General Biochemistry II (Chem5820) _Syllabus

Prerequisites
Full year of General (college) Chemistry, two semesters of Organic Chemistry, and their prerequisites, in particular College Algebra. This course is a continuation of Chem5810 and will heavily draw knowledge from Chem5810. Students who have taken Chem3810 should seek the permission of instructor at the first week of the class.

Instructor contact information
Instructor: Xiaojun Ren
E-mail: xiaojun.ren@ucdenver.edu
Office: Science 4135; Lab: Science 4139
Office Phone: 303-556-5659
Office hours: Tues/Thurs 3:30-5:00 pm or by appointment

Course information
Classroom: North 1602
Days: Tues/Thurs
Times: 2:00PM - 3:15PM

Textbook

Course overview
The course of general biochemistry II (Chem5820) is design to teach the chemical and physical foundations of the genetic information flow and the energy flow and to relate these to living organism. The course will cover the chemical and physical properties of DNA replication and repair, transcriptional synthesis of RNA, protein synthesis and degradation, and gene regulation. The course will also cover the chemical and physical properties of metabolism of carbohydrates, lipids, and amino acids, and how these processes are coordinately regulated in living organism. After completing the course, students should have attained knowledge to explain real-life situations related to the genetic information flow and the energy flow.

Course Objective
After completing the course, you will be able to:
(1) Summarize the overall processes of genetic information flow and energy flow in living organisms.
(2) Describe and explain the biochemical steps and reactions which involve in these process and the enzymes that catalyze them.
(3) Design experiments to test unknown functions of genes.
(4) Analyze and critique scientific research papers published recently.
(5) Present scientific research papers published.
(6) Explain real-life situations at molecular basis.

**Grading**
Grades will be based on a total of 500 points as detailed below.

<table>
<thead>
<tr>
<th>Points</th>
<th>Letter grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100%</td>
<td>A</td>
</tr>
<tr>
<td>85-89%</td>
<td>A-</td>
</tr>
<tr>
<td>80-84%</td>
<td>B+</td>
</tr>
<tr>
<td>75-79%</td>
<td>B</td>
</tr>
<tr>
<td>70-74%</td>
<td>B-</td>
</tr>
<tr>
<td>65-69%</td>
<td>C+</td>
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<tr>
<td>60-64%</td>
<td>C</td>
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<tr>
<td>55-59%</td>
<td>C-</td>
</tr>
<tr>
<td>Below 54%</td>
<td>D</td>
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</tbody>
</table>

The above points and the corresponding letter grade are the “guaranteed” cutoffs. However, if overall grade distribution is downwards, the course will be graded based on a distribution of the total points accumulated.

**Extra credits**
A maximum of 20 points in total is possible. Answering question in class: 1 point. Asking relevant question in class or office hours: 1 point. A maximum of 2 points per week possible.

**Regrading policy**
After an exam is graded and returned to you, the answer key will be posted on Canvas. If you think you deserve better grade on a certain question and would like me to regrade your exam, I will be happy to correct any mistakes or explain scoring.

**Class participation and breakout grading**
After the first week, a maximum of 3 points per week possible, except during exam weeks and during project work. Completed breakout/quiz: 2 points. Attendance: 1 point/day.

**Homework assignments**
Doing homework is essential for your success in this class. Homework will be collected preceding the class lecture. Each will be graded on a scale of 0 to 5 based on completeness and
effort. In addition, some exam problems will resemble homework problems. Late homework will lose 5% of their potential value for each day.

Exam
Quiz and exam questions will be based on the material covered in lectures. Each exam will focus on the materials covered by the lectures given in this time period, but may draw on materials from earlier exam periods, especially those related to the materials covered in this time period. All students are expected to take the quizzes and exams at the scheduled time. If an extreme situation arises and you must be absent from a quiz or exam, please contact me by email or phone as soon as possible to figure out a resolution. Only if you can provide a written note to that situation, you will be allowed to take a make-up exam. To preserve the academic integrity of the course, I reserve the right to alter the content and/or format of the original exam when creating a make-up exam. Please note that the difficulty of the make-up exam may be different from the original exam. If you miss an exam without making any prearrangements, you will receive 0 (zero) points for that exam.

Research paper report and presentation
Students will be grouped for research paper report and presentation. Groups are required to analyze, critique, and present a research publication (literature) on the topics that have been studied. Research publication (literature) will be assigned by instructor. The research paper report will review the overall goals of the selected research publication, explain the model systems and methods used to interpret the results and offer alternative explanations for the results. Instructions for the format and content of report will be posted on the Canvas site. You may resubmit a corrected version of the reports within one week of when it is returned to you. Resubmitted reports will be re-graded and the two grades for the report will be averaged. Late reports will lose 5% of their potential value for each day. Late resubmits will not be accepted. Each individual’s contribution to the group effort must be documented.

Presentation for the research publication (literature) you have analyzed should be prepared to last 10 minutes, plus 5-10 minutes for questions and discussions. In most cases you will not be able to present the entire paper – select the most important measurements and explain how they were done and why they are important. Grading rubrics will be distributed during the course. Each individual’s contribution to the group effort must be documented.

Team (group) work
Scientific research is to explore the unknown of the world by collaborative efforts of scientists from different disciplines. Through collaboration and forming team, researcher from different disciplines can move beyond disciplines and accomplish more. The teaming research reflects in today’s journal publication. Most scientific research papers have more than five authors, and some have more than twenty contributing people. To provide a more authentic experience of actual scientific research, research paper report, presentation, problems during class, and end-of-semester project will be done in groups. You are encouraged to meet with other students outside of class for studying and doing homework problems; however each person must turn in his/her own work so the Academic Honesty policy still applies (see below).
## Tentative Schedule for Lectures

<table>
<thead>
<tr>
<th>Date</th>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 21</td>
<td></td>
<td>Syllabus/Nucleotide and Nucleic Acids</td>
<td>Syllabus/ Ch.8</td>
</tr>
<tr>
<td>Jan. 23</td>
<td>1</td>
<td>Nucleotide and Nucleic Acids</td>
<td>Ch.8</td>
</tr>
<tr>
<td>Jan. 28</td>
<td>2</td>
<td>DNA-Based information technology</td>
<td>Ch.9</td>
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<tr>
<td>Jan. 30</td>
<td>3</td>
<td>Gene and chromosomes</td>
<td>Ch. 24</td>
</tr>
<tr>
<td>Feb. 4</td>
<td>4</td>
<td>DNA replication, repair, and recombination</td>
<td>Ch. 25</td>
</tr>
<tr>
<td>Feb. 6</td>
<td>5</td>
<td>DNA replication, repair, and recombination</td>
<td>Ch. 25</td>
</tr>
<tr>
<td>Feb. 11</td>
<td>6</td>
<td>RNA synthesis</td>
<td>Ch. 26</td>
</tr>
<tr>
<td>Feb. 13</td>
<td>7</td>
<td>RNA synthesis</td>
<td>Ch. 26</td>
</tr>
<tr>
<td>Feb. 18</td>
<td>8</td>
<td>Protein synthesis and degradation</td>
<td>Ch. 27</td>
</tr>
<tr>
<td>Feb. 20</td>
<td>9</td>
<td>Protein synthesis and degradation</td>
<td>Ch. 27</td>
</tr>
<tr>
<td>Feb. 25</td>
<td>10</td>
<td>Regulation of gene expression</td>
<td>Ch. 28</td>
</tr>
<tr>
<td>Feb. 27</td>
<td>11</td>
<td>Group project 1</td>
<td></td>
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<tr>
<td>Mar. 4</td>
<td>1</td>
<td>Group project 1</td>
<td></td>
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<tr>
<td>Mar. 6</td>
<td>2</td>
<td>No class (Optional: attending the seminar on Friday Mar. 7)</td>
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<tr>
<td>Mar. 11</td>
<td>3</td>
<td>Group project 1</td>
<td></td>
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<tr>
<td>Mar. 13</td>
<td>4</td>
<td>Review genetic information flow</td>
<td></td>
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<tr>
<td>Mar. 18</td>
<td>5</td>
<td>Student review</td>
<td></td>
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<tr>
<td>Mar. 20</td>
<td>6</td>
<td>Exam-1</td>
<td></td>
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<tr>
<td>Mar. 25</td>
<td>7</td>
<td>Spring break</td>
<td></td>
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<tr>
<td>Mar. 27</td>
<td>8</td>
<td>Spring break</td>
<td></td>
</tr>
<tr>
<td>Apr. 1</td>
<td>9</td>
<td>Chemical foundations of metabolism</td>
<td>Ch. 13</td>
</tr>
<tr>
<td>Apr. 3</td>
<td>10</td>
<td>Chemical foundations of metabolism</td>
<td>Ch. 13</td>
</tr>
<tr>
<td>Apr. 8</td>
<td>11</td>
<td>Glycolysis, gluconeogenesis and pentose pathway</td>
<td>Ch. 14-Ch15.1-15.3</td>
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<tr>
<td>Apr. 10</td>
<td>12</td>
<td>Glycolysis, gluconeogenesis and pentose pathway</td>
<td>Ch. 14- Ch15.1-15.3</td>
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<td>Apr. 15</td>
<td>13</td>
<td>Glycogen</td>
<td>Ch. 15.4-15.5</td>
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<tr>
<td>Apr. 17</td>
<td>14</td>
<td>TCA cycle</td>
<td>Ch. 16</td>
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<tr>
<td>Apr. 22</td>
<td>15</td>
<td>TCA cycle/Oxidative phosphorylation</td>
<td>Ch. 19</td>
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<td>Apr. 24</td>
<td>16</td>
<td>Oxidative phosphorylation</td>
<td>Ch. 19</td>
</tr>
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<td>Apr. 29</td>
<td>17</td>
<td>Group project</td>
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<tr>
<td>May. 1</td>
<td>18</td>
<td>Group project</td>
<td></td>
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<tr>
<td>May. 6</td>
<td>19</td>
<td>Group project</td>
<td></td>
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<tr>
<td>May. 8</td>
<td>20</td>
<td>Review energy flow</td>
<td></td>
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<tr>
<td>May. 13</td>
<td>21</td>
<td>Exam-2 (NC1602 2:00 pm-3:15 pm)</td>
<td></td>
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<tr>
<td>May. 15</td>
<td>22</td>
<td></td>
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Policies and administrative information

Enrollment: It is each student’s responsibility to confirm class enrollment. It is very difficult to add a student to a class after the census date, so it is strongly recommended that all students check their own enrollment status before that date.

Accessibility: The University of Colorado Denver is committed to providing reasonable accommodation and access to programs and services to persons with disabilities. Students with disabilities who want academic accommodations must register with Disability Resources and Services (DRS), 2514 North Classroom Building, 303-556-3450, TTY 303-556-4766, FAX 303-556-2074. Their staff will assist in determining reasonable accommodations as well as coordinating the approved accommodations. I will be happy to provide approved accommodations, once you provide me with a copy of DRS’s letter.

Academic Honesty: Students are expected to know, understand, and comply with the ethical standards of the University. In addition, students have an obligation to inform the appropriate official of any acts of academic dishonesty by other students of the University. Academic dishonesty is defined as a student’s use of unauthorized assistance with intent to deceive an instructor or other such person who may be assigned to evaluate the student’s work in meeting course and degree requirements. Examples of academic dishonesty include, but are not limited to, the following:

Plagiarism: Plagiarism is the use of another person’s distinctive ideas or words without acknowledgment. The incorporation of another person’s work into one’s own required appropriate identification and acknowledgment, regardless of the means of appropriation. The following are considered to be forms of plagiarism when the source is not noted:

- Word-for-word copying of another person’s ideas or words
- The mosaic (the interspersing of one’s own words here and there while, in essence, copying another’s work)
- The paraphrase (the rewriting of another’s work, yet still using their fundamental idea or theory)
- Fabrication of references (inventing or counterfeiting sources)
- Submission of another’s work as one’s own
- Neglecting quotation marks on material that is otherwise acknowledged (Note: in science, previous work is very rarely quoted verbatim. Proper style for a scientific paper is to paraphrase or summarize previous work and cite it).

Cheating: Cheating involves the possession, communication, or use of information, materials, notes, study aids or other devices not authorized by the instructor in an academic exercise, or communication with another person during such an exercise. Example of cheating are:

- Copying from another’s paper or receiving unauthorized assistance from another during an academic exercise or in the submission of academic material
Using a calculator when its use has been disallowed

Collaborating with another student or students during an academic exercise without the consent of the instructor

Fabrication and Falsification: Fabrication involves inventing or counterfeiting information, i.e., creating results not obtained in a study or laboratory experiment. Falsification, on the other hand, involves the deliberate alteration of changing of results to suit one’s needs in an experiment or other academic exercise.

Multiple Submissions: This is the submission of academic work for which academic credit has already been earned, when such submission is made without instructor authorization.

Misuse of Academic Materials: The misuse of academic materials includes, but is not limited to, the following:

Stealing or destroying library or reference materials or computer programs.
Stealing or destroying another student’s notes or materials, or having such materials in one’s possession without the owner’s permission.
Receiving assistance in locating or using sources of information in an assignment when such assistance has been forbidden by the instructor.
Illegitimate possession, disposition, or use of examinations or answer keys to examinations.
Unauthorized alteration, forgery, or falsification.
Unauthorized sale or purchase of examinations, papers, or assignments.

Complicity in Academic Dishonesty: Complicity involves knowingly contributing to another’s acts of academic dishonesty.

Students are required to know the academic honesty policy of UCD. These policies are available at http://catalog.ucdenver.edu/content.php?catoid=6&navoid=530. We will strive to make this class a collaborative learning environment, but when it comes to the quizzes and exams, you must be held individually accountable for your knowledge and ability.

**ACADEMIC DISHONESTY WILL NOT BE TOLERATED & WILL RESULT IN AN F.**

At a minimum, academic honesty violations in this class will result in a grade reduction (most likely an F grade) for the quiz or exam in question. The maximum penalty is an F grade in the course. Violations may also be reported to the UCD Academic Ethics Committee, which determines if a violation should be included in a student’s permanent record.

**Incomplete grades:** CLAS policy states that incomplete grades are not granted for low academic performance. To be eligible for an Incomplete, students must:

- Successfully complete a minimum of 75% of the course.
- Have special circumstances beyond their control that preclude them from attending class and completing graded assignments.
- Make arrangements to complete missing assignments with the original instructor. Verification of special circumstances is required.
Fall 2013 CLAS Academic Policies

Spring 2014 CLAS Academic Policies

The following policies pertain to all degree-seeking students in the College of Liberal Arts and Sciences.

- **Schedule verification:** It is each student’s responsibility to verify online that his/her official registration is correct: verify before classes begin and prior to the drop/add deadline. Failure to verify schedule accuracy is not sufficient reason to justify a late add or drop.

- **E-mail:** Students must activate and regularly check their official student e-mail account for CU Denver business: [http://www.ucdenver.edu/student-services/Pages/WebMail.aspx](http://www.ucdenver.edu/student-services/Pages/WebMail.aspx). Those who forward email must check CU Denver e-mail regularly for messages not automatically forwarded.

- **Waitlists:**
  - Students are **not** automatically notified if they are added to a class from a waitlist.
  - Students are **not** automatically dropped from a class if they never attended, stopped attending, or do not make tuition payments.
  - Waitlists are purged after the 1st week of classes, after which a paper Schedule Adjustment Form (SAF or drop/add form) is required. It is the student's responsibility to get the form (online or at the Advising Office, NC 4002), have it signed, deliver it to the Registrar (Annex 100) or the Student Services Center (NC 1003), and verify her/his schedule online.

- **Late adds** (after 5 February) will be approved only when circumstances surrounding the late add are beyond the student’s control. This will require a written petition and verifiable documentation. Petition forms are available in NC 4002. The signature of a faculty member on a SAF does not guarantee that a late add petition will be approved.

- **Late drops/withdrawals** (after 7 April) will be approved only when circumstances surrounding the late drop have arisen after the published drop deadline and are beyond the student’s control. This will require a written petition and verifiable documentation. The signature of a faculty member does not guarantee that a late drop/withdrawal petition will be approved.

- **Tuition:** Students are responsible for completing arrangements with financial aid, family, scholarships, etc. to pay their tuition prior to Census Date (5 February). Students who drop after that date are (1) financially responsible for tuition and fees, (2) academically responsible and will receive a "W" grade, and (3) are ineligible for a refund of COF hours or tuition.

- **Graduation:**
  - Undergraduate students wishing to graduate in Spring 2014 must complete the online Graduation Application form, in the UCD Access Portal, and meet with their academic advisor to obtain a graduation application. This application must be submitted by Census Date (5 February). You can obtain an application only after meeting with your advisor. There are no exceptions to this policy.
  - Graduate students wishing to graduate in Spring semester 2014 must complete the online Graduation Application form, in the UCD Access Portal, and have a Request for Admissions to Candidacy on file with the CU Denver Graduate School (LSC 1251) no later than 5 PM, February 5, 2014.

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**Important Dates and Deadlines**

- **January 20, 2014:** Martin Luther King Holiday. Last day to withdraw from all classes via UCDAccess and receive a refund of the $200 advance payment and all tuition.
- **January 21, 2014:** First day of classes.
- **January 26, 2014:** Last day to add or waitlist classes using UCDAccess. After this date, a Schedule Adjustment Form (SAF) is required to change, add, or drop.
- **January 27, 2014:** Last day to drop without a $100 drop charge. No adds permitted on this day.
January 28 – February 5, 2014:
- UCDAccess registration is closed; registration now requires a SAF with faculty signature.
- Verify your registration via UCDAccess. You are not registered for a course unless your name appears on the official roster; conversely, your name may have been added automatically from the waitlist without notification, which means that you will be held responsible.

February 5, 2014: Census date.
- 2/5/14, 5 PM: Last day to add structured courses without a written petition for a late add. This is an absolute deadline and is treated as such. This does not apply to independent studies, internships, project hours, thesis hours, dissertation hours, and modular courses.
- 2/5/14, 5 PM: Last day to drop a course or completely withdraw from Spring 2014 using a SAF and still receive tuition refund, minus the drop fee. After this date, tuition is forfeited and a "W" will appear on the transcript. This includes section changes. This is an absolute deadline.
- 2/5/14, 5 PM: Last day to request Pass/Fail or No-Credit option for a course.
- 2/5/14, 5 PM: Last day for a graduate student to register for a Candidate for Degree and last day for a Ph.D. student to petition for a reduction in hours.
- 2/5/14, 5 PM: Last day to apply for Spring 2014 graduation. If an undergraduate, you must make an appointment and see your academic advisor to apply. If a graduate student, you must complete the Intent to Graduate and Candidate for Degree forms.

February 17-26, 2014: Faculty can use the Early Alert system.

March 24-30, 2014: Spring Break-(no classes; campus open).

April 7, 2014, 5 PM: Last day for non-CLAS students to drop or withdraw without a petition and special approval from the academic dean. After this date, a dean’s signature is required.

April 22, 2014, 5 PM: Last day for CLAS students to drop or withdraw with signatures from the faculty and dean but without a full petition. After this date, all schedule changes require a full petition. Petitions are available in NC 4002 for undergraduates and in the CU Denver Graduate School offices for graduate students.

May 12-17, 2014: Finals Week. No schedule changes will be granted once finals week has started--there are no exceptions to this policy. Commencement is May 17.

May 22, 2014: Due date for faculty submission of grades (tentative).