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

Summer A/C Semester, 2016

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: 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 in the Shands complex). Directions: walk south on Newell Drive to the Academic Research Building (ARB) and continue through breezeway and up courtyard stairs to the ARB Atrium. Turn right and proceed to MSB Atrium, turn right and up stairs to N2-200. Reviews, lecturer office hours, and help sessions are held at times and locations to be announced in class.

Prerequisites: Organic Chemistry (CHM 2210 and 2211, CHM 2215 and 2216, or their equivalents at other universities) or the 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, **6th edition,** by David L. Nelson and Michael M. Cox**.** New York**:** W.H. Freeman and Company, 2013. Textbooks can be purchased at the Health Center Bookstore, Room MG-15. Texts are also available in several local commercial bookstores. A few copies are currently on reserve in the Health Center Library, in the Communicore building. Students considering a career in the life sciences might wish to buy instead Biochemistry, Fourth Edition, by Donald Voet and Judith G. Voet. This is a comprehensive, graduate-level text that will have a useful life beyond BCH 4024.

Web Page: This syllabus, expanded policies, and other information about the course are available both on the "Canvas E-learning" site http://lss.at.ufl.edu. All other course-related files can be found there.

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. There is **NO** approved third-party course package.

Tests and Grading: Examinations will start at 9:00, 11:00 am and 1:30 pm on the following Thursdays: June 2, June 16, and July 14 in Room CG-28 (Computer Testing Center, Communicore Building, Health Science Center). Any changes in these times will be announced. The final examination (noncumulative) is scheduled at the same times on Friday, Aug. 5, also in the Test Center. Please check these exam dates for conflicts with any other classes. If you will have a consistent conflict with these exam times, such as a class, lab or another exam, DO NOT register for this class.

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 RANK in the class, based on these exams. Exams will cover the material discussed in the lectures, in the discussion periods, and in the textbook. A complete description of exams, make-up options, and grading criteria is available at the Sakai E-Learning site. Information on UF grading policy is available at: http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html.

Testing Accommodations: Any student 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 instructor in the first two weeks of the course. Dr. Kevin Brown will be handling DRC testing accommodations for those of you with the necessary documentation, please forward documentation to: **BIOCH-MAIL-BCH4024@mail.ufl.edu**

Exam Make-Up: A make-up examination is provided for students who miss ONE of the first three exams, WITH the prior permission of the course coordinator, for an acceptable reason. Written documentation WILL be required for all makeup requests. The make-up exam is scheduled for Thursday, July 21 at 1 pm.

Be warned that previous history suggests missing an exam strongly correlates with a lower overall grade in BCH 4024, as the makeup will be weeks later than the lectures for that area, and you will also have less time to study for the final. Do not miss an exam unless the reason is important. The makeup exams are specific to the missed exam, i.e., not cumulative.

The final examination is also NOT cumulative, and NO makeup is available for the final. Students failing to take the final exam will receive zero points for that test. All students must take the final exam, as scheduled. Exceptions will be made only with the explicit prior approval of the course coordinator.

Contact Information: Questions about course organization and operation, including exams and grades, should be directed to Dr. Zeile using the **Canvas email system**. Office hours for organizational matters will be by appointment only.

NOTE: Please direct all emails concerning the course to this email address, it is monitored daily. Canvas email from students in the on campus section of BCH 4024 will NOT be monitored, and class-related emails to personal email accounts may be overlooked.

Faculty:

Dr. William L. Zeile ("WLZ") Course Coordinator & Lecturer
Office: R3-206A ARB; phone: 294-4974
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Dr. Daniel L. Purich ("DLP")
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Dr. Kevin D. Brown (abbrev. "KDB")
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kdbrown1@ufl.edu

Faculty wish to emphasize that attending class and taking fullest advantage of faculty and SI office hours and help sessions is imperative for success in this course. We have found that those students, who regularly attend class and who seek assistance or clarification, are far more successful in BCH 4024. Office hours for the faculty will be announced in class and are posted outside their office doors.

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

Lecture	Day and Date	Faculty	Specific Topic & Recommended Reading
L-1	Mon, 5/9/16	WLZ, DLP, KDB	Course Organization; Water, Acids/Bases, etc. (Ch. 1, pp. 1-36)
L-2	Tues, 5/10/16	DLP	Molecular Interactions; Amino Acids; Peptides (Ch. 2, pp. 43-70)
L-3	Wed, 5/11/16	DLP	Peptide Bonds (Ch. 3, pp. 71-107)
L-4	Fri, 5/13/16	DLP	Structure of Proteins, (Ch. 4, pp. 113-155)
L-5	Mon, 5/16/16	DLP	Protein Dynamics and Protein Folding (Ch. 4, pp. 113-155)
L-6	Tues, 5/17/16	DLP	Hemoglobin & Cooperativity (Ch. 5, pp. 155-179)
L-7	Wed, 5/18/16	DLP	Enzyme Mechanism and Catalysis (Ch. 6, pp. 183-194; Ch. 13, pp. 495-501)
L-8	Fri, 5/20/16	DLP	Enzyme Kinetics (Ch. 6, pp. 205-220, Ch. 13, pp. 516-520), (Ch. 6, pp. 194-205)
L-9	Mon, 5/23/16	DLP	Bioenergetics (Ch. 13, pp. 489-495, 501-511)
L-10	Tues, 5/24/16	DLP	Carbohydrates and Glycobiology (Ch. 7, pp. 235-265)
L-11	Weds, 5/25/16	WLZ	Lipids (Ch. 10, pp. 343-367; Ch. 11, pp. 372-375
L-12	Fri, 5/27/16	WLZ	Membrane Proteins, Properties, and Functions (Ch. 11, pp. 375-395)
---	Mon, 5/30/16	No Class	Memorial Day
L-13	Tues, 5/31/16	WLZ	Membrane Protein Transporters (Ch. 11, pp. 395-413)
L-14	Wed, 6/1/16	WLZ	Membrane Protein Signaling I (Ch. 12, 419-449)
E-1	Thur, 6/2/16	Exam 1	[Lectures L-1 thru L-12] 9:00, 11:00 AM & 1:30 PM
L-15	Fri, 6/3/16	WLZ	Membrane Protein Signaling II (Ch. 12, 449-469)
L-16	Mon, 6/6/16	WLZ	Overview of Intermediary Metabolism and Introduction to Glycolysis (Ch. 13, 485-488, Ch. 14, 527-551, Ch. 15, 569-577)
L-17	Tues, 6/7/16	WLZ	Glycolysis: Enzymes , Substrates, Products, Energy

			Relationships (Ch. 15, 584, 588-89)
L-18	**Wed, 6/8/16**	**WLZ**	**Gluconeogenesis (Ch. 15. 551-558; 582-594)**
L-19	**Fri, 6/9/16**	**WLZ**	**Glycogen Metabolism (p. 246; Ch. 15. 594-609)**
L-20	**Mon, 6/13/16**	**WLZ**	**Respiration: Pyruvate Dehydrogenase, TCA, Pentose Phosphate Shunt (Ch. 14, 558-564, Ch. 16, 615-638)**
L-21	**Tues, 6/14/16**	**WLZ**	**Electron Transport (Ch. 19, 707-722; Ch. 13, 512-521)**
L-22	**Wed, 6/15/16**	**WLZ**	**Oxidative Phosphorylation and Introduction to Lipids (Ch. 19, 723-737, Ch. 10, 343-350, 355, 359)**
E-2	**Thur, 6/16/16**	**Exam 2**	**[Lectures L-13 Thru L-22] 9:00, 11:00 AM & 1:30 PM**
L-23	**Fri, 6/17/16**	**WLZ**	**Lipid Metabolism and Fatty Acid Oxidation (Ch. 17, 652-666)**
----	**Mon, 6/20/16**	**No Class**	**Summer Break Starts (Classes Resume on Monday, June 27)**
L-24	**Mon, 6/27/16**	**WLZ**	**Fatty Acid Oxidation, Ketogenesis, and Biosynthesis (Ch. 17, 666-668; Ch. 21, 806-817)**
L-25	**Tues, 6/28/16**	**WLZ**	**Phospholipid and Triglyceride Biosynthesis Sterol and Lipoprotein Metabolism (Ch. 21, 820-845)**
L-26	**Wed, 6/29/16**	**DLP**	**Amino-Acid Biosynthesis and Specialized Amino Acids (Ch 18, 675-681)**
L-27	**Fri, 7/1/16**	**DLP**	**Urea Cycle (Ch 18, 682-687, Ch 22, 872-875)**
---	**Mon, 7/4/16**	**No Class**	**Independence Day**
L-28	**Tue, 7/5/16**	**DLP**	**Nucleotide Biosynthesis (Ch 22, 882-894)**
L-29	**Wed, 7/6/16**	**DLP**	**Nucleotide Degradation; Deoxynucleotide Biosynthesis (Ch 22, 882-894)**
L-30	**Fri, 7/8/16**	**DLP**	**RNA & DNA: Structure and Interactions (Ch. 8, pp. 271-302)**
L-31	**Mon, 7/11/16**	**KDB**	**Chromatin Structure and Genome Organization; (Ch 8, pp 277-82, Ch 24, 947-971)**

L-32	**Tue, 7/12/16**	**KDB**	**DNA Replication (Ch 25, 977-992)**
L-33	**Wed, 7/13/16**	**KDB**	**Prokaryotic Transcription and Gene Control (Ch 28, 1115-1135)**
E-3	**Thur, 7/14/16**	**Exam 3**	**[Lecture-24 thru Lecture-33] 9:00, 11:00 AM & 1:30 PM**
L-34	**Fri, 7/15/16**	**KDB**	**Eukaryotic Transcription and Gene Control (Ch 28, 1136-1146)**
L-35	**Mon, 7/18/16**	**KDB**	**Post-Transcriptional RNA Processing (Ch 26, 1033-1050)**
L-36	**Tues, 7/19/16**	**KDB**	**Protein Synthesis I (Ch 27, 1065-1099)**
L-37	**Wed, 7/20/16**	**KDB**	**Protein Synthesis II**
Makeup	**Thurs, 7/21/16**	**Exams 1-3**	**Advanced Permission Required to take Makeup!**
L-38	**Fri, 7/22/16**	**KDB**	**Post-Translational Modifications and Protein Targeting (Ch 27, 1096-1109)**
L-39	**Mon, 7/25/16**	**KDB**	**DNA Damage and Repair (Ch 25, 993-1003)**
L-40	**Tues, 7/26/16**	**KDB**	**Recombination and Transposition (Ch 25, 1003-1016)**
L-41	**Wed, 7/27/16**	**KDB**	**Growth Factor Signaling (Ch 12, 439-444, 469-472)**
L-42	**Fri, 7/29/16**	**KDB**	**Cell Cycle Mechanics (Ch 12, 439-444, 469-472)**
L-43	**Mon, 8/1/16**	**KDB**	**Cancer I – Oncogenes (Ch 12, 473-479)**
L-44	**Tues, 8/2/16**	**KDB**	**Cancer II – Tumor Suppressors and Metastasis**
L-45	**Weds, 8/3/16**	**KDB**	**In-Class REVIEW**
E-4	**Fri, 8/5/16**	**Exam 4**	**[Lecture-34 thru Lecture-45] 9:00, 11:00 AM & 1:30 PM**