Syllabus

Chemistry 2210
Organic Chemistry
Spring 2022

Professors: Ned B. Bowden

Class Times: The lectures are on Tuesday and Thursday from 9:30 to 10:45 in Shambaugh library auditorium and from 11:00 to 12:15 in Chemistry W290.

UICapture: I will record the lectures and post them on ICON almost immediately after class is complete.

Final Exam: The date of the final exam will be announced during the semester.
Note: I do not have a make-up final. If you miss the final, you have to either take a zero or take the final at the end of the Summer or Fall 2022 semesters.

Contact Info: Ned Bowden
W425 Chemistry Building
Ned-bowden@uiowa.edu

Course Website: ICON, http://icon.uiowa.edu

IMPORTANT: To reach me or set an appointment please send an email and I will try to respond quickly.

Office Hours
Ned's office hours are on Mondays from 3:00 to 4:30 and on Wednesdays from 11:30 to 1:00 in my office in W425 CB. Based on attendance, I may need to move discussion sections down the hall to room E427 CB. If I move my office hours to E427, I will put a note on my door.
I run my office hours as question and answer sessions. Please come with questions about what you are having trouble understanding. We can work through problems to help you understand the material.

I reserved these times for you and am happy to meet and discuss problems you are having. If these times do not work for you, we will set an appointment by email to meet another time.

**Discussion Sections**
The course TA’s will lead these discussions. This time is reserved for problem solving, discussion of lecture material, and explanations of exam answers. I strongly encourage you to attend these sections as the TAs are excellent and can help you learn the material. Their email addresses and office hours are given below. All TA office hours are held in the TA center on the second floor of the chemistry building.

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<tr>
<th>TA</th>
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<tr>
<td>Banarjee Zetandro</td>
<td><a href="mailto:zetandro-banarjee@uiowa.edu">zetandro-banarjee@uiowa.edu</a></td>
<td>Monday: 6:30-7:30 PM</td>
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<td>Thursday: 6:30-7:30 PM</td>
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<tr>
<td>Grant Shivers</td>
<td><a href="mailto:grant-shivers@uiowa.edu">grant-shivers@uiowa.edu</a></td>
<td>Monday: 4:30-5:30 PM</td>
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<td>Tuesday: 4:30-5:30 PM</td>
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**Why Are You in This Class?**
Organic chemistry is a beautiful subject! I have taught this class before and know that most of you are “pre” students. By this statement I mean that you are premed, prenursing, prepharmacy, prelaw, or another variant. This class is required for entrance into a professional school or is needed to prepare you for a nationwide test. These are all fine reasons for taking this class and I am glad you are here. My goal is to teach you some of the most beautiful parts of organic chemistry in hopes that it can help you learn the material in other, closely related courses.

In this class you are going to learn how to think critically. Organic chemistry is more than the memorization of a bunch of facts and it is certainly more than applying a few simple rules to get the right answer. **Organic chemistry is 90% science and 10% art**; I can teach you the right rules and how to think about problems in organic chemistry, but you must learn how to apply these rules. This class is considered tough because it is unlike others that you have taken before. You will not have a series of equations from which you may derive answers. You will have a bunch of facts and you must learn how to think critically to solve problems. Therefore, you must learn to think like a detective and piece answers together with everything that you know. I will help you as much as I can to learn these skills.

**How to Study for This Class**
This class is not one where you can look over the material right before the exam and expect to do well. This class requires constant and diligent effort in order to do well. We compiled a list of suggestions to help you succeed. These are only suggestions; some of you may be naturals at organic chemistry and can get by with less work, but for the other 99% of the class this list will help you get the grade that you want.

1. Study for this class at least one hour a day. Organic chemistry is hard to learn but with consistent effort you can do it. Some of you will spend more time; others will spend less time depending on your abilities, motivation, and expectations for a grade.

2. Do all of the homework and suggested problems. You will learn from doing the homework, you will learn by struggling with the homework! Learning occurs when you are forming questions in your mind and seeking the answers; learning does not happen when you are copying
someone else’s work. Your grade in this class depends on your test taking skills so use the homework to learn the material.

3. Form study groups.

4. Skim the text before coming to class.

5. Go to the discussion sections and ask questions.

6. Rewrite your lecture notes. You will be surprised as to how much this will help you learn the material.

7. Study with a pencil and paper nearby! You will learn the material best by writing it down in your notebook as you are studying. Most people don’t learn well by sight alone, you must use your hands when you study.

**What You Should Take Away From This Class**
1. The ability to draw mechanisms for simple organic reactions
2. Knowledge of common reactions
3. Understand functional groups and how to convert from one to another
4. Understand how to apply organic chemistry to a variety of fields including most things biological.
5. The ability to name molecules and recognize key functional groups
6. Understand some of the how and why of organic chemistry.

**Exams**
There will be three hourly exams on the following days from 8:45-10:15 PM.

- **Exam 1:** Wednesday, February 16th in MacBride Hall Auditorium
- **Exam 2:** Wednesday, March 30th in MacBride Hall Auditorium
- **Exam 3:** Wednesday, April 27th in MacBride Hall Auditorium

Leave all textbooks, models, notes, etc. at home or you will be required to leave them in the front of the classroom during the exam. The exams will be closed book and the answers should be written in blue or black ink. Exams written in pencil will not be eligible for a regrade. Exams will be returned following the exam grading and will be available at the chemistry center on the second floor of the chemistry building (E225 CB) immediately after that class. Your grades will be posted on ICON as soon as possible.

Each exam is comprehensive but will emphasize material since the previous exam. Organic chemistry builds on what was learned before, it is important to continually add to your fountain of knowledge. Exams must touch on material that was learned earlier in the semester, but in most instances we will use concepts that we covered since the previous exam. It is wise to review all the material since Day 1 for each exam.

Anything that is covered through the end of class on the day before the exam is fair game for the exam. We more or less follow the book, so you will be able to determine where we stopped before the exam. If you have any doubt, study for the whole chapter that we are working on.

The final exam will be comprehensive.

**On-line Homework**
The online homework on Achieve will force you to draw structures, learn concepts, and prepare you to excel in this course. These problems are critical to learning chemistry, so we will take advantage of Achieve.

I will post one homework assignments for each chapter (chapter 1-13). I will post the assignment for each chapter the day that we start each chapter and the assignments will be due 8 days later. You should assume we are going to have regular homework assignments and look on Achieve for them.

The homework questions will be assigned at random from a pool of questions so if students wish to work together, they may still get different questions. Because of this, I am assigning the homework as “full collaboration”. That phrase means that you may work with your classmates, friends, tutors, or anyone else to complete the homework. You may work alone if you wish, but no penalty will be given to those who work together. This policy does not mean that you should copy someone else’s homework; that is not allowed and will be viewed as cheating. You must make an honest effort to complete the homework and understand the answers. One good method to know if you understand the answers is to ask yourself if you can reproduce your homework if you needed to repeat the assignment alone. If you can reproduce your homework, you have some level of understanding of it. Homework is an excellent vehicle for learning class material, take advantage of this opportunity and you will do well on the exams.

The instructions and due date for each assignment will be clearly listed on each assignment. You will be allowed to redo each question as many times as you need, but there is a 5% penalty for each wrong answer. No late homework will be graded nor will extensions be given without University approved reason. If you anticipate not being able to complete an assignment by the due date, please reach out to us for further discussion.

**Final Exam**
The final exam will be comprehensive over the whole semester. The date and time of the final exam will be announced by the registrar during the semester.

**Suggested Problems**
The Achieve problems are an excellent starting point to learning the material, but to excel in this course you need to work on problems in the book too. These problems are not collected or graded, but it is clear from how students do on the exams who did them and who did not do them.

I strongly encourage you to work the problems at the end of each chapter as we finish discussing the chapter in class. These problems are broken up into different topics; you should attempt a few of the problems from each topic until you are comfortable that you understand it. At the end of the syllabus I list suggested problems to work on.

A poor, but common way, to do the book problems to look at the problem and answer key. Many students will look at a problem in the book, write nothing down, and then look at the answer key. Is this how I will test you? Will I ask you a question, give you the answer, and then ask you if the answer is correct? The best way to do the book problems is to look at the problem, write down your best answer, and then look at the answer key. It is O.K. to struggle with the material, that is how you learn! You are expected to not know all of the answers immediately, you will learn quite a bit by determining the correct answer without the answer key.

**Grading**
This course will be graded on an absolute scale based on hourly exams, homework, and a final exam. At the end of the semester I will calculate your score out of 100% and assign grades as shown below. I will not raise these standards.

A+: 100-97
A:  96.99-82
A-: 81.99-78
B+: 77.99-72
B:  71.99-67
B-: 66.99-61
C+: 60.99-57
C:  56.99-51
C-: 50.99-47
D+: 46.99-45
D:  44.99-42
D- 41.99-40.01
F:  40-0

You will be graded on the three hourly exams, homework, and a final exam. Your final grade will be calculated as follows.

Three hourly exams: 51%
Achieve homework: 19%
Final exam: 30%

Your test scores will be posted on ICON.

**Regrades**
If you feel that your test has been graded unfairly you can ask for a regrade. Write the reason for your regrade on the front of the test and submit it to the chemistry center after class within one week after the exam was available to be returned. The whole exam may be regraded. Regrades are not possible on tests written in pencil or erasable ink.

**Supplemental Instruction**
There will be supplemental instruction for this course. The SI leader is an undergraduate who took organic chemistry and did excellent. She will hold weekly sessions to help you better learn organic chemistry. SI has worked well in the past and helped many students, if you are struggling, they are an additional resource.

The SI instructor is Lena Volfson and her sessions will start on week two. Two sessions will be in person at the Academic Resource Center (ARC). It is on the ground floor of the IMU next to the Hills bank. One session will be virtual and here is the link:
https://apps.its.uiowa.edu/swipe2/site/arc/signin/virtual/orgchem1

Mondays: 6:30-7:20 PM (in person)
Tuesdays: 1:00-1:50 PM (virtual)
Thursdays: 3:00-3:50 PM (in person)

**Cheating**
Our scientific environment is maintained through the actions of its members and the trust we place in one another. Scientists are expected to remain honest in their words and actions. When this trust is broken the results are often severe and career threatening. One should not cheat on
the false assumptions that 1) no one is harmed if no one is aware of the cheating or 2) it is alright to cheat if you aren’t caught. A good scientist will hold themselves to a higher standard where cheating, even if it isn’t discovered, is wrong.

With this important responsibility comes the privilege of being a member of a community that values openness and truth. As you are all scientists in training we will expect you to act accordingly and with an upright manner. Anyone caught cheating will flunk and will be reported to the administration.

Discussion Sections
The TAs will run the discussion sections. These times are reserved for you to work problems with the TAs and to ask questions. The TAs are an excellent resource and can help you to understand the important points in each chapter. I urge you to attend the discussion sections and to work with the TAs to improve your understanding of the material.

If you cannot attend your discussion section, feel free to attend a different one.

Make-up Exams
Make-up exams will be given under exceptional circumstances only. Under no circumstances will a make-up be given to take the place of a regular exam taken earlier. To sign up for a make-up exam, email the chemistry center with the reason for your absence.

Course Objective
Organic chemistry books are written such that someone can earn money from their sale, to sell a book it must cover more material than is reasonable for a one year course. We will try to cover as much of the book as possible without going too fast. We will cover Chapters 1-13.

Required Textbook

Optional Materials
A "Student Study Guide/Solutions Manual" for the textbook is also available which contains answers to the problems in the text. The bookstore offers model kits and I strongly suggest purchasing one. It will greatly help you to “see” organic molecules in three-dimensions.

Suggested Textbook
David R. Klein, Organic Chemistry 1 as a second language, 2nd edition, John Wiley and Sons. This book is an excellent vehicle to help you learn organic chemistry and would be wise to purchase.

Attendance at Lecture
Attendance is not mandatory but encouraged. We may introduce material outside of the book, you are responsible for learning that material as it may appear on an exam.

Disabilities
I would like to hear from anyone who has a disability which may require some modification of seating, testing, or other class requirements so that appropriate arrangements may be made. Please contact me during office hours.
ADMINISTRATIVE INFORMATION from CLAS:

DROP-ADD SLIPS: For information on making any changes in registration, please visit the Office of the Registrar’s site listed below:
https://registrar.uiowa.edu/changes-registration

COURSE INFORMATION: Inquiries about details of the course (e.g. extra copies of the syllabus, exam times and places, times and places of discussion sessions, etc.) should be taken to the Chemistry Center (chemistry-center@uiowa.edu).

DROP DATES: Deadline Date: September 03, 2021: last day to drop a course without a W.
Deadline Date: November 01, 2021: Last day to drop without Dean's approval.

DEPARTMENTAL HOME: Department of Chemistry

DEPARTMENTAL CONTACT INFORMATION: Len MacGillivray, DEO, E331 CB; Lindsay Elliott, Secretary to the Chair, E331 CB, 319-335-0200.

ADMINISTRATIVE HOME
The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at http://clas.uiowa.edu/students/handbook.

ATTENDANCE AND CLASSROOM EXPECTATIONS
Students are responsible for attending class and for knowing an instructor’s attendance policies, which vary by course and content area. All students are expected to attend class and to contribute to its learning environment in part by complying with University policies and directives regarding appropriate classroom behavior or other matters.

ABSENCES
Students are responsible for communicating with instructors as soon they know that an absence might occur or as soon as possible in the case of an illness or an unavoidable circumstance. Students can use the CLAS absence form to help communicate with instructors who will decide if the absence is excused or unexcused; the form is located on ICON within the top banner under “Student Tools.” Delays by students in communication with an instructor could result in a forfeiture of what otherwise might be an excused absence (https://clas.uiowa.edu/students/handbook/attendance-absences).

ABSENCES: ILLNESS, UNAVOIDABLE CIRCUMSTANCES, AND UNIVERSITY SPONSORED ACTIVITIES
Students who are ill, in an unavoidable circumstance affecting academic work, or who miss class because of a University sponsored activity are allowed by UI policy to make up a missed exam. Documentation is required by the instructor except in the case of a brief illness. Students are responsible for communicating with instructors as soon as the absence is known (https://opsmanual.uiowa.edu/students/absences-class#8.1).

ABSENCES: HOLY DAYS
Reasonable accommodations are allowed for students whose religious holy days coincide with their classroom assignments, tests, and attendance if the student notifies the instructor in writing of any such religious Holy Day conflicts within the first days of the semester and no later than the third week. (See the UI Operations Manual, https://opsmanual.uiowa.edu/students/absences-class#8.2).
ABSENCES: MILITARY SERVICE OBLIGATIONS
Students absent from class due to U.S. veteran or U.S. military service obligations (including military service-related medical appointments, military orders, and National Guard Service obligations) must be excused without penalty. Instructors must make reasonable accommodations to allow students to make-up exams or other work. Students must communicate with their instructors about the expected possibility of missing class as soon as possible. (For more information, see https://opsmanual.uiowa.edu/iv-8-absences-class%C2%A0-0).

ACADEMIC INTEGRITY
All undergraduates enrolled in courses offered by CLAS have in essence agreed to the College's Code of Academic Honesty. Academic misconduct affects a student's related grade and is reported to the College which applies an additional sanction including suspension. Outcomes about misconduct are communicated through UI email (https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code).

ACCOMMODATIONS FOR DISABILITIES
UI is committed to an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as a mental health, attention, learning, vision, and a physical or health-related condition) by registering with Student Disability Services (SDS). The student is then responsible for discussing specific accommodations with the instructor. More information is at https://sds.studentlife.uiowa.edu/.

CLASS RECORDINGS: PRIVACY AND SHARING
Some sessions of a course could be recorded or live-streamed. Such a recording or streaming will only be available to students registered for the course. These recordings are the intellectual property of the faculty, and they may not be shared or reproduced without the explicit written consent of the faculty member. Students may not share these sessions with those who are not enrolled in the course; likewise, students may not upload recordings to any other online environment. Doing so is a breach of the Code of Student Conduct and in some cases is a violation of the Federal Education Rights and Privacy Act (FERPA).

COMMUNICATION AND THE REQUIRED USE OF UI EMAIL
Students are responsible for official correspondences sent to the UI email address (uiowa.edu) and must use this address for all communication within or with UI (Operations Manual, III.15.2).

COMPLAINTS ABOUT ACADEMIC MATTERS
Students with a complaint about a grade or a related academic issue should first visit with the instructor and then with the course supervisor (if one is assigned), and next with the Chair of the department or program offering the course. If not resolved, students may bring their concerns to the College of Liberal Arts and Sciences: https://clas.uiowa.edu/students/handbook/student-rights-responsibilities.

FINAL EXAMINATION POLICIES
The final exam schedule is published during the fifth week of the fall and spring semesters or on the first day of summer classes; students are responsible for knowing the date, time, and place of their final exams. Students should not make travel plans until knowing this information. A student with exams scheduled on the same day and time or who have more than two final exams on the same day should visit this page for how to resolve these problems by the given deadline: https://registrar.uiowa.edu/makeup-final-examination-policies. No exams may be scheduled the week before finals; some exception, however, have been made for labs,
language courses, and off-cycle courses (https://registrar.uiowa.edu/final-examination-scheduling-policies).

FREE SPEECH AND EXPRESSION
The University of Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We are committed to open inquiry, vigorous debate, and creative expression inside and outside of the classroom. Visit Free Speech at Iowa for more information on the University’s policies on free speech and academic freedom (https://freespeech.uiowa.edu/).

NONDISCRIMINATION IN THE CLASSROOM
The University of Iowa is committed to making the classroom a respectful and inclusive space for people of all gender, sexual, racial, religious, and other identities. Toward this goal, students are invited in MyUI to optionally share the names and pronouns they would like their instructors and advisors to use to address them. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University’s Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity (https://diversity.uiowa.edu/eod; +1 319 335-0705 or diversity.uiowa.edu).

Respect for Diversity: It is our intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender, sexual orientation, disability, age, socioeconomic status, ethnicity, race, culture, perspective, and other background characteristics. Your suggestions about how to improve the value of diversity in this course are encouraged and appreciated. Please let us know ways to improve the effectiveness of the course for you personally or for other students or student groups.

In addition, in scheduling exams, the University has attempted to avoid conflicts with major religious holidays. If, however, exams or major deadlines have been scheduled in such a way that creates a conflict with your religious observances, please let us know as soon as possible so that we can make other arrangements.

SEXUAL HARASSMENT
Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, please see https://osmrc.uiowa.edu/.

MENTAL HEALTH
As a student you may experience a range of issues that can cause barriers to learning. These might include strained relationships, anxiety, high levels of stress, alcohol/drug problems, feeling down, or loss of motivation. University Counseling Services is here to help with these or other issues you may experience. You can learn about the free, confidential mental health services available on campus by calling 319-335-7294 or visiting https://counseling.uiowa.edu/. Help is always available.

Students are always welcome to reach out to us, but please note that the instructors and TA’s are mandatory reporters. If a student does not wish to disclose information to us, but is still in need to help, we highly recommend University Counseling Services as a confidential source of aid.
Dear all,

I know that organic chemistry is not an easy class and it will get harder as the semester progresses. Learning how to study is very important as this course may be very different from what you have taken before.

Two years ago I asked some of the top students in Organic Chemistry for Majors what they did to prepare for the exams. I hope their responses help provide motivation/insight/suggestions that you need for success too. Their unedited comments are below.

You can learn this material. It may not be easy for most of you, but you can do it. It requires time, effort, practice, and an engaged brain.

Best, Ned

**Student 1**

To study for the exams, I make sure I am prepared by watching every lecture AND taking notes on the print outs as I watch. Doing the homeworks is good preparation as well. I do most of it/all that I can individually, but then I meet and study with a group in order to get help and help others. Working in a group is really helpful. I also take the practice exams before each actual exam along with looking over my notes several times.

**Student 2**

The homework is the most helpful thing for me - it forces me to sit down and review the concepts each chapter covers. I try to start the homework about a week before it is due so I am not rushed through it. I also have a group that gets together to work through the problem sets about twice each week. Within the whole group, at least one of us usually has a good idea of the correct answer for challenging problems. We disagree frequently on how to approach a problem, but that's good because it forces us to analyze the material more closely. Working on homework in a group has been a major part of being able to learn these concepts.

I also make sure to watch each lecture online and take notes on the provided slides as well. Watching the lectures online before lecture makes working problems during lecture time more beneficial because I actually have an idea of what is going on.

Before the second exam I read chapter 7 of Jones/Fleming. I also skimmed through each practice problem in the book to get an idea of what I should be able to do for the test. I did not work out every single one, but I worked out the ones that dealt with concepts I found more difficult. Taking the practice exam was helpful as well - it gave me an idea of what I needed to spend more time on and helped to guide my studying.

The day before the exam I went through all of the notes from online lectures and from lectures in Van Allen and noted anything I was confused by. I then went over that material plus the material from exam 1 (briefly) to complete my preparation for exam 2.

**Student 3**

I always try to watch the online lectures before class so I know what's going on with the practice problems in class. For the Sn2, E2, etc chapter in particular, I made sure to start the homework early and do little chunks each night. The biggest thing I did that was helpful was to make charts.
or study guides summarizing the general trends, and make notes about things I tended to mess up so I don't do it again. I also study in a group a lot.

**Student 4**

What works for organic chemistry is exactly what you recommended at the beginning of the semester: listen to the lectures before class, make sure to understand the problems from class, do the homework before the night before it is due to really understand it, go over the practice exam, go through the problems in the back of the book, and come into office hours with any questions. I try to make sure that I understand the concepts behind the problems, and not just look at the answer to the question. The "Organic Chemistry as a Second Language" book also really helped me understand the different kinds of reactions for this exam. Another thing that really helps me is going over my homework after it is graded so that I understand the types of mistakes that I make so I know what to watch out for on the exam.

**Student 5**

I usually read the chapters in the book before we discuss them in class, so I have a solid background with which to approach class problems. I pay special attention to the "worked problems" in the book and try to understand how the writers are approaching these problems and coming to the answers. When we have problems in class that I can't solve, I try to go back after class to figure out what I was doing wrong and how I should have approached the problem.

Practice problems. Lots and lots of practice problems. I also went back and listened to the online lectures for Chapter 7, since that was the most difficult chapter on this test for me.
Suggested Problems

Chapter 1: 1-25, 26, 29, 31, 32, 33, 35, 39, 40, 41, 42, 43, 45, 46, 48, 50, 52, 53, 56, 57, 59
Chapter 3: 1-32, 34, 36, 40, 43, 44, 45, 46, 49, 50, 51
Chapter 4: 1-33, 34, 35, 37, 39, 41, 42, 44, 45, 46, 49, 51, 54, 55, 58
Chapter 5: 1-24, 26, 30, 33, 34, 35, 36, 39,
Chapter 6: 1-29, 31, 33, 34, 37, 40, 41, 42, 45, 47, 51, 53, 54, 56, 58
Chapter 7: 1-39, 41, 42, 46, 47, 49, 52, 54, 55, 58, 61, 62, 64, 66, 69, 72, 74, 75
Chapter 8: 1-45, 46, 47, 49, 52, 54, 56, 58, 60, 61, 63, 64, 67, 68, 71, 76, 78
Chapter 9: 1-25, 26 (a few of these), 30, 32, 33, 36, 37, 38, 41, 43
Chapter 10: 1-29, 32, 33, 35, 36, 38, 40, 42, 46, 48, 49, 50, 51, 54, 58, 60
Chapter 11: 1-38, 39, 42, 43, 45, 47, 49, 51, 52, 53, 55, 58, 60, 63, 65, 66
Chapter 12: 1-11, 12, 14, 15, 16, 18, 19, 20, 22, 23, 24, 25, 27, 30
Chapter 13: 1-32, 33, 34, 35, 38, 40, 42, 44, 45, 47, 48, 49, 53, 54