

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

Summer A/C Semester, 2020

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.

Summer 2020: BCH4024 will be conducted as an on-line course with pre-recorded lectures.

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 are also 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 the course are available on Canvas. The syllabus is also available on the Department of Biochemistry & Molecular Biology's website, <http://biochem.med.ufl.edu/academics/undergraduate-courses>.

Lecture Notes and Pre-recorded Lectures: **ALL** faculty lecture notes and pre-recorded lectures 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.

Class participation: We want to emphasize that disciplined, and up-to-date study of Lecture notes and Pre-recorded lectures is central to success in this course. Students who maintain focus and seek assistance score higher in BCH 4024 than those who do not. Office hours by Zoom for the faculty will be announced on Canvas and posted outside their office doors. The BCH4024 **Supplemental Instruction** program is very popular and highly effective and you as a student will be encouraged to participate by Zoom meetings.

Tests and Grading: The examinations will start at the times indicated below on **Tuesday** June 2, **Tuesday** July 7 and **Tuesday** July 28 in Canvas with proctoring by HonorLock. The Final Exam will be on **Tuesday** August 11. 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.

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 more 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. Douma** (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 6. 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**.

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 follow the announcements through your email and Canvas. Regularly check your UF email account.

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/>.

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.

School Holidays:

- Memorial Day, Monday 5/5/20
- Summer break begins Monday 6/22/20; Classes resume on Monday, July 6

Faculty:

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

Dr. Daniel L. Purich (“DLP”)
Office: R3-126 ARB
dlpurich@ufl.edu

Dr. Kevin Brown (“KDB”)
The contact for Dr. Brown’s section is Dr. Lauren Douma
ldouma@ufl.edu **All DRC emails MUST be sent to the email address below**

Dr. Lauren G. Douma, Co-Coordinator (for DRC accommodations)
Office: R3-252 ARB
BIOCH-MAIL-BCH4024@mail.ufl.edu

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

Lecture	Faculty	Specific Topic & Recommended Reading
L-1	DLP	PROTEIN STRUCTURE - Water structure, Ionization, pH and Buffers
L-2	DLP	PROTEIN STRUCTURE - Amino Acids as Protein Building Blocks
L-3	DLP	PROTEIN STRUCTURE - Peptides - Bonding, Ionization, and Sequencing
L-4	DLP	PROTEIN STRUCTURE - Interactions among Amino Acid Side Chains
L-5	DLP	PROTEIN STRUCTURE - Understanding Protein Structure
L-6	DLP	PROTEIN STRUCTURE - Protein Folding, Unfolding, and Misfolding
L-7	DLP	PROTEIN STRUCTURE - Protein Binding Interactions (Hemoglobin)
L-8	DLP	How Enzymes Work
L-9	DLP	PROTEIN STRUCTURE - Enzyme Kinetics
L-10	DLP	INTRO TO METABOLISM - Basics of Pathway Organization, Regulation and Bioenergetics
L-11	DLP	NITROGEN METABOLISM - Digestion and Amino Acid Absorption
EXAM 1	Tues, 6/2/20	[Lectures L-1 thru L-11] Examination Times TBA
L-12	DLP	NITROGEN METABOLISM - Mobilization of Amino Acids and Biosynthesis of Nonessential Amino Acids & Specialized Amino Acids
L-13	DLP	NITROGEN METABOLISM - Ammonia Assimilation
L-14	DLP	NITROGEN METABOLISM - Urea Cycle: Averting Ammonia Toxicity, Pyrimidine Nucleotide Biosynthesis
L-15	DLP	NITROGEN METABOLISM - Purine Nucleotide Biosynthesis Salvage & Degradation Transporters
L-16	DLP	Carbohydrates: Structure & Function
L-17	WLZ	Lipids (Lecture notes L-21)
L-18	WLZ	Biological Membranes (Lecture notes L-22)

L-19	WLZ	Membranes and Membrane Proteins (Lecture notes L-23)
L-20	WLZ	Membrane Protein Transporters (Lecture notes L-24)
L-21	WLZ	Membrane Protein Signaling I & II (Lecture notes L-25, 26)
L-22	WLZ	Overview of Intermediary Metabolism and Introduction to Glycolysis (Lecture notes L-27)
L-23	WLZ	Glycolysis (Lecture notes L-28)
EXAM 2	Tues, 7/7/20	[Lectures L-12 Thru L-23] Examination Times TBA
L-24	WLZ	Gluconeogenesis (Lecture notes L-29)
L-25	WLZ	Glycogen Metabolism, Regulation of Carbohydrate Metabolism and Pentose Phosphate Pathway (Lecture notes L-30, 31)
L-26	WLZ	Respiration and Introduction to the Citric Acid Cycle (Lecture notes L-32)
L-27	WLZ	Citric Acid Cycle and Electron Transport (Lecture notes L-33, 34)
L-28	WLZ	Oxidative Phosphorylation (Lecture notes L-35)
L-29	WLZ	Lipid Metabolism and Fatty Acid Oxidation (Lecture notes L-36)
L-30	WLZ	Ketogenesis and Fatty Acid Biosynthesis (Lecture notes L-37, 38)
L-31	WLZ	Cholesterol Synthesis and Plasma Lipoproteins (Lecture notes L-39, 40)
L-32	KDB	DNA Structure and Genome Organization (Lecture notes L-41)
L-33	KDB	DNA Replication (Lecture notes L-42)
EXAM 3	Tues, 7/28/20	[Lecture-24 thru L-33] Examination Times TBA
MAKEUP	Tues, 8/4/20	Exams 1-3 Advanced Permission required to take Makeup!
L-34	KDB	Prokaryotic Transcription and Gene Regulation (Lecture notes L-43)
L-35	KDB	Eukaryotic Transcription and Gene Regulation (Lecture notes L-44)
L-36	KDB	Post-Transcriptional RNA Processing (Lecture notes L-45)

L-37	KDB	Translation (Lecture notes L-46)
L-38	KDB	Post Translational Modifications & Protein Trafficking (Lecture notes L-47)
L-39	KDB	DNA Damage and Repair (Lecture notes L-48)
L-40	KDB	Recombination and Transposition (Lecture notes L-49)
L-41	KDB	Growth Factor Signaling (Lecture notes L-50)
L-42	KDB	Cell Cycle Mechanics (Lecture notes L-51)
L-43	KDB	Cancer Biology (Lecture notes L-52 & 53)
L-44	KDB	Cancer Biology (Lecture notes L-52 & 53)
EXAM 4	Tues, 8/11/20	[Lecture-34 thru L-44] Examination Times TBA