Basic Biochemistry 103.3  
Chemistry & Biochemistry  
Fall 2021

Instructor Information
Dr. Laura Klein  
Email: Laura.Klein93@login.cuny.edu  
Phone: 718.664.4274  
Online office hours  Wednesdays, 12:30-1:30 pm

Course Information
Course site (LMS)  
Blackboard

Course Description
CHEM 103.3. Basic Biochemistry. 2 lec., 1 rec. hr.;  
3 cr. Prereq.: A grade of C or better in CHEM 102.3  
and 102.1; coreq.: CHEM 103.1. The third of a three semester sequence intended for students  
planning careers in allied health fields such as nutrition, dietetics, and nursing. This course  
presents a study of the structure, properties, and metabolism of the major groups of biological  
importance, with special emphasis on the role of those compounds required in diet. Not open to  
majors in the chemistry, biochemistry, or chemical education concentration. Fall, Spring (LPS**, SW**, SCI**)

Course Requirements:
There will be two main learning sessions and a final review session. PowerPoint slides will be  
provided to allow students to produce their own study/review sheets from readings, in-class  
lectures and other asynchronous activities. The two sessions focus broadly on: 1) protein  
structure (water, pH and enzymes), as well as the basic pathways involved in energy  
conversion, and carbohydrate structure, and 2) carbohydrate (metabolism), lipids (structure and  
metabolism, protein/amino acid metabolism), and chemical messengers. This class will include:

1. Multiple choice asynchronous homework assignments and practice quizzes will be posted on Blackboard, providing that focuses on gathering basic information.
2. Additional asynchronous work that helps students assess, analyze and synthesize information will take the form of discussion boards.
3. In-class/outside, group preparation of concept maps for synthesis of the major concepts addressed.
4. Two formal assessments--a midterm exam covering the first session and a final exam covering the second session. These will be a variety of question formats and together will constitute 50% of the grade.
5. Bonus multiple choice questions will be provided throughout the semester that can raise the final grade by a full letter grade.
Course Goals/Objectives
As described in the learning objectives, students should, after passing this class, have a thorough conceptual appreciation for the structure/function relationships of the major biomolecules involved in nutrition, and the chemical processes the body uses to maintain homeostatic control of energy balance. Additional goals concern the students learning more about how to gather and organize information and assess the quality of research studies so as to build meaning and understanding that they can use in their careers and their personal lives.

Learning Objectives
After completing the course, students will be able to:
- Describe the structures and properties of cell components, including amino acids, proteins, carbohydrates, and lipids.
- Describe the properties of water and the role that interactions with water have on the physical and chemical properties of cell components.
- Explain the functions of enzymes, the mechanisms of enzymatic catalysis, interactions of enzymes with substrates and inhibitors, and the roles of coenzymes and vitamins.
- Describe how biological molecules are transported through the body and across lipid membranes.
- Analyze the metabolic pathways leading to the degradation of carbohydrates, fats, and proteins, and understand how metabolic reactions are coupled to the synthesis of ATP.
- Calculate the energy yields of nutrient degradation.
- Describe how metabolic pathways are regulated in response to energy needs, energy balance, and the cellular environment.

This course fulfills the Pathways Required Core requirement: http://gened.qc.cuny.edu/pathways/

Books, materials, tools, and accounts
Queens College Online Bookstore: https://qc.textbookx.com/institutional/index.php
Books and Materials: Books and Materials: Bettelheim/Brown/Campbell/Farrell/Torres - Bundle: Introduction to General, Organic and Biochemistry, Loose-leaf Version, 12th + OWLv2, 1 term (6 months)
Printed Access Card [9781337915984]

Readings
Chapters on water, bonds, liquids, pH, protein structure, enzymes, carbohydrate structure and metabolism, lipid structure and metabolism, protein metabolism and chemical messengers.

Required tools and accounts
Computer & WIFI access, Blackboard access, CUNY email account access

Technical Support
If you require technical help with your Queens College email or CUNYfirst account please contact the Queens College helpdesk by emailing helpdesk@qc.cuny.edu or visiting their website: https://www.qc.cuny.edu/Computing/helpdesk/Pages/Welcome.aspx.
Assessment

Content for grade is as follows: The lecturer will have programmed Blackboard to give students an up-to-date course grade. This grade will be guaranteed to be accurate the week before the final drop date for the course and the week before each examination. At other times, it may be less accurate due to delays in grading and/or grade submission into Blackboard.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Component</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>15%</td>
<td>Homework assignments</td>
<td>150 pts</td>
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<tr>
<td>5%</td>
<td>Participation quizzes</td>
<td>50 pts</td>
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<tr>
<td>15%</td>
<td>Discussion boards</td>
<td>150 pts</td>
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<tr>
<td>15%</td>
<td>Concept map work</td>
<td>150 pts</td>
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<tr>
<td>50%</td>
<td>Midterm &amp; Final exams</td>
<td>500 pts</td>
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<tr>
<td>100%</td>
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<td></td>
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<tr>
<td>10%</td>
<td>Bonus assignments</td>
<td>100 pts available</td>
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Students will be assigned the following final letter grades, based on calculations coming from the course assessment section. Grading scale is as follows:

- **A+**: 96 – 100%
- **A**: 88 – 95%
- **B+**: 84 – 87%
- **B**: 76 – 83%
- **C+**: 72 – 75%
- **C**: 64 – 71%
- **C-**: 60 – 63%  
  Students in this bracket who pass the final exam with a grade of C or better will earn a grade of C, not a C- in this class.
- **D**: 50 – 59%
- **F**: < 50%

Note that this grade scale is a 12-point scale and that it has only a single minus grade.

The minus grades have been converted to the next higher grade. For example, the grade for someone who earns 88 – 92% is an A instead of an A-.

The 12-point scale accounts for the fact that there is NO CURVE in this course. There are opportunities for you to work on bonus homework questions to improve your grade, but no curve.

**Important note on missed classes, late work**

Students who miss classes will be responsible for gathering information from classmates, and/or watching the videos made available on Blackboard so as to fill in the provided PowerPoint slides. All assignments will have due dates and those multiple-choice assignments calculated by Blackboard will lose 50% if completed after the due date. Rubrics for other assignments will spell out the penalty for late work.

**Reasonable Accommodations For Students With Disabilities**

Students with disabilities needing academic accommodation should register with the Special Services Office by emailing QC.SPSV@qc.cuny.edu.

For more information about services available to Queens College students, visit the Office of Special Services website: https://www.qc.cuny.edu/studentlife/services/specialserv/Pages/default.aspx

**CUNY Policy On Academic Integrity**
Academic Dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion as provided at https://www.cuny.edu/about/administration/offices/legal-affairs/policies-procedures/academic-integrity-policy/. Please read this document, paying careful attention to the sections on plagiarism and Internet plagiarism. If you are not sure how to cite work you have found on the internet, please review the APA Guidelines provided by the Purdue OWL.

**Netiquette**

Please maintain a professional demeanor when posting online. You can be respectful even when you have a difference of opinion. Treat others as you'd want to be treated yourself. Don't type in all caps, as that is the online equivalent of shouting. If you need to emphasize a word or phrase, use italics.

**Statement on student wellness**

[Sample Text] “As a student, you may experience a range of challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. QC services are available free of charge. You can learn more about confidential mental health services available on campus at:”
https://www.qc.cuny.edu/StudentLife/services/counseling/counseling/

**Use of Student Work**

All programs in New York State undergo periodic reviews by accreditation agencies. For these purposes, samples of student work are occasionally made available to those professionals conducting the review. Anonymity is assured under these circumstances. If you do not wish to have your work made available for these purposes, please let the professor know before the start of the second class. Your cooperation is greatly appreciated.

**Course Evaluation**

During the final four weeks of the semester, you will be asked to complete an evaluation for this course by filling out an online questionnaire. Please remember to participate in these course evaluations. Your comments are highly valued, and these evaluations are an important service to fellow students and to the institution, since your responses will be pooled with those of other students and made available online, at the Teaching Evaluations Data: Spring 2010 – Present (http://ctl.qc.cuny.edu/evaluations/data/). All responses are completely anonymous; no identifying information is retained once the evaluation has been submitted.

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**Class Schedule:** This schedule is subject to change. Students will be notified in writing of such changes.

For the most up to date information and activities, always refer to this document and the course site:
https://bbhosted.cuny.edu/webapps/blackboard/content/listContentEditable.jsp?content_id=_52494596_1&course_id=_1985101_1&mode=reset.

**Course schedule:**

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Chapter(s)</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to the course and expectations</td>
<td></td>
<td>9/01</td>
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<tr>
<td>Topic</td>
<td>Chapters</td>
<td>Dates</td>
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<tr>
<td>Water, pH and intro to protein function</td>
<td>3, 5, 6, 8</td>
<td>9/03, 9/08, 9/10</td>
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<tr>
<td>Amino acids and proteins</td>
<td>21</td>
<td>9/15, 9/17</td>
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<tr>
<td>Enzymes and vitamins</td>
<td>22, 29</td>
<td>9/22</td>
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<tr>
<td>Generation of biochemical energy</td>
<td>4, 26</td>
<td>9/24, 9/29</td>
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<tr>
<td>Carbohydrate structure</td>
<td>19</td>
<td>10/01, 10/06</td>
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<tr>
<td>Midterm exam</td>
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<td>10/08</td>
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<tr>
<td><strong>2. Carbohydrate metabolism</strong></td>
<td>19, 28</td>
<td>10/13, 10/15, 10/20</td>
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<tr>
<td>Lipid structure</td>
<td>20</td>
<td>10/22, 10/27</td>
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<tr>
<td>Lipid metabolism</td>
<td>20, 28</td>
<td>10/29, 11/03, 11/05</td>
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<tr>
<td>Protein and amino acid metabolism</td>
<td>21, 28</td>
<td>11/10, 11/12, 11/17</td>
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<tr>
<td>Chemical messengers</td>
<td>23</td>
<td>11/19, 12/01, 12/03</td>
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<tr>
<td>Review for exam</td>
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<td>12/08, 12/10</td>
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<tr>
<td>Reading day</td>
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<td>12/11</td>
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<tr>
<td><strong>Final exam</strong></td>
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<td>date to be announced</td>
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