

COURSE SYLLABUS
BCH 4024: INTRODUCTION TO BIOCHEMISTRY AND MOLECULAR BIOLOGY
COURSE COORDINATOR: Dr. William L. Zeile

Summer A/C 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.

Meeting Times and Places: Lectures are held Mondays, Tuesdays, Wednesdays, and Fridays (2nd period, from 9:30 a.m. to 10:45 a.m.) in the second-floor Stetson MSB (Medical Sciences Building) Auditorium (Room N2-200).

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, 2012. Textbooks may be bought at the Health Center Bookstore (Room MG-15) and are also available in several other local, commercial bookstores. Used copies of the 5th edition are widely available.

Web Page: This syllabus, expanded policies, and other information about the course are available on Canvas. 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 site. All other course-related files can also be found there. There is NO approved course package.

Attendance: We want to emphasize that attendance is central to success in this course. Students who regularly attend class and seek assistance score higher in BCH 4024 than those who do not. Office hours for the faculty will be announced in class and posted outside their office doors. The BCH4024 **Supplemental Instruction** program is very popular and highly effective.

Audio Recording of Lectures: Students are allowed to make audio recordings of lectures for their personal use. The recordings are NOT to be posted in online formats. Posting of recordings is specifically prohibited by the Student Conduct Code, "A Student must not, without express Authorization from Faculty, make or receive any Recording, through any means over any medium, of any academic activity, including but not limited to a Recording of any class." Failure to comply with this provision of the Student Conduct Code will result in disciplinary action.

Tests and Grading: Examinations will start at the times indicated below on **Thursday** June 6, **Wednesday** July 3 and **Thursday** July 25 in Room CG-28 (Computer Testing Center, Communicore Building, Health Science Center). The Final Exam will be on **Thursday** August 8. Online exam **SIGN-UP** is mandatory. A sign-up will be held prior to Exam 1 for Exams 1-3, and then a second sign-up will be conducted for Exam 4. If you will have a consistent conflict with these exam times, such as another class, lab, or some other exam, then **DO NOT** register for BCH4024.

Please note: This year Exam 2 will be given on a Wednesday (Wednesday, July 3rd) in lieu of class. Lectures will resume on Friday, July 5th.

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 the basis of their performance on these exams. Exams will cover the material discussed in the lectures or in the textbook. There is **NO EXTRA CREDIT**. For detailed

information on grading please 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>.

Students requesting special-needs classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student. The student must provide this documentation to **Dr. Brown** (BIOCH-MAIL-BCH4024@mail.ufl.edu) during the first week of the classes for **DRC accommodations**.

A make-up examination is provided for students who miss **ONE** of the first three exams for some acceptable reason, **WITH PRIOR PERMISSION** from **Dr. Zeile**. Generally, this will be illness, injury, or some other unforeseeable scheduling conflict. Written documentation will be required for all makeup requests. All make-up exams are scheduled for Thursday, August 1 at 9:00 AM. Be warned that previous history suggests missing an exam correlates with a lower score. Although the makeup exams are designed for equal difficulty, they will be weeks later than the lectures for that section of the course, and you will also have less time to study for the final. The makeup exams are specific to the missed exam, not cumulative. No make-up exam is available for Exam 4, so to complete BCH4024 students must take Exam 4 as scheduled. Students failing to take an exam will receive zero points for that test. Exceptions will be made only with the explicit prior approval of **Dr. Zeile**.

The Testing Center uses **iMac** computers equipped with a scientific calculator (version 10.7.1). No other calculator is allowed during an exam. Students are strongly encouraged to practice functions such as log, anti-log and scientific notation on a Mac prior to taking exams. The proctors are prohibited from helping students perform calculations.

By agreement of the faculty, BCH4024 will **NOT** allow general review of exams. Be assured that exam questions undergo a rigorous statistical review after every test. Student concerns voiced during and after the exam are taken into serious consideration. The answer key may be adjusted and extra points awarded based on the results of the faculty review. Dr. Zeile is willing to review exam results with individual students upon request.

Course Communications: Announcements will be made in class and by email to your **ufl.edu** account. We cannot use gmail, yahoo or any other email for official business. It is your responsibility to attend class to hear announcements, clear your spam file, and regularly check your UF email account.

Course Contact Information: Questions about course organization, including exams and grades, should be directed to Dr. Zeile via email (not telephone). Office hours for organizational matters will be by appointment only.

Faculty:

Dr. William L. Zeile (“WLZ”), Course Coordinator
Office: R3-206A ARB
wzeile@ufl.edu

Dr. Kevin Brown (“KDB”), Co-Coordinator (for DRC accommodations)
Office: R3-216B ARB
BIOCH-MAIL-BCH4024@mail.ufl.edu

Dr. Daniel L. Purich (“DLP”)
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dlpurich@ufl.edu

**COURSE OUTLINE FOR
BCH 4024: INTRODUCTION TO BIOCHEMISTRY AND MOLECULAR BIOLOGY**

Lecture	Day and Date	Faculty	Specific Topic & Recommended Reading
L-1	Mon, 5/13/19	DLP	Water: Structure, Ionization, pH & Buffers
L-2	Tues, 5/14/19	DLP	Amino Acid as Protein Building Blocks
L-3	Wed, 5/15/19	DLP	Peptides: Bonding, Ionization, Sequencing, Side-Chain Interactions
L-4	Fri, 5/17/19	DLP	Understanding Protein Structure
L-5	Mon, 5/20/19	DLP	Protein Folding, Unfolding & Misfolding
L-6	Tues, 5/21/19	DLP	Protein Binding Interactions (Myoglobin & Hemoglobin)
L-7	Wed, 5/22/19	DLP	How Enzymes Work
L-8	Fri, 5/24/19	DLP	Enzyme Kinetics
---	Mon, 5/27/19	No Class	Memorial Day
L-9	Tues, 5/28/19	DLP	Metabolic Pathways: Organization, Bioenergetics & Regulatory Strategies
L-10	Weds, 5/29/19	DLP	Nitrogen Metabolism: Protein Digestion & Amino Acid Absorption
L-11	Fri, 5/31/19	DLP	Nitrogen Metabolism: Mobilization of Amino Acids
L-12	Mon, 6/3/19	DLP	Nitrogen Metabolism: Urea Cycle & Averting Ammonia Toxicity
L-13	Tues, 6/4/19	DLP	Nitrogen Metabolism: Biosynthesis of Nonessential & Specialized Amino Acids
L-14	Wed, 6/5/19	DLP	Nitrogen Metabolism: Purine Nucleotide Biosynthesis, Salvage, and Degradation

E-1	Thur, 6/6/19	Exam 1	[Lectures L-1 thru L-11] 8:30, 10:30 AM & 12:30 PM
L-15	Fri, 6/7/19	DLP	Nitrogen Metabolism: Pyrimidine Nucleotide Biosynthesis & Ribonucleotide Reductase
L-16	Mon, 6/10/19	DLP	Carbohydrates: Structure & Function
L-17	Tues, 6/11/19	WLZ	Lipids (Lecture notes L-21)
L-18	Wed, 6/12/19	WLZ	Biological Membranes (Lecture notes L-22)
L-19	Fri, 6/14/19	WLZ	Membranes and Membrane Proteins (Lecture notes L-23)
L-20	Mon, 6/17/19	WLZ	Membrane Protein Transporters (Lecture notes L-24)
L-21	Tues, 6/18/19	WLZ	Membrane Protein Signaling I & II (Lecture notes L-25, 26)
L-22	Wed, 6/19/19	WLZ	Overview of Intermediary Metabolism and Introduction to Glycolysis (Lecture notes L-27)
L-23	Fri, 6/21/19	WLZ	Glycolysis (Lecture notes L-28)
----	Mon, 6/24/19	No Class	Summer Break Starts (Classes Resume on Monday, July 1)
L-24	Mon, 7/1/19	WLZ	Gluconeogenesis (Lecture notes L-29)
L-25	Tues, 7/2/19	WLZ	Glycogen Metabolism, Regulation of Carbohydrate Metabolism and Pentose Phosphate Pathway (Lecture notes L-30, 31)
E-2	Wed, 7/3/19	Exam 2	[Lectures L-12 Thru L-23] 8:30, 10:30 AM & 12:30 PM
-----	Thur, 7/4/19	No Class	Independence Day
L-26	Fri, 7/5/19	WLZ	Respiration and Introduction to the Citric Acid Cycle (Lecture notes L-32)
L-27	Mon, 7/8/19	WLZ	Citric Acid Cycle and Electron Transport (Lecture notes L-33, 34)
L-28	Tues, 7/9/19	WLZ	Oxidative Phosphorylation (Lecture notes L-35)
L-29	Wed, 7/10/19	WLZ	Lipid Metabolism and Fatty Acid Oxidation (Lecture notes L-36)

L-30	Fri, 7/12/19	WLZ	Ketogenesis and Fatty Acid Biosynthesis (Lecture notes L-37, 38)
L-31	Mon, 7/15/19	WLZ	Cholesterol Synthesis and Plasma Lipoproteins (Lecture notes L-39, 40)
L-32	Tue, 7/16/19	KDB	DNA Structure and Genome Organization
L-33	Wed, 7/17/19	KDB	DNA Replication
L-34	Fri, 7/19/19	KDB	Prokaryotic Transcription and Gene Control
L-35	Mon, 7/22/19	KDB	Eukaryotic Transcription and Gene Control
L-36	Tues, 7/23/19	KDB	Post-Transcriptional RNA Processing
L-37	Weds, 7/24/19	KDB	Protein Synthesis I
E-3	Thur, 7/25/19	Exam 3	[Lecture-24 thru Lecture-34] 8:30, 10:30 AM & 12:30 PM
L-38	Fri, 7/26/19	KDB	Protein Synthesis II
L-39	Mon, 7/29/19	KDB	DNA Damage and Repair
L-40	Tues, 7/30/19	KDB	Recombination and Transposition
L-41	Weds, 7/31/19	KDB	Growth Factor Signaling
Makeup	Thurs, 8/1/19	Exams 1-3	Advanced Permission required to take Makeup! (9:00 AM)
L-42	Fri, 8/2/19	KDB	Cell Cycle Mechanics
L-43	Mon, 8/5/19	KDB	Cancer Biology I
L-44	Tues, 8/6/19	KDB	Cancer Biology II
E-4	Thur, 8/8/19	Exam 4	[Lecture-35 thru Lecture-44] 8:30, 10:30 AM & 12:30 PM