# BCH 5413 – Fall 2023

## Mammalian Molecular Biology and Genomics Distance Learning
## Course Coordinator: Dr. Deborah Smith

This course is designed for graduate or advanced undergraduate students desiring a higher-level survey course in molecular biology that goes 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.**

**COURSE PROFESSORS:** Recorded lectures are delivered by seven University of Florida Professors.

- Dr. Michelle Gumz
  Associate Professor
  Dept of Physiology & Aging
- Dr. Lauren Douma
  Assistant Professor
  Dept. Biochemistry & Molecular Biology
- Dr. Ming Xie
  Assistant Professor
  Dept. Biochemistry & Molecular Biology
- Dr. Nancy Denslow
  Professor
  Dept. Veterinary Medicine
- Dr. Jianrong Lu
  Associate Professor
  Dept. Biochemistry & Molecular Biology
- Dr. Melike Caglayan
  Assistant Professor
  Dept. Biochemistry & Molecular Biology

- Dr. Deborah Smith (Course Coordinator)
  Instructional Assistant Professor
  Dept. Biochemistry & Molecular Biology

**Please Note that for the distance learning course all content related questions are directed to Dr. Smith and the Graduate Assistants.**

**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.** This textbook is also optional. Readings for the last section of the course refer to this textbook.

**CANVAS 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 modules based on quiz and exam dates. You can access these materials from the canvas home page.

**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".**

**COURSE DELIVERY:** The course content is delivered as a series of recorded lectures by six University of Florida Professors. Each lecture is accompanied by a set of review questions. All lectures are available from the beginning of the semester, but the graded assignments follow a set schedule. There is a recommended lecture schedule available in the introductory module to assist you in aligning the lectures with the graded assignments and your own circumstances. The lectures and review questions provide all of the information required for the graded portions of the course, although the optional textbooks can provide background information to assist you in understanding the material.

**GRADED DISCUSSIONS (40pts):** There are **eight (8) graded discussions** in this course.

- You are required to participate in 4 of 8 discussion sessions. They must be distributed so that 2 posts are in the first half of the semester (Exam 1 and 2) and 2 posts are in the second half of the semester (Exams 3 and 4). 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 as many times as you wish to get all of your questions answered, but only four posts will count towards your grade.
- There are four ways for you to earn points for participation:
    - Ask a question regarding lecture material here that is not already asked in the review questions or online help section above or
    - 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.
    - Write about a concept or figure from the lecture that is not ready asked about in the review questions. Be sure to put your explanation in your own words.
    - Respond to one of your classmates' posts with a deeper explanation of concepts associated with their post.
- Discussions are worth 10pts each for a total of 40pts.

**QUIZZES (105pts):** There will be **eight (8) open book quizzes** in this course.

- Quizzes will be administered according to the course schedule. 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 one 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 (either EDT or EST as appropriate) on the opening date until 11:59pm (either EDT or EST as appropriate) on the closing date. 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 (400pts):** There will be four (4) exams in this course.

- The exams will be held according to the course schedule. Exams will cover material within the associated lectures. The exam will consist of a combination of multiple choice and short answer questions. The exams are 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 EDT until 11:59pm EDT 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.
- **Make-up exams**. Every student is expected to complete each exam only on the scheduled day during the posted time frame and within the time allotted. Exceptions will be made for true emergencies. Written documentation is required for such circumstances and must be approved by Dr. Smith in advance of the exam.
- 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 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, letter grades are 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, you will be provided with 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 grade, 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.

**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 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. There is a calendar available in the class introductory information and announcements will be made to assist you in organizing your time.

**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 one of the GAs: Eli Newcomb at Elijah.newcomb@ufl.edu.

# BCH 5413 – Class Schedule – Fall 2023

| 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 Aug 29th through 11:59pm on Wed Aug 30th** | |
| 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 Sept 12th through 11:59pm on Wed Sept 13th** | |
| **Exam 1** | **Lecture 1 – 9 Open 8:00am on Friday Sept 15th through 11:59pm on Sat Sept 16th** | |
| 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 Sept 26th through 11:59pm on Wed Sept 27th** | |
| 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 Tuesday Oct 10th through 11:59pm on Wed Oct 11th** | |
| **Exam 2** | **Lectures 10 – 18 Open 8am on Friday October 13th through 11:59pm on Saturday Oct 14th** | |
| 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 Oct 24th through 11:59pm on Wed Oct 25th** | |
| 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 Tues Nov 7th through 11:59pm Wed Nov 8th** | |
| **Exam 3** | **Lectures 19 – 28 Open 8:00am on Sunday Nov 12th through 11:59pm on Mon Nov 13th** | |
| 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 Tues Nov 21st through 11:59pm on Wed Nov 22nd** | |
| 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 Wednesday December 6th through 11:59pm Thurs Dec 7th** | |
| **Exam 4** | **Lectures 29 – 39 Open 8:00am on Sunday Dec 10th through 11:59pm on Monday Dec 11th** | |