COURSE SYLLABUS - Spring 2019

BIOL483/ BIOL583/ CHEM 463- General Biochemistry

Monday/Wednesday 4:30-6:20

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| **Date** | **Lecture Topic** | **Chapter (pg)** | **Problems** |
| W, 1/23 | Intro to Biochemistry  Water, pH and Buffers | 1 (1-20) (Pg 501-506)  2 (47-68) | 1: 6, 7, 12  2: 2, 4, 5, 8, 10, 11, 13, 14, 15, 16 |
| M, 1/28 | Amino Acids, peptides, and proteins | 3 (75-97) | 3: 2, 5, 11, 13, 14, 17 |
| W, 1/30 | Protein structure | 4 (115-151) | 4: 7, 11, 13 |
| M, 2/4 | Protein function | 5 (157-174) | 5: 1, 3, 5, 7, 8, 9 |
| W, 2/6 | Kinetics | 6 (187-212) | 6: 4, 7, 9, 11, 13 |
| M, 2/11 | Kinetics | 6 (213-225) | 6: 23, 24 a and b |
| W, 2/13 | **EXAM 1** |  |  |
| M, 2/18 | Mechanism/Bioenergetics | 13 (495-526) | 13: 2, 3, 4, 6, 9, 12, 13, 19, 26 |
| W, 2/20 | Carbohydrates | 7 (241-267) | 7: 2, 6, 7, 14, 16, 23 |
| M, 2/25 | Glycolysis | 14 (533-558) | 14: 8, 10, 11, 14 |
| W, 2/27 | Glycolysis /Gluconeo | 14 (558-570) | 14: 21, 22, 23, 30 |
| M, 3/4 | regulation | 6 (225-236), 15 (575-600) | 15: 4, 5, 6 |
| W, 3/6 | **EXAM 2** |  |  |
| M, 3/11 | **NO CLASS** |  |  |
| W, 3/13 | **NO CLASS** |  |  |
| M, 3/18 | Carbohydrate synthesis | 20 (780-798) | 20: 20,21 |
| W, 3/20 | Regulation | 15 (601-614) | 15: 8, 9, 11, 14 |
| M, 3/25 | Lipids | 10 (361-381) | 10: 2, 4, 5, 16 |
| W, 3/27 | Membranes | 11(387-405)) | 11: 4, 6, 7, 11, 12,13 |
| M, 4/1 | Transport | 11 (405-431) | 11: 15, 19, 21 |
| W, 4/3 | Lipid Biosynthesis | 21 (811-854) | 21:3, 6, 8, 15, 16, 17 |
| M, 4/8 | **EXAM 3** |  |  |
| W, 4/10 | Fatty Acid Oxidation | 17 (649-670) | 17: 4, 6, 7, 11, 12, 17 |
| M, 4/15 | Fatty Acid Ox-cont |  |  |
| W, 4/17 | Citric Acid Cycle | 16(619-642) | 16: 1, 2, 6, 7, 11, 21, 34 |
| M, 4/22 | Oxidative phosphorylation | 19 (711-750) | 19: 1, 4, 6, 17, 19 |
| W, 4/24 | Ox-Phosph cont/Biosignal | 12 (437-487) | 12: 6, 10 |
| M, 4/29 | Biosignaling continued |  | 12: 3, 11, 13, 16 |
| W, 5/1 | Hormonal Regulation | 23 (918-948) | 23: 11, 16, 20 |
| M, 5/6 | REVIEW |  |  |
| **Wednesday**  **May 8th** | **FINAL EXAM**  **4:30 pm -7:15 pm** | NOT SET YET. NEED TO ASK THE SECOND WEEK OF SCHOOL |  |

Instructor: Dr. Deborah Polayes Office: Exploratory Hall Room 1206

Office hours: Monday 10:30-12 pm and Tuesday 9-11 am or by appointment.

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**Required text:** Nelson & Cox, 2017 **Lehninger Principles of Biochemistry**,

7th edition, W.H. Freeman and company

Optional Course Material: Osgood & Ocorr, 2017, The Absolute, Ultimate Guide to Lehninger Principles of Biochemistry, 7th edition, W.H. Freeman and company

**Overview:** My goal in teaching General Biochemistry is to impart the knowledge necessary to appreciate the complexity of the cell through its biochemical reactions. The content of the course is described in the list of weekly lectures. Students are expected to attend lectures and to read the chapters listed below. The problems listed are recommended to help in your understanding of the material.

Lecture material will be presented by PowerPoint slides, and will contain material not found in the textbook. Questions and/or comments to the instructor during class are encouraged

**POLICIES:** To enroll in BIOL 483 you must have completed BIOL 213, Chem. 313 **OR** you must have transferred equivalent courses, OR you must have permission of the instructor.

**Late work is not accepted** in this course.

Make-up examinations are **not** given in this course. If a student misses a scheduled examination without prior permission, s/he will receive a grade of zero. If, for any reason, the class does not meet on a scheduled exam day, the test will be given the next time the class does meet.

The honor code protects the honest student, the reputation of George Mason University, and the value of the degree earned here. We should all support it both by personal honesty and by refusing to tolerate dishonesty in others. Students should report suspected cheating to the Honor Committee.

**GRADING:** The grading for this course will be based upon three in-class exams, and one final exam. These exams will cover the material discussed in lecture as well as assigned reading. The exams will consist of matching, multiple choice, True/False, definition and short answer questions. In addition, you will have 12 unannounced quizzes/ group work in class worth a total of 12% of your grade. The exams total 88% of your grade. The highest graded exam is worth 28% while the other three will each be worth 20% a piece.

Exam 1 + 2 + 3 + final 88%

In class questions 12%

**Final Grade %** = 100%

FINAL GRADES: 93-100 =A, 90-92 = A-, 85-89 = B+, 80-84 = B, 75-79 = C+, 70-74 = C, 60-69 = D, <60 = F

Biol583-001

Spring 2019

**Graduate reading list**

The following articles are assigned reading for Biol583 (General Biochemistry). The articles can be downloaded on-line at University libraries, e-journal finder. Each article needs to be read on your time and you will be tested on the material from the article at the time of the listed exam. There will be one or two questions about the paper. The questions may deal with the experimental design, the results or the conclusions the authors reached about their data.

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| **Article title** | **Exam Date** |
| Granold, M, Hajieva, P, Tosa, MI, Irimie, F-D, and Moosmann, B. (2018) Modern Diversification of the Amino Acid Repertoire Driven by Oxygen. PNAS 115: 41-46 | Exam 1 (2/13) |
| Xiaoyu, H., et. al. (2018) The mTOR Pathway Regulates PKM2 toAaffect Glycolysis in Esophageal Squamous Cell Carcinoma. Technology in Cancer Research and Treatment 17-1-10 | Exam 2 (3/6) |
| Stolarczyk, E.I., Reiling, C.J., and Paumi, C.M. (2011) Regulation of ABC transporter Function via Phosphorylation by Protein Kinases. Curr Pharm Biotechnol 12(4) 621-635 | Exam 3 (4/8) |
| Hong, S, et. al (2017) Dissociation of muscle insulin sensitivity from exercise endurance in mice by HDAC3 depletion. Nature Medicine 23:223-234 | Final Exam (5/8) |