

BCH 5413 – Summer 2022

Mammalian Molecular Biology and Genomics

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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: There are two textbooks recommended as readings for the course. 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/>) and will provide all of the information required for the course. These readings provide an additional resource to assist you in understanding the concepts covered in the lecture..

- ***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 for the first two sections of the course refer to this edition of the textbook.
- ***Molecular Cell Biology by Lodish et al, 6th (2008) or 7th (2013) edition.*** Readings for the last section of the course refer to this textbook.

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/>).

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 four units. Each unit consists of lectures associate with two discussions, two quizzes, and one Exam. The modules in canvas are organizes according to the due dates for these assignments. Each lecture will consist of a .pdf file of the PowerPoint slides used in the lecture, a video recording of the lecture, and a set of review questions. The exams cover the material within the unit and are NOT cumulative.

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. There is a discussion thread for each quiz section. Newly submitted questions will be answered online in writing by our teaching assistant (TA) Marc McLeod (marc.mcleod@ufl.edu) in a timely manner. Only questions pertaining to lecture content associated with the next quiz and/or 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. Additionally, exam study questions are available at the end of each lecture section. The TA will answer questions that pertain to the study guide in the unit discussion. **Note:** if you have questions or issues other than clarification of content, please contact the course coordinator, Deborah Smith (dsmith43@ufl.edu) directly.

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 4 of 8 discussion sessions. There will be one discussion open prior to each of the 8 quizzes. Four discussion grades will be dropped, so you only need to participate in four. You can participate, however, as many times as you wish to get all of your questions answered. There are two ways for you to earn points for participation: (1) you can ask a question regarding lecture material here that is not already asked in the review questions 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 40pts.

QUIZZES: There will be **eight (8) quizzes** in this course.

- Quizzes will be administered according to the schedule below. Each quiz will cover only the material within the associated section of lectures. Quizzes are not cumulative.
- Quizzes are **75 minutes long** and must be completed within a continuous 75 minute 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, notes, and other resources, but no individuals 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 8am EST on the opening date until 11:59pm EST on the closing date (approximately 3 days). You are free to take the quiz anytime within that time frame.

Quizzes are worth a total of 105pts, 15pts each with the lowest score dropped.

EXAMS: There will be four (4) exams in this course.

- The exams will be held according to the schedule below. 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 internet 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 11:59pm EST the following evening. 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 four (4) exams, the top seven (7) quiz scores, and four (4) graded discussions. 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 four exams, seven quizzes and four 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: Marc McLeod at marc.mcleod@ufl.edu.

BCH 5413 – Class Schedule – Summer 2022

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