

**York University**  
**Department of Chemistry and Department of Biology**

**Advanced Biochemistry, Winter 2022**

**Biology 3010 3.0 / Chemistry 3050 3.0 / Biochemistry 3010 3.0**

***Instructor:*** Derek Wilson

Office: LSB331C

email: dkwilson@yorku.ca

***Lectures:*** M/W/F 9:30 – 10:30

**Jan 10 – 31:** Online (Zoom link will be sent before each lecture)

**Feb 2 onwards:** SLH (Steadman) D or online live (+recording if possible)

***Office Hours:*** Monday, Wednesday, and Friday 10:30-11:30 LSB331C

***Prerequisites:*** SC/BIOL 2020 4.0 or BCHM 2020 4.0 or SC/CHEM 2050 and SC/CHEM 2020 6.0.

***Calendar Description:*** A detailed discussion of enzyme structure and function. The chemistry and metabolism of biological molecules. Metabolic regulation at the level of enzyme activity. Knowledge of general concepts of metabolism and of basic aspects of enzyme structure and function is assumed.

***Text\*:*** I recommend ‘*Biochemistry*’ Donald Voet and Judith Voet, any edition, John Wiley & Sons, Inc. publishers.

\* This text is recommended, but **not** required. *Most* of the material will be available in any recent, university level biochemistry text and in the (online) lecture notes.

***Library Material:*** A number of biochemistry textbooks are on reserve in the Steacie Library including...

*Lehninger Principles of Biochemistry*, Nelson & Cox.

*Biochemical Calculations*, Segel.

*Biochemistry*, Horton, Moran, *et al.*

*Biochemistry*, Stryer.

*Introduction to Protein Structure*, Branden & Tooze.

***Website:*** Course material can be accessed by linking from <http://www.yorku.ca/dkwilson>. All documents pertaining to the course will be posted.

***Marking scheme:***

**Midterm exam 1 - 30%** February 16<sup>th</sup> & 18<sup>th</sup>

**Midterm exam 2 - 30%** March 23<sup>rd</sup> & 25<sup>th</sup>

**Final exam - 40%**

**Grading:** The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g. A+=9, A=8, B+=7, B=6, C+=5, C=4, D+=3, D=2, E=1, F=0). A letter grade for the course will be assigned based on the final percentage grade (A+=90-100, A=80-89, B+=75-79, B=70-74, C+=65-69, C=60-64, D+=55-59, D=50-54, E=40-49, F=0-39).

**Academic Honesty:**

York students are required to maintain high standards of academic integrity and are subject to the **Senate Policy on Academic Honesty:**

(<https://www.yorku.ca/secretariat/policies/policies/academic-honesty-senate-policy-on/>)

Students may also review York's 'SPARK' materials on the **Academic Integrity:**

(<https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/>)

**Access/Disability:** Students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities may need accommodation in exam requirements. Students are encouraged to notify the course director and to seek advice from the Counselling and Development Centre. Failure to notify the course director of your needs in a timely manner may jeopardize the opportunity to arrange for academic accommodation.

**Notes:**

(1) **E-mail policy.** All emails must include the name of the sender. It is preferred that your@yorku.ca email address be used. Messages from accounts like bleh@hotmail.com or similar may not receive a reply, probably because the email will be sent to my spam box.

(2) **Missed exams.** Missed tests and exams require an 'Attending Physician's Statement'. **Doctor's notes will NOT be accepted. This documentation must be submitted within 3 working days of the missed test/exam.**

(3) There may or may-not be a **make-up for missed midterm tests/exams.** If not, for each missed midterm (with appropriate documentation) the value of the test will be added to the remaining midterm and final exam (for a missed midterm exam 1) or to the final exam (for a missed midterm exam 2).

(4) **Re-grade policy.** If, after tests are graded and returned, there is a question concerning the grading of a test, the *entire* test should be returned. The *entire* test may then be re-graded. All requests for re-grading must be made in writing and must be submitted to Dr. Wilson no later than the end of lecture 1 week after the test is returned to the class. The request should identify the question of concern and briefly explain the marking error and/or scientific reason why your answer merits further consideration.

## **Course Outline (Approximate!!)**

Week 1 (Jan 10<sup>th</sup> - 14<sup>th</sup>): *Introduction. What is this thing called 'metabolism'?*

Week 2 (Jan 17<sup>th</sup> -21<sup>st</sup>): *Proteins – Amino acids to Peptides to Proteins*

Week 3 (Jan 24<sup>th</sup> – 28<sup>th</sup>): *Enzymes and Protein Structure*

Week 4 (Jan 31<sup>st</sup> – Feb 4<sup>th</sup>): *Enzyme Regulation and Mechanisms – Kinetics and Thermodynamics*

Week 5 (Feb 7<sup>th</sup> – 11<sup>th</sup>): *Enzyme dynamics and Function*

Week 6 (**Feb 14<sup>th</sup> – 18<sup>th</sup>**): *Review, Mid-Term! (Feb 16<sup>th</sup> and 18<sup>th</sup>)*

**Reading Week** (Feb 19<sup>th</sup> – 25<sup>th</sup>)

Week 7 (Feb 28<sup>th</sup> – March 4<sup>th</sup>): *Metabolic Pathways, Enzymes and Energy Metabolism*

Week 8 (March 7<sup>th</sup> – March 11<sup>th</sup>): *Metabolism of Fatty Acids*

Week 9 (March 14<sup>th</sup> – March 18<sup>th</sup>): *Metabolism of Nucleotides and Amino Acids*

Week 10 (**March 21<sup>st</sup> – March 25<sup>th</sup>**): *Review, Mid Term! (March 23<sup>rd</sup> & 25<sup>th</sup>)*

Week 11 (March 28<sup>th</sup> – April 1<sup>st</sup>): *Metabolism of Iron/Calcium*

Week 12 (April 4<sup>th</sup> and April 8<sup>th</sup>): *Metabolism of Caffeine, Metabolic Poisons, Exam prep*

Extra, maybe!: *Evolution of Metabolism*