BCH 5413 – Spring 2021

Mammalian Molecular Biology and Genomics

Drs. Melike Caglayan, Nancy Denslow, Lauren Douma, Michelle Gumz, Jana Jenquin, Jianrong Lu, Mingyi Xie, and Deborah Smith (Course Coordinator)

This course is designed for graduate or advanced undergraduate students desiring a higher-level survey course in molecular biology that is beyond an introductory course. Lectures and discussions will emphasize modern molecular, biochemical, and genetic approaches to solving problems of current interest in molecular biology. Students should have a working knowledge of introductory molecular biology such as that covered in Lehninger's Principles of Biochemistry; or Mathews & Van Holde, Biochemistry, etc. *We do not recommend this course for students who have not had an introductory course in molecular biology* (e.g., BCH 4024 or its equivalent). **BCH 5413 is a prerequisite for BCH 6415, Advanced Cellular & Molecular Biology.**

CREDIT: Three (3) hrs

TEXTBOOK: *Molecular Biology*, by R.F. Weaver, 5th Edition, 2012. The textbook is optional but supplies important information that can facilitate learning the key concepts for the course. Reading assignments refer to this edition of the textbook. All lecture slides and supplemental instructional material will be posted on the UF Canvas website under BCH 5413 at the Academic Technology web site (http://lss.at.ufl.edu/).

LECTURES: All lecture recordings, slides, and supplemental instructional material will be posted on the UF Canvas website under BCH 5413 at the Academic Technology web site (http://lss.at.ufl.edu/). *Please note*: The lecture recordings were created in the fall semester when the on campus version of the course was conducted via zoom. Keep in mind that things like office hours and review sessions as described in the recording are not available this semester. There are, however, other review materials provided under each lecture in canvas.

WEB PAGE: All lecture notes, lecture videos, announcement, and supplemental instructional material will be posted on the UF Canvas website under "BCH5413: at the academic technology website (http://lss.at.ufl.edu/). The course is organized into three units under the ***modules*** tab in canvas. Each unit is further divided into individual lectures. Each lecture will consist of a .pdf file of the PowerPoint slides used in the lecture and a video recording of the lecture. Additional review questions are also provided. All lecture material is available the entire semester, but the discussions, quizzes and exams have specific due dates.

Please note that all course content and lecture materials are legally the intellectual property of the individual course faculty members and the University of Florida. The materials for the course are only available at the UF "Canvas E-learning site".

ONLINE Q&A HELP: Throughout the semester, students may submit written questions on the lecture material under the ***discussion*** link on the course website in Canvas. For each unit, there will be two discussion threads. The first discussion thread is "Unit # - TA". Newly submitted questions will be answered online in writing by our teaching assistant (TA) Chris Fields (chr21711@ufl.edu), in a timely manner. Only questions pertaining to lecture content associated with the next exam will be answered. The questions and answers will be available to the entire class by clicking on the ***discussion*** link for each unit. The TA will answer as many questions as possible in a one-hour session each day. The day prior to each exam, the TA will answer submitted questions for up to two hours. Additionally, exam study questions are available at the end of each unit module. The TA will answer questions that pertain to the study guide in the unit discussion. The second thread is a graded discussion and is described in the grading section below.

How to use the Discussion for Q&A: Under the Discussion link and the relevant Unit #, click on "reply", then type your question in the indicated box; be sure to click on "Post Reply" to submit the question. The TA will then answer all question from that session by replying. For a new question, again click on "reply" immediately under the unit # discussion heading.

GRADED DISCUSSIONS: You are required to participate in 5 of 6 discussion sessions. There will be one discussion open prior to each of the 6 quizzes. One discussion grade will be dropped, so you only need to participate in 5. You can participate in one of two ways: (1) you can ask a question regarding lecture material here that is not already asked in the review questions or online help section above or (2) you can answer one of the review questions that has not already been answered. You will receive feedback on the completeness of your answers in this section.

Discussions are worth 10pts each for a total of 50pts.

QUIZZES: There will be **six (6) quizzes** in this course. Quizzes will be administered roughly every two weeks and according to the schedule below. Each quiz will cover only the material within the associated section of lectures. Quizzes are not cumulative.

Quizzes are **one hour long** and must be completed within a continuous 1-hour window once the quiz is started. Quizzes are completely multiple choice and are aimed at keeping you on task with the course and improving your overall grade. You **are allowed** to use your book and notes during the quizzes. You **do not** have to schedule quizzes with honorlock. If you have listened to the lecture, taken notes and are organized at the time of the quiz, you should do well. Quizzes will be available for the entire week leading up to the due date and you are free to take the quiz anytime within that time frame.

Quizzes are worth a total of 100pts, 20pts each with the lowest score dropped.

EXAMS: There will be three (3) exams in this course. The exams will be held according to the schedule below (Oct 8, Nov 12, and Dec 17). Exams will cover material within the associated lectures. The exam will consist of a combination of multiple choice and short answer questions. The third exam is not cumulative. Each exam is worth 100pts.

Exams will be administered using an online proctoring service, HonorLock. Note that this service requires a computer that is connected to the interned and has a web-cam; ***the web-cam is required***. You will find instructions and a practice HonorLock Quiz (no point value) at the end of the modules in canvas. Make sure to read the instructions and take the practice quiz well before exam 1. ***The exam will not be reopened for technical difficulties!*** Exams will be available from 8:00AM Eastern Standard Time until 4:00AM EST the following morning. It is anticipated that this schedule will provide sufficient latitude to meet the demands of varying student schedules and different time zones. Exams are 2 hours long and must be completed within one continuous 2-hour window once the exam is started.

There will be **NO MAKE-UP EXAMS** in this course. Every student is expected to complete each exam only on the scheduled day during the posted time frame and within the time allotted. The only exception will be for true medical emergencies, and written documentation from a physician, hospital, etc. will be required for such circumstances. Students requesting special-needs classroom accommodations must first register with the Dean of Students Office, which will provide documentation to the student, who then must provide this documentation to the course coordinator in the first week of the course.

GRADING: Grades will be determined entirely by the total points from all three (3) exams and the top five (5) quiz scores. Because this is a graduate level course, the grading on a scale based upon the performance for the

entire section. To make the grading process more transparent and allow students to assess their performance during the course, we will provide an approximate grading scale after each individual exam. However, be mindful that your final grade is determined by the cumulative total of all three exams, five quizzes and five discussions, and is affected by the distribution of final scores for the entire class. In determining the final grading curve for the entire course, and effort will be made to avoid having a small difference in points determining a higher or lower grade. Thus, a difference of one or two points on any single exam is unlikely to affect your final grade. Information on UF grading policy is available at: http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html.

Final grades for the course are accessible at One.UF; we DO NOT post final grades on the Canvas website.

NECESSARY TIME COMMITMENT AND MANAGEMENT: As a distance learning class, it is expected that each student manages his/her own time. Recognize, however, the BCH5413 is considered a demanding rigorous course and will require a substantial and diligent time commitment to do well. The on-campus course is a three-hour per week lecture course. University of Florida guidelines recommend three (3) hours of study for each one (1) hour of lecture to do well. Students in the distance learning course should therefore set aside enough time each week to listen to three hours of lecture, take notes, study, and prepare for quizzes and exams.

CONTACT INFORMATION: For any communication with the course coordinator and/or the TA, please put BCH5413 in the subject line to help ensure your message is not overlooked.

- For questions regarding course organization and operation, including exams and grades should be directed to the course coordinator: **Deborah Smith** at dsmith43@ufl.edu.
- For questions regarding course content and clarification, please use the discussion link on canvas first, so all students may see the questions and response. If additional help is needed then contact the TA: Chris Fields at chr21711@ufl.edu.

BCH 5413 – Class Schedule – Spring 2021

Lecture	Topic		Instructor
1	DNA & RNA Structure		Dr. Deborah Smith
2	Chromatin & Chromosomes		Dr. Deborah Smith
3	Cloning I - Vectors, cDNA		Dr. Michelle Gumz
4	Cloning II – Genomic		Dr. Michelle Gumz
5	DNA Sequencing		Dr. Deborah Smith
6	Blotting		Dr. Michelle Gumz
7	PCR & Microarrays		Dr. Michelle Gumz
Quiz 1	**Lectures 1 – 7**	**Open 8:00am Saturday Jan 23 through 11:59pm Wednesday Jan 27**	
8	Recombinant Protein Expression		Dr. Michelle Gumz
9	Site Directed Mutagenesis		Dr. Lauren Douma
10	Genome Manipulation I		Dr. Deborah Smith
11	Genome Manipulation II		Dr. Deborah Smith
12	DNA Replication I		Dr. Ming Xie
13	DNA Replication II		Dr. Ming Xie
14	DNA Replication III		Dr. Ming Xie
Quiz 2	**Lectures 8 – 14**	**Open 8:00am Wednesday Feb 10 through 11:59pm Monday Feb 15**	
Exam 1	**Lectures 1 – 14**	**Open Noon Friday Feb 19 through 11:59pm Saturday Feb 20**	
15	DNA Double Stranded Break Repair and Recombination		Dr. Jianrong Lu
16	DNA Repair Mechanisms I		Dr. Melike Caglayan
17	DNA Repair Mechanisms II		Dr. Melike Caglayan
18	Prokaryotic Transcription I		Dr. Jena Jenquin
19	Prokaryotic Transcription II		Dr. Jena Jenquin
20	Eukaryotic Transcription I		Dr. Jena Jenquin
21	Eukaryotic Transcription II		Dr. Jena Jenquin
22	Eukaryotic Transcription III		Dr. Jena Jenquin
Quiz 3	**Lectures 15 – 22**	**Open 8:00am Thursday Feb 25 through 11:59pm Monday March 1**	
23	RNA Processing I		Dr. Ming Xie
24	RNA Processing II		Dr. Ming Xie
25	Translation I		Dr. Nancy Denslow
26	Translation II		Dr. Nancy Denslow
27	Translation III		Dr. Nancy Denslow
28	Translation IV		Dr. Nancy Denslow
Quiz 4	**Lectures 23 – 28**	**Open 8:00am Saturday March 13 through 11:59pm Wednesday March 17**	
Exam 2	**Lectures 15 – 28**	**Open Noon Friday March 19 through 11:59pm Saturday March 20**	
29	Epigenetics I		Dr. Jianrong Lu
30	Epigenetics II		Dr. Jianrong Lu
31	RNA-mediated Gene Regulation		Dr. Michelle Gumz
32	Cancer - Cell Cycle I		Dr. Jianrong Lu
33	Cancer - Cell Cycle II		Dr. Jianrong Lu
34	Cancer - Signal Transduction I		Dr. Jianrong Lu
Quiz 5	**Lectures 29 – 34**	**Open 8:00am Saturday April 3 through 11:59pm Wednesday April 7**	
35	Cancer - Signal Transduction II		Dr. Jianrong Lu
36	Cancer - Oncogenes I		Dr. Jianrong Lu
37	Cancer - Oncogenes II		Dr. Jianrong Lu
38	Cancer - Tumor Suppressors		Dr. Jianrong Lu
39	Cancer - Chromosome Abnormalities		Dr. Jianrong Lu
Quiz 6	**Lectures 35 – 39**	**Open 8:00am Saturday April 17 through 11:59pm Wednesday April 21**	
Exam 3	**Lectures 29 – 39**	**Open Noon Friday April 23 through 11:59pm Saturday April 24**	