

**COURSE SYLLABUS**  
**BCH 4024: INTRODUCTION TO BIOCHEMISTRY AND MOLECULAR BIOLOGY**  
**DISTANCE LEARNING**  
**COURSE COORDINATOR: Dr. Kevin D. Brown**

**Fall Semester, 2019**

**Credit:** four (4) hours

**Course Description:** BCH 4024 surveys the structure, function, and metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. It introduces concepts in cell structure, replication and growth, and metabolic regulation.

**Prerequisites:** Organic Chemistry (CHM 2210 and 2211, CHM 2215 and 2216, or their equivalents at other universities) or consent of course coordinator. In certain cases, with permission, CHM 2211 or CHM 2216 may be taken concurrently. CHM 2200 is NOT an acceptable prerequisite for BCH 4024.

**Text:** *Lehninger Principles of Biochemistry, 7th edition*, by David L. Nelson and Michael M. Cox. New York: W.H. Freeman and Company, 2012. Textbooks may be bought at the Health Center Bookstore (Room MG-15) and are also available in several other local, commercial bookstores. A few copies are currently on reserve in the Health Center Library, located in the Communicore building.

**Web Page:** This syllabus, lecture notes, lecture videos, expanded policies, and other information about the course are available on the "Canvas E-Learning" site, <http://lss.at.ufl.edu>. All course notes, video supplements, and announcements are available only at the Canvas site. The syllabus is also available on the BCH 4024 site, <http://biochem.med.ufl.edu/academics/undergraduate-courses>.

**Lecture Notes:** ALL faculty lecture notes for this course are available ONLY at the "Canvas E-Learning" site. All other course-related files can also be found there.

**Tests and Grading:** There will be four exams. Exams 1-4 will be held during a reserved 42 hr time window extending from Friday to Saturday on established testing dates (see schedule below for exam dates). Exams are available from 9:00 AM on Friday to 9:00 PM on the following Saturday. Exams are 90 mins long, 50 multiple choice questions.

Distance examinations will be done using ProctorU ([www.proctoru.com](http://www.proctoru.com)), I have included a PDF file explaining the process of signing up for ProctorU. Note, this on-line proctoring service requires a computer that is connected to the internet and has a web-cam. You are expected to take the exam on a computer that is **HARD-WIRED** to the internet to avoid being dropped during the exam. If your connection is dropped, ProctorU cannot re-establish your connection.

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** on scores for these exams. Exams will cover the material discussed in the lecture videos, on the lecture notes, and in the textbook.

Students requesting special-needs classroom accommodation 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.

**Make-up exams:** It is anticipated that, given the wide latitude we have provided in scheduling exams, all students will be able to set their schedules to take all four exams during the indicated testing dates. Make-up exams can be provided given adequate documentation of a need to miss an exam, and will only be granted with the permission of the Course Director. It is anticipated that the need to make-up an exam will be a rare event.

Make-up exams will take place from Monday, December 2 at 9:00 AM (Eastern time) to 9:00 PM Tuesday, December 3. Grades will be calculated based on exam scores recorded as of the end of the make-up period - there will be no make-up of the make-up exam.

**Contact Information:** Questions about course organization and operation, including exams and grades, should be directed to Dr. Brown via the Canvas email system.

**Faculty:**

Dr. Kevin D. Brown (KDB) [kdbrown1@ufl.edu](mailto:kdbrown1@ufl.edu)

Dr. Brian D. Cain (BDC) [bcain@ufl.edu](mailto:bcain@ufl.edu)

Dr. Robert McKenna (“RMcK”) [rmckenna@ufl.edu](mailto:rmckenna@ufl.edu)

Dr. William L. Zeile (“WLZ”) [wzeile@ufl.edu](mailto:wzeile@ufl.edu)

Dr. Daniel L. Purich (“DLP”) [dlpurich@ufl.edu](mailto:dlpurich@ufl.edu)

Faculty office phone numbers are available on the Departmental Webpage (<http://biochem.med.ufl.edu>), however, email is the preferred contact method.

**Supplemental Instruction:**

A Teaching Assistant (TA) will be assigned to this course. The TA will be responsible for answering questions posted on the “Discussion” board on Canvas. The TA will also make available to the class various review materials such as:

- Video-guided worksheet reviews
- Video and print resources created by tutors
- Practice exams drafted by prior TAs

Further information on these tutoring resources will be made as the semester progresses.

**Necessary Time Commitment and Management:**

As a distance learning class, it is expected that each student manages his/her own time. Recognize, however, that BCH4024 is a demanding course and will require a substantial and diligent time commitment to do well. On-campus, BCH4024 is a 4 lecture / week course, such a time commitment should be similar for the distance learning students. We have had numerous distance learning students who have done quite well in the past, but do not underestimate the rigorous nature of this course and content.

**COURSE OUTLINE FOR  
GMS 5905: FUNDAMENTALS OF BIOCHEMISTRY AND MOLECULAR BIOLOGY**

<b><u>Lecture</u></b>	<b><u>Lecturer</u></b>	<b><u>Lecture Topic</u></b>
L-1	RMcK	<b>Biological Organization</b>
L-2	RMcK	<b>Water, Molecular Interactions, and Acid-Base Chemistry</b>
L-3	RMcK	<b>Nucleic Acids</b>
L-4	RMcK	<b>Amino Acids</b>
L-5	RMcK	<b>Peptides and Peptide Bonds</b>
L-6	RMcK	<b>Three-Dimensional Structure of Proteins</b>
L-7	RMcK	<b>Protein Dynamics and Protein Folding</b>
L-8	RMcK	<b>Protein Separation and Purification</b>
L-9	RMcK	<b>Protein Ligand Interactions</b>
L-10	RMcK	<b>Enzyme Mechanism and Catalysis I</b>
L-11	RMcK	<b>Enzyme Mechanism and Catalysis II</b>
L-12	RMcK	<b>Enzyme Kinetics and Inhibition</b>
L-13	RMcK	<b>Enzyme Regulation and Bioenergetics</b>
L-14	RMcK	<b>Carbohydrates and Glycobiology</b>
L-15	RMcK	<b>Lipids</b>
<b>E-1</b>	<b>Friday, 9/6- Saturday, 9/7</b>	<b>EXAM 1 [LECTURES L-1 THRU L-15]</b>
L-16	WLZ	<b>Biological Membranes</b>
L-17	WLZ	<b>Membrane Proteins</b>
L-18	WLZ	<b>Membrane Protein Transporters</b>
L-19	WLZ	<b>Membrane Protein Signaling I</b>
L-20	WLZ	<b>Membrane Protein Signaling II</b>
L-21	WLZ	<b>Introduction to Metabolism</b>
L-22	WLZ	<b>Glycolysis</b>
L-23	WLZ	<b>Gluconeogenesis</b>

L-24	WLZ	<b>Glycogen Metabolism</b>
L-25	WLZ	<b>Regulation of Carbohydrate Metabolism</b>
L-26	WLZ	<b>Respiration and Introduction to the Citric Acid Cycle</b>
L-27	WLZ	<b>Citric Acid Cycle</b>
L-28	WLZ	<b>Electron Transport</b>
<b>E-2</b>	<b>Friday, 10/4 – Saturday, 10/5</b>	<b>EXAM 2 [LECTURES L-16 THRU L-28]</b>
L-29	WLZ	<b>Oxidative Phosphorylation</b>
L-30	WLZ	<b>Introduction to Lipid Metabolism and Fatty Acid Oxidation</b>
L-31	WLZ	<b>Ketogenesis and Fatty Acid Synthesis</b>
L-32	WLZ	<b>Regulation of Fatty Acid Oxidation and Synthesis</b>
L-33	WLZ	<b>Cholesterol Synthesis</b>
L-34	WLZ	<b>Plasma Lipoproteins</b>
L-35	DLP	<b>Amino Acid Metabolism: Digestion &amp; Assimilation</b>
L-36	DLP	<b>Amino Acid Degradation and Disposition</b>
L-37	DLP	<b>Amino Acid Metabolism: Urea Cycle</b>
L-38	DLP	<b>Amino Acid Metabolism: Nonessential AA Biosynthesis</b>
L-39	DLP	<b>Amino Acid Metabolism: Specialized Amino Acids and Heme</b>
L-40	DLP	<b>Purine Nucleotide Biosynthesis, Degradation and Salvage</b>
L-41	DLP	<b>Pyrimidine Nucleotide Biosynthesis and Deoxynucleotide Biosynthesis</b>
L-42	BDC	<b>DNA and Chromatin</b>
L-43	BDC	<b>DNA Replication I</b>
L-44	BDC	<b>DNA Replication II</b>
<b>E-3</b>	<b>Friday, 11/1 - Saturday, 11/2</b>	<b>EXAM 3 [LECTURES L-29 THRU L-44]</b>
L-45	BDC	<b>Prokaryotic Transcription and Gene Regulation</b>
L-46	BDC	<b>Eukaryotic Transcription and Gene Regulation I</b>

L-47	BDC	<b>Eukaryotic Transcription and Gene Regulation II</b>
L-48	BDC	<b>Post-Transcriptional RNA Processing</b>
L-49	BDC	<b>Protein Synthesis I</b>
L-50	BDC	<b>Protein Synthesis II</b>
L-51	BDC	<b>Post-Translational Modifications</b>
L-52	KDB	<b>DNA Damage and Repair</b>
L-53	KDB	<b>Recombination and Transposition</b>
L-54	KDB	<b>Growth Factor Signaling</b>
L-55	KDB	<b>Cell Cycle Control</b>
L-56	KDB	<b>Cancer Biology I - Oncogenes</b>
L-57	KDB	<b>Cancer Biology II - Tumor Suppressors</b>

**E-4      Friday, 11/22 – Saturday 11/23    EXAM 4      [LECTURES L-45 THRU L-57]**

**MAKE-UP (Requires Course Director prior approval): Monday, 12/2 – Tuesday, 12/3**