Chemistry 8 Organic Chemistry 
Spring 2018

Contact Information
Instructor: Laura Kapitzky, PhD
Office Location: DH 417
Telephone: 408-924-4952
Email: laura.kapitzky@sjsu.edu
Office Hours: 1:30 – 2:30 Tuesdays and Thursdays
Class Days/Time: Lecture TTh 9:00 - 10:15AM
Classroom: DH 351
Prerequisites: CHEM 001B (with a grade of "C" or better; "C-" not accepted). Notes: CHEM 008 is not a satisfactory prerequisite for CHEM 112B. No credit toward Chemistry major or minor.

Texts/Readings

Required Textbook

Optional Study Guide

Canvas Course Website and MYSJSU Messaging
Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the course Canvas site. I may also use the email address listed on your mySJSU account to send information on Chem 8. You are responsible for checking
for messages on this email and the Chem 8 Canvas site on a regular basis to learn of any updates. Canvas website: https://sjsu.instructure.com/courses/1257195

Course Description and Prerequisites

Introduction to the chemistry of carbon compounds for allied health majors and others requiring only 3 units of organic chemistry lecture. Prerequisite: CHEM 001B (with a grade of "C" or better; "C-" not accepted). Notes: CHEM 008 is not a satisfactory prerequisite for CHEM 112B. No credit toward Chemistry major or minor.

Chemistry 8 is designed to introduce you to organic chemistry in a one-semester course format. The intent of this course is to familiarize you with the basic concepts and properties of molecules based on carbon. As you will see, organic chemistry impacts many areas of your daily life.

Course Goals and Learning Objectives (CLOs)

- Appreciation for the nature and scope of organic chemistry.
- Application of key concepts from general chemistry including electronegativity, bonding (ionic and covalent), hybridization of atomic orbitals, and molecular orbital theory to organic systems.
- Draw valence bond and Lewis dot structure for organic species, including formal charges.
- Draw skeletal structures for organic compounds.
- Apply acid-base concepts to organic systems; predict ordering of acid or base strength.
- Name alkanes, alkenes, polyenes, alkynes, alkyl halides, aromatic compounds, carbonyl compounds, amines and their various derivatives using systematic (IUPAC) nomenclature.
- Learn common names for some key chemicals.
- Draw reaction mechanisms for some key reactions.
- Recognize stereochemistry and be able to apply the Cahn-Ingold-Prelog system to designation of stereochemistry (E/Z or R/S).
- Learn many of the reactions of alkanes, alkenes, polyenes, alkynes, aromatic, carbonyl, and amine compounds, and closely related species. Be able to predict reactions involving these functional groups.
- Be able to solve problems employing spectroscopic methods including mass spectrometry, infrared and NMR spectroscopy.
- Understand the basic chemical and structural features of biomolecules, including lipids, carbohydrates, amino acids and proteins, and nucleic acids.

**Program Learning Outcomes (PLOs)**

Chemistry 8 satisfies the following Undergraduate Program Learning Outcome for the Chemistry Department:

Program Learning Objective #2 - Demonstrate understanding of core concepts, methods and limits of scientific investigation to effectively solve problems in organic chemistry.

**Course Requirements and Assignments**

**Catalog Description:** Introduction to the chemistry of carbon compounds for allied health majors and others requiring only 3 units of organic chemistry lecture.

The scheduled time for this course is Tues and Thurs 9:00am to 10:15am in DH 351.

**Tentative Course Calendar:** A tentative schedule for the semester appears at the end of this document. Note in particular the dates for the Hour Exams and the Final Exam.

**University Policies and Student Responsibilities**

“Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practical. Other course structures will have equivalent workload expectations as described in the syllabus.” (3 credit course = ~9 hrs/week)

NOTE that University policy F69-24, “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to ensure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”
Attendance Policy

Beyond the initial day of class, roll will not be taken. However, attendance of the lectures is mandatory. If you miss a lecture, you are still responsible for all the material discussed in lecture (some of which may not be in the text). Note we will cover a significant amount of material during each class meeting. If you miss class meetings, it will be difficult to catch up due to the volume. Also, you are responsible for keeping up with any changes in the course or exam schedule, which otherwise may not be publicized outside of the lecture time. Please arrive promptly at 9:00am. A tentative lecture and course schedule is found at the end of this Greensheet.

Exams

There will be 3 midterm exams (each approx. 60min) given throughout the semester, each with a maximum score of 100 points. You are required to take any 2 midterm exams. If you take all 3 midterm exams, the two highest scores will be used in the calculation of your grade. If you do not take one of the midterm exams, for any reason, this will be the score which will not be used in the grade calculation. The midterm exams will be given at the start of the lecture period. Plan to arrive on time when an exam is scheduled, since all exams will be collected at the same time, no extra time is provided if you start late.

The final exam will be comprehensive for all material covered in Chem 8, and will be worth 150 points. The final exam is required for everyone.

Quizzes

Quizzes will be given at the start of the lecture and will cover the material since the last quiz or exam. Each quiz will be worth 20 points total and will be completed in the first 15 minutes of class. Questions will be graded with no partial credit; it is either right or wrong. Arrive on time since all quizzes will be collected at the same time, no extra time is provided if you start late. Three quizzes will be given but only two will count towards your grade. The lowest quiz score (or missed quiz) will be not be used in the calculation of your final grade.

Homework

Homework problem sets for each chapter are listed at the end of this greensheet. Homework will be due one week after we finish the chapter in lecture, and will be submitted on Canvas. Homework will be graded for completion, and no partial credit will be given. Late homework is not accepted, and the lowest homework score will be dropped from your grade.
In-class Work – Extra Credit

Scattered throughout the semester there will be a few in-class problems assigned. These problems will be worth a variable number of extra credit points, and will be graded for completion. Extra credit points will be added to your final point total for the class. There are no make-ups for missed in-class problems.

Missed Exams, Quizzes, Regrade Requests, and Late Homework

Missed Quizzes and Exams

You are required to take any 2 of the 3 midterm exams given. If a midterm exam or quiz is not taken for any reason, that exam or quiz will be the one score that is not used in final grade calculation. A makeup will only be considered if you miss a second midterm exam or quiz due to an unforeseen emergency and provide a documented and verifiable reason. In all cases, you must contact me as soon as reasonably possible. Before any action will be taken, you will be required to provide a verifiable document describing your emergency with an official’s name and phone number. Note this only applies if you miss a second exam or quiz.

Missed Homework and In Class Work

Late homework will not be accepted. There are no make-ups for missed in-class work. The lowest homework score and lowest in class work score will be dropped in calculating your final grade.

Regrade Requests

Any request for a regrade or recalculation of any exam or quiz must be made within one week after the exam is returned in class (if you are not in class the day it is returned, it is your responsibility to obtain your exam/quiz from me). No regrades will be considered beyond this time. The exam must be left with me, and I will review the entire exam.

Grading Policy

Your final grade will be based on:

- 70 (15%) points for homework (14 assignments, 5 points each)
- 40 (9%) points for in-class quizzes (2 quizzes, 20 points each)
- 200 (43%) points for two Hour exams (2 exams, 100 points each)
- 150 (33%) points for the Final (you can’t drop the final)

TOTAL 460 points
Grades will be assigned on a "+/" system. The course grades will be assigned according the following ranges:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>100-97%</td>
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<tr>
<td>A</td>
<td>96-93%</td>
</tr>
<tr>
<td>A-</td>
<td>92-90%</td>
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<tr>
<td>B+</td>
<td>89-87%</td>
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<tr>
<td>B</td>
<td>86-83%</td>
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<tr>
<td>B-</td>
<td>82-80%</td>
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<td>C+</td>
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<tr>
<td>D-</td>
<td>62-60%</td>
</tr>
<tr>
<td>F</td>
<td>&lt;59%</td>
</tr>
</tbody>
</table>

Any modifications will be in your favor, but you should not expect significant changes. Note that the "class average" for a given exam is not necessarily a "C" grade. Grades are assigned by these grade ranges, not by "curves."

In assigning grades, one set of criteria are applied equally to all students in the class - everyone has the same opportunity as everyone else to earn their grade.

Note that "incomplete" grades will only be considered if you have an unexpected situation or emergency that prevents you from finishing the semester. It is required that you have completed most of the course work with a passing grade until that point. A typical situation is a medical emergency that prevents you from taking the final exam - to be considered you must provide information and a means to verify the emergency. Poor performance in the class or inability to keep up with the material is not an acceptable reason for an incomplete or to drop the class.

When exams are returned to you, you will usually find written comments on incorrect answers. Read these carefully since they not only provide feedback on those exam questions, but are intended to guide you for future exams. The keys for every exam will be posted shortly after the exam is given. Use this information for a self-assessment of your progress in Chem 8. Ask me questions if something is not clear.

Exam and Quiz Policies:

- A "scantron" may be required for exams, I will announce this in class.
- IDs may be randomly checked so always bring a picture ID.
- Seats will be assigned at my discretion.
- All you need for exams and quizzes are a prepared mind and a pen or pencil. No other materials are allowed at your desk during exams and quizzes.

Other Class Policies:

- Courtesy and respect: treat your fellow classmates and your instructor as you would like to be treated – respectfully and with courtesy.
- Audio Recording: audio (only) recording is allowed. I do not allow video recording. See also University Policies below.
• **Cell Phones:** Out of courtesy, turn these off during lectures and exams.

• **Computers:** You may use your laptop only during class lectures, as long as you can do so in a way that is not distracting to other students. Computers or any web-enabled devices are not allowed during exams.

**Safe and Respectful Community**

We hope that the classroom and laboratory will serve as an environment that will promote learning and the development of new ideas, as well as be a safe and respectful community. Behavior that interferes with the normal academic function in a classroom or lab is unacceptable. Students exhibiting this behavior will be asked to leave the class. Examples of such behavior include:

a) Persistent interruptions or using disrespectful adjectives in response to the comments of others.

b) The use of obscene or profane language.

c) Yelling at classmates and/or faculty.

d) Persistent and disruptive late arrival to or early departure from class without permission.

e) Physical threats, harassing/bullying behavior, or personal insults (even when stated in a joking manner).

f) Use of personal electronic devices such as pagers, cell phones, PDAs in class, unless it is part of the instructional activity.

**University Policies**

As a student at SJSU, you should review these University Policies which apply to ALL university courses.

http://www.sjsu.edu/gup/syllabusinfo/#GeneralExpectations

The topics include the following:

- General Expectations, Rights and Responsibilities of the Student
- Dropping and Adding
- Consent for Recording of Class and Public Sharing of Instructor Material
- Academic integrity
- Campus Policy in Compliance with the American Disabilities Act
- Student Technology Resources
- SJSU Peer Connections
In addition to the university policies above, I have additional policies that apply specifically to Chem 8. Please note the following:

Consent for Recording of Class and Public Sharing of Instructor Material
Audio recording of lectures is allowed. I do not allow video recording of lectures. Much of the material I prepare for Canvas is prepared by me and is considered my personal property. It may not be shared with anyone who is not enrolled in Chem 8.

Academic integrity
Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act
If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/drc/ to establish a record of their disability.

Emergencies and Building Evacuations
If you hear a continuously sounding alarm, or are told to evacuate the building by an Emergency Coordinator, walk quickly to the nearest exit (out the door and turn left to exit the Science Building). Take your personal belongings as you may not be
allowed to return. Follow the instructions of the Emergency Coordinators. Be quiet so you can hear instructions. Once outside, move away from the building. Do not return to the building unless the Police or the Emergency Coordinator announces that this is permissible.

**Study Tips for Chem 8**

In Chem 8, we will cover a broad range of material. Although we will not go into as much detail as the one-year OChem courses (112A/112B), we still will cover much of the background and fundamental concepts important in organic chemistry. The material we cover will require a certain amount of memorization, but note that understanding and **application** of chemical principles will also be an important feature of this course (and the exams!). Some tips for success in Chem 8:

1. **Read the assigned chapter sections before coming to class.** Much of the material covered in class will be based on the chapter readings, and the lecture will emphasize and illustrate what you have already read. If you know what is already in the book before the lecture, you will not have to spend your time copying down information which replicates what is in the text, but only new information that is described. This way, you will have the chance to really listen to the important points that are mentioned, and may avoid writer's cramp! Additionally, because of the volume of material we will have to cover, I may mention important points or reactions briefly in lecture, especially if I feel the book does a good job in describing the information. **You are always responsible for the information assigned in the chapter readings, whether or not we spend a significant time on the topic in lecture. If the information is still unclear, ask me!** It is also possible that I may add information and questions to the lecture that is not in the book (another reason why attendance is important!).

2. **During the lecture, listen for important points and terms and highlight them in your notes for further study.** As soon as possible after the lecture, look up these items and make sure you understand them. It will be a good idea to make a list summarizing these points; consider making a **List of Key Concepts** for each chapter. Periodically, pull out this list and refresh your memory on these points, referring to the textbook and notes, if necessary. This will be especially important as the semester progresses, and new material incorporates information that was covered earlier.

3. **PROBLEMS, PROBLEMS, PROBLEMS!!!** Working problems is extremely important in organic chemistry - you may understand the concepts from the book and lecture perfectly, but you must also show that you can apply them in the context of a problem for the exams. I suggest that you work on the problems immediately after each class. Don’t wait until just before an exam to do the problems!
4. Before an exam, review the material in the text and lecture notes. Use your summary list of key points and make sure you understand all of them, and can explain them without notes. Once again, do the assigned problems (and any others provided) and be sure you can work them without referring to notes. Work them alone and under conditions as if you are taking a real exam.

You are welcome to send me questions by email. If you have a large number of questions please come to my office hours. I may not be monitoring questions that come in over the weekends.

**Homework Problem Sets**

Chapter 1:  1.34, 1.35, 1.38, 1.40, 1.47, 1.48, 1.53, 1.57, 1.60, 1.64

Chapter 2:  2.34, 2.39, 2.45, 2.46, 2.47, 2.54, 2.59, 2.73

Chapter 3:  3.25, 3.26, 3.29, 3.40, 3.42, 3.47, 3.56, 3.59

Chapter 4:  4.33, 4.35, 4.39, 4.42, 4.48, 4.53, 4.56, 4.57

Chapter 5:  5.26, 5.27, 5.32, 5.33, 5.36, 5.40, 5.47, 5.50, 5.58

Chapter 6:  6.29, 6.32, 6.36, 6.37, 6.38, 6.40, 6.42, 6.44, 6.45

Chapter 7:  7.25, 7.26, 7.30, 7.33, 7.34, 7.36, 7.39, 7.41, 7.44

Chapter 8:  8.26, 8.27, 8.33, 8.36, 8.45, 8.55


Chapter 10: 10.33, 10.35, 10.39, 10.40, 10.44, 10.53


Chapter 12: 12.24, 12.25, 12.26, 12.30, 12.36, 12.38, 12.50, 12.54

Chapter 14: 14.27, 14.32, 14.33, 14.36, 14.43

Chapter 15 & 16: 15.23, 15.25, 15.32, 15.38, 15.39, 16.21, 16.23
# Tentative Class Schedule

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
<th>Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>1/25/2018</td>
<td>Course intro, study tips for O-chem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td>1/30/2018</td>
<td>Structure and Bonding, Formal Charge</td>
<td>1.1 - 1.5</td>
<td></td>
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<tr>
<td>Thursday</td>
<td>2/1/2018</td>
<td>Structure and Bonding; Acids and Bases</td>
<td>1.6 - 1.12</td>
<td></td>
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<tr>
<td>Tuesday</td>
<td>2/6/2018</td>
<td>Alkanes</td>
<td>2.1 - 2.5</td>
<td>Chapter 1 due</td>
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<tr>
<td>Thursday</td>
<td>2/8/2018</td>
<td>Quiz 1, Alkanes 2</td>
<td>2.6 - 2.11</td>
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<tr>
<td>Tuesday</td>
<td>2/13/2018</td>
<td>Alkenes and Alkynes</td>
<td>3.1 - 3.9</td>
<td>Chapter 2 due</td>
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<tr>
<td>Thursday</td>
<td>2/15/2018</td>
<td>Reactions of Alkenes and Alkynes</td>
<td>4.1 - 4.6</td>
<td>Chapter 3 due</td>
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<tr>
<td>Tuesday</td>
<td>2/20/2018</td>
<td>Reactions of Alkenes and Alkynes</td>
<td>4.7 - 4.11</td>
<td></td>
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<tr>
<td>Thursday</td>
<td>2/22/2018</td>
<td>EXAM 1 (Chpt 1 - 4)</td>
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<td>Chapter 4 due</td>
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<td>2/27/2018</td>
<td>Aromatic Compounds</td>
<td>5.1 - 5.6</td>
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<tr>
<td>Thursday</td>
<td>3/1/2018</td>
<td>Aromatic Compounds</td>
<td>5.7 - 5.10</td>
<td></td>
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<tr>
<td>Tuesday</td>
<td>3/6/2018</td>
<td>Stereochemistry; Fischer Projections</td>
<td>6.1 - 6.6</td>
<td>Chapter 5 due</td>
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<tr>
<td>Thursday</td>
<td>3/8/2018</td>
<td>Quiz 2, Stereochemistry</td>
<td>6.7 - 6.10</td>
<td></td>
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<tr>
<td>Tuesday</td>
<td>3/13/2018</td>
<td>Organohalides: Substitution Reactions</td>
<td>7.1 - 7.6</td>
<td>Chapter 6 due</td>
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<tr>
<td>Thursday</td>
<td>3/15/2018</td>
<td>Organohalides: Elimination Reactions</td>
<td>7.7 - 7.10</td>
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<tr>
<td>Tuesday</td>
<td>3/20/2018</td>
<td>Alcohols, Phenols, Ethers</td>
<td>8.1 - 8.8</td>
<td>Chapter 7 due</td>
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<tr>
<td>Thursday</td>
<td>3/22/2018</td>
<td>EXAM 2 (Chpt 5 - 8)</td>
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<td>Tuesday</td>
<td>3/27/2018</td>
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<tr>
<td>Thursday</td>
<td>3/29/2018</td>
<td><em><strong>Spring Break</strong></em></td>
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<td></td>
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<tr>
<td>Tuesday</td>
<td>4/3/2018</td>
<td>Aldehydes and Ketones 1</td>
<td>9.1 - 9.6</td>
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<tr>
<td>Thursday</td>
<td>4/5/2018</td>
<td>Aldehydes and Ketones 2</td>
<td>9.7 - 9.10</td>
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<td>Tuesday</td>
<td>4/10/2018</td>
<td>Carboxylic Acids and Derivatives 1</td>
<td>10.1 - 10.5</td>
<td>Chapter 9 due</td>
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<tr>
<td>Thursday</td>
<td>4/12/2018</td>
<td>Carboxylic Acids and Derivatives 2</td>
<td>10.6 - end</td>
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<td>4/17/2018</td>
<td>Quiz 3, α-Carbonyl Reactions</td>
<td>11.1 - 11.6</td>
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<td>Thursday</td>
<td>4/19/2018</td>
<td>α-Carbonyl Reactions</td>
<td>11.7 - 11.11</td>
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<td>Tuesday</td>
<td>4/24/2018</td>
<td>Amines</td>
<td>12.1 - 12.7</td>
<td>Chapter 11 due</td>
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<tr>
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<td>4/26/2018</td>
<td>EXAM 3 (Chpt 9 - 12)</td>
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<td>5/1/2018</td>
<td>Carbohydrates</td>
<td>14.1 - 14.11</td>
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<tr>
<td>Thursday</td>
<td>5/3/2018</td>
<td>Amino Acids, Peptides, Proteins</td>
<td>15.1 - 15.5</td>
<td>Chapter 14 due</td>
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<tr>
<td>Tuesday</td>
<td>5/8/2018</td>
<td>Amino Acids, Peptides, Proteins</td>
<td>15.6 - 15.10</td>
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<tr>
<td>Thursday</td>
<td>5/10/2018</td>
<td>Lipids and Nucleic Acids</td>
<td>16.1 - 16.11</td>
<td></td>
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<tr>
<td>Wednesday</td>
<td>5/16/2018</td>
<td>Final Exam: 7:15 - 9:30 am</td>
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<td>Chapter 15 and 16</td>
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