Course Syllabus

Course Information

Course Number/Section	BIOL5420
Course Title	Molecular Biology
Term	2023 Fall
Course Meeting Time	TR 10 – 11:45 PM
Course Meeting Location	SCI 2.230

Professor Contact Information

Professor	Tae Hoon Kim
Office Phone	972-883-6496
Email Address	genome@utdallas.edu
Office Location	BSB 12.629
Online Office Hours	W 11 – 11:30AM
Other Information	virtual office meeting via MS Teams preferred

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Course Pre-requisites, Co-requisites, and/or Other Restrictions

Undergraduate knowledge on genetics and molecular biology expected.

Course Description

Genetic analysis of gene structure (mutations and their analysis, complementation, and recombination), gene expression (transcription, translation), and the regulation of gene expression in selected model systems.

Student Learning Objectives/Outcomes

1. Be able to understand the major concepts of molecular biology and genetics of prokaryotic and eukaryotic organisms.
2. Be able to critically read, explain, and discuss scientific papers in the molecular biology field.
3. Be able to analyze research problems and design experiments to address them.

Required Textbooks and Materials

There are no required textbooks. Weekly reading assignments on eLearning

Genetic Switch by Mark Ptashne is a strongly suggested book for the course but not required.

Assignments & Academic Calendar

WEEK/ DATES	TOPIC/LECTURE	READING/ONLINE MATERIALS	ASSESSMENT / ACTIVITY	DUE DATE
Week 1 8/22 8/24	Introduction: review of terms & techniques	Video: The Scientist documentary narrated by George C. Scott	Survey 1	8/24 10:00AM
Week 2 8/29 8/31	Genetic Analysis I: Mutations & screens	2.1 DeLucia Cairns Nature 1969 2.2 Anzalone Nature 2019	Reading Quiz 1 Reading Quiz 2	8/29 10:00AM 8/31 10:00AM
Week 3 9/5 9/7	Experimental System I: *lac* repressor	3.1 PaJaMo JMB 1959 3.2 Gilbert PNAS 1966	Reading Quiz 3 Reading Quiz 4	9/5 10:00AM 9/7 10:00AM
Week 4 9/12 9/14	Experimental System II: Phage λ	Video: CSHL Presentation by Tom Maniatis 4.1 Ptashne PNAS 1967 4.2 Cui PNAS2013	Reading Quiz 5 Reading Quiz 6	9/12 10:00AM 9/14 10:00AM
Week 5 9/19 9/21	Genetic Analysis II Molecular & atomic genetics	Video: Yeast Two Hybrid System 5.1 Brent Ptashne Cell 1985 5.2 Hecht PNAS 1983	Reading Quiz 7 Reading Quiz 8	9/19 10:00AM 9/21 10:00AM
Week 6 9/26 9/28	Genetic Analysis III Recombination & transposition -	Video: Eric Wieschaus Lecture 6.1 6.1 Nusslein-Volhard Nature 1980 6.1a Hartl Genetics 2001 6.1b Price Nature 2018 (optional) No class – exam day	**Exam 1**	**10/01 11:59PM**
Week 7 10/3 10/5	Experimental System III: Transcription	7.1 Young Science 1983 7.2 Berger Cell 1992	Reading Quiz 9 Reading Quiz 10	10/3 10:00AM 10/5 10:00AM
Week 8 10/10 10/12	Genetic Analysis IV: Suppression, synthetic lethality & epistasis	8.1 Thompson Cell 1993 8.2 Cooper Science 2006	Reading Quiz 11 Reading Quiz 12	10/10 10:00AM 10/12 10:00AM

WEEK/ DATES	TOPIC/LECTURE	READING/ONLINE MATERIALS	ASSESSMENT / ACTIVITY	DUE DATE
Week 9 10/17 10/19	Experimental System IV: Translation & Signaling	9.1 Pillai Science 2005 9.2 Velazquez Cell 1992	Reading Quiz 13 Reading Quiz 14	10/17 10:00AM 10/19 10:00AM
Week 10 10/24 10/26	Genetic Analysis V: Mosaic analysis & Single Cell Biology	10.1 Xu Nature 2010 10.2 Weissman Cell 2022	Reading Quiz 15 Reading Quiz 16	10/24 10:00AM 10/26 10:00AM
Week 11 10/31 11/2	Experimental System VI: Genome editing -	Video: Jay Shendure Seminar 11.1 Finlay Nature 2018 No class - exam day	**Exam 2**	**11/5 11:59PM**
Week 12 11/7 11/9	Group Projects Group Project Meetings Group Presentations	Group Project Meetings Student Project Proposals	Specific aims draft	11/7 10:00AM
Week 13 11/14 11/16	Group Projects Group Presentations Group Presentations	Student Project Proposals Student Project Proposals		
Week 14 11/21 11/23	Fall Break - -	No class No class		
Week 15 11/28 11/30	Group Projects Group Presentations Group Presentations	Student Project Proposals Student Project Proposals		
Week 16 12/5 12/7	Group Projects Group Presentations Group Presentations	Student Project Proposals Student Project Proposals	**Written Research Proposal** Survey 2	**12/8 11:59PM** 12/8 11:59PM

Grading Policy

Reading Quizzes are based on the assigned reading. There are 16 total reading quizzes for the course and each question on the quiz is worth 1 point and each quiz will have 3-5 questions. Reading quizzes constitute the largest portion of the final score that is used to determine the letter grade.

There are two exams for the course. The exam will be open book. It is expected that student work completely alone on these exams without consultation with any other individual. Each exam is worth 20 points.

There is one writing assignment which is a research proposal. The research proposal is to be developed as a group assignment. Each student will be assigned to a group before exam 1. The writing assignment is worth 20 points.

There is one oral presentation assignment. This is also group activity. Each group that has developed a research proposal will present this proposal to the class. The oral presentation is worth 20 points.

Course participation will be evaluated by attendance, and active engagement with the course materials and classroom participation (including and not limited to completion of class surveys, evaluation of written proposals and oral presentations, etc). Course participation is worth 10 points.

The final grade will be determined by totaling the equally weighted points from reading quizzes, exams, writing assignment and oral presentation and course participation.

The final letter grade will be assigned based on the following schedule:
100-90% of maximum possible score is equivalent to A
89-75% of maximum possible score is equivalent to B
74-50% of maximum possible score is equivalent to C
<49% of maximum possible score is equivalent to F

Course & Instructor Policies

Make-up exams
There will be no make-up exams.

Extra Credit
There will be no extra credit work.

Late Work
If the assignment, exam or project is turned in late by 1 day late (within 24 hours of due date/time), late work will result in 50% reduction in possible grade. If the assignment, exam or project is late by 2 or more days, the late work will obtain no credit.

Special Assignments
There are no special assignments.

Class Participation
Students are strongly encouraged to attend and actively participate in the classes. Students are expected to work in teams.

Classroom Citizenship
Students are expected to treat each other and the instructor with respect. While team work and group study are encouraged, students are expected to work independently on quizzes and exams.

Class Materials

Required primary literature and reading material for each week will be made available on eLearning.

These materials may be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Attendance

Regular and punctual class attendance is required. Students who fail to attend class regularly are inviting scholastic difficulty.

Class Participation

Regular class participation is expected. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

Academic Support Resources

The information contained in the following link lists the University's academic support resources for all students.

Please see http://go.utdallas.edu/academic-support-resources.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please review the catalog sections regarding the credit/no credit or pass/fail grading option and withdrawal from class.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.