, reprogramming cellular metabolism, inducing/accessing vasculature, and activating metastasis. Students will gain foundational molecular biology knowledge applied to cancer. The course also examines established and emerging therapies, plus diagnostic strategies for cancer detection.

Student learning goals

By the end of this course, students will be able to:

- Develop a fundamental understanding of gene regulation and how cells control identity and function.
- Demonstrate an understanding of DNA replication and recombination.
- Explain the mechanisms underlying transcription regulation in prokaryotes and eukaryotes.
- Demonstrate an understanding of RNA synthesis, processing and functions.
- Understand how defects in gene regulation contribute to diseases such as cancer.
- Understand gene editing and how modern therapeutics use it to manipulate gene regulation.

Attendance

In-person attendance is expected for all class meetings. Attendance will be taken based on log-in information into iClicker. Please sign up for an **iClicker account** (see Minimum Technology Requirements on page 1). Class will start promptly at 8:00 am and end at 9:20 am. Credit points for good attendance may be given at the end of the semester. Absences due to illness will be excused if a health provider's note or similar documentation is provided.

Please remember to mark yourself present on the iClicker app as you come into the classroom.

Class recordings

Lectures will not be recorded. If you would like to record audio of the lecture to later help you study the material, please contact me to obtain permission. No video recordings are permitted.

Student participation (10% of your overall grade)

You are encouraged to participate and promote classroom discussion through

- Answering questions using iClicker
- Asking questions and/or follow-up questions
- Sharing anecdotal experiences relevant to the scientific concept(s) being discussed in the classroom (for e.g. experiences related to cancer, cancer treatment, etc.)
- Attending graduate student presentations (see below)

Your participation in the class will mainly be assessed through iClicker participation. Other forms of participation may be considered toward participation when iClicker participation is lacking or when the final grade is borderline to the next higher grade.

Exams (60% of your overall grade)

There will be 3 mid-term exams. All exams will count towards your final grade.

- **There will be no make-up exams**, except in cases of emergencies, which will be considered on a case-by-case basis.
- Any student found cheating on any exam will receive a grade of zero (0) for that exam and may face other disciplinary action(s).
- **The exam dates are fixed and will not change.** The content included on each exam may be different than what is listed in the tentative course schedule. If there are changes to the topics covered on an exam, it will be announced in class and on Canvas. Students will not be tested on concepts that have not been covered in the class.
- **All exams, including the final exam, are non-comprehensive**, i.e., only topics covered since the previous exam will be covered in the next exam.

Student assignment (30% of your overall grade)

During the course, you will work towards an assignment based on your interests. This could be a review paper, a NIH-style grant, creating content (infographics, videos, animations, etc.), teaching a topic, presenting scientific findings, clinical case study, or entrepreneurship assignment. Every assignment has to be related to cancer, and a student will indicate potential assignments of interest.

The assignment type and topic must be finalized by Sept 17th.

On Sept 22nd, each student will provide a brief overview of their assignment and their overall approach to conduct that assignment. Each student's assignment product will be reviewed by Dr. Sohal and everyone else in the class.

Grading

Your final course grade will include your **3 exam scores (60%)**, **in-class participation (10%)**, and **assignment scores (30%)**. Grading will follow a standard scale:

100 – 90%	A
89 – 80%	B
79 – 70%	C
69 – 60%	D
59% & below	F

Students with disabilities

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time; however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information, please see the ODA website at disability.unt.edu. If you believe you have a disability requiring accommodation, please contact Dr. Antunes and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.

Academic integrity

According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. The Department of Biological Sciences adheres to and enforces UNT's policy on academic integrity. Absolutely no form of copying, plagiarism, or any other type of academic dishonesty will be tolerated. Students who turn in plagiarized work or who are caught cheating will receive a grade of zero for that assignment or exam and may even be withdrawn from the course.

Emergency notification and procedures

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

Acceptable student behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, etc. The Code of Student Conduct can be found at deanofstudents.unt.edu/conduct.

Access to information – Eagle Connect

Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail: aits.unt.edu/eagleconnect/

Course Evaluation

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course. The dates when the evaluation will be open for you to complete will be announced during the semester.

Student Expectations

As a first-generation college graduate, I know firsthand that creating a successful career requires hard work, passion, perseverance, the ability to adapt, and implement learning as a lifelong process. This is especially true in the world of AI, when your authenticity and your unique abilities will likely become the main distinguishing factors. Below, I have summarized some of the ways you can gain most out of this course (or any course) and hopefully, create a learning process that makes you competitive for your choice of career.

- **Attend the lectures!** Use the learning opportunities that lecture provides. You don't only learn about course content in lecture, you also learn to get disciplined about a schedule, how to take notes, how to sort through the material covered, and how to apply what you read about to novel situations.
- **Participate in class!** By communicating your ideas, you organize your thoughts. I want to hear what you have to say! Ask questions, during or after class.
- **Take good notes!** Be selective about what you write down. You don't have to copy slides word for word – I post the lecture slides on Canvas before class. Not all of the points made in class will be written out on the lecture slides, so it is important for you to come to class and take notes on what I say. Listen, and write only the main points. Get notes from a classmate if you miss class.
- **Be curious!** The textbook contains much more detailed information about the topics than we can reasonably cover in class. Remember, the courses you take at UNT prepare you for your future career, so don't just think about studying for the exams. Embrace the knowledge!
- **Study!** The rule of thumb is that you spend 2 hours of study time for each hour spent in class, but you may need more or less time – only you can determine that. Some topics will require more time, others less. You should get into the habit of studying weekly, not just right before exams. We cover a lot of material and it will get overwhelming quickly if you do not keep up. Studying for exams will be a lot easier if you have reviewed on a weekly basis. Your grade will show it!
- **Draw and write as you study!** Test yourself. Writing and drawing things out is a great way to make sure you really understand the concepts. Often times, simply reading the material is not sufficient to assimilate the information.
- **Study in groups!** Discussing material with others always helps reinforce concepts. It forces you to organize thoughts and think about important points. Talking with peers about the material also helps you clarify misconceptions. Also, teaching others is a great way to improve your own understanding of the material!
- **Get help if you need it!** Ask questions. I want to know if I need to clarify concepts. Stop me in lecture or come to my office hours and ask if things don't make sense. Seek help early on, before the amount of material gets out of hand. Also, utilize the resources available to students at the [UNT Learning Center](#).

In full transparency, some of these points are from my own experiences and some are adapted from others'.

COURSE LECTURE SCHEDULE – FALL 2026

DATE	DAY	CHAPTER(S)	SPECIFIC TOPIC(S)
AUG 18	TUES	–	Introduction & Syllabus
AUG 20	THURS	–	Public databases for cancer research <i>The Cancer Genome Atlas; Human Cell Atlas, Cancer Cell Line Encyclopedia</i>
AUG 25	TUES	1	The Biology and Genetics of Cells and Organisms
AUG 27	THURS	2	The Nature of Cancer
SEP 01	TUES	3	Cancer as an Infectious Disease
SEP 03	THURS	4	Cellular Oncogenes
SEP 08	TUES	5	Growth Factors, Receptors, and Cancer
SEP 10	THURS	5	Growth Factors, Receptors, and Cancer
SEP 15	TUES	6	Cytoplasmic Signaling Circuitry Programs Many of the Traits of Cancer
SEP 17	THURS		EXAM 1 (Chapters 1-6 + additional material)
SEP 22	TUES	–	ASSIGNMENT BRIEFING
SEP 24	THURS	7	Tumor Suppressor Genes
SEP 29	TUES	8	pRb and Control of the Cell Cycle Clock
OCT 01	THURS	9	p53: Master Guardian and Executioner
OCT 06	TUES	10	Eternal Life: Cell Immortalization and Tumorigenesis
OCT 08	THURS	11	Multi-Step Tumorigenesis
OCT 13	TUES	11	Multi-Step Tumorigenesis
OCT 15	THURS	12	Shaping and Characterizing the Cancer Genome
OCT 20	TUES		EXAM 2 (Chapters 7-12 + additional material)
OCT 22	THURS	13	Dialogue Replaces Monologue: Heterotypic Interactions and the Biology of Angiogenesis
OCT 27	TUES	–	Extracellular vesicles as emerging mediators of cell-to-cell communication
OCT 29	THURS	14	Moving Out: Invasion and Metastasis
NOV 03	TUES	14	Moving Out: Invasion and Metastasis
NOV 05	THURS	15	Crowd Control: Tumor Immunology
NOV 10	TUES	–	Current and Emerging Cancer Therapeutics
NOV 12	THURS	16	Cancer Immunotherapy
NOV 17	TUES	17	The Rational Treatment of Cancer
NOV 19	THURS		EXAM 3 (Chapters 13-17 + additional material)
NOV 24	TUES	–	THANKSGIVING BREAK – NO CLASS
NOV 26	THURS	–	THANKSGIVING BREAK – NO CLASS
DEC 01	TUES		STUDENT ASSIGNMENTS
DEC 03	THURS		STUDENT ASSIGNMENTS (continued)
DEC 08	TUES		STUDENT ASSIGNMENTS (continued)

*The schedule is tentative and subject to change. Topics per day may vary, but exam dates are set and will not change.