

COURSE SYLLABUS
BCH 4024: INTRODUCTION TO BIOCHEMISTRY AND MOLECULAR BIOLOGY
COURSE COORDINATOR: Dr. Brian D. Cain

Fall 2020

Credit: four (4) hours

Course Objectives: BCH 4024 provides a survey of the structure, function, and metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. It introduces concepts in molecular biology including replication, gene regulation, transcription, translation, and control of cell growth. Pre-recorded lectures will be accessible entirely online through Canvas this semester.

Prerequisites: Organic Chemistry (CHM 2210 and 2211, CHM 2215 and 2216, or their equivalents at other universities) or consent of course coordinator. CHM 2200 is not an acceptable prerequisite for BCH 4024.

Recommended Text: *Lehninger Principles of Biochemistry, 7th edition*, by David L. Nelson and Michael M. Cox. New York: W.H. Freeman and Company, 2017. Textbooks may be bought at the Health Center Bookstore (Room MG-15) and available in several other local, commercial bookstores. Used copies of the 5th and 6th editions are widely available.

Web Page: This syllabus, expanded policies, and other information about BCH4024 are available on Canvas. The syllabus is also available at: <http://biochem.med.ufl.edu/academics/undergraduate-courses>.

Lecture Notes: Faculty lecture notes for this course are available at the Canvas site.

Supplemental Instruction: The SI program is very popular and highly effective. We strongly encourage all students participate.

Tests and Grading: All exams will be administered through Canvas/Honorlock. Exams 1-3 are scheduled for Thursdays September 17, October 15 and November 12. Exam 4 will be on Monday December 14. Times are specified below.

The four, ninety-minute examinations are each worth one-hundred (100) points, with a course total of four-hundred (400) points. Students' final letter-grades will be determined solely based on performance on exams. Exams will cover the material discussed in the lectures and presented on PowerPoint slides. There is **NO EXTRA CREDIT**. For more detailed information on grading see the BCH4024 Testing and Grading Policies in Canvas. Information on the UF grading policy is available at: <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>.

Make Up Exams: A make-up examination is available for students who miss **ONE** of the first three exams with the **PRIOR PERMISSION** of **DR. CAIN**. The student is expected to provide some acceptable reason for his/her absence. Examples of reasons for missing an exam include illness, injury, or some unforeseeable scheduling conflict. Written documentation will be expected to support all makeup requests. All make-up exams are on Thursday, November 19. Make-up exams are not cumulative and are designed for equal difficulty. Students failing to take an exam will receive zero points for that test.

DRC Accommodations: Students requesting special-needs accommodation for testing must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student. During the first two weeks of class, it is the student's responsibility to provide this documentation to **Dr. Douma** at BIOCH-MAIL-BCH4024@mail.ufl.edu.

Honorlock: All BCH4024 exams will be administered using the Honorlock Chrome extension (<http://www.honorlock.com/extension/install>). Honorlock will provide a calculator when an exam requires one. For all exams you must use Chrome web browser, a computer that is connected to the internet, and a webcam (external or internal) which can be turned to give a 360° view of your testing room. You are expected to take the exam on a computer that is **HARD-WIRED** to the internet to avoid loss of internet connection during the exam. If your connection is dropped, the exam timer will not stop. Honorlock technical support can be reached at: <https://honorlock.com/support/>

By agreement of the faculty, BCH4024 will **NOT** review of individual student exam results this semester. Be assured that exams undergo a rigorous statistical review of every individual question. The faculty also consider student concerns voiced immediately after exams. Adjustments to the answer key may occur and extra points will be awarded based only on the results of the faculty assessment.

Attendance: BCH4024 is offered in the asynchronous format online. Students are responsible for the content of lecture recordings and class notes accessible in Canvas.

Course Communications: Faculty Announcements are made through Canvas, and Dr. Cain will communicate with individuals using email to your **ufl.edu** account. We cannot use gmail, yahoo, or any other email for official business. Questions about course organization, including exams and grades should be directed to Dr. Cain via email (not telephone). Each lecturer is responsible for his/her own material. Lecturers will announce their office hours and online format. Individual SI Groups will establish their own communication plans.

COVID-19 Related Practices: Due to the ongoing pandemic, no face-to-face student-faculty contacts are anticipated. Students are strongly encouraged to wear face coverings and social distance in their daily lives. The individual BCH4024 faculty member sets their own office hours and policies governing those interactions. Faculty will make themselves available through some mechanism involving Zoom conferencing in their preferred format. He/she may –or may not -- choose to record office hours.

Privacy: Students who opt to participate in live online office hours participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, keep your camera off and do not use a profile image. Likewise, students who un-mute during office hours and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Social Media: Students sharing course materials or information through any large social media site, such as GroupMe, is strictly **PROHIBITED**. Establishing or participating in a site will be considered as a violation of the UF Honor Code. The Honor Code states, Section 3 **Violations of the Student Honor Code Item 2**, "Using any materials or resources, through any medium, which the Faculty has not given express permission to use and that may confer an academic benefit to the Student." (page 13)

Honor Code: UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code specifies behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct. If you have any questions or concerns, please consult Dr. Cain.

Technical Issues: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu. If you experience technical difficulties during an exam, contact Honorlock support immediately. Honorlock technical support can be reached at: <https://honorlock.com/support/>. Dr. Cain really cannot help you with connection problems!

Course Evaluation: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

BCH4024 Faculty:

Dr. Brian D. Cain (abbreviated “BDC” in the syllabus), and Course Coordinator
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Dr. Lauren Douma, (“LGD”) and Course Coordinator (for DRC Accommodations)
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COURSE OUTLINE FOR BCH 4024/ GMS 5905: INTRODUCTION TO BIOCHEMISTRY AND MOLECULAR BIOLOGY

<u>Lecture</u>	<u>Lecturer</u>	<u>Lecture Topic</u>
1	DLP	Water structure, Ionization, pH and Buffers
2	DLP	Amino Acids as Protein Building Blocks
3	DLP	Peptides - Bonding, Ionization, and Sequencing
4	DLP	Interactions among Amino Acid Side Chains
5	DLP	Understanding Protein Structure
6	DLP	Protein Folding, Unfolding, and Misfolding

7	DLP	Protein Binding Interactions (Hemoglobin)
8&9	DLP	How Enzymes Work
10&11	DLP	Enzyme Kinetics
12	DLP	Carbohydrates - Structure & Function
E1	Thursday, Sept 17 at 5:00-10:10 PM	EXAM 1 [LECTURES 1 THRU 12]
13	DLP	Introduction to Metabolism Part 1 - Basics of Pathway Organization, Regulation and Bioenergetics
14	DLP	Digestion and Amino Acid Absorption
15	DLP	Mobilization of Amino Acids
16	DLP	Ammonia Assimilation
17	DLP	Urea Cycle: Averting Ammonia Toxicity
18	DLP	Biosynthesis of Nonessential & Specialized Amino Acids
19	DLP	Pyrimidine Nucleotide Biosynthesis
20	DLP	Purine Nucleotide Biosynthesis Salvage & Degradation Transporters
21	WLZ	Lipids
22	WLZ	Biological Membranes
23	WLZ	Membrane Proteins
24	WLZ	Membrane Protein Transporters
25	WLZ	Membrane Protein Signaling 1
26	WLZ	Membrane Protein Signaling 2
E-2	Thursday, Oct 15 at 8:20-10:10 PM	EXAM 2 [LECTURES 13 THRU 26]
27	WLZ	Introduction to Metabolism Part 2
28	WLZ	Glycolysis
29	WLZ	Gluconeogenesis
30	WLZ	Glycogen Metabolism
31	WLZ	Regulation of Carbohydrate Metabolism

32	WLZ	Cellular Respiration
33	WLZ	The Citric Acid Cycle
34	WLZ	Electron Transport
35	WLZ	Oxidative Phosphorylation
36	WLZ	Introduction to Lipid Metabolism
37	WLZ	Ketones and Fatty Acid Synthesis
38	WLZ	Regulation of Fatty Acid Metabolism
39	WLZ	Cholesterol Synthesis
40	WLZ	Plasma Lipoproteins

E-3 Thursday, Nov. 12 at 8:20-10:10 PM EXAM 3 [LECTURES 27 THRU 40]

MAKE-UP Thursday, Nov. 19 at 6:00-8:00 PM Exams 1-3 MU (written permission by Dr. Cain only)

41	LGD	DNA Structure and Genome Organization
42	LGD	DNA Replication
43	LGD	Prokaryotic Transcription and Gene Regulation
44	LGD	Eukaryotic Transcription and Gene Regulation I
45	LGD	Eukaryotic Transcription and Gene Regulation II
46	LGD	Post-transcriptional RNA Processing
47	LGD	Translation I
48	LGD	Translation II and Posttranslational Modifications
49	LGD	DNA Damage & Repair
50	LGD	Signal Transduction and Cell Cycle Control
51	LGD	Cancer Biology I
52	LGD	Cancer Biology II

E-4 Monday, Dec. 14 at 3:00-5:00 PM EXAM 4 [LECTURES 41 THRU 52]